Article

Socio-economic condition of fish farmers of Jhikargachha upazila in Jessore district, Bangladesh

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Abstract: The present study was conducted to assess the livelihood status of fish farmers and socioeconomic condition in the Jhikargachha upazila, Jessore, Bangladesh. Data were collected from 50 fish farmers for a period of six months from June 2016 to November 2016. The study indicated that 38% of the farmers were in age structure of 50-60 years, 44 farmers (88%) were Muslims and others Hindu (12%). About 82% farmers had a primary occupation of agriculture and others were involved in business (8%), service (4%) and politics (4%). It was found that, 66% farmers had joint family and others lived in separated family (34%). Majority (44 farmers) respondents had concrete house and rest of (6 farmers) had semi-concrete house. Almost (44%) farmers used concrete toilet and rest of farmers used semi-concrete (56%). All the respondents used to drink tube well water for drinking and other household works. Out of 50 fish farmers, 4% had no education (illiterate), 36% had primary education, 42% secondary level (Up to X), 10% S.S.C., 4% H.S.C. and 4% bachelor level of education. In the study area, 32% of the farmers had ponds of 34-66 dec, 28% had pond of 15-33 dec, 14% had ponds of up to 100 dec, 22% had ponds of 101-330 dec and 4% had ponds of 330-above dec. It was found that, 62% farmers had training on fish farming and rest 38% farmers had no training on fish farming. Among 50 farmers 64% farmers were found used to invest their own credit and rest 36% farmers took loan from bank, NGO, money lender and broker agency. Most of the farmers were interested to stock rui, catla and mrigal and other species. In the study area, cow dung was used by 50 (100%) of farmers, 47 farmers used urea, 40 farmers used TSP and 34 farmers used MoP. It was found that, 40% farmers produced fish between 1001 kg – 2000 kg/year and 17 (34%) farmers produced 3001 kg-above/year. The highest income was 3,30,75,000Tk/Year and the lowest income from a pond was 20000 Tk/Year. In the study area, every farmer had at least one mobile phone. Almost 96% farmers were used to go MBBS doctor and only 4% to homeopathic treatment.

Keywords: socio-economic study; fish farmer; Jhikargachha upazila; Jessore

1. Introduction

As a member of south Asian country, Bangladesh is an agrarian, highly populated developing country and the nation striving hard for rapid development of its economy. Critics showed that the future economic and social advancement of the country is highly depends on the agricultural sectors and plays a vital role in the socio-economic blossoming of rural area, carry out the animal protein demand, creating new employment opportunity, eradication of poverty and earning foreign exchange for the national economy. About 2.7 million people are directly employed in this sector and another 17.80 million people indirectly earn their livelihood indirectly involving activities related to fisheries (DoF, 2015). At present fisheries and aquaculture contributes 3.69% to

Asian J. Med. Biol. Res. **2017**, 3 (4)

463

national GDP and 2.01% to foreign exchange earnings through export (Export Promotion Bureau, 2014). Fisheries sectors contributed to agricultural GDP as 23.12% (Bangladesh Economic Review, 2015). In fish production was 3,68,4894 MT in 2014-15 fiscal years. Fish also contributed about 60% to the nation's animal protein intake during 2013-14. At present annual fish intake by an individual is 19.34 kg and the annual fish demand is 3.09 million metric tons (DoF, 2015). So malnutrition problem can be reduced by increasing the production of fish. Fisheries sector creates 1.4 million full time employments and nearly 11 million part time employments (Haque *et al*, 1991). A large portion of rural family members are engaged in part time fishing from the beels (Hughes *et al.*, 1994). It creates diverse livelihood opportunities for a number of people, many of whom living below the poverty level, in the form farmers, operators, employees, traders, intermediaries, day laborers and transporters (Ahmed and Rahman 2005). Pond fish farming has been proved to be a profitable business than rice cultivation. So many farmers in rural areas are converting their rice field into aquaculture pond (Islam *et al*., 2002). Many pond fish farmers in rural areas have taken fish farming activities as their secondary occupation and most of the people involved in fish farming improved their socioeconomic condition through pond fish farming activities (Ara, 2005). Bangladesh has got a large number of ponds scattered all over in the country. There are 47, 08,193 ha water bodies of which 3, 77,968 ha ponds are suitable for fish culture (BBS, 2014 and DoF, 2015). It has been estimated that about 1.28 million people are directly related to fishing activities (Mahfuj *et al*., 2012). For sustainable rural development and poverty elimination, different approaches have been adopted and the "Sustainable Livelihood Approach" has been gradually expanded with its own core and principles for poverty focused development activities (DFID, 1998). A sustainable livelihood approach is a way of thinking about the objectives, scope and priorities for development. Considering the financial hardship and other complexities of the rural fish farmers, it is important to analyze their livelihood status. In near present years further improvement in pond aquaculture has gained due to application of technique by introducing scientific strategies of pond preparation (liming, repair dam), species selection, stocking density, feed application, fertilizers, water exchange and proper management. This scientific knowledge is gain by the fish farmer in upazila fisheries office and local NGOs. In the recent year fish farming activities are gradually increase in Jhikargachha upazila. Most of the farmer followed two types of culture technique are characterized by extensive (traditional) and improved traditional (semi-intensive) system. The present study was planned to know the status of fish culture in ponds of the study area. Therefore, the present study was done with the objectives to investigate the fish culture strategy and management in some selected area of Jhikargachha upazila under Jessore district and to know the socio-economic condition of involved fish farmer.

2. Materials and Methods

2.1. Study area and periods

The study was conducted in some selected areas of Jhikargachha upazila during June to November, 2016 by using survey and frequent interview method. Fifty fishermen of the area were interviewed during the survey. The study was carried out in the five unions named Navaran, Nirbashkhola, Hazaribagh, Shankarpur and Bankra (Figure 1).

Figure 1. Map of Jhikargachhaupazila showing the study area.

Asian J. Med. Biol. Res. **2017**, 3 (4)

464

2.2. Target group
Total 50 farmers from five unions (10 farmers from each union) in Jhikargachha upazila were selected purposively.

2.3. Data collection
2.3.1. Primary sources
The questionnaire interviews were the primary sources of acquired data. Interviews were conducted at the pond sites and home in the selected area. At the time of interview, the physical conditions of the ponds and the fish cultivation methods like pond repairing, application of food and fertilizers, harvesting, etc. were observed for well understanding the fish production technology in the study area. Time required for each interview was about an hour to one and half hour.

2.3.2. Secondary sources
The secondary sources of data were central library, Bangladesh Agricultural University, Mymensingh; different websites and journals; Upazila Fisheries Office, Jhikargachha and District Fisheries Office, Jessore.

2.4. Data processing and analysis
After collection of data from the field, data were verified to eliminate errors and inconsistencies. Then the data were tabulated carefully. The qualitative data were categorized and analyzed mainly based on descriptive statistical analysis using MS excel.

3. Results
3.1. Age structure of fish farmers in Jhikargachha, Jessore
In the study area, majority of fish farmers (38%) were 50-60 years old. On the other hand, 30% respondents were less than 40 years old and 32% respondents were 40-50 years old (Table 1).

Table 1. Age of the fish farmers in Jhikargachhaupazila, Jessore.

Age group (years)	No. of respondents	Respondents (%)
30-40	15	30
41-50	16	32
51-60	19	38
Total	**50**	**100**

3.2. Religion status
It was recorded that 44 (88%) farmers were Muslim and 6 (12%) farmers were Hindu (Figure 2).
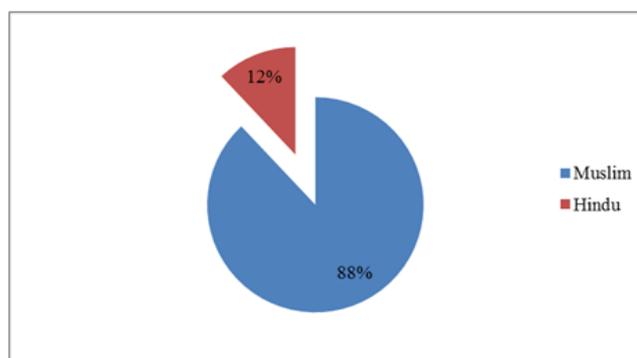
Figure 2. Religion status of fish farmer in Jhikargachha upazila, Jessore.

3.3. Primary occupation of fish farmers
According to the survey, the fish farmers were found to be involved in activities such as agriculture (82%), business (8%), service (4%) and politics (4%) and rest (2%) as daily labor work (Figure 3).

Asian J. Med. Biol. Res. **2017**, 3 (4)

465
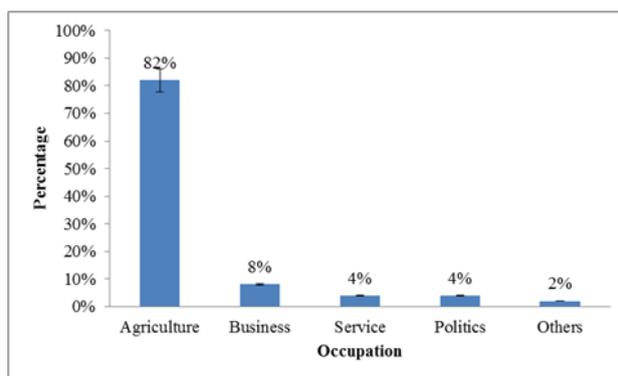
Figure 3. Primary occupation of fish farmers.

3.4. Family type
It was found that 66% fish farmers lived in joint families and 34% lived with separated families (Table 2).

Table 2. Family type of fish farmers in Jhikargachha upazila, Jessore.

Family type	No. of respondents	Respondents (%)
Joint	33	66
Separated	17	34
Total	**50**	**100**

3.5. Family member
It was found that around 13 (26%) families had four members, 9 (18%) families had five members, 16 (32%) families had six members and 12 (24%) families had seven or more members in their family in the study area (Figure 4).

Figure 4. Family member percentage of fish farmers.

3.6. Housing condition of fish farmers
Majority respondents around 44 (88%) had concrete house (Concrete wall with concrete roof) and rest of 6 (12%) respondents had semi-concrete (Concrete wall and tin shed roof) house (Figure 5).
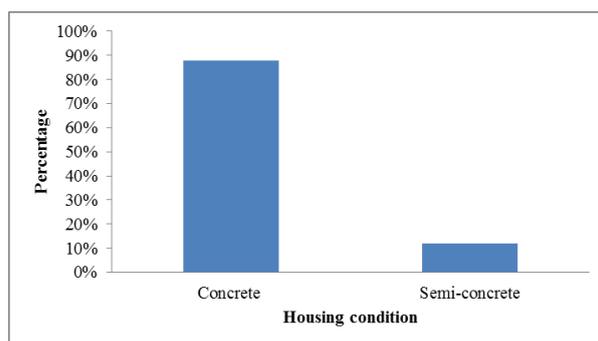
Figure 5. Housing status of pond fish farmers in the study area.

Asian J. Med. Biol. Res. **2017**, 3 (4)

466

3.7. Sanitation facilities
In the study area it was found that 100% farmer had a good sanitation facility. Almost 22 (44%) farmers used concrete (concrete platform) toilet and rest of 28 (56%) farmers used semi- concrete (concrete platform with tin shed) toilet (Figure 6).
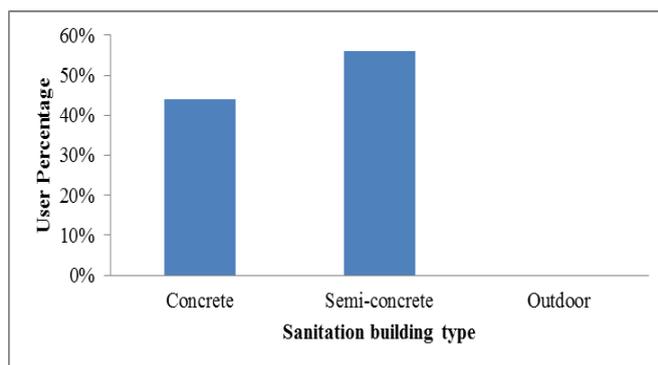
Figure 6. Sanitation facilities of farmer in Jhikargachha upazila, Jessore.

3.8. Drinking water sources
All the 50 respondents (100%) were used to drink tube well water and other household work. Every farmer had at least one tube well in the house premises (Table 3).

Table 3. Drinking water source of farmer in Jhikargachha upazila, Jessore.

Water source	No. of respondents	Respondents (%)
Tube well	50	100
Other	0	0
Total	**50**	**100**

3.9. Educational status of fish farmers
There were six categories used to determine the level of education. Out of 50 fish farmers, 4% had no education (illiterate), 36% had primary level, 42% had secondary level (up to X), 10% had S.S.C. level, 4% had H.S.C. level and 4% had bachelor level of education (Figure 7).
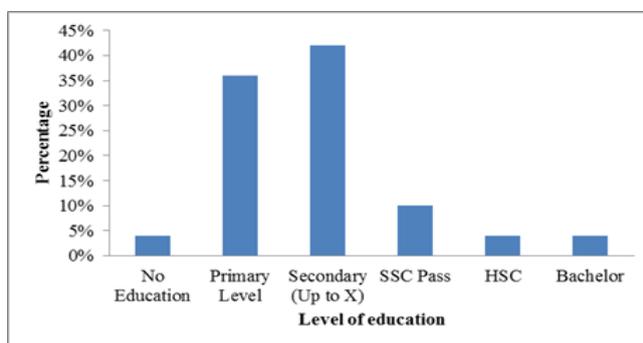
Figure 7. Educational status of fish farmers in Jhikargachha upazila.

3.10. Farmer's children education status
In the study area, 9 (18%) farmer's children had primary education, 33 (66%) farmer's children had secondary level, 6 (12%) farmer's children had higher secondary level and rest 2 (4%) farmer's children had bachelor level of education (Figure 8).

Asian J. Med. Biol. Res. **2017**, 3 (4)

467
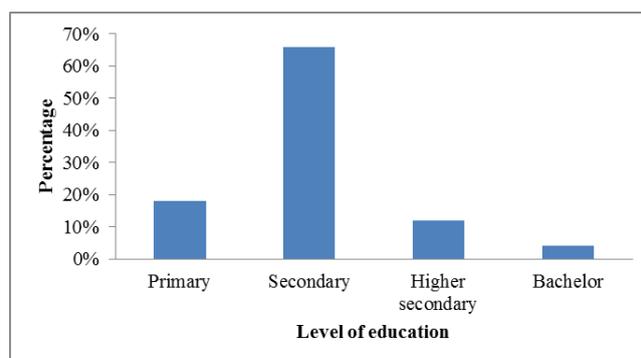
Figure 8. Farmer's children education status in Jhikargachha upazila, Jessore.

3.11. Size of the pond of fish farmers
Among the 50 farmer, most of them (32%) had ponds with size of 34-66 dec. On the other hand, 14 (28%) farmers had 15-33 dec. ponds, 14% had up to 100 dec., 22% had 101-330 dec. and 4% had 330-above decimal ponds (Table 4).

Table 4. Pond area of farmer in Jhikargachha upazila, Jessore.

Pond size (decimal)	No. of respondents	Respondents (%)
15-33	14	28
34-66	16	32
67-100	7	14
101-330	11	22
331-Above	2	4
Total	**50**	**100**

3.12. Training of fish farmers
In the study areas, all the selected farmers (Table 5) received training on fish poly culture from the local NGO named BRAC, ASA and ANSER; government organization like Department of Fisheries (DoF) and Upazila Fisheries officer (UFO). It was found that 31 (62%) farmers had training on fish farming and rest 19 (38%) farmers had no training on fish farming (Table 5).

Table 5. Receiving of training of fish farmers in Jhikargachha upazila, Jessore.

Training receive	No. of respondents	Respondents (%)
Yes	31	62
No	19	38
Total	**50**	**100**

3.13. Finance source
It was found that 32 (64%) farmers used to invest their own credit. And rest of 18 (36%) farmers used money taken from bank, NGO, money lender and broker agency as a loan. The overall interest percentage of money in Jhikargachha upazila was 7% (Figure 9).
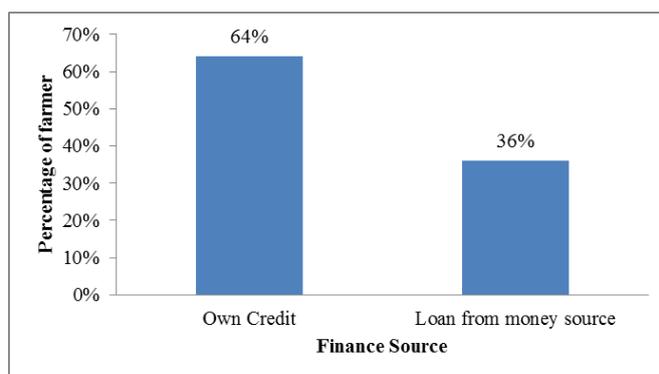
Figure 9. Finance source of farmer.

3.14. Fish stocked by farmers

Among 50 farmers, most of the farmers stocked and cultured rui (*Labeo rohita*), catla (*Catla catla*) and mrigal (*Cirrhinus cirrhosus*). The other species like bata (*Labeo bata*) was stocked by 43 farmers, silver carp (*Hypophthalmichthys molitrix*) was stocked by 44 farmers, grass Carp (*Ctenopharyngodon idella*) was stocked by 30 farmers, common carp (*Cyprinus carpio*) was stocked by 34 farmers, pangus (*Pangasius hypophthalmus*) was stocked by 25 farmers, mirror Carp (*Cyprinus carpio*) was stocked by 39 farmers, Tilapia (*Oreochromis niloticus*) was stocked by 32 farmers, monosex-tilapia was stocked by 1 farmer, scale carp (*Cyprinus carpio*) was stocked by 2 farmers, sarpunti (*Puntius gonionotus*) was stocked by 1 farmer, Bighead (*Hypophthalmichthys nobilis*) was stocked by 22 farmers and tengra (*Mystus tengara*) was stocked by 10 farmers in farm ponds (Figure 10).
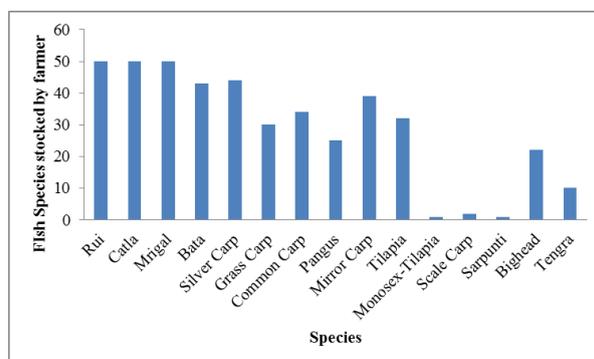
Figure 10. Fish Species stocked and cultured in Jhikargachha upazila, Jessore.

3.15. Feed types preferred by farmers

It was found that 72% (36) of the farmers applied supplementary and homemade feed prepared with rice-bran and mustard oil cake and 28% (14) farmers used company made commercial feed (Figure 11).
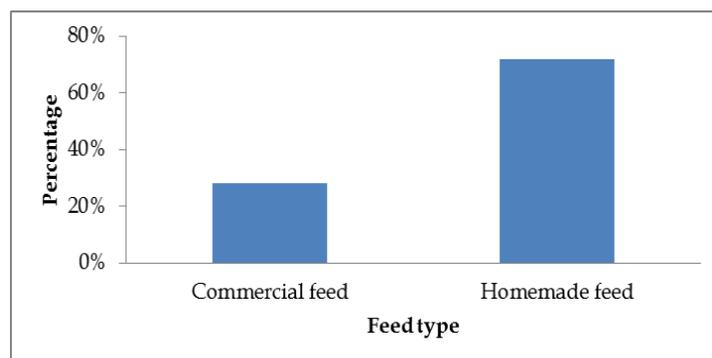
Figure 11. Feed preferred by fish farmers in Jhikargachha upazila, Jessore.

Asian J. Med. Biol. Res. **2017**, 3 (4)

469

3.16. Fertilizer used in fish farming

In the study area, cowdung was used by 50 (100%) farmers. Urea was used by 47 farmers, TSP (Triple super phosphate) was used by 40 farmers and MoP (Murate of Potash) was used by 34 farmers (Figure 12).
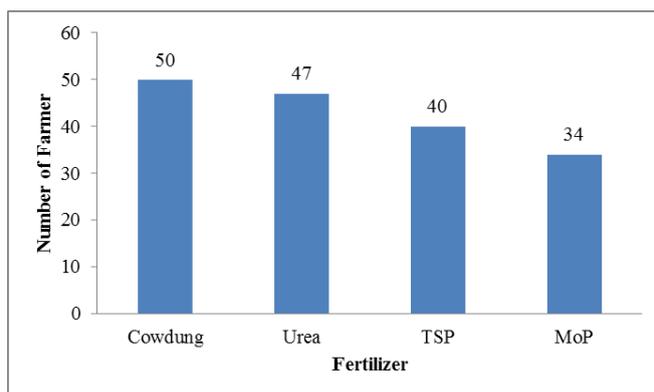
Figure 12. Fertilizer used by farmers.

3.17. Grow out time of fish allowed by farmer

During the interview periods every farmer responds that, they allowed to grow fish in their pond was to 6 month or more.

3.18. Production of Fish

Fish production was continuously increasing in the surveyed area because of gaining knowledge on fish culture. The highest production was measured as 27000 kg/year and the lowest production was 650 kg/year. It was found that there were 4 (8%) farmers produced 600 kg – 1000 kg/year, 20 (40%) farmers produced 1001 kg – 2000 kg/year, 9 (18%) farmers produced 2001 kg – 3000 kg/year, and 17 (34%) farmers produced 3001 kg - above/year in the study area (Table 6).

Table 6. Average fish production of 30 ponds in Jhikargachha upazila, Jessore.

Average production (kg/year)	No. of respondents	Respondents (%)
600 - 1000	4	8
1001 - 2000	20	40
2001 - 3000	9	18
3001 - Above	17	34

3.19. Annual income

The highest income was 33075000 Tk/year and the lowest income from a pond was 20000 Tk/year. Among 50 farmers, almost 28 (56%) farmers got their annual income as 100001 Tk to 500000 Tk and 5 (10%) farmers got their annual income as 500001 Tk to 1000000 (Figure 13).
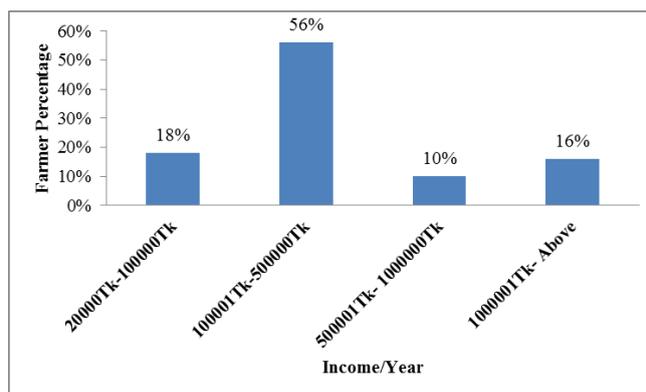
Figure 13. Annual income pattern of 50 pond farmers under four culture systems.

Asian J. Med. Biol. Res. **2017**, 3 (4)

470

3.20. Public or private bank account status of farmer

It was found that every farmer had at least one bank account. Some farmers had more than one account. In rural area BKash, Dutch-Bangla Bank, MCash, OK cash and other mobile banking were too much popular for any amount of transaction.

3.21. Mobile phone used by farmers

In the study area, it was found that every farmer had at least one mobile phone. Some farmer had more than one. They usually consulted with feed dealers, fertilizer dealers, NGO workers, technical service providers along with government official through mobile phone.

3.22. Health status of farmers and their family

It was found that 48(96%) farmers were used to go MBBS doctor or allopathic treatment and only 2 (4%) farmers were used to go to homeopathic treatment (Figure 14).
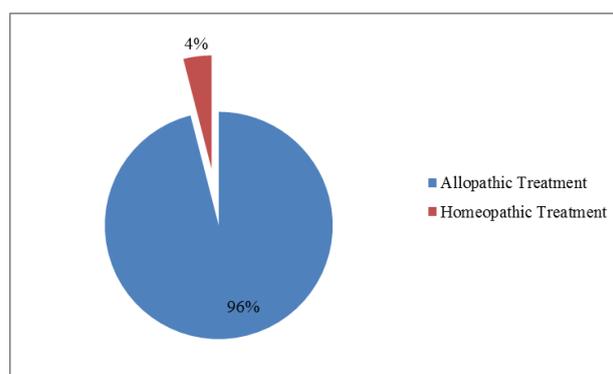
Figure 14. Health treatment status of farmers.

3.23. Problems faced by the fish farmers

A number of constraints and risks were reported by the farmers. Every farmer responds these problems. These problems are diseases; lack of proper management; theft; lack of quality fish fry; cheating of fry traders and multiple ownerships of ponds.

4. Discussion

The present study observed that, the highest number of fish farmer's age were 50 to 60 year (38%) and lowest age (30%) were 30-40 years. Khatun *et al.* (2013) reported that the age group of 36-50 years was the highest (46%) and 51-65 years were the lowest (26%) considering all fish farmers. This result is more or less relevant to the present study. Rana (1996) found in his study in Sirajgonj district that 70% of pond farmers were in 18-45 years. Ali *et al.* (2009) found that most of the fish farmers (50%) belonged to age group of 31 to 40 years in Mymensingh district. The more or less relevant study were conducted by Islam *et al.* (2017); Rahman *et al.* (2017); Hossain *et al.* (2015); Asif *et al.* (2015); Islam *et al.* (2014); Hossain *et al.* (2016); Sharif *et al.* (2015); Islam *et al.* (2015); Ali *et al.* (2016); Rahaman *et al.* (2015); Sharif *et al.* (2016) and Ahsan *et al.* (2016). Present study observed that, 44 (88%) farmers were Muslims and 6 (12%) farmers were Hindu in the present study. Khatun *et al.* (2013) mentioned, 82% of fish farmers were Muslims and 18% were Hindus. Islam (2012) observed that all the fish farmers (100%) were Muslims which has similarity with the present study. Ali *et al.* (2008) was found that maximum fish farmers were Muslims (94%) while small proportions (6%) were hindus in some selected areas of Bagmara upazilla under Rajshahi district. Islam *et al.* (2015) investigated in Sundarban region 62% was muslim and 38% was Hindu. The more or less relevant study was conducted by Islam *et al.* (2017); Zaman *et al.* (2017); Hossain *et al.* (2015); Asif *et al.* (2015); Islam *et al.* (2014); Hossain *et al.* (2016); Sharif *et al.* (2015); Ali *et al.* (2016); Rahaman *et al.* (2015); Sharif *et al.* (2016) and Ahsan *et al.* (2016). Present study observed that aquaculture was not the primary occupation of most of the fish farmers. Only 82% involved in agriculture, rest of farmers were involved with business (8%), service (4%), politics (4%) and rest of (2%) farmers involved with daily labor work. These studies are more or less similar with the study of Ahmed (2003); Biswas (2003); Islam *et al.* (2014); Islam *et al.* (2017); Hossain *et al.* (2015); Asif *et al.* (2015); Islam *et al.* (2014); Hossain *et al.* (2016); Sharif *et al.* (2015); Islam *et al.* (2015); Ali *et al.* (2016); Rahaman *et al.* (2015); Sharif *et al.* (2016); Zaman *et al.* (2017); Ahsan *et al.* (2016) and Sen and Roy (2015). In the study of

Asian J. Med. Biol. Res. **2017**, 3 (4)

471

Jhikargachha, Jessore it was found that 66% fish farmers lived in joint families and 34% lived in separated families. Provakar *et al.* (2013) found that about 54% of farmers lived in joint families and 46% in nuclear (seperated) families in Shahrasti upazila of Chandpur district. This result is not relevant to the present study. Ali *et al.* (2008) was found that about 28% farmers lived with joint families and 72% lived with nuclear families. Sharif *et al.* (2015); Ahsan *et al.* (2016) and Asif *et al.* (2015) stated the similar result with the present findings. It was found that around 13 (26%) families had four members in their family, 9 (18%) families had five members in their family, 16 (32%) families had six members in their family and 12 (24%) families had seven and more members. Hossain *et al.* (2015) found that 27% family had only 2-4 members. The highest 60% family has only 5-7 members. Halder (2002) recorded the largest family size (6.67 persons) was in Cast net fishermen and smallest family size (4.50 persons) was in hogra fishermen of Doba Beel. Most of the fish farmer (45%) belonged in 4 to 5 member's family in Mymensingh district (Ali *et al.* 2009). Average members in the household of the fishermen were found 3.60±1.34 by Islam *et al.* (2013) which has similarity with present findings. In present study, majority respondents 44 (88%) had concrete house (concrete wall with concrete roof) and rest of 6 respondents (12%) had semi-concrete (concrete wall and tin shed roof) house. Hossain *et al.* (2009) found that 40.3% of farmers' had house of earthen condition, 46.7% had semi-concrete and 10% had concrete house. However, at beel Chandpur, 36.67%, 56.67% and 6.67% farmer had earthen house, semi-concrete and concrete house respectively. Rahman (2003) reported that 70% of houses were earthen, while 21% were semi-concrete and only 9% were concrete. Islam *et al.* (2017); Islam *et al.* (2014), Asif *et al.* (2015), Islam *et al.* (2015) and Sharif *et al.* (2015) did the same study. All the study is more or less similar with the present study. It was found that almost 22 (44%) farmers used concrete (concreted platform) toilet and rest of 28 (56%) farmers used semi- concrete (Concrete platform with tin shed) toilet. Sharif *et al.* (2015) found that 5% concrete toilet, 50% has earthen toilet and 45% semi concrete toilet. Asif *et al.* (2015) investigated in Jessore that about 69% and 31% of fish farmers used semi-concrete and concrete toilet respectively. All these study are more or less similar with the present study. All the respondents 50 (100%) farmers used to drink tube well water and other household work. Hossain *et al.* (2015) found that 100% fishermen used tube-well water for drinking purpose. Sharif *et al.* (2015) described that about 97% fish farmers used tube well and rest 3% of the farmer uses pond water. This has more or less similarity with the present study. Education has a role in influencing yields through production decisions. Out of 50 fish farmers, 4% had no education (illiterate), 36% had primary level, 42% had secondary level (Up to X), 10% had S.S.C. pass level, 4% had H.S.C. level and 4% had bachelor level of education. Provakar *et al.* (2013) found in his study in Shahrasti upazila of Chandpur district that about 10% had no education while 16%, 48%, 16% and 10% had primary, secondary, higher secondary and bachelor level of education, respectively. 23.3% farmers were illiterate whereas 14.4%, 8.9% and 6.7% were educated up to primary, secondary and higher secondary or above level, respectively. This study also has similarity with the findings of Hossain *et al.* (2009), Islam *et al.* (2014), Hossain *et al.* (2015), Asif *et al.* (2015), Islam *et al.* (2015); Zaman *et al.* (2017) and Sharif *et al.* (2015). In the present study, 9 (18%) childrens of farmers had primary education, 33 (66%) had secondary level, 6 (12%) children had in higher secondary level and rest 2 (4%) children of farmers had bachelor level. Hossain *et al.* (2015) investigated in Rajshahi that 64% of fishermen were found to send their children to school whereas 36% did not send children for schooling. These results are similar with the present (Asif *et al.,* 2015 and Islam *et al.,* 2014). Among the 50 farmer most of them (32%) had the agricultural land (34-66 dec). On the other hand, 28% had (15-33 dec), 14% had up to 100 dec, 22% had (101-330 dec) and 4% had (330-above dec). Provakar *et al*. (2013) reported that the average pond size of the area was 0.24 ha (60 dec) in Shahrasti upazila of Chandpur district. This study is not similar to the present study. Khan (2012) revealed that the average pond size was 0.13 ha in Sreemongal upazila of Maulvibazar district which is not to similar to the present study. Islam (2011) reported that the average pond size was 0.16 ha with a range from 0.04 to 0.81 ha in some selected areas of Maulvibazar district. All the studies are more or less similar with the present study (Asif *et al.,* 2014). It was found that, 62% (31) farmer had training on fish farming and rest of 38% (19) farmer had no training on fish farming. Sarwer *et al.* (2016) said that 18% received formal training from Upazila Fishery Office with the help of Department of Fisheries (DoF). Hossain *et al.* (2015) stated that only 20% fishermen had training on one or more than one related matter, 80% have no any training. These results differ with the findings of Biswas (2003) and Sultana (2001) study. Khatun *et al*. (2013) reported that 14% of farmers received training from DoF and 7% of farmers gain fish farming experience from relatives. It was found that 32 (64%) farmer used to invest their own credit. And rest of 18 (36%) farmers took loan from bank, NGO, money lender and broker agency. Sarwer *et al.* (2016) reported that 91% of the farmers used their own money for fish farming and 6% of the farmers received loan from bank for farming activities. 3% of the fish farmers received loan from other sources. Sharif *et al.* (2015) stated that 5% of finance are contributed by farmers, 73% farmers got finance from bank whereas 22% farmers took finance from local moneylenders. Asif

Asian J. Med. Biol. Res. **2017**, 3 (4)

472

et al. (2014) and Zaman *et al.* (2017) did similar research and got the relevant results. About 70% farmers fertilized ponds after removing of weeds. Along with rui, catla and mrigal the farmer used to stock other species like bata (43 farmers), silver carp (44 farmers), grass carp (30 farmers), common carp (34 farmers), pangus (25 farmers), mirror carp (39 farmers), tilapia (32 farmers), monosex-tilapia (1 farmer), scale carp (2 farmers), sarpunti (1 farmer), bighead carp (22 farmers) and tengra (10 farmers) were stocked. Ahmed (2003) observed that peak period of carp polyculture was from April to December. On the other hand, Tanjina (2011) stated that there were 17 available fish species under five orders found during the study period in Shinghorkhali beel in Dinajpur district. Ahmed (2003) also stated that there were about 15 different fish species found to culture in the farms of Naogaon district. Biswas (2003) stated that there were about 14 different fish species found to culture in the farms of Mymensingh district. Most of the farmers had small size pond where they used household waste, rice bran and mustard oil cake to feed fishes. Farmers increased the use of feeds as rice bran, mustard oil cake along with commercial feed. Provakar *et al.* (2013) found in Shahrasti upazila of Chandpur district that 95% of the farmers applied supplementary feed such as rice bran, mustard oil cake and commercially manufactured feed and rest 5% of farmers depended on the natural food in the pond. Alam (2006) found that 80% of the farmers applied supplementary feed such as rice bran and mustard oil cake. In the study area, cowdung was used by 50 (100%) farmers. Urea was used by 47 farmers, TSP (Triple super phosphate) was used by 40 farmers and MoP (Murate of Potash) was used by 34 farmers. Saha *et al.* (2003) found that only 25% farmers gave fertilizer in the pond which has no similarity with the present work. Saha (2004) observed that the average dose of inorganic fertilizer of urea was 387 kg/ha/year and TSP 176 kg/ha/yr. Rahman (1998) found in his study that doses of organic and inorganic fertilizer were 11,075 kg/ha and 739 kg/ha, respectively. This study is not equivalent with the present study. Rana (1996) found that farmers used organic fertilizer was 8,122 kg/ha/year and urea was 3l5 kg/ha/year and TSP was 111 kg/ha/yr. Zaman *et al.* (2017) also found the similar results with the present study. The highest production was 27000 kg/yr and the lowest production was 650 kg/yr. It was found that, there were 4 (8%) farmers produced 600–1000 kg/yr, 20 (40%) farmers produced 1001-2000 kg/yr, 9 (18%) farmers produced 2001-3000 kg/yr, and 17 (34%) farmers produced 3001kg - above/yr during the study. This production is more or less similar with the study of Siddika *et al.* (2016); Hossain *et al.* (2014); Akter (2001) and Ali *et al.* (2015). The highest income was 33075000 Tk/yr and the lowest income from a pond was 20000 Tk/yr. In the study area 9 (18%) farmers got their annual income from 20000 to 100000 Tk. Almost 28 (56%) farmers got their annual income from 100001 to 500000 Tk, some 5 (10%) farmers got their annual income from 500001 Tk to 1000000 Tk and rest of 8 (16%) farmers got their annual income from 1000001 Tk to above. Provakar *et al.* (2013) stated that the highest (34%) fish farmers earned 75,000 to 1,00000Tk per year in Shahrasti upazila of Chandpur district. Islam (2015) stated that the average fish production of 16.67% respondents were high (3188 kg/ha/yr), 33.33% respondents were medium (2627/kg/ha/yr), 16.67% low (1864 kg/ha/yr) and 33.33% were very low (1407 kg/ha/yr) which is similar with the present study. It was found that, every farmer in the study area had at least one bank account. Some farmers had more than one account for saving money and money transaction. BKash, Dutch-Bangla Bank, MCash, OK cash and other mobile banking was too popular for any amount of transaction in the study area. Zaman *et al.* (2017); Asif *et al.* (2015) and Sharif *et al.* (2015) did the same study and their findings are more relevant with the present study. It was found that 100% farmers had one or more mobile phone. Which is similar with the findings of Asif *et al.* (2015) and Sharif *et al.* (2015). It was found that 48 (96%) farmers were visited MBBS doctor or took allopathic treatment and only 2 (4%) of farmer were used to go to homeopathic treatment which is relevant with the findings of Zaman et al. (2017); Siddika *et al.* (2016); Islam *et al.* (2014); Sharif *et al.* (2015); Islam *et al.* (2015); Hossain *et al.* (2014) and Ali *et al.* (2015).

From the survey, it was found that diseases, theft, shadow of trees, fallen leaves of tree, multiple ownership, lack of quality feed, lack of quality fish fry, water contamination by human baths and clothes washing, rapid water decrease in dry season, dike erosion in rainy season, snakes ate fishes in the pond etc were the major problems of fish production. Ali *et al.* (2009) and Ali *et al.* (2015) reported that lack of scientific knowledge, multiple ownership of ponds, attack of fish disease and non-availability of good quality fish fry were the major problems in pond fish culture in Bangladesh. Mollah *et al.* (1990) conducted that the farmers have major constraints as; 72.50% of farmers reported theft was one of the main problems followed by financial problem (40%), lack of contact with fisheries officer (37.75%), lack of fish seeds (27.50%) and lack of feeds (23.75%) which hampered the production in Laxmipur district which has no similarity with the present study. The similar study on prospects and constrains were conducted by Shabuj *et al.* (2016); Chowdhury *et al.* (2015); Sharif *et al.* (2015); Yeasmin *et al.* (2015); Razeim *et al.* (2017); Rahman *et al.* (2015); Rahman *et al.* (2017); Hossain *et al.* (2016); Islam *et al.* (2017); Shabuj *et al.* (2015); Islam *et al.* (2015); Islam *et al.* (2016) and Hossain *et al.* (2017).

Asian J. Med. Biol. Res. **2017**, 3 (4)

473

5. Conclusions

Generally fish farming played a vital role in the uplifting of the life style and socio-economic condition of fish farmer of Jhikargachha upazila. From the results of present study, it can be concluded that fish culture has broad socio-economic benefits for the fish farmers. If the farmers are given precious training, economic support on easy terms and conditions, more profit would be outputted. Thus it can be concluded that fish farming is a fruitful business that can help the peasant to uplift their livelihood situation as well as economic criteria. This study also explored some major problems which were faced by the local people after starting the fish culture. From the survey, it was found that diseases, lack of proper management, theft, multiple ownership and lack of quality fish fry etc. were the major problems of fish production.

Conflict of interest

None to declare.

References

Ahmed F, 2003. Comparative study on carp polyculture practices of three different NGOs in Mymensingh district. M.S. thesis, Department of Fisheries Management, Bangladesh Agricultural University, Mymensingh.

Ahmed N and MM Rahman, 2005. A study on fish marketing system in Gazipur, Bangladesh. Pak. J. of Biol. Sci., 8: 287-292.

Ahsan MK, NS Runa, SK Ghosh, MM Hasan and M Kamal, 2016. Socio-economic condition of fishermen and intermediaries involved in marine fish marketing chain in Cox's Bazar area, Bangladesh. Asian J. Med. Biol. Res., 2: 67-73.

Akter N, 2001. An economic analysis of pond pangas fish production in a selected area of TrishalUpazila in Mymensingh District.MS Thesis, Department of Agricultural Economics, BAU, Mymensingh.

Alam G, 2006. Status of fish farming and livelihoods of fish farmers in some selected areas of MithapuqurUpazila in Rangpur district, An M.S. Thesis, Department of Fisheries Management, Bangladesh Agriculture University, Mymensingh.

Ali H, MAK Azad, M Anisuzzaman, MMR Chowdhury, M Hoque and MI Sharful, 2009. Livelihood status of the fish farmers in some selected areas of Tarakanda upazila of Mymensingh district. J. Agrofor. Environ., 3: 85-89.

Ali MH, MD Hossain, ANGM Hasan and MA Bashar, 2008. Assesment of the livelihood status of the fish farmers in some selected areas of BagmaraUpazila under Rajshahi district. J. Bangladesh Agril. Univ., 6: 367-374.

Ali MM, AA Asif, MAI Shabuj, S Vaumik, MA Zafar and BMN Sharif, 2016.Status of polyculture *Pangasius hypophthalmus* with carps in Jhikargacha upazila of Jessore district, Bangladesh. Int. J. Fish. Aquat. Stud., 4: 423-430.

Ali MY, R Rahmatullah, M Asadujjaman, MGU Bablu and MG Sarwer, 2015. Impacts of banning period on the socio-economic condition of hilsa fishermen in shakhchor union of lakshmipursadarupazila, Bangladesh. Middle-East J. Sci. Res., 23: 2479-2483.

Ara Y, 2005. Assessment of small scale fresh water fish farming for sustainable livelihoods of the rural poor farmers. M.S. Thesis, Department of Fisheries Management, Bangladesh Agricultural University, Mymensingh.

Asif AA, MA Samad, BMS Rahman, MA Rahman, MH Rahman, SM Yeasmin and A Nima, 2014. Study on management of fish fry and fingerling marketing of Jessore in Bangladesh. International Journal of Business, Social and Scientific Research, 2: 127-135.

Asif AA, MA Samad, MH Rahman, MA Farid, SM Yeasmin, BMS Rahman and A Nima, 2015. Socio-economic condition of fish fry and fingerling traders in greater Jessore region. Int. J. Fish. Aquat. Stud., 2: 290-293.

Bangladesh Economic Review, 2015. Finance division, Ministry of finance, Government of the people's republic of Bangladesh.

BBS, 2014. Statistical year book of Bangladesh. Bangladesh Bureau of Statistics, Statistical Division, Government of People's Republic of Bangladesh, Dhaka, 60-115 pp.

Biswas D, 2003. Study of the impacts of aquaculture in and around fish farms in Mymensingh District. MS Thesis. Department of Aquaculture, Bangladesh Agricultural University, Mymensingh.

Chowdhury AA, MS Uddin, S Vaumik and AA Asif, 2015. Aqua drugs and chemicals used in aquaculture of Zakigonjupazilla, Sylhet. Asian J. Med. Biol. Res., 1: 336-349.

Asian J. Med. Biol. Res. **2017**, 3 (4)

474

DFID, 1998. Sustainable livelihoods guidance sheets, Department for International Development (DFID), London, UK.

DoF, 2015. Jatio Matshaw Saptaha Sankalan 2015. Department of Fisheries, Ministry of Fisheries and Livestock, Bangladesh, 18-37 pp.

Export Promotion Bureau, 2014. Annual export report.Ministry of Commerce, TCB Bhaban, 1, Kawran Bazar (2ndand 4th Floor) Dhaka-1215, Bangladesh.

Halder DK, 2002. Studies on the availability of small indigenous species (SIS) of fishes and socioeconomic condition of fishers in two rice fields. M.S. Thesis. Department of Fisheries Management, BAU, Mymensingh.

Haque MZ, MA Rahman and MS Shah, 1991. Studies on the density of Rohu (Labeorohita) fingerlings in polythene bags for transportation. Ban. J. Fish., 14: 145-148.

Hossain A, MAR Hossain, AA Asif, S Ahmed and A Satter, 2017. Fish fermentation in Lalpur, Brahmanbaria district: ecological implication and value chain analysis. Asian Australas. J. Biosci. Biotechnol., 2:159-172.

Hossain FI, MI Miah, MHA Hosen, R Pervin and MR Haque, 2015. Study on the socio-economic condition of fishermen of the punorvaba river under sadar upazila, Dinajpur. Journal of Fisheries, 3: 239-244.

Hossain MA, AA Asif, MA Zafar, MT Hossain, MS Alam and MA Islam, 2015. Marketing of fish and fishery products in Dinajpur and livelihoods of the fish retailers. Int. J. Fish. Aquat. Stud., 3: 86-92.

Hossain MI, C Siwar, MB Mokhtar, MM Dey and AH Jaafar, 2009. Socio-economic condition of fishermen in seasonal floodplain beels in Rajshahi district, Bangladesh. Res. J. Soc. Sci., 4: 74-81.

Hossain MT, MS Alam, MH Rahman, AA Asif and SM Rahmatullah, 2016. Present status of Indian major carp brood stock management at the hatcheries in Jessore region of Bangladesh. Asian Australas. J. Biosci. Biotechnol., 1: 362-370.

Hossain MZ, A Pal, MA Hasan, MS Parvej, N Nahar and AA Asif, 2016. Nutritional status and socio-demographic characteristics of the people of south-west coastal region in Bangladesh. Asian Australas. J. Biosci. Biotechnol., 1: 323-332.

Hossain S, MT Hasan, MT Alam and SK Mazumder, 2014. Socio-economic condition of the fishermen in jelepara under pahartoli of Chittagong district. J. Sylhet Agril. Univ., 1: 65-72.

Hughes RS, Adnan and B Dalal-Clayton, 1994. Floodplains or flood plans. International Institute for Environment and Development and Research and Advisory services, London, 77 pp.

Islam FMK, AA Asif, M Ahmed, MS Islam, B Sarker, MA Zafar and M Rahman, 2017. Performances of resource poor households in aquaculture practices in sadarupazila, Meherpur, Bangladesh. Int. J. Fish. Aquat. Stud., 5: 281-288.

Islam MA, AA Asif, MA Samad, BMS Rahman, MH Rahman, A Nima and SM Yeasmin, 2014. Socio-economic conditions of the fish farmers in Jessore, Bangladesh. International Journal of Business, Social and Scientific Research, 2: 153-160.

Islam MM, AA Asif and MR Amin, 2016. The induced breeding of common carps (*Cyprinus carpio*) in Bangladesh. Indian Journal of Science, 23: 619-632.

Islam MM, AA Asif, S Vaumik, MA Zafar, BMN Sharif, MH Rahman and S Shahriyar, 2015.Socio Economic Status of Fry Collectors at Sundarban Region. Int. J. Fish. Aquat. Stud., 3: 89-94.

Islam MR, MJH Biswas, MGR Akanda, MR Amin, IM Hasan, AA Asif, S Sheheli and BMN Sharif, 2015. Attitude of the farmers towards climate change effect on agriculture. Asian J. Med. Biol. Res., 1: 367-379.

Islam MR, MN Hoque, SM Galib and MA Rahman, 2013. Livelihood of the fishermen in MonirampurUpazila of Jessore district. Bangladesh. J. Fish., 1: 37-41.

Islam MS, AA Asif, B Sarker, A Satter, M Ahmed, M Rahman, MA Zafar and SM Rahmatullah, 2017. Fry production and its marketing system of North-West fisheries extension project at Parbatipur, Dinajpur, Bangladesh. Asian J. Med. Biol. Res., 3: 368-378.

Islam MS, SMM Murshed, M Moniruzzaman and MA Baree, 2002. Rice-cum fish farming in selected areas of Mymensingh District. Journal of Biological Sciences, 2: 715-718.

Islam S, 2011. Studies on pond fish farming and livelihoods of rural farmers in some selected areas of Maulvibazar District. MS Thesis, Department of Aquaculture, Bangladesh Agricultural University, Mymensingh.

Khatun S, RK Adhikary, M Rahman, MNA Sikder and MB Hossain, 2013.Socio-economic status of pond fish Farmers of charbata, Noakhali, Bangladesh. Int. J. Life Sci. Biotec. Phar. Res., 2: 356-365.

Mahfuj MSE, MB Hossain, and MH Minar, 2012. Biochemical composition of an endangered fish, *Labeo bata* (Hamilton, 1822) from Bangladesh water. Am. J. Food Tech., 7: 633-641.

Asian J. Med. Biol. Res. **2017**, 3 (4)

475

Mollah AR, SNI Chowdhury and MAB Habib, 1990. Input output relationship in fish production under various pond sizes, ownership pattern and constraints. Bangl. J. Tra. Dev., 3: 87-101.

Rahaman MM, MA Zafar, BMN Sharif, P Paul, AA Asif, MM Islam and MI Hossain, 2015.Tilapia Oreochromismossambicus marketing system in greater Jessore region, Bangladesh. Int. J. Fish. Aquat. Stud., 3:95-103.

Rahman H, JA Mirza, AHossain, AA Asif, E Haq, P Chwakravorty and M Rahman, 2017. Economics of fish production in paddy fields in Bangladesh. Asian J. Med. Biol. Res., 3: 379-390.

Rahman MA, MH Rahman, SM Yeasmin, AA Asif and D Mridha, 2017. Identification of causative agent for fungal infection and effect of disinfectants on hatching and survival rate of bata *Labeo bata* larvae. Adv. Plants Agric. Res., 7: 00264.

Rahman MH, MA Rahman, MMM Hossain, SM Yeasmin and AA Asif, 2015. Effect of feeding management of broodstock on breeding performance of bata *Labeo bata*. Asian J. Med. Biol. Res., 1: 553-568.

Rahman MM, 1998. An economic study of ponds fish culture in some selected area of Mymensingh District.MS Thesis, Department of Agricultural Economics, Bangladesh Agricultural University, Mymensingh.

Rahman MM, 2003. Socioeconomic aspects of carp culture development in Gazipur Bangladesh. MS Thesis submitted to the Department of Fisheries Management, BAU, Mymensingh.

Rana MS, 1996. An Economic Analysis of Pond fish Culture in some selected areas of Sirajgonj district, MS Thesis, Department of Agricultural Economics, BAU, Mymensingh.

Razeim MA, MG Farouque, MA Sarker, AA Asif and M Ahmed, 2017. Attitude of farmers towards Pangas farming for their livelihood improvement. Asian Australas. J. Biosci. Biotechnol., 2:106-119.

Saha MK, 2003. A study on fish production technology in North-West Bangladesh.MS thesis, Department of Aquaculture, BAU, Mymensingh.

Saha SR, 2004. Status of pangasiid catfish (*Pangasius hypophthalmus*) farming in Mymensingh region. MS Thesis, Department of Fisheries Management, BAU, Mymensingh.

Sarwer MG, MY Ali, S Bhowmik, M Asadujjaman and MS Sharmin, 2016. Pond Farming and Livelihood Status of Fish Farmers in Subarnachar, Noakhali, Bangladesh. Agric. Biol. J. N. Am., 7: 134-139.

Sen A and M Roy, 2015. Socio-economic status of fish farmers in Tripura, India. Int. J. Cur. Res., 7: 17090-17096.

Shabuj MAI, AA Asif, O Faruq, MR Bari and MA Rahman, 2016. Brood stock management and induced breeding of Thai pangus *Pangasius hypophthalmus* practiced in the hatcheries of Jessore Region, Bangladesh. International Journal of Business, Social and Scientific Research, 4: 235-246.

Shabuj MAI, T Bairagi, AA Asif, O Faruq, MR Bari and MS Neowajh, 2015. Shrimp disease investigation and culture strategies in Bagerhat district, Bangladesh. Asian J. Med. Biol. Res., 1: 545-552.

Sharif BMN and AA Asif, 2015. A Present status of fish hatchlings and fry production management in greater Jessore, Bangladesh. Int. J. Fish. Aquat. Stud., 2:123-127.

Sharif BMN, AA Asif, S Vaumik, MA Zafar, MM Islam and MA Samad, 2015. Socio-economic condition of fish farmer and trader at the village of Pitamborpur in Chaugachha upazilla in Jessore, Bangladesh. Int. J. Fish. Aquat. Stud., 3: 212-217.

Sharif BMN, MY Ali, MK Saha, MA Ahmad, MA Islam and MR Amin, 2016. Economic analysis of the fishery activities of Bergobindapur *baor* at Chaugachha upazila under Jessore district of Bangladesh. Asian J. Med. Biol. Res., 2: 436-441.

Siddika T, RK Adhikary, MHU Jaman, S Khondoker, N Tabassum, MFU Zaman, 2016. Socio Economic Conditions of the Hatchery Labors in Chanchra Area of Jessor District in Bangladesh. Agriculture, Forestry and Fisheries, 5: 30-36.

Sultana S, 2001. Socioeconomic Impact of the Adopting of BFRI Involved Polyculture and Carp Nursery Technologies in some selected areas of TrishalUpazila in Mymensingh District, MS Thesis, Department of Agricultural Economics, BAU, Mymensingh.

Tanjina M, 2011. A study on problems of Shinghorkhalibeel in Dinajpur District.MS Thesis, Department of Fisheries Management, Bangladesh Agricultural University, Mymensingh.

Yeasmin SM, MA Rahman, MMM Hossain, MH Rahman and AA Asif, 2015. Identification of causative agent for fungal infection and effect of disinfectants on hatching and survival rate of common carp *C. carpio* larvae. Asian J. Med. Biol. Res., 1:578-588.

Zaman MFU, MA Samad, MA Islam, MHU Jaman, S Khondoker and AA Asif, 2017. Assessment of sustainability of Pangasius (*Pangasiushypophthalmus*) farming at Jhikargachhaupazila in Jessore district, Bangladesh. International Journal of Fauna and Biological Studies, 4: 109-119.