CHAPTER-7

PROBLEMS OF SEED AND TABLE FISHCULTURE AND ITS SOLUTIONS IN ASSAM

7.1. INTRODUCTION:

Fishculture has been an occupation of thousands of rural Assamese people for long time. However, the occupation is still at the subsistence level. Though it is at subsistence level, people have not discarded it. Rather, low laying agricultural lands are converted to ponds by many people which indicates that it provides something better than agriculture to those engaged in it in terms of income and nutrition. But it is not growing at a fast rate which is clear from the engagement of smaller percentage of total or working population in the job till now. There is a high demand for fish in the market, which is proved by the significant growth of market price of fish along with the rise in domestic state production of fish (at 3.2 percent annual exponential rate during 1995-96 to 2014-15) during last 20 years. Despite these, fishculture in Assam has been facing a large number of economic and non-economic problems that needs to be addressed properly for the sustainable development of this sector.

In this chapter, the problems of whole fishculture have been viewed from three different angles, viz, seed fish culture, table fish culture, and ornamental fish culture. Further, problems of both seed fish and table fish culture are discussed separately from two different angles: (1) Non-economic and (2) Economic.

First of all, non-economic problems like lack of education among the rearers, recurrent flood and negative outlook of the society towards the people engaged in this occupation are discussed. Lastly, various solutions to the problems are given. Here, primary data have been presented in tabular form and simple statistical tools like percentage is used for the analysis of collected data.

7.2 PROBLEMS OF SEED FISHCULTURE:

Problems of seed fish culture is broadly categorised into two: (1) Non-economic and (2) Economic.

7.2.1 NON-ECONOMIC PROBLEMS ASSOCIATED WITH SEED FISHCULTURE:

7.2.1.1 LACK OF EDUCATION AMONG THE SEED FISH REARERS:

Seed fishculture of Assam is carried out mainly by the literate or semi-literate persons. It is observed from table 7.1. that only 1.66 per cent and 3.33 per cent sample seed fish rearers are postgraduate and graduate respectively among the sample rearing families. Usually, educated youths do not come forward to take up this occupation. Rather, they prefer even a clam VI standard job in nearby towns. In general, there is a tendency of these educated youth to migrate to the nearby towns or cities for any kind of job instead of seeking a self-employment opportunity in seed fishculture in their own villages. This may be due to higher opportunity cost, hard labour and high risk associated with it due to flood. Thus, fishcullture is mostly run by the illiterate and semi-literate people of the society, who have no proper idea about scientific as well as commercial process of rearing fish. Besides, due to illiteracy and information gap, the rearers fail to avail the opportunities provided to them by the Government from time to time. Of course, for encouraging the rearers and to provide necessary information, there are Fishery officials engaged by the State Government, who would play important role in providing necessary assistance and disseminating relevant information to the rearers. During field investigation, a large number of rearers reported that the demonstrators in their localities hardly visit either to facilitate technical guidance or to inform them of the government's schemes of assistance. Due to inferiority complex also, the uneducated or little educated rearers do not feel easy to meet the senior officers of the department for help and guidance or to file complaints against the officers. A few rearers reported that some employees of fishery department demand bribes against the release of sanctioned grants.

Table-7.1
Distribution of Sample Households according to their Educational Status during 2016-17

Educational Status	Bhabanipur C.D. Block	Mandia C.D. Block	Pakabetbari C.D. Block	Grand Total
Illiterate	8 (16)	6 (15)	6 (20)	20 (16.67)
Primary	11 (22)	9 (22.5)	8 (26.67)	28 (23.33)
Up to X	12 (24)	10 (27.5)	5 (16.67)	27 (22.5)
HSLC Passed	10 (20)	7 (17.5)	6 (20)	23 (19.16)
HSSLC Passed	6 (12)	6 (15)	4 (13.33)	16 (13.33)
Graduate	2 (4)	1 (2.5)	1 (3.33)	4 (3.33)
Post Graduate	1 (2)	1 (2.5)	0	2 (1.66)
Other Technical Degree	0	0	0	0
Total	50	40	30	120

Source: Compiled from field investigation.
Note: The figures in the parentheses represent percentages.

7.2.1. 2. OUTLOOK OF THE SOCIETY:

The traditional seed fish rearers are not free from the customs, usages and conventions which are intimately bound up with the cultural complexity in Assam. The illiterate and literates alike are not free from the prejudices against fish culture. In this modern commercial era also, there is thinking that fishculture is a practice of lower caste people *Kaibarta*. Due to this thinking, number of rearers of seed fish in Hindu community has been declining. If we consider the state as a whole there are a few rearers who belong to Hindu general category of the society. However, in the sample collected from Barpeta district all the rearers are found to belong to Muslim community. Even, in Muslim community also, 35 per cent of educated youths in the sample families reported that they have hesitation in rearing seed fish and prefer any government job. Therefore, it appears that besides the problems like hard labour and high dependency on nature the traditional rearers who are relatively rich have been leaving this occupation for the fear of losing social status. Many of the well to do families, who used to culture seed fish previously, have now stopped to continue their practice and have given their ponds to others on rent.

7.2.1.3. RECURRENT FLOOD:

Recurrence of flood is another non-economic problem faced by the seed fish growers. Barpeta is a low laying and flood prone area, often the rearers have to face the problem of devastating flood. The rearers of Bhabanipur, Mandia and

Pakabetbari CD Block cannot forget the damage caused to them by the flood of 2004 in which they had to lose everything. Those who invested with borrowed fund from village Mahajan at a high rate of interest are still in debt trap. The rearers have to face unpredictable flood due to release of excessive water by the neighbouring country Bhutan. For such overnight flood, the rearers do not have any preparation to face. Here, 86.67 per cent seed fish rearers reported that recurrent flood is a major problem of rearing seed fish in Assam (Table 7.3).

7.2.1ECONOMIC PROBLEMS OF SEED FISH REARING:

7.2.2.1 FINANCIAL PROBLEM:

For every productive operation, finance is a main pre-requisite. According to Mathur (1979) every problem of the small producer concerning production or raw materials, quality or marketing is ultimately a financial one. Even, the success of a tiny sector depends upon the availability of finance. Although meagre investment is required, the problem of finance in seed fish culture cannot be underestimated. The seed rearers have to depend basically on their own source of finance and many of them do not have adequate finance for the expansion of their activity as well as for the adoption of upgraded technology. During 2016-17, 86.66 per cent of the sample households are found to depend on their own finance (Table 6.3).

As most of the seed fish rearers are not financially sound, they can not undertake large scale rearing in spite of their willingness. Money lenders play an important role in financing Fishculture. Here, 77.5 per cent rearers are provided finance by the moneylenders. The rate of interest varies from 60 per cent to 120 per cent per year. Therefore, the rearers prefer to abstain from expanding the activity than to borrow from the moneylenders. The loan taken from the relatives of the rearers is also insignificant. Only 3.33 per cent of the sample rearers received loan from their near relatives. It is because of the deplorable pecuniary condition of their relatives. From the field investigation, it is understood that the seed fishculture suffers from the dearth of institutional finance for its upliftment. The commercial banks in Assam are not interested to advance credit to seed fishculturists because of the fact that the rearers fail to produce sufficient land as collateral security against sanction of loans. During field investigation, 3.33 per cent rearers were found to take loans from banks.

Thus, poor and unstable financial condition of the rearers in one hand and high rate of interest charged by village Mahajans and negligence of commercial banks on the other force the rearers to limit their activities at a very small scale. It is observed from Table-7.3 that 91.67 per cent of the sample families have reported to suffer from financial crunch even at their existing level of production. For the overall development of seed fish culture in Assam, availability of institutional finance at low rate of interest at appropriate time is, thus, an essential condition.

7.2.2.2. LACK OF CAPITAL:

Two types of capital, namely, fixed and working are necessary for rearing seed fish. In seed fishculture, fixed capital consists of pond, eco hatchery, *handi* and bamboo trays. The fixed capital represents the assets bought for long term or permanent use. The working capital is needed to continue the process of rearing activities. Usually, it consists of labour charges (if employed), fertilisers, lime, cleaner, feed, transport cost, net, etc.

There were 391 hatcheries in Assam out of which 373 were in private sector and remaining 18 were in government sector in 2014-15. In the district of Barpeta which ranked first in the production of seed fish in 2014-15 among all the districts of Assam, there were 43 hatcheries in 2014-15. All hatcheries are in private sector which shows the role of government in the development of seed fish production in the district. For production of seed fish, a minimum amount of Rs.12,00000/- (approx) is required for the construction of an eco hatchery, which can be used for a long period (Table-7.2). However, out of total cost of production of hatchery, 80 per cent would be provided by government as subsidy. Most of the seed fish rearers are not in a position to finance the remaining 20 per cent equivalent to Rs.2,40,000/ either through own source or through bank loan. Due to lack of hatchery, most of the seed fish rearers have to depend upon favourable weather for mating the fishes and to lay eggs.

The working capital is required to meet the expenses on feed, labour (if hired labour is used), transport cost, etc. But, due to the lack of working capital, many of the seed fish rearers cannot undertake rearing of seed fish in proper time and sometimes avoid the same.

Table-7.2
Capital Cost of Construction of a Hatchery under NFDP Finance

Item	Amount in Rs.
Construction of overhead reservoir cum Office Room	4,62,850.00
Construction of breeding pool	2,81,010.00
Construction of hatching pool	1,43,980.00
Construction of spawn collection tank	46,480.00
Purchase of pipes and fitting	1,25,270.00
Installation of pump set with shed	1,05,750.00
Purchase of oxygen cylinders	35,000.00
Total	**1200340.00**

Source: Directorate of Fishery, Government of Assam

7.2.2.3. TECHNOLOGICAL PROBLEM AND LACK OF TRAINING:

Another economic problem associated with seed fish-culture is poor technology and lack of training of the rearers. Improvement in the technology and advanced training to seed fish rearers can help in large-scale production at a lower average cost of production on the one hand and also improve in quality of the seed fish on the other. Moreover, training also makes seed fish rearers more efficient and capable of using up to date equipments and thus ensures quality production. However, during 2014-15, only 2354 fishculturalists got training at block level while 2157 fishculturalists got training at district level by Directorate of fisheries, Government of Assam. Although Barpeta district ranked top in the production of seed fish in 2014-15, only 90 fishculturalists got training at block level while 103 fishculturalists got training at district level by Directorate of fisheries in the same year.

Still now, primitive and outdated techniques of production are used in seed fishculture involving hard labour and maximum time with meagre income. Therefore, the majority of present generation youths do not prefer this activity as a source of livelihood. From table 7.3, it is observed that 10 per cent rearers of the sample face the problem of technological upgradation.

In order to face stiff competition from imported cheaper seed fish from West Bengal, technological improvement is an urgent need in fishery sector of Assam. It is also needed for increasing production at the right time as well as for reducing the cost of production and improvement in the quality of seed fish.

Although Assam has improved a lot in seed fish production in recent years, it has to go a long way in future course of time.

Technological improvement in fishery sector would be meaningless, if no simultaneous steps have been taken to train up the traditional rearers with advanced technique of production. Therefore, before application of advanced technology, proper training should be provided in advance as far as possible. For this, rearers should be motivated and trained to embrace the new technology. But for the overall development of this sector, the Government of Assam should take necessary measures and initiative for short term courses of advanced training facilities, and, extensive training facilities should be organised. In this regard, the Directorate of Fishery, Government of Assam and Fishery College, Raha may also extend its helping hand.

7.2.2.4. MARKETING PROBLEM:

The terminology of market is not confined to sales only; rather it involves a comprehensive management philosophy to develop the right product for a specific group of customer in terms of functions, designs, quality and price (Dutta and Ganguly, 1979). Marketing is always consumer oriented. It starts with the customer and ends with the customer. In other words, the process of marketing begins with the analysis of market needs and ends with satisfying those needs of the target market (Rao, *et al,* 2004). Marketing requirements go on changing with economic development, technological changes, change in purchasing power and tastes & habits of the customers or consumers.

In the seed fish market, seed fish is the output of the seed fish rearers which is demanded by the table fish rearers as input. Table fish rearers want quality seed at proper time and at the lowest prices. Majority of the seed fish rearers (96%) of Barpeta sell their output directly to the customer. Thus, the middlemen have a limited role in it. Only four per cent seed fish producers sell their output in the hands of middlemen. That is a positive side of seed fish rearers. However, most of the time the producers of seed have to move to Guwahati, Mangoldai, Krishnai, etc. to sell their product. Although government procurement price is there, it is much lower than market price and it has not been revised since 2014-15 as shown in table-7.3. Instances are there when their products were not sold in many times. It is because of lack of organised market of seed fish.

Table-7.3
Government Procurement Price of Seed Fish in 2014-15

Name of Seed	Rate
River spawn	Rs.500 per lakh
Induced breed (IMC & Exotic carp)	Rs.500 per lakh
Fry (all species)	Rs.150 per thousand
Fingerlings (all species) (40mm to 80mm)	Rs.250 per thousand
Advanced fingerlings (80mm and above)	Rs.3 per piece
Carried over seeds	Rs.250 per kg

Source: Directorate of Fishery, Govt of Assam

7.2.2.5. INFRASTRUCTURAL PROBLEMS:

One of the most important problems of seed fishculture is infrastructural problems in the form of pond, eco hatchery and transportation (Table-7.4). Out of three CD blocks, rearers of Bhabanipur block have not to face transportation problem. However, transportation is one of the major hindrances for the rearers of Mandia and Pakabetbari CD Blocks. The problems become acute in rainy days in transporting their output to other places. Apart from this, 6.67 per cent rearers face the problem of pond for expansion of their production level. High rate of increase in the price of land makes it difficult for the rearers to purchase land for construction of either new or expansion of existing ponds. Moreover, increased rate of rent of pond (@Rs.15000/ per bigha pond per year) acts as another hurdle in their expansion activity.

Another infrastructural problem is shortage of eco hatchery. Among the sample rearers, 86.67 per cent rearers reported that they are facing the problem of shortage of eco hatchery. The problem is severe in the CD Block of Mandia and Pakabetbari (Table-7.4).

Table-7.4 Problems of Seed Fish Culture

Problems/ Blocks	Bhabanipur C.D. Block	Mandia C.D. Block	Pakabetbari C.D. Block	Grand Total
Financial Problem	45 (90)	38 (95)	27 (90)	110 (91.67)
Technical and Training	5 (10)	4 (10)	3 (10)	12 (10)
Land (Pond)	4 (8)	3 (7.5)	13.33	8 (6.67)
Flood	48 (96)	38 (95)	29 (96.67)	115 (95.84)
Eco hatchery	40 (80)	36 (90)	28 (93.34)	104 (86.67)
Transportation	0	30 (75)	25 (83.34)	55 (45.84)
Total	**50**	**40**	**30**	**120**

Source: Compiled from field investigation.
Note: The figures in the parentheses represent percentages.

7.3 PROBLEMS OF TABLE FISH-CULTURE:

Like seed fish, table fish culture has been also facing lots of problems. The problems of table fish culture is also broadly categorised into two as mentioned earlier (1) Non-economic and (2) Economic.

7.3.1 NON-ECONOMIC PROBLEMS ASSOCIATED WITH TABLE FISHCULTURE:

During investigation, four non-economic problems were found noticeable. These four are the lack of education among the rearers, discouraging rural atmosphere, recurrent of flood and poor implementation of law in catching fish.

7.3.1.1. LACK OF EDUCATION:

Fishculture is an occupation of uneducated and semi-educated people in Assam. Because of lack of education, fishculturists are unable to understand the process of up-gradation and benefits to be received from up-gradation. As they are uneducated or semi-educated, they hesitate to place their problems to officers of fishery department. They are also not aware of the schemes provided by the Government. At the same time, they fail to approach the bank officials for bank loan which is available at a lower rate of interest compared to village Mahajans. Because of lack of education, they are satisfied with their existing situation and consider it as the gift of God.

It is observed from table-7.5 that there is no post graduate or technical degree holder among the table fish rearers. Only 4.45 per cent table fishculturists are graduate. Compared to seed fishculture, illiterate people engaged in table fishculture are higher with 36.67 per cent. Combining illiterate and primary school passed, its percentage goes upto 60 per cent and above. Thus, we can conclude that table fishculture lies in the hands of illiterate and semi educated people.

Table-7.5
Distribution of Sample Households according to their Educational Status during 2016-17

Educational Status	Bhabanipur C.D. Block	Mandia C.D. Block	Pakabetbari C.D. Block	Grand Total
Illiterate	12 (30)	10 (33.33)	11 (55)	33 (36.67)
Primary	10 (25)	8 (26.67)	5 (25)	23 (25.56)
Up to X	6 (15)	5 (16.67)	2 (10)	13 (14.45)
HSLC Passed	4 (10)	3 (10)	1 (5)	8 (8.89)
HSSLC Passed	5 (12.5)	3 (10)	1 (5)	9 (10)
Graduate	3 (7.5)	1 (3.33)	00	4 (4.45)
Post Graduate	00	00	00	00
Other Technical Degree	00	00	00	00
Total	40	30	20	90

Source: Compiled from field investigation.
Note: The figures in the parentheses represent percentages.

7.3.1.1.2. DISCOURAGING ATTITUDE OF SOCIETY:

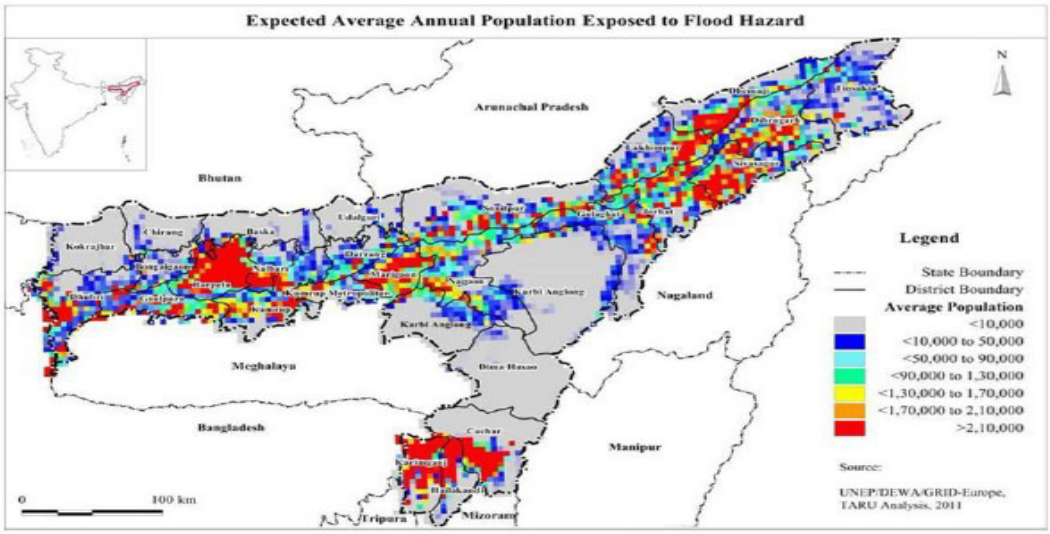
Either rearing or catching of fish in river, pond, lake, etc. have been an occupation of *Kaibarta* people, a lower caste in Assam. Since time immemorial, this community is accorded a lower status in the society They were regarded as untouchable. Although they are not untouchable in the present day Assamese society, the occupation is still considered as a lower graded occupation. Due to the prevalence of this perception in the mind of many youths, they feel better remain unemployed than to engage themselves in fishing. The youths have also thoughts in their minds that they will not be able to have a groom from a good family because of lower social status and high risk associated with the occupation.

7.3.1.1.3 FLOOD:

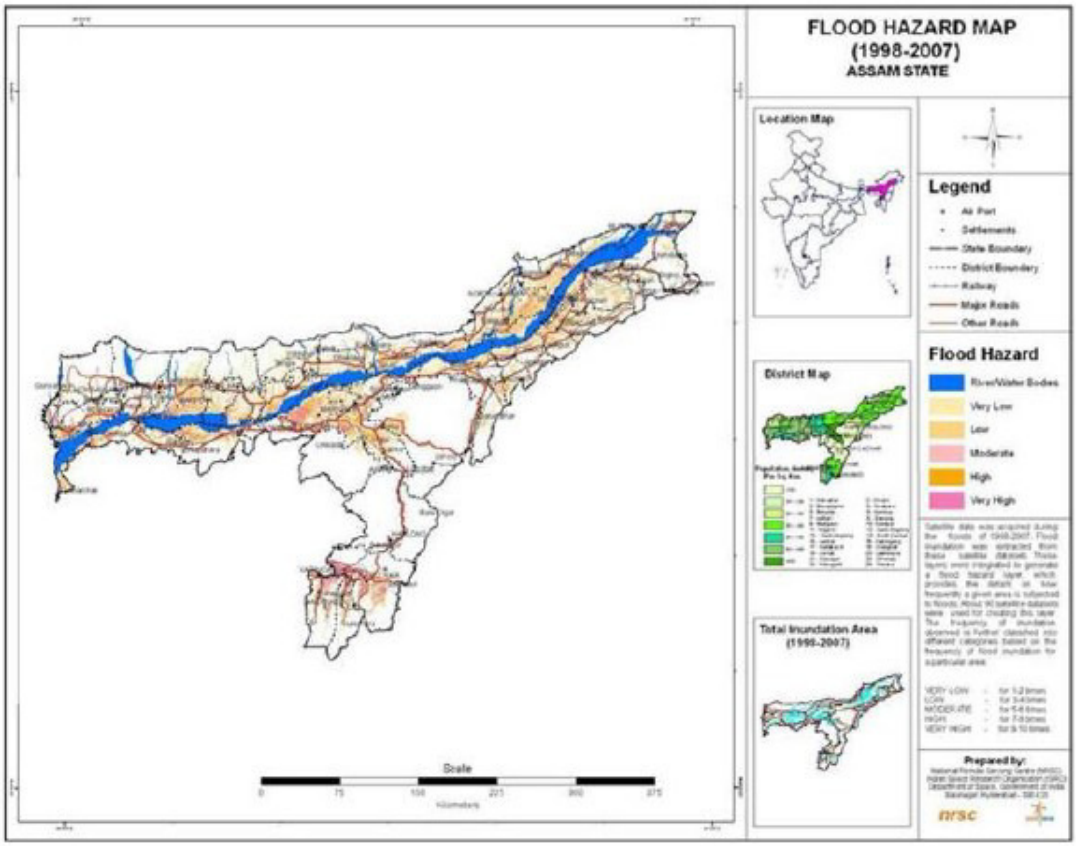
Another noticeable non-economic problem for fishculturists of Assam is recurrent flood in Assam. Rivers in Assam are prone to floods mainly because of heavy rainfall within a short span of time. The river water brings tremendous amount of silt and other debris and raising the river beds. Therefore, it becomes impossible for the main channel to manage the vast volume of water received during the rainy seasons. Brahmaputra valley of Assam had experienced major floods in 1954, 1962, 1966, 1972, 1974, 1978, 1983, 1986, 1988, 1996, 1998, 2000, 2004 and 2007 (Map-7.1 & 7.2). As Barpeta district is at the foot hills of Bhutan and the river Brahmaputra, Nakhanda, Palla, Saulkhuwa Beki, etc. are

flowing through this district. The district is always affected whether flood is in Upper Assam through Brahmaputra or heavy rainfall in Bhutan. Often the ponds of fishculturists are over flooded and they have to incur losses in spite of their hard labour. As there is always a fear psychosis of loss caused by flood in the minds of fishculturists, they cannot wait for longer period and sell their product in one year or two. A good number of fishculturists said that had they been able to rear fish for four to five years in their ponds, the return would have been more as age old fish yields higher price per kilogram than younger ones. Moreover, most of them don't have crop insurance also. It is observed from table-7.4 that 93.34 per cent table fishculturists have considered flood as a major hindrance in their occupation.

Map-7.1 Map of Assam showing Flood Hazard Map (1998-2007)



Map-7.2 Map of Assam showing Expected Average Annual Population exposed to Flood Hazard



7.3.1.1.4. POOR IMPLEMENTATION OF LAW:

With a view to increase the production of fish in Assam, law has been passed in the State Assembly of Assam and amended from time to time to punish those people who go against the law. Some of the legal existing legal measures are given below.

Catching of brood fish (fish carrying eggs and sperm) of species, viz. Rohu, Catla, (Bahu), Mrigal, Mali (Calbasu), Chital, Kharia, Pithia (Mahasol), Gharia and Kuri (Gonius) is prohibited from 1st May to 15th July in any proclaimed fishery.

Secondly, catching and killing, by any method, of fish for any purpose whatsoever including consumption and selling of under sized fish of species viz. Rohu, Catla, Bahu, Mrigal, Chital, Kharia, Pithia (Mahasul) Gharia below 23 cm in length and Mali (Calbasu), Gonius, Kurhi/ Bhagan below 10 cm in length is prohibited from 1st August to 31st October:

However, the above restrictions may be relaxed by the order of the Directorate of Fisheries in writing, for fishculture purposes only.

All under sized fish specified secondly above caught in the nets shall either be left into the fishery or supplied to the Fisheries Department by the lessee in live conditions at the rate to be fixed by Government from time to time.

Thirdly, no movable *Bana*[1] with gap less than 7 cm sq. shall be used for fishing between 1st May to 15th July in any rivers, *Doba*s or *Beel*s or Fisheries.

Bana with less than 7 cm. sq. gaps fixed at the mouth of *Beel*s or *Doba*s or at the boundaries of River Fisheries by which water is drained out. It is permissible to be used only during fishing season other than the period from 1st May to 15th July of the year.

If fish is being protected during this time, there would have been no shortage of fish in the state of Assam. However, poor implementation of the law is observed and lots of brood fishes (fish carrying eggs and sperm) are caught and consumed during this period.

Mass awareness programmes must be organised to make people understand of not killing fish during this period. At the same time, alternative income generating occupation must also be provided to the fishculturists during this period. In addition to it, punitive action should be extended along with cash penalty.

7.3.2 ECONOMIC PROBLEMS ASSOCIATED WITH TABLE FISHCULTURE:

7.3.2.1. FINANCIAL PROBLEM:

Like seed fish culture, table fish culture is also facing the problem of finance. They need different financial assistance ranging from short period to long period depending upon their requirement like purchase of seed, feed, fertilizers, payment of wages and purchase of land. In the absence of collateral, majority of them are unable to have loan from banks and other financial institutions and have to take loan from village money lender or traders at a very high rate of interest ranging from 30 per cent to 150 per cent as shown in chapter-6. It is observed from table 7.4 that 94.45 per cent table fish rearers has financial problem at their existing production level.

[1] *Bana* is net made of bamboo stick and jute to block fish movement from one area to another in pond, *Beel*, river or lake.

7.3.2.2. UNCERTAINTY:

Fishculture is highly dependent on nature. If monsoon is favourable, output will be good and the fishculturists get a good return from their investment. However, if monsoon is not favourable, output will be adversely affected. Moreover, use of too much chemical fertilizer in agricultural land by farmers pollutes the water. Among all the districts of Assam, Barpeta district ranked 4th position in terms of use of chemical fertilizers in total (Nitrogen, K, Phosphorous, N & Potash, P) in Rabi crops with 11823.10 tonnes and 5th position with 11421.55 tonnes in total in Kharif crops during 2014-15. Consumption of chemical fertilizers in the district was 91.26 kg per hectare which was much higher than the state average 68.46 kg per hectare during 2014-15[2]. Thus fishes are becoming prone to various types of diseases resulting loss of crops and money to rearers. Thus, there is always an environment of uncertainty in fishculture in Assam. Moreover, there is an uncertainty in prices also as there is no revision of minimum support price for fish from time to time. The last revision was price of table fish was in 2014-15 by Directorate of Fishery, Government of Assam. Moreover, government procurement price is much lower than the market price. In addition to this, most of the rearers do not know the procurement process of the government. Thus, when there is abundant production, fishculturist don't get fair price and sometimes they even fail to cover the cost of production. Government procurement price of major table fish is shown in table-7.6. Thus positive correlation of profit and risk & uncertainty advocated by Prof. F. B. Hawley in his "Risk theory of profit" and Prof F. H. Knight in his "Uncertainty bearing theory of profit" does not hold good in fishculture of Assam.

[2] Directorate of Economics and Statistics Assam (2015) *Statistical Hand Book Assam,* Table 6.15, Pp.16-17.

Table-7.6
Government Procurement Price of Table Fish in Assam

Name of Species	Rate below 1 kg	Rate from 1kg to 1.5kg	Rate from 1.5kg to 2.5kg	Rate above 2kg
Indian major carps	100/	120/	130/	150/
Exotic species	60/	80/	110/	120/
Major carps	100/	150/	-	-
Chital	120/	200/	250/	300/
Ari, Bhew	80/	150/	175/	200/
Magur	350/	-	-	-
Sighi, Kawai, Sol, Sal, Kanduli	150/	-	-	-
Garoi, Cheng, Bami, Kochia, Tora, etc	100/	-	-	-
Pangassia (Kash)	80/	100/	-	-
Wallago Attu	100/	150/	175/	200/
Weed fishes including Tilap	80/	-	-	-

Source: Directorate of Fishery, Govt. of Assam

7.3.2.3. LAND:

Fishculture is a land intensive while supply of land is limited in nature. With growing rural population at a high rate with 21.43 per cent during 2001-2011 in the district of Barpeta which is higher than that of the state 17.07 per cent during the same period, pressure of population on land has been increasing[3]. As a result, price of land in the rural areas of Barpeta district has increased many folds in recent years. Price of per Bigha agricultural land has become four to five lakhs depending on the location of the land. With the increase in price of land, rent of ponds has also increased at a high rate. Thus, increasing price of land and rent has pushed the price of fish which has affected the demand for local fish in Assam. It is observed from table-7.4 that 38 per cent has faced the paucity of land for fishculture.

7.3.2.4. RISING INPUT PRICES:

Rising input prices has become one of the serious problems of fishculture in Assam. Price of feed has been increasing rapidly in recent years. Recently, price of fertilizers and medicine to be used in fishery has also gone up. Rent on

[3] Directorate of Economics and Statistics Assam (2015) *Statistical Hand Book Assam,* Table 1.04, Pp.8-9.

pond has also increased due to limited supply and excess demand for pond. As fishculture is labour intensive, rapid rise in wages has raised the cost of production of table fish. Anyway, rising input prices has raised the overall cost of production and thus price of fish which ultimately affects its demand. From table-7.7, it is observed that 42.23 per cent table fish rearers face the problem of rising input prices.

7.3.2.5. COMPETITION FROM LOW-PRICED IMPORTED FISH:

One of the most serious problems that the fishery sector of Assam today has been facing is the competition from outside the state rearers and sellers of fish. Imported fish is considered as inferior to local fish of Assam by consumers. Still hundreds of tonnes of fish especially carp fish are flooded in Assam from West Bengal, Andhra Pradesh, etc. Now a days even local breed like live *Kaio, Kuchia*, are also imported from those states. During 2014-15, 12,640 tonnes of fish were imported to Assam out of which 340 tonnes were imported to the district of Barpeta alone. Price of imported fish is much lower than the local ones in the one hand and a layman cannot distinguish between local and imported fish on the other. Thus customers are often cheated by the dishonest traders. Therefore, local fish rearers are not getting justified price for their products and they become pessimist for their future carrier in fisculture. During field survey, 45.56 per cent table fish rearers reported that imported fish is a major threat to their occupation. However, remaining fishculturists have their faith in that people prefers local fish to imported fish. Therefore, they are not in trouble from imported fish (Table-7.4).

7.3.2.6. MISCELLANEOUS PROBLEMS:

Among other economic problems, problem of marketing can be mentioned as one of the major problems. Trading in table fish in Assam particularly in the district of Barpeta is unorganised in nature. There were only 121 registered fish markets for raw fish in Assam while two were for dry fish in 2014-15. In the district of Barpeta, there are only eight registered fish market for raw fish. It indicates that a large section of fish in Assam and particularly in the district of

Barpeta are traded in unregistered market. In this unorganised market, there are always the chances of unfair practices in terms of quality, weight, price, etc.

Research and Development (R&D) can play an important role for the development of fishery sector in Assam. However, there is a shortage of experts of fishery and laboratories in Assam. There were 197 experts of fishery in Assam out of which 136 were government and only 61 were private in 2014-15. This number is very short in comparison to the growing importance of this sector in the economy of Assam. In the district of Barpeta, there were only four experts in government sector and three in private sector. At present, there are only three laboratory of fishery in Assam located at Jorhat, Kamrup and College of Fisheries, Raha in the district of Nagoan.

Table-7.7
Problems of Table Fish Culture

Problems/ Blocks	Bhabanipur C.D. Block	Mandia C.D. Block	Pakabetbari C.D. Block	Grand Total
Financial Problem	38 (95)	29 (96.66)	18 (90)	85 (94.45)
Feed	10 (25)	8 (26.66)	6 (30)	24 (26.67)
Land (Pond)	18 (45)	13 (43.34)	7 (35)	38 (42.23)
Flood	38 (95)	29 (96.67)	17 (85)	84 (93.34)
Transportation	1 (2.5)	22 (73.34)	17 (85)	40 (44.45)
Input Price	15 (37.5)	12 (40)	11 (55)	38 (42.23)
Imported Fish	20 (50)	10 (30)	11 (55)	41 (45.56)
Total	**40**	**30**	**20**	**90**

Source: Compiled from field investigation.
Note: The figures in the parentheses represent percentages.

7.4. PROBLEMS IN ORNAMENTAL FISHCULTURE:

There are some species of fish in Assam which are treated as ornamental fish. Among them, *Botia, Chital, Chanda, Choliha, Puntius, Marhachav balus, Chena* are said to be prominent. Demand for this ornamental fish is very high outside the state as well as outside the country also. During 2014-15, Assam exported 2.5 lakh to 3 lakh ornamental fish to other states of the nation. The monetary value of this export is ten lakh rupees. At the same time, Assam has imported ten lakh ornamental fish like Gappy, Moilly, Angle, Chichled, Gourami, Suciess, etc equivalent to the value of twenty lakh rupees. Although there is a huge scope of ornamental fish outside the state and outside the country, fishculturists of Assam are not aware of these opportunities. There were only 23 registered ornamental fish production units in Assam. Out of those 22

are in private sector and one in government sector. In the district of Barpeta, there is an only one registered ornamental fish production unit. Registered commercial units dealing with ornamental fish were only 78 in Assam and three (3) in Barpeta district during 2014-15.

7.5 SOLUTION TO THE PROBLEM:

Looking at the existing water resources of Assam, the present situation of fishculture of Assam is not satisfactory at all. This sector is enclosed by so many socio-economic problems. Therefore, measures are necessary of the hour to overcome these problems and bring this sector in the right track.

First of all, irrespective of seed fish, table fish or ornamental fish this sector is in the hands of uneducated or semi educated people. Educated youth are not interested to this sector either because of hard labour or low status accorded to this occupation or high risk associated with it. Development of this sector is impossible until and unless educated young are involved in this occupation. Fishculture can yield more income than salary of a III or IV grade government or private job if it is organised in a proper way.

Secondly, permanent solution of flood in Assam is necessary for the growth of this sector. It cannot be done by one individual or by the fish farmers. Either Central or State or both the governments will have to come forward to solve this problem permanently. If this problem can be solved, risk and uncertainty involved in this occupation will decline to a great extent and more and more people will come forward to adopt this occupation. Success of fishculture in Andhra Pradesh or West Bengal can be attributed to a great extent to the absence of frequent flood in those states.

Thirdly, insurance to the fish rearers at low premium can boost this sector as it will also reduce the risk associated with this occupation. Having insured their crops, they may not hesitate to expand their business. The employees of the insurance company may come forward to meet the farmers as most of them are not aware of those insurance facilities.

Fourthly, availability of institutional credit at low or subsidized rates of interest to the rearers at the right time is necessary. If needed, bank employees may have to approach the rearers to advance loans to the fishculturists without collateral security.

Fifthly, for the development of seed fish culture, adequate number of eco-hatchery must be constructed in those areas where this activity is concentrated. It will help the seed fish rearers to produce seed fish at the right time at low cost which help them to supply seed to the table fish rearers in due time. It will reduce the import of seed fish from West Bengal.

Sixthly, more and more rural fish culturists must be trained by trained, experienced and successful fish rearers and experts in this sector. The success story of successful fish rearers will encourage the existing fish rearers to adopt scientific method of fish rearing and the rural youths who are interested in fishculture to pursue as their carrier.

Seventhly, new markets both within India and outside India have to be explored especially for ornamental fish of Assam. E-commerce of ornamental fish can help in expanding market of ornamental fish.

Lastly, development of road transport and communicating facilities in the rural areas is necessary for the overall development of fishculture of Assam. As seed fish has to be sent live to the destination in one hand and table fish is also perishable on the other, therefore, improvement in road conditions from rural to urban areas will help the fish rearers immensely.

7.6 CONCLUSION:

In a nutshell, one can say that the fishery sector of Assam (seed fish, table fish and ornamental fish) has been facing number of economic and non economic problems. Among the non economic problems, the most important are recurrent flood, illiteracy among the rearers and negative attitude of the society towards fishculture. Similarly, the economic problems are lack of eco hatchery, lack of finance and capital, technological improvement and training, marketing problems, etc. With the removal of these problems, this sector will flourish and attract educated youths towards it.

References:

Das, M. and Bayan, B. (2011), "Scope of Fishculture in Assam: An Economic Analysis", Financing Agriculture, Vol.432, No. 3, Pp. 20-23.

Directorate of Economics and Statistics Assam (2015) *Statistical Hand Book Assam.*

Dutta, S. and Ganguly, A. K. (1979), "Type and sources of market information for small-scale industrial sector", paper presented in the national workshop on marketing information for small-scale and rural industries, National Institute of Small Industry Extension Training, Hyderabad.

Mathur, S. P. (1979), *Economics of Small Scale Industries*, Sundeep Prakashan, Delhi, P. 129.

Rao, B. R. K, Mohan, V. K and Chiranjeeveelu, P (2004), "Marketing of Handicraft: A Study of Consumer Behaviour", *Sedme*, Vol. 31, No. 1, March, 2004, P. 27.