



AgEcon SEARCH
RESEARCH IN AGRICULTURAL & APPLIED ECONOMICS

The World's Largest Open Access Agricultural & Applied Economics Digital Library

This document is discoverable and free to researchers across the globe due to the work of AgEcon Search.

Help ensure our sustainability.

Give to AgEcon Search

AgEcon Search
<http://ageconsearch.umn.edu>
aesearch@umn.edu

*Papers downloaded from **AgEcon Search** may be used for non-commercial purposes and personal study only. No other use, including posting to another Internet site, is permitted without permission from the copyright owner (not AgEcon Search), or as allowed under the provisions of Fair Use, U.S. Copyright Act, Title 17 U.S.C.*

UTILIZATION OF FISH PONDS IN MYMENSINGH DISTRICT*

M. HarunAli, M. Ali Akbar amt M. Habibur Rahman**

ABSTRACT

There are about 17 Lkh ponds covering 3 lakh acres in rural Bangladesh. A survey of 297 ponds in Mymensingh district revealed that a vast majority of the owners did not practice scientific fish culture due to multiplicity of ownership, lack of resources, unavailability of improved fish fries. Consequently fish output per acre was very low. Production of fresh water fish can, therefore, be increased to a considerable extent by ensuring scientific utilization of existing fish ponds.

I. INTRODUCTION

Bangladesh is potentially very rich in water resources. In 1979 more than 33 lakh were under inland fisheries of which more than 3.3 lakh acres were under 17 lakh and tanks (GOB 1981). Most of these ponds and tanks are spread over about 68000 villages of the country. Although with the increase in population in the country, demand inland fish protein is gradually increasing, production of inland fisheries has been actually decreasing in recent years (Table 1). Again most of this inland fish production, around 95 percent, were raised and caught in beels, haors, ponds, tanks, rivers, etc. as wild fish crop. Only about 2 to 5 percent of total fish production were raised and caught in the scientifically managed ponds and tanks. There are, of course, some socio-economic that stand in the way of the development of pisciculture in fresh water ponds and in this country. Research on the socio-economic aspects of pisciculture is, ore, demanding (Gill and Motahar 1982, p. 3). The present study was undertaken ut the socio-economic problems that are adversely affecting fresh water fish culture selected areas of Mymensingh district. The specific objectives of the study were (i) 'ne the utilization of ponds and tanks in the villages in relation to ownership pat.

*The paper is partly based on a BARC sponsored research report "A Study on Utilization Pattern of Ponds in Some Selected Areas of Mymensingh District" completed in June 1979. The authors alone are responsible for the views expressed in this note.

** The authors are Assistant Professors in the Faculty of Agricultural Economics and Rural Sociology, Bangladesh Agricultural University, Mymensingh.

tern, (ii) to determine the nature and type of pisciculture and related socio-economic problems faced by the owners of the ponds and tanks.

In section II the method of the survey is described. Discussion of findings is presented in section III. Implications of the findings are discussed in section IV.

II. DATA BASE AND METHOD OF THE SURVEY

All the six thanas (Kotwali, Muktagacha, Fulbaria, Trisal, Gafargaon and Bhaluka) of Sadar South Subdivision of Mymensingh district were primarily selected for the study. Two-stage stratified random sampling method was followed in selecting ponds and owners under report. From each thana five villages and from each village ten ponds were sampled randomly. All the owners of ponds under single ownership and 50 percent owners of each pond under joint ownership were also selected at random. Thus, the total number of sample ponds were 297 covering 70.7 percent of the total ponds of the selected villages while the total number of selected owners were 549 out of 1051 owners of the selected ponds. All the 549 owners were interviewed by two trained enumerators. Data collection was started in March 1978 and completed by February 1979.

III. DISCUSSION OF FINDINGS

Utilization Pattern of the Ponds

Among the 297 sample ponds, 49 (16.5 percent) belonging to 78 owners were found in derelict condition¹. Proportion of derelict ponds varied from two percent in Trisal to 8 percent in Muktagacha, 10 percent in Fulbaria, 24 percent in Kotwali and 57 percent in Bhaluka thana. There was no derelict pond in Gafargaon thana. The higher percentage of derelict ponds in Bhaluka was mainly due to the low elevation of land in this thana. The remaining 248 (83.5 percent) ponds belonging to 471 owners were found in non-derelict condition².

Regarding the utilization patterns of 49 derelict ponds 36 (73.5 percent) were found to be used for washing of livestock animals. Nearly 74 percent and 21 percent of the derelict ponds were reported to have been used for jute retting and irrigation purposes respectively. The embankments of 67 percent, 35 percent and 16 percent of these ponds were used for fruits/vegetables cultivation, grazing land and as drying floor for paddy straw respectively. Only 6 percent of the ponds were used for duck rearing (Table 2).

TABLE 1. ESTIMATES OF FISH OUTPUT IN BANGLADESH

Year	Estimating Agency	Quantity (000 tons)		
		Inland	Marine	Total
1962/63	Nutrition Survey, Dhaka University	622	55	677
1967/68	Fishing Village Study, BFDC	NA	99	NA
1972/73	First Five Year Plan, GOB	719	90	809
1973	Fisheries Directorate	713	87	800
	Private Consultant	800	50	850
1973/74	FAO/DANIDA Report	729	85	814
	Fisheries Directorate	732	88	820
1974/75	FAO Country Perspective Study	550	99	649
	Fisheries Directorate	734	90	824
1975/76	FAO Yearbook	550	90	640
	Fisheries Directorate	732	89	821
1977/78	Fisheries Directorate	522	118	640
1979/80	Fisheries Directorate	524	122	646
1980/81	Fisheries Directorate	525	125	650

Source : Jabbar and Karim 1979, p. 76 ; GOB 1980 ; GOB 1981.

As regards the use of non-derelect ponds, nearly all the ponds were reported to be used more or less for fish culture. Nearly 90 percent, 5 percent and 34 percent of the sample ponds were used for drinking/bathing purposes, irrigation and duck rearing purposes respectively. The embankments of 79 percent, 70 percent and 50 percent of these ponds were used for fruit/vegetable cultivation, grazing land and as drying floor for paddy straw respectively (Table 2).

TABLE 2. UTILIZATION PATTERN OF SAMPLE PONDS

Purposes used	Derelect ponds		Non-derelect ponds		All ponds	
	Num- ber	Percent of total	Num- ber	Percent of total	Num- ber	Percent of total
Fish culture	-	-	248	100.0	248	83.5
Drinking/bathing purposes	-	-	223	89.9	223	75.0
Washing of animals	36	73.5	-	-	36	12.1
Irrigation	12	20.5	13	5.2	25	8.4
Jute retting	36	73.5	-	-	36	12.1
Duck rearing	3	6.1	85	34.3	88	29.6
Boundaries for fruits/vegetables	33	67.3	195	78.6	228	76.8
Boundaries used as grazing land	17	34.7	173	69.8	190	63.4
Boundaries used as drying floor for paddy straw	8	16.3	124	50.0	132	44.4

Source : Field survey.

Ownership Pattern, Size and Extent of Fish Culture

Agricultural land in Bangladesh is divided and sub-divided into countless tiny plots due to law of inheritance. Consequently it is often observed that a single pond has several owners or the same household has a tiny share in several ponds.

It was evident in the study that out of 297 ponds nearly 84 percent were under joint ownership and only 16 percent were under single ownership. This proportion did not differ between derelict and non-derelict ponds. The number of share of a pond in some cases were as many as 7, the average being 4.

In order to know the extent of fish culture in non-derelict ponds, owners were asked about the extent to which ponds were utilized for fish culture. If the pond was used for fish culture to the fullest technically feasible extent, 100 percent utilization was expected to be reported. In this respect Table 3 indicates that out of 47 ponds under single ownership 6, 25 and 16 ponds were utilized upto the extent of 75, 50 and 25 percent respectively.

TABLE 3. EXTENT OF FISH CULTURE IN NON-DERELICT PONDS BY OWNERSHIP PATTERN

Ownership pattern of ponds	Extent of fish culture				Total number of ponds
	Upto 100 %	Upto 75 %	Upto 50 %	Upto 25 %	
Single ownership	-	6 (12.8)	25 (53.2)	16 (34.0)	47 (100)
Joint ownership	-	8 (3.9)	74 (36.8)	119 (59.3)	201 (100)
Total under both ownership	-	14 (5.6)	99 (39.9)	135 (54.5)	248 (100)

Figures within parentheses indicate percentages.

Source : Field survey.

TABLE 4. CLASSIFICATION OF PONDS ACCORDING TO SIZE

Size group (acres)	Derelict		Non-derelict		Total	
	Number	Percent	Number	Percent	Number	Percent
Upto 0.24	10	20.4	15	6.0	25	8.4
0.25-0.49	4	8.2	93	37.5	97	32.7
0.50-0.74	17	34.7	62	25.0	79	26.6
0.75-0.99	11	22.4	44	17.8	55	18.5
1.00 and above	7	14.3	34	13.7	41	13.8
Total of all sizes	49	100.0	248	100.0	297	100.0

Source : Field survey.

TABLE 5. EXTENT OF FISH CULTURE IN NON-DERELICT PONDS
ACCORDING TO SIZE OF POND

Size of ponds (acres)	Extent of pisciculture				Total number of ponds
	Upto 100%	Upto 75%	Upto 50%	Upto 25%	
Below 0.50	-	4 (3.7)	37 (34.3)	67 (62.0)	108 (100)
0.51-1.0	-	4 (3.8)	42 (39.6)	60 (56.6)	106 (100)
1.01 and above	-	2 (5.9)	12 (35.3)	20 (58.8)	34 (100)
Total of all sizes	-	10 (4.0)	91 (36.7)	147 (59.3)	248 (100)

Note : Figures within parentheses indicate percentages.

Source : Field survey.

On the other hand, out of 201 ponds under joint ownership 8, 74 and 119 ponds were utilized upto the extent of 75, 50 and 25 percent respectively (Table 3). No pond under any kind of ownership was found to be utilized above 75 percent. This indicates that ponds under single ownership were better utilized for fish culture than those under joint ownership. Moreover, it was found that ponds falling under medium size group (0.5 to 1.0 acre) were utilized to a greater extent than those falling under small and large size groups (Tables 4,5).

Method of Fish Culture

Compared to an average of 242.6 kg under traditional method, yield of fish can be raised upto 3621.0 kg per year per acre under modern technique. The new technology requires fertilizers and supplementary feed to the growing fish (Jhingran 1979, p.7). Although all the fish pond owners cultivated fishes in their ponds, most of them followed the traditional method of cultivation with local carps only. A vast majority (97 percent) of the fish-pond owners were completely unaware about the exotic/improved species of fishes and they were not also familiar with the scientific method of fish cultivation. So on an average annual fish catch from non-derelict ponds amounted to 190.6 kg per acre excluding the small fishes in the area under review (Table 6). About 85 percent of the catch has been consumed by the owners and the remainder has been sold.

TABLE 6. ANNUAL FISH CATCH AND CONSUMPTION

Category of ponds	Number of ponds	Average size of ponds (acres)	Total annual catch			Average Catch	
			kg	% consumed	% sold	per pond (kg)	per acre (kg)
Derelict	49	0.61	2537	94.5	5.5	51.8	84.9
Non-derelict	248	0.62	29311	84.5	15.5	118.2	190.6
Total/average	297	0.62	31848	85.4	14.6	107.2	172.9

Source : Field survey.

Socio-Economic Problems

About 85 percent of all the fish pond-owners surveyed (549 heads of households) felt that joint ownership of the ponds was a major problem, while 15 percent considered it as a minor problem for fish culture in ponds (Table 7).

Increasing fish production from a pond depends upon availability of good and healthy fish fries. But a substantial majority (82 percent) reported that unavailability of fish fries of improved varieties was a major problem for pisciculture in ponds, 15 percent of the owners thought it was a minor problem and only 3 percent replied that it was not a problem. The method of fish culture and management of the ponds under study was primitive, based largely on traditional beliefs and experience of the past rather than on conscious application of scientific knowledge. About 81 percent of the owners indicated that lack of scientific knowledge on pisciculture was a major problem with 12 percent informing that this was a minor problem (Table 7).

Lack of sufficient fund for bringing the derelict ponds under cultivation through minor reclamation and for purchasing the improved fries/fingerlings for fish culture in non-derelict ponds was a major problem to about 60 percent of the fish pond owners. It was, on the otherhand, a minor problem to 35 percent of owners in the study area. Almost all the respondents maintained that fish fries were to be bought at a time of the year when they had little cash money. Consequently most of them were unable to purchase adequate amount of fish fries at the right time. There was little provision for financial resources to re-excavate the derelict ponds. Thus lack of funds appeared to be a major problem for scientific and efficient pisciculture.

Lack of marketing and preservation facilities also emerged as a problem in the study (Table 7). Due to poor communication system, the fish pond-owners of Bhaluka thana in particular were observed to face tremendous problems of marketing fishes³.

IV. IMPLICATIONS OF FINDINGS

In Bangladesh, the minimum requirement of protein per capita per day has been estimated as 45.3 gm of which one third i.e. 15 gm should be of animal origin (Jabbar and Karim 1979). The present supply of animal protein is 5 gm and the contribution of terrestrial animals to the animal protein supply is 1.3 gm (25 percent) and the rest comes from fish. This amount of fish protein comes from 22.4 gm of whole fish since 16.5 percent of the whole fish is protein (DU 1977). The current per capita annual intake of fish at this rate amounts to about 8 kg. In view of the fact that farming of the cattle

TABLE 7. FISH POND OWNERS' RESPONSES TO SUGGESTED PROBLEM AREAS ON CULTURE FISHING IN PONDS

Sl. No.	Suggested problem areas	Owners' responses (Percentages)		
		Major problem	Minor problem	No problem
1.	Joint ownership	85	15	-
2.	Unavailability of fish fries/fingerlings	82	15	3
3.	Lack of technical know-how	81	12	7
4.	Lack of training and supervision	75	15	10
5.	Attack of predators and thieves	32	24	44
6.	Lack of fund for pisciculture	60	35	5
7.	Insufficient marketing facilities	12	30	58
8.	Inadequate preservation facilities	10	25	65
9.	Lack of net facilities	18	35	47
10.	Lack of boat facilities	5	15	80

Source : Field survey.

offers rather limited scope for expansion in near future, the share of fish in total protein supply should increase further. Fish production, therefore, has to be increased on a priority basis (Jabbar and Karim 1979). But estimated fish production has declined in recent years inspite of substantial potentialities for increasing fish production from inland & marine sources. While efforts have to be made to increase fish production from marine sources, quite a good deal of production of fresh water fish can be increased by ensuring the efficient and scientific use of the already existing fish ponds and tanks in the rural areas.

The development of tank resources does not require important and sophisticated capital intensive technology and can rely on skills and resources built within Bangladesh. It is a good complement to rural works, and it can be integrated into the planning and operation of large water control projects to ensure rational water management in the interior areas. Furthermore, tank development is a labour-intensive and highly productive activity (Smith 1973, p. 298).

Considering the major problem areas of pisciculture in ponds and tanks faced by fish pond owners under study, the following measures may be taken to increase pond fish production.

1. Nursery fish ponds need to be established in each thana of the country for adequate supply of fish fries of both indigenous and exotic species for the fish pond owners. Moreover, the fish fries should be supplied to the rural markets or direct to the villages at a reasonable price with the initiative of government and other concerned institutions and agencies.
2. The government proposed 'Fishery Bank' may be established in each thana and the commercial and other specialized banks may also be encouraged to advance fisheries loan to the fish farmers at a reasonable rate of interest. The methods and procedures of obtaining such loans should be simple.
3. With a view to improving the relationship among the multiple sharers of a pond for improved fish culture more village based cooperatives may be formed and the existing ones may be reorganized to include programme on pond fish culture. Such co-operatives may also be provided with sufficient fish fries, technical know-how, credit facilities, net-boat facilities and marketing facilities.
4. Government Fisheries Department should take necessary initiative to train up the fish pond owners on pond fish culture and management of fish ponds at the Thana Training and Development Centre.

5. The derelict ponds need to be re-excavated in order to increase pond fish production in the country. The commercial and other specialized banks may offer long-term loan to the derelict pond owners to enable them to re-excavate their ponds for improved fish culture.

6. The Fishery Department and the Bangladesh Fisheries Development Corporation should play a vital role in providing effective supervision, advice and service for fish disease control, etc. to the fish pond owners with the help of well trained officers.

Notes

1. Derelict ponds here refer to ponds usually without full closed boundaries remaining dry for most part of the year. During monsoon, these ponds are used for retting jute. Some fish come into these ponds through open channel from nearby canals, paddy fields, etc.
2. Non-derelict ponds here refer to ponds having closed boundaries. These are used both for pisciculture and drinking-bathing purposes.
3. The fish pond owners of Bhaluka faced tremendous marketing problem because the Dhaka-Mymensingh road was not completed at the time of the survey. Currently the problem may be much less due to the operation of this high-way.

REFERENCES

- Ali and Akbar 1979 M. H. Ali and M. A. Akbar : *A Study on Utilization Pattern of Ponds in Some Selected Areas of Mymensingh District*. Dhaka : Bangladesh Agricultural Research Council, June 1979 (Unpublished report).
- DU 1977 Dhaka University : *Nutrition Survey in Bangladesh*. Dhaka : Institute of Nutrition and Food Science, 1977 (Unpublished data)
- Dumont 1973 Rene Dumont : *Problems and Prospects of Rural Development in Bangladesh*. Dhaka : The Ford Foundation, November, 1973.
- Gill and Motahar 1982 G. J. Gill and Syed Abu Motahar : *Social Factors Affecting the Use of the Aquatic System in Farming in Bangladesh*. Paper presented at the Third International Seminar on Maximum Livestock Production from Minimum Land, BARI, Joydebpur, February 15-19, 1982.
- GOB 1980 Government of the People's Republic of Bangladesh : *The Second Five Year Plan*. Dhaka : Planning Commission, 1980.
- GOB 1981 ——— : *Statistical Year Book of Bangladesh*. Dhaka : Bangladesh Bureau of Statistics, 1981.

- Jabbar and Karim 1979** M. A. Jabbar and Mahmudul Karim : "Economics of Alternative Technologies for Harvesting and Processing Marine Fish in Bangladesh". *Bangladesh Journal of Agricultural Economics*, II, 1 (June 1979).
- Jhingran 1979** V. G. Jhingran : "Fortune in a Fish Pond". *The ADAB News*, VI, 1, (January 1979).
- Smith 1973** D. V. Smith : 'Opportunity for Village Development : The Tanks of Bangladesh'. *The Bangladesh Economic Review*, I, 3 (1973).