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Nutritional Benefits and Economic Importance of Homestead Pond Fish Culture in the rural area of Sitakund, Bangladesh

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Abstract

Homestead ponds filled with fish play important roles for the development of rural health and economy. Previous research showed that fishes from homestead ponds fulfill 25-50% of the nutrition requirement and helped for the 15% of economic development for the poor people of Bangladesh. This study investigated on this issue in Bangladesh by doing a survey over 20 ponds of different areas of Sitakunda. This study aims that homestead ponds may work as nutritional and economic source for the rural people. The study reported on pond size, diet system, fish production and economic evaluation. The result showed that people eat more fish from their own pond (64.15%) than the local market (35.85%). It is also clear from the result that their nutritional demand is fulfilled where average daily consumption is 98.25gm. They produce 132.30 kg fish yearly on average and earn money by selling the surplus portion. These results suggest that people should increase fish production in the ponds adjacent to their homes.

Introduction

"Mache vat e Bangali" is a well-known Bangla proverb for the Bangladeshi people. Bangladesh is full of water sources abundant with fish. Fish is an important element of animal protein and so it plays a key role for fulfilling the nutritional demand of rural people. The small indigenous species (SIS) (Mola, Puti, Koi) have very high levels of essential micronutrients like vitamin A, iron, and minerals. Besides, aquaculture is a profitable business than any other agriculture. Hence, it helps in the rural economy. Bangladesh is self- sufficient in fish production. The total yearly production of fish is 41.43MT.

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In the fiscal year 2017-18 and people of Bangladesh consume on average 62 gm of fish daily where as the requirement is 60gm (BBS). Previously, a study was done in Bangladesh in these issues. Reaching out over 900,000 households in Bangladesh the study shows that fishes from homestead pond helped for the nutrient requirement and produced a substantial surplus that can be sold (de Pee *et al.,* 2015). In general, aquaculture has the potential to reduce poverty directly or indirectly through establishing and strengthening food consumption linkages but also through "income linkages," and "employment linkages" in Bangladesh (Belton *et al.,* 2012). Reducing poverty in low-income countries through smallholder development remains compelling where the majority of people live in rural areas, and agriculture remains the largest single source of employment. Bangladesh has placed emphasis on diversified food production, employment and income generation activities at the farm level similar to many other countries in order to achieve food security in its Poverty Reduction Strategy (Bangladesh Planning Commission, 2005; Murshed-E-Jahan *et al.,* 2010). Aquaculture are largly determined by the availability and access to assets and thus, the capacity of poor people to benefit from aquaculture occurs mostly through indirect food consumption linkages (Roos *et al.,* 2007; Belton & Little, 2011; Belton *et al.,* 2016; Bogard *et al.,* 2017). The reliability and generalizability of research aiming to clarify the outcomes of aquaculture on poverty have often been compromised because they are based on case studies and/or limited in geographical scope, and are designed with variable degrees of methodological rigour (Bene *et al.,* 2016). Attempts have been made in Bangladesh to promote vegetable cultivation alone and integrated with other farming components (such as pond and livestock) to meet the gap between supply and demand, and improve households food and nutrition security as well as increase income (Weinberger and Genova, 2005). Another case study in Bangladesh showed that "ponds play a crucial role in providing household income and fish for consumption, contributing 15% of total household income and 25-50% of total fish consumption (Belton and Azad 2012)". Based on the previous results, in our statistical research we predicted that fishes from adjacent ponds helps for fulfilling the demand of nutrition and for the economic development of rural people .

Materials and Method

Procedure

For this survey 20 ponds were taken under observation from different areas of Sitakunda like Sayedpur, Muradpur, Guliakhali. For the survey, approximately one month was utilized in rural areas of Sitakunda, Chattogram, Bangladesh. Different questions were asked about the pond, dietary system, fish production and economic aspect. Questions were asked randomly from the beneficiary's of YPSA Fisheries and Livestock Unit and all of them were responded to the survey.

Measures

For measurement, the survey was made of different questions like how many days they eat fish in a week (never, 2-3, 4-5, more than 5). Another question was about how much (gm) fish they eat daily. For the fish production, there was also question about whether they sell fish or not (never=0, sometimes=1, frequently=2). 'Yes'/ 'No' question was designed to know about the lactating mother and child member where no=0, yes=1. Survey was also done to find out how many days they eat fish from the pond and how many days they eat fish from the local market. We also wanted to know about the amount of fish that they produce in their pond and they sell in the local market.

Results

Descriptive Statistics

Table-1 shows the variables that were collected from the survey. This table also includes average, minimum and maximum value of the variables. According to the survey most of the people get the required fish nutrition from their own pond (on average 11.49). Additionally, the total amount of homestead consumption (1297. 059) is greater than the local market consumption (702.941). Moreover, all the people sell the extra portion of their fish production.

Table 1: Descriptive Statistics Fish Production and Consumption

Variable	Average (kg)	Minimum (kg)	Maximum (kg)
Yearly consumption	17.68	8.54	24.00
Yearly production	132.30	21.00	220.00
Yearly sell	115.06	8.10	198.88

Table 2 expressed the details of pond size , daily to year consumption of fish from the experimental ponds according to the homestead area and local market. The consumption rate exressed the yearly selling and production amount of cultured fish in the upazila .

Table 2 : Pond size and Fish Consumption According to the Pond

						Consumption (gm)				Consumption %	
Sn	Name of Pond Owner	pond size (decimal)	daily cosumption (gm)	weekly consumption (gm)	yearly consumption (kg)	home stead pond	local market	Yearly Sell (kg)	Yearly Production (kg)	home stead pond %	local market %
1	Sajeda	32	100	400	19.2	9.60	9.60	180.80	200.00	50.00	50.00
2	Nurnahar	20	95	285	13.6	9.12	4.48	116.40	130.00	67.06	32.94
3	Johora	8	90	180	8.54	4.27	4.27	81.46	90.00	50.00	50.00
4	Saheda	10	100	300	14.4	9.60	4.80	80.60	95.00	66.67	33.33
5	Motahara	14	80	400	19.2	11.52	7.68	110.80	130.00	60.00	40.00
6	Lucky	30	110	440	21.12	21.12	0.00	198.88	220.00	100.00	0.00
7	Shilpi	15	70	350	16.8	6.72	10.08	153.20	170.00	40.00	60.00
8	Hasina	8	100	300	14.4	14.40	0.00	90.60	105.00	100.00	0.00
9	Jasmin	12	95	380	18.24	13.68	4.56	121.76	140.00	75.00	25.00
10	Halima	8	120	360	17.28	11.52	5.76	92.72	110.00	66.67	33.33
11	Aysha	25	90	450	21.6	8.64	12.96	8.10	21.06	40.00	60.00
12	Tamanna	10	100	400	19.2	19.20	0.00	75.80	95.00	100.00	0.00
13	Khaleda	12	110	440	21.12	10.56	10.56	108.88	130.00	50.00	50.00
14	Aklima	25	100	300	14.4	9.60	4.80	135.60	150.00	66.67	33.33
15	Moriom	15	95	475	22.8	13.68	9.12	127.20	150.00	60.00	40.00
16	Asma	13	120	360	17.28	5.76	11.52	122.72	140.00	33.33	66.67
17	Fatema	15	100	400	19.2	9.60	9.60	160.80	180.00	50.00	50.00
18	Jahanara	10	110	330	15.84	10.56	5.28	74.16	90.00	66.67	33.33
19	Lutfur Nahar	30	100	500	24	19.20	4.80	176.00	200.00	80.00	20.00
20	Shirin	17	80	320	15.36	11.52	3.84	84.64	100.00	75.00	25.00
	Total	329			353.58	229.87	123.71	2301.12	2646.06	1297.06	702.94
	Average	16.45	98.25	368.50	17.68	11.49	6.19	115.06	132.30	64.85	35.15

From the study, it is found that conusmption rate of upazila inhabitants are basically higher in local market rather than production from local fish pond (Figure 1).

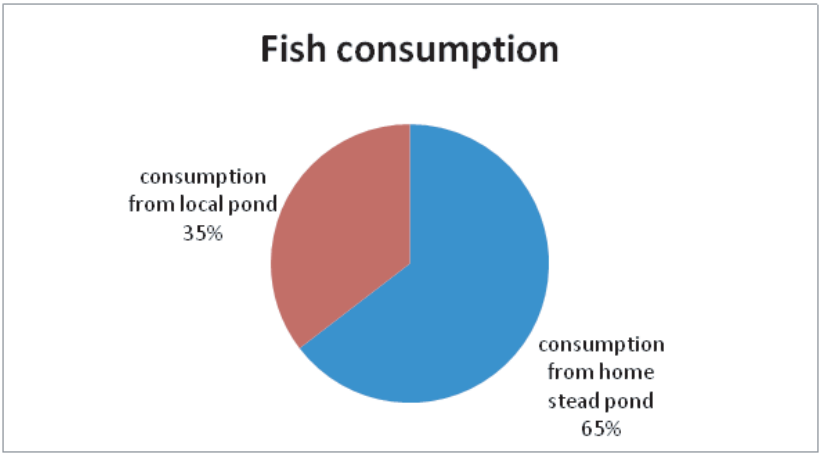
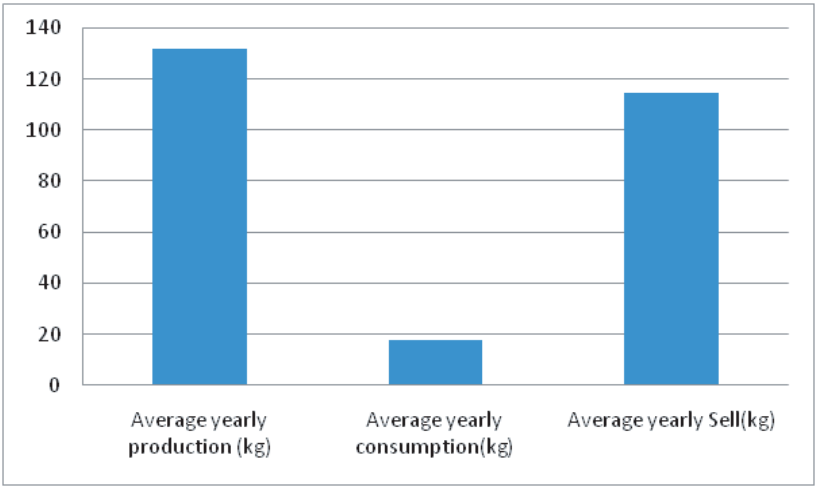


Figure 1: Percentage of homestead consumption and local market consumption

Relationship between homestead pond and nutritional demand and economic development

The hypothesis of the study that is homestead pond may help for fulfilling the demand of nutrition and for the economic development of rural people was tested by dividing the data set into two categories. As reported in figure 1, one category was consumption from homestead pond and another category was local market. The response showed that homestead pond consumption is higher than the local market consumption. Hence, we can assume that village people mostly fulfill their nutritional demand from their own pond. On the other hand, the yearly production is much higher than the yearly consumption. Hence, it is very clear that the rest amount of fish people can sell and earn. However, the overall result shows strong support for the study.

Figure 2: The relation between yearly consumption and yearly production



Discussion

Overall, the result of the survey mostly supports the paper's hypothesis. Findings show that people eat more fish from their own pond .However the previous studies of Bangladesh showed that people consume 25-50% 0f fish from their pond.

One limitation is that the survey was done only from 20 ponds. In addition, it is based on only one upazilla. This survey does not show any data from the other villages or other districts of Bangladesh. Another limitation is the sample of only 20 families. An assumption cannot be generalized only surveying a small group of people. However, the results of the survey have a lot of variation. For example, the consumption from local pond is 64.85% and the consumption from local market is 35.15%. Hence, the difference is very clear between these two categories. That's why it mostly presents strong support for the hypothesis.

Despite these limitations this survey triggers toward the further survey about nutrition and economic development. It provides an idea to the other researchers working on the same experiment. Besides, the results can make people concerned about the matter by letting them know the actual scenario or statistics. Hence, it shows the importance on increasing fish production in the homestead ponds.

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