

**SURVEY ON GALDA SEED PRODUCTION
AND MARKETING IN THE SOUTHWEST OF
BANGLADESH**



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**SURVEY ON GALDA SEED PRODUCTION
AND MARKETING IN THE SOUTHWEST OF
BANGLADESH**

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SURVEY ON GALDA SEED PRODUCTION AND MARKETING IN THE SOUTHWEST OF BANGLADESH

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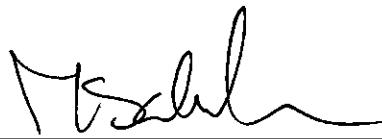
Fisheries and Marine Resource Technology Discipline

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DECLARATION

The results in this project thesis are entirely the candidate's own investigation and no part of the results has been accepted for any degree, nor it is being concurrently submitted for any degree

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TO

My Parents

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Abstract

A field survey was conducted on Galda seed production and marketing in some selected areas of southwest coastal region of Bangladesh. The main sources of Galda seed production are natural collection from the coastal rivers and hatcheries. There were a total of seven stakeholder groups in the production and marketing chain of the seed. They were the collectors and the hatchery producers, the farias, the local depots, central depots and the farmers. The farias collect the seed from the collectors; they supply the seed to the local depots and rarely to the central depots. The hatchery productions are principally supplied to the central depots. The socio-economic conditions of the stakeholders groups revealed that the collectors and the farias are the most disadvantaged groups; the hatchery owners are mainly the NGOs and comparatively well off people. The depots owners also are the richest group of people. The whole chain of production and marketing does suffer from various shorts of limitations and problems.

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LIST OF ABBREVIATIONS

GDP	Gross Domestic Product
DOF	Department Of Fisheries.
NGO	Non Government Organization.
FAO	Food & Agricultural Organization.
BRAC	Bangladesh Rural Advancement Committee
EEZ	Exclusive Economic Zone.
KM	Kilometer
DFID	Department For International Development
BFRF	Bangladesh Fisheries Research Forum

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CHAPTER ONE
INTRODUCTION

1.0. INTRODUCTION

1.1. Background of the study:

Bangladesh is a riverine country. It is abound with a vast and varied type of waters such as canals, flood plains, lakes, tanks and ponds, beels, haors, baors and a long coastline displaying wide diversify in their biotic and abiotic characteristics. Blessed with a conducive climate, the country offers immense scope and potential for a considerable increase in fish production. Fisheries contributes 80% of the national animal protein intake, about 6% of the total GDP (Gross Domestic Product) and more than 12.5 % of the total foreign exchange earnings (Matshya Saptha Sankalan, 1999).



The total fish production in Bangladesh was estimated at 1.78 million tones in 2000-01; of which 1.4 million tones (97%) were obtained from the inland waters, and the remaining 0.38 million tones (21%) came from marine water (DOF,2002). Presently 1.4 million people are engaged full time and 12 millions as part time in fisheries sector in the country for livelihood and trade. Another 3.08 million fish and shrimp farmers are cultivating fish both at subsistence and commercial level. In Bangladesh, fish farming is currently one of the most important sectors of the national economy. Within the overall agro-based economy of the country, the contribution of fisheries sector has been considered to hold good promise for creating jobs, earning foreign currency and supplying protein. A large number of people, many of whom living below the poverty line, find employment in the domestic fish marketing chain in the form of farmers, processors, traders, intermediaries, day laborers and transporters (Ahmed *et al.*, Islam, 1996; DFID, 1997; Kleih, 2001).

Fisheries activities are considered as a low-class profession and fishermen are traditionally poor. They live from hand to mouth (Hannan, 1984). These fishermen are socially, economically and educationally disadvantaged communities and lack their own financial resources (Rahman, 1994). Fishermen and their families in the South and South East Asia often are considered to be among the poorest of the poor (Bailey, 1994).

In Bangladesh, most of the fishermen are illiterate and few have primary level of education (Rahman, 1994a; Bailey and Doulman, 1994). Only about fifteen percent of them are literate. Their per capita income and living standard are at the lowest ebb (Chowdhury, 1994).

The fisheries resources play a vital role in the socio-economic development of the country. Bangladesh possess 716 KM coastlines with 310 Km EEZ (Exclusive Economic Zone) that is highly prospective for fisheries. At present, the total shrimp production of our country is 1,10,990 metric tons where inland water provides 49,568 metric tons of shrimp. (DOF, 1996).

The fresh water galda known as prawn (*Macrobrachium rosenbergii*) has emerged in the last few years as one of the most important aquatic resources. These species has a number of advantages if compared with other crustaceans. It adapts with a wide range of temperature (15° C to 35° C). Fast growing individuals of the species reach the marketable size in about 6 to 7 months. Its high nutritional value and omnivorous feeding habit has made this species an excellent candidate for culture.

The culture is now being practiced at traditional level or at best at improved traditional level where some amounts of feeding, fertilization and water management are done; the farmers are mainly small holders unlike the *Penaenus monodon* farmers who are mainly rich and powerful ones. The demand of seed was primarily used to be met from the natural collection, however in recent times the hatchery produced seed is meeting a significant part of the demand though farmers have a number of claims against the quality of hatchery produced seeds. The nursery technology of the seed is not optimum, so with the poor nursed or without nursed post larvae/juveniles going into the traditional or semi-improved culture farms, the per unit production has remained ever low in Bangladesh.

At present the total estimated area of prawn culture is more than 30,000 hectare in Bangladesh. This compares with a total of 3,500 hectare in the mid 1980s. The total production area is believed to have expanded by approximately 20 per annum in the last 15 years. The total prawn farming area in Khulna, Satkhira and Bagerhat are 9,551.46 hectare, 9,544.16 hectare and 7,710.38 hectare respectively. And galda production in these districts, Khulna, Satkhira and Bagerhat are 13,623.22 MT, 13,531.23 MT and 23,616.64 MT respectively. (DOF, 2004).

Galda culture can be a profitable culture. A study on existing farming practice in some galda producing villages in Dumuria, Khulna showed that the total production cost for a 100 decimal pond could stand at Tk. 19,680 /ha, while the net profit stood at Tk. 40,920 /ha. (Khan and Shah, 2006). The traditional culture practice is beset with number of vital problems like high mortality of prawn fry, viral disease of prawn, water quality deterioration in prawn farm,

lack of acclimatization during stocking, high interest rate of loan, mortgage of property are the significant problems of farmers in the southwest of Bangladesh (Khan and Shah, 2006).

Shah (2006) carried out a study on the value chain analysis of galda production and marketing in the same area of Khulna and suggested to leave of different stakeholder groups in chain and the chain is plugged with various problems.

In prawn marketing, the most serious difficulties seem to occur in remote communities, who lack transport, poor road facilities and where they are in a particularly weak position in relation to intermediaries. The middlemen have established a new marketing chain based on the extreme exploitation of the prawn farming communities by setting up an artificial pricing policy through intermediaries at different levels (Ahmed, 2001; Ahmed, 2003; Shah, 2006). As a result farmers could not get real price due to poor knowledge on pricing policy. Therefore it is important to know the existing prawn marketing systems. Aside from a better understanding of prawn production and marketing systems, it seems important to identify farming constraints and marketing inefficiencies which is having negative impacts on the livelihoods of the poor farmers, traders and associated groups.

However, to see the production and marketing system of prawn fry in some of the most promising areas of Khulna and Bagerhat- Dumuria, Chuknagar, Fakirhat and Mollerhat, the present experiment was undertaken. For this purpose structured questionnaire was used for collecting the different information from the stakeholder groups. It is seen in this experiment that there five stakeholder groups in the fry production and marketing chain in the area. Those stakeholders are collectors, farias, local depot owners and the central depot owners; all have the different stakes and problems and that needs careful address.

The experiment, however, was based on the following objectives,

- To know the source of galda fry in the region.

- To know the galda seed marketing channel.

- To know the problems related to galda seed marketing.

- To provide possible information for improvement of the marketing channel.

CHAPTER TWO
MATERIALS AND METHODS

2.0 MATERIALS AND METHODS

2.1 Selection of the study area

Greater Khulna areas, by far, has come out as the most important galda farming area and two of the important bazaars, in the area viz., Chuknagar and Dumuria were selected for survey from Khulna district. Similarly, in Bagerhat district, Fakirhat and Mollerhat were the principal galda farming areas, thus these bazaars were purposively selected to collect data on seed marketing.

2.2 Selection of sample size

The important stakeholder groups were the fry collectors, the farias, the local depot proprietors and the central depot proprietors. The table showed the number of samples from each stakeholder groups.

Table 1: number and types of sample from the study areas

Types of persons	No. of persons
Fry collectors	25
Farias	30
Local depot proprietors	20
Central depot proprietors	50

2.3 Data collection

For collection of data a structured questionnaire was prepared. Before formulating the questionnaire, visits were made in the study area. Different information about fry marketing was collected during the visit. After finalizing the questionnaire relevant data were collected by interviewing all the stakeholder groups.

2.4. Secondary sources

For supporting the primary data, secondary data were also collected from different sources. The sources were as follows:

- 1) DOF (Publications, extension materials)
- 2) Books and journals.
- 3) Other concerned sources like researchers, fisheries extension workers etc.

2.5 Analysis of data

The collected data were carefully edited to eliminate errors after sorting and checking. The data were then transferred to tabular forms after careful examination and calculation. The analysis of data was done with the help of statistical tools like measures of central tendencies and dispersions.

CHAPTER THREE
RESULTS AND DISCUSSION

3.0 RESULTS & DISCUSSION

3.1. Fry collectors

The foremost link in the fry marketing chain of fry is the collectors. They catch galda fry from wild sources (the tidal river and mangrove areas). After catching the fry they sell these to the farias (middlemen). Generally the fry collectors do not go the farias for sale. In Dumuria, Chuknagar, Fakirhat and Molleraht the depots collect the fry from the fry collectors from the districts of Chandpur, Laksmipur, Noakhali, Cox'sBazar, Chittagong, Satkhira, Khulna, Bagerhat, Borguna, Pirojpur, Jhalakati, Barisal, Bhola, Patuakhali. Fry is also collected from Sundarban. Some fry collectors sell their fry directly to the depots.

3.1.1. Age structure

The selected 25 fry collectors were grouped into three categories according to their age. The first category includes persons of <30 years of age, second category includes 31-49 years and thirds category includes 50-65 years of age.

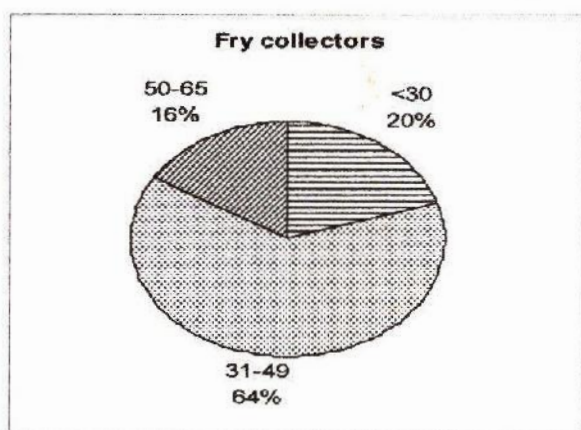


Figure: 1 Age categories of the fry collectors

Figure: 1 Again 20 % of fry collectors were in the age category of <30 years, 64 % fry collectors were in the age category of 31-49 years and the remaining 16 % were in the age category of 50-65 years. It is revealed from the figure that most of the fry collectors belong to the age category of 31-49 years. The fry collectors those who were the senior member of the family had interviewed in the study area.

3.1.2. Level of education

The selected fry collectors were grouped into four categories according to their level of education. Table 2 reveals that among the fry collectors 40, 36 and 24 % were illiterate, up to primary level and secondary level respectively while no fry collector was found at above secondary level of education. Most of the fry collectors (10 out of 25) were found illiterate.

Table 2: The level of education of farias and fry collectors

Level of education	Fry collectors	
	Number	% of total
Illiterate	10	40
Upto primary level	9	36
Upto secondary level	6	24
Above secondary level	0	00
Total	25	100

3.1.3. Annual income

The selected 25 fry collectors were categorized into three according to their level of annual income. The first category includes the fry collectors having annual income of upto Tk. 20,000.00 the second and third categories include Tk. 20,001.00 to Tk. 50,000.00 and Tk. 50,001.00 and above respectively. It was found that the annual income of 36 % of the fry collectors was upto Tk. 20,000.00 while 48 % of the fry collectors had annual income ranging from Tk. 20,001.00 to Tk. 50,000.00 and 16 % of fry collectors had income of Tk. 50,001.00 and above. The majority of the fry collectors had annual income ranging income from Tk. 20,001.00 to Tk. 50,000.00. Here, the total income of the family is counted that represented by the collectors.

Table 3: Annual income of the farias and fry collectors

Level of income (Tk)	Fry collectors	
	Number	% of total
Upto Tk. 20,000.00	9	36
Tk. 20,001.00 to Tk. 50,000.00	12	48
Tk. 50,001.00 and above	4	16
Total	25	100.0

3.1.4. Sources of fry

3.1.4.1. Natural sources

The principal source of galda is nature. The seed is collected at the advanced post larval stages. Coastal tidal rivers, estuaries, Bay of Bengal and Sundarban mangrove swamp are the main natural sources of fry. In the surveyed area, natural sources of galda seed were reported to come from Koyra river, Vodra river, Shakbaria river, Shibsha river, Balashwar river, Haringhata river, Pathuria river, Salta river etc. in the southwest of Bangladesh and huge groups of men, women and children are engaged in catching the PL from the rivers. The supply of seed comes from the districts of Chandpur, Laksmipur, Noakhali, Cox's Bazar, Chittagong, Borguna, Pirojpur, Jhalakati, Barisal, Bhola and Patuakhali.

3.1.4.2. Hatchery production

The hatchery produced seed and sometimes seed from Indian origin are available in the local areas. Since last 2-3 years the hatchery established by BRAC has also been engaged in galda seed production in the area. There are nine BRAC hatcheries present throughout Bangladesh. In the surveyed area, a total of 5 galda hatcheries were seen to be in operation. These are:

BRAC Galda Hatchery, Jessore

BRAC Galda Hatchery, Dumuria

Galda Hatchery, Dumuria

BRAC Galda Hatchery, Bagerhat

Galda Chingri Hatchery, Bagerhat

Among these, hatcheries production of Bagerhat BRAC Galda Hatchery is the highest than that of the others. In the year 2004, the production of galda PL was 72.44 lakh; in 2005 the production was 65.24 lakh and in 2006 the figure was 22.5 lakh from one cycle. Every year these hatcheries accomplish three cycles of galda PL production. Galda Hatchery, Dumuria has started production from the year 2005. The production of this hatchery was 45 lakh in 2005. The production of BRAC Galda Hatchery, Dumuria was about 62 lakh in 2005. Jessore BRAC Galda Hatchery's production target in 2006 was 23 lakh. This hatchery has started production from year 2006 after several years of intervals. The production of Galda Chingri Hatchery, Bagerhat was about 28 lakh in 2006.

3.1.5. Season and duration of fry collection

Galda seed marketing starts in the month of March - April. The demand of fry rises from April to mid-May; the peak period of the fry marketing is May to June/July. The maximum harvest from nature occurs during this time of the year (in the high tide). Hatchery-produced seed are available between March to September. Indian black marketed fry comes at the end of the culture season, during June, July and August. Galda fry are available almost all the year.

3.1.6. Selling places of fry

The seed produced either from the natural sources or from the hatcheries in the study area or beyond are marketed in following the bazaar/market places in the whole of greater Khulna district.

Dumuria bazaar

Chuknagar bazaar

Batiaghata bazaar

Koyra bazaar

Dakope bazaar

Chitalmari bazaar

Mollerhat baraghat bazaar

Mollerhat nishokhali bazaar

Kuliar bazaar

Fakirhat upazila bazaar

Faltita bazaar

Rampal foyla bazaar and so on.

Majority of the depots are located in these areas. Generally, the farmers come to these markets for purchasing the seed, but some farmers who have large requirement go to hatcheries directly for purchasing the seed.

3.1.7. Mortality of fry

The naturally collected fry are under physical stress because of mishandling. Thus they are subjected to higher mortality by the time they arrive the depots. On the other hand, hatchery produced PL transported to depots are not subjected to that much stress. According to the fry collectors, if proper care is taken then maximum mortality rises up to 5 %.

3.1.8. Transportation

Way of transport is badly essential for highly perishable commodity like galda fry. So perishable goods must be moved as early as possible from the producing centre to the consuming centre, "Adequate and efficient transportation is a cornerstone of our modern marketing system" (Kohls, 1980). Transport is important not only because it is essential to the operation of the marketing system, but also because it accounts for a very substantial part of total marketing costs (Abbott, 1958)

Means of transport is badly essential for live product like galda fry. So, the fry must be moved as early as possible from collection area to the stocking pond even in long distant areas. For fry or fingerlings carrying, aluminum pot or plastic barrel are used with no specified densities with hand agitation of water.

In the study area, the galda seed were seen to be transported by using indigenous technique. In this system galda seed were transported in plastic tank or other metal tanks with hand agitation of water. In case of long distance, plastic drum and pick-up van were used for transportation. Though modern technique of galda seed transportation is by using polythene bag filled with oxygen, it was rarely seen in the area.

In the study area, among the various modes of transportation, slow moving van, trains, rickshaws, truck, nocimon were found to carry galda fry from one place to another. The various modes of transportation used by the fry collectors are shown in Table 4.

Table 4: Percentage of various modes of transportation used by fry collectors

Mode of transportation	Fry collectors
Rickshaw	2
Van	10
Shoulder load	5
Head load	8
Total	25

Maximum of the fry collectors used low cost vehicle. The fact was that those carried small amount of fry and they sold their production to the farias or consumers. In addition, the fishermen collected the fry adjacent to the fry market.

3.1.9. Counting

Counting system galda fry is almost traditional. Hence, some collectors count each fry by using clam shell. Again, some other collectors count galda fry on assumption basis. i. e. they count fry in a small pot and number of pot that contains in a large pot which consists of fry. Then total number of fry is the multiplication product of number of pot and number of fry held in one pot.

If, A = Total number of galda fry in large container,

B = Total number of galda fry in small pot, and

C = Number of pots that needed to fulfill the large container,

Then, $A = B \times C$

3.1.10. Selling of fry

Buying and selling are the functions of exchange. Both have their primary objectives of negotiating favorable terms of exchange. Buying generally includes the selection of kinds of goods, the determination of quality and quantities and the selection of sources of assisting and persuading service (Dewan, 1967).

In the surveyed area, the price of galda seed varies from time to time. Each thousands of galda seed were sold with a range of 1,500 taka to 2,500 taka which fluctuates on the basis availability.

In Dumuria Bazar and Chuknagar Bazar, on an average fry collectors sold their 90 % fry to farias and rest 10 % to local depot proprietors. On the other hand, In Fakirhat and Mollerhat Bazar, on average fry collectors sold their 80 % fry to farias and rest 20 % to local depot proprietors. In Jessore BRAC Galda Hatchery and Bagerhat BRAC Galda Hatchery, on an average hatchery personnel (RSS) sold their 70 % fry to commission agents, 10% to depot proprietors and rest 20 % to farmers.

3.1.11. Problems faced by fry collectors

The selected fry collectors were asked whether they faced any problems in marketing their fry. The problems reported by them are presented in table 5. They encountered a variety of marketing problems such as poor communication and high transportation cost, low price of fry, higher market tolls. Pressure of farias and local depot proprietors are remarkable problems faced by fry collectors. Sometimes farias don't give payment at the time of purchasing. More than 84 % collectors reported this problem. Poor communication and high transportation cost was reported as the second major problem by 80 % of the respondents.

Table 5: Problems faced by the fry collectors in fry marketing

Reported problems	Number of respondents	Percentage
Pressure of farias and local depot proprietors	21	84
Poor communication and high transportation cost	20	80
Low price of fish	15	60
Higher market tolls	12	48

3.1.12. Measures Suggested by fry collectors

Fry collectors' suggestions in connection with the solutions of the problems were presented in table 6. Although there were variations in responses among the fry collectors, the suggestions were arranged on the basis of responses. The highest number (about 92 %) of the fry collectors suggested that the law and order i.e. removal of farias' and local depot proprietors' pressure on fry collectors and establishment of payment timely which is followed by suggestions such as Improvement of roads and communication facilities (72 %) Market tolls should be fixed (80 %). Again farias and local depot proprietors make syndicate and they are responsible for establishing low price of fry. Fry collectors want to remove this situation entirely.

Table 6: Fry collectors' suggestions regarding solutions of the problems

Suggestions	Number of respondents	Percentage
Removal of farias' and local depot proprietors' pressure on fry collectors	23	92
Improvement of roads and communication facilities	18	72
Market tolls should be fixed	20	80
Reasonable price of fry	25	100

3.1.13. Problems faced by hatcheries

Hatcheries mentioned that they faced few problems compared to other stakeholders related to galda fry marketing. They faced only the problem of commission agents' pressure with that of farmers'. Actually hatchery tries to sell the galda PL directly to the farmers for more benefit. But in the sense of more sell they want to sell galda fry to commission agents or depot

proprietors. Again, improper communication facilities, inadequate water and electricity supply were marked problems in galda PL marketing.

3.1.14. Measures suggested by the hatcheries

Hatcheries suggested that there should be proper system that conflicts between commission agents and farmers could easily buy galda PL from hatchery. Again, other facilities related to marketing should be provided.

3.2. Farias / Commission agents

The farias act as middlemen between the fry collectors and the local depots. The farias are actually the commission agents who do the function of negotiating transactions between fry collectors and local depots of fry on receipt of local depots' commission. They get 4 % commission from the fry collectors and 5 % commission from the local depot's proprietors at the relevant area of fry collection. Generally they go to the fry collectors and buy fry and supply these to the local depot proprietors.

The commission agents act as middlemen between hatchery and depot proprietors or farmers. The commission agents did the function of negotiating transactions between Regional Sector Specialist (RSS) of hatchery and depots of fry on receipt of local depots' commission or farmers on profit.

3.2.1. Age structure

The selected 30 farias were grouped into three categories according to their age. The first category includes persons of 18-30 years of age, second category includes 31-49 years and thirds category includes 50-65 years of age.

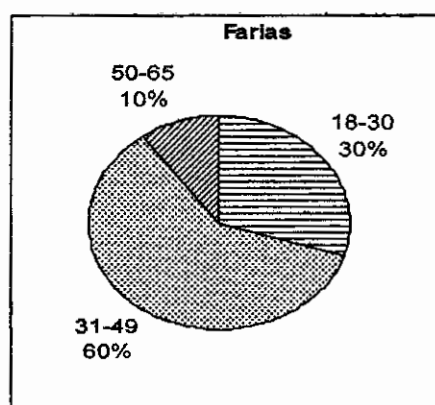


Figure: 2: Age categories of the farias

Figure: 2 shows that 30 % of farias were in the age category of 18-30 years, 60 % farias were in the age category of 31-49 years and the remaining 10 % were in the age category of 50-65 years. It is revealed from the figure that most of the farias belong to the age category of 31-49 years.

3.2.2. Level of education

The selected farias were also grouped into four categories according to their level of education. Table 7(i) reveals that 43.33 % farias were illiterate, 30 % were upto primary level, 20 % were upto secondary level and 6.67% were above of secondary level of education. It is observed that most of the farias were illiterate.

Table 7(i): The level of education of farias

Level of education	Farias	
	Number	% of total
Illiterate	13	43.33
Upto primary level	9	30
Upto secondary level	6	20
Above secondary level	2	6.67
Total	30	100

3.2.3. Annual income

The selected 30 farias were categorized into three according to their level of annual income. The first category includes the proprietors having annual income of upto Tk. 50,000.00 the second and third categories include Tk. 50,001.00 to Tk. 1,00,000.00 and Tk. 1,00,001.00 and above respectively. Table 7(ii) reveals that the annual income of 40 % of the farias was upto Tk. 50,000.00 while 36.67 % of the farias had annual income ranging from Tk. 50,001.00 to Tk. 1,00,000.00 and 23.33 % of the farias had income of Tk. 1,00,001.00 and above. The majority of the farias had annual income of upto Tk. 50,000.00.

Table 7(ii): Annual income of the farias

Level of income (Tk)	Farias	
	Number	% of total
Upto Tk. 50,000.00	12	40.0
Tk. 50,001.00 to Tk. 1,00,000.00	11	36.67
Tk. 1,00,001.00 and above	7	23.33
Total	30	100.0

3.2.4. Transportation & Mortality of fry

Farias buy galda fry from fry collectors and supplied to the local or central depot proprietors. Hence, mortality occurs during transportation. Improper transportation caused much mortality, which resulted into loss in the overall business. In the investigation it was found that the average mortality was up to 5 %.

In the study area, among the various modes of transportation, slow moving van, trains, rickshaws, truck, nocimon were found to carry galda fry from one place to another. The various modes of transportation used by the farias are shown in Table 8.

Table 8: Percentage of various modes of transportation used by fry collectors and intermediaries

Mode of transportation	Farias
Truck	7
Rickshaw	4
Van	6
Pick-up van	8
Nocimon	5
Total	30

3.2.5. Pricing (Buying and selling)

In Dumuria Bazar and Chuknagar Bazar, farias collect their entire fry from fry collectors and sold their total fry to local depot proprietors. In Fakirhat and Mollerhat Bazar, on an average farias collect their entire fry from fry collectors and sold their total fry to local depot proprietors.

In Jessore BRAC Galda Hatchery and Bagerhat BRAC Galda Hatchery, on an average commission agents collect their entire fry from hatchery and sold their 60 % fry to depot proprietors and rest of 40 % to farmers.

3.2.6. Problems faced by fry Farias

The farias were asked to mention the problems faced by them in fry marketing. Table 9 shows the problems that were reported by farias. They encountered a variety of marketing problems such as poor communication and high transportation cost, low price of seed, financial hardship, higher market tolls and the law order situation. Poor communication and high transportation cost was reported as the major problem by 86.66 % of the respondents. The other problems in descending order are financial hardship, higher market tolls, low price of fry as reported by 70%, 60% and 56.66% of the respondent farias respectively. Political instability, price fluctuation are others problem encountered by the farias of 50% and 40% farias respectively.

Table 9: Problems faced by the farias in fry marketing

Reported problems	Number of respondents	Percentage
Poor communication and high transportation cost	26	86.66
Financial hardship	21	70
Higher market tolls	18	60
Low price of fry	17	56.66
Political instability	15	50
Price fluctuation	12	40

3.2.7. Measures Suggested by farias

Farias' suggestions in connection with the solutions of the problems were presented in table 10. Although there were variations in responses among the farias, the suggestions were arranged on the basis of responses. The highest number (about 90 %) of the farias suggested improving of roads and communication facilities which is followed by suggestions such as financial solvency should be provided (80 %) Market tolls should be reasonable (73.33 %). The depot proprietors make syndicate for lowering the price of fry. The farias want to remove this situation. Furthermore, political instability and price fluctuation, as remarkable problem should be eradicated that was suggested by farias of 56.66% and 50% respectively.

Table 10: Farias' suggestions regarding solutions of the problems

Suggestions	Number of respondents	Percentage
Improvement of roads and communication facilities	27	90
Financial solvency	24	80
Reasonable market tolls	22	73.33
Reasonable price of fry	18	60
Political stability	17	56.66
Price stability	15	50

3.3. Local depot proprietors

It is the third step in the chain. Local depot proprietors act as wholesaler in this marketing channel. Wholesaling is a major step in the marketing activities (Kohls and Uhl, 1980). They are the big merchants with possession of fixed business premises in the whole sale market and they perform the business with a large volume of transactions. Local depots are available in the nearby region of fry collection. The local depot proprietors invest a large amount of money in the business, supplying fry into other districts as well as within the district. The local depot proprietors purchase fry from farias and sell it to far away district buyers. Sometimes the local depots proprietors collect fry from collectors directly.

3.3.1. Age structure

The selected local depot proprietors were grouped into three categories in accordance with their age. The first category includes persons between 18-30 years age, second category includes between 31-49 years and thirds category includes persons between 50-65 years of age. There were local (primary) depots available where galda were collected.

Table 11: Local depot proprietors' age category

Age category	Number	% of total
18-30	5	25.0
31-49	11	55.0
50-65	4	20.0
Total	20	100.0

Table 11 shows that 25 % of the local depot proprietors were in the age category of 18-30 years, 55 % were in the age category of 31-49 years and the remaining 16 % were in the age category of 50-65 years in the local depots. It is revealed from the table that most of the local depot proprietors belong to the age category of 31-49 years due to their physical strength in fishing. Other two age categories are mainly engaged as helper.

3.3.2. Level of education

The selected twenty local depot proprietors were grouped into four categories according to their level of education. The first category includes illiterate (who did not know how to read and write), the second category includes those who read upto primary level, the third category includes those who read upto secondary level of education and the fourth category includes those who were above secondary level.

In accordance with the level of education of the local depot proprietors, Table 12 shows that 60 % were illiterate, 25 % were educated upto primary level and 15 % were educated upto secondary level. No proprietors were found educated above secondary level. It is observed that most of the proprietors (12 out of 20) were illiterate.

Table 12: Local depot proprietor's level of education

Level of education	Number	% of total
Illiterate	12	60
Upto primary level	5	25
Upto secondary level	3	15
Above secondary level	0	0
Total	20	100.0

3.3.3. Annual income

The selected local depot proprietors were grouped into three categories according to the level of their annual income. The first category includes the proprietors having annual income upto Tk. 50,000.00 the second and third categories include Tk. 50,001.00 to Tk. 1,00,000.00 and Tk. 1,00,001.00 and above respectively.

Regarding the annual income of the selected local depot proprietors, Table 13 reveals that the annual income of 70 % of the proprietors was upto Tk. 50,000.00 while 20 % of the proprietors

had annual income ranging from Tk. 50,001.00 to Tk. 1,00,000.00 and 10 % of proprietors had income of Tk. 1,00,001.00 and above. The majority of the local depot proprietors had annual income upto Tk. 50,000.00.

Table 13: Annual incomes of local depot proprietors

Level of income(Tk.)	Number	% of total
Upto Tk. 50,000.00	14	70.0
Tk. 50,001.00 to Tk. 1,00,000.00	4	20.0
Tk. 1,00,001.00 and above	2	10.0
Total	20	100.0

3.3.4. Condition of the local depots

3.3.4.1. Building materials

In terms of construction materials, the local depots were categorized into 'Kancha' (made of bamboo, bamboo-fence with earthen floor), 'Semi-pacca' (made of bamboo, wood and tin roof with concrete floor), and 'Pacca' (made of bricks, RCC and concrete). Building materials of the local depots are shown in the table no. 14.

The physical condition of the majority of the depots in Chuknagar, Dumuria, Fakirhat and Mollerhat were Semi-pacca (45 %) followed by Kancha (35 %) and pacca (20 %).

Table 14: Building materials of the prawn fry local depots in Chuknagar, Dumuria, Fakirhat and Mollerhat

Condition	Location				Total	%
	Chuknagar	Dumuria	Fakirhat	Mollerhat		
<i>Kancha</i>	1	2	3	1	7	35
<i>Semi-pacca</i>	3	2	2	2	9	45
<i>Pacca</i>	1	1	0	2	4	20
Total	5	5	5	5	20	100

3.3.4.2. Size of the Depots

In terms of size the local depots were categorized into three types small (area below 150 square feet), medium (area between 150 to 200 square feet) and large (area more than 200 square feet). The size of depots in Chuknagar, Dumuria, Fakirhat and Mollerhat are shown in the figure no. 3.

Medium size local depots in all of the regions are maximum in numbers whereas large size depots are minimum in number. Out of the 20 local depots surveyed, the number of small, medium and large size were 7, 9, 4 respectively.

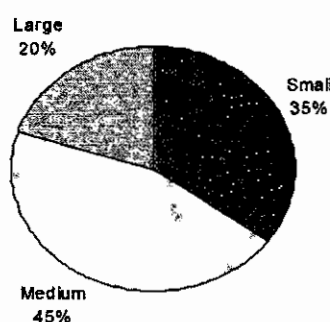


Figure 3: Size of local depots in the study area

3.3.5. Mortality and Transportation of fry

At the local depots enough care is taken that no mortality occurs. The local depot owners try their best to sell their lots before any mortality occur. Rickshaw vans are used in transportation. Hence the probability of fry mortality is very low. At this stage the mortality is very low being average at up to 6 %. Table 15 shows the range of mortality and the percentage of the local depots owners in the area.

Table 15: Mortality percentage of fry according to local depots owners

Range of mortality percentage	No. of local depots owners	Percentage
0-2	12	60
>2-4	6	30
>4-5	2	10
Total	20	100

The various modes of transportation used by local depot proprietors are shown in Table 16.

Table 16: Percentage of various modes of transportation used by local depot proprietors

Mode of transportation	Local depot distributors
Truck	3
Rickshaw	5
Van	7
Pick-up van	3
Nocimon	2
Total	20

3.3.6. Pricing (buying and selling)

In the surveyed area, the price of galda seed vary from time to time. Each thousands of galda seed were sold with a range of 1,500 taka to 2,500 taka which fluctuates on the basis availability.

In Dumuria Bazar and Chuknagar Bazar, on an average local depot proprietors purchased 90% of fry from farias and rest 10 % from fry collectors directly. They sold major portion (70 %) fry to central depot proprietors and 30 % fry to farmers. In Fakirhat and Mollerhat Bazar, on an average local depot proprietors purchased 80% of fry from farias and rest 20 % from fry collectors directly. They sold major portion (70 %) fry to central depot proprietors and 30 % fry to farmers.

3.3.7. Problems faced by local depot proprietors

The local depot proprietors were asked to mention the problems faced by them in fry marketing. Table 17 shows the problems that were reported by them. They encountered a variety of marketing problems relevant to marketing facilities such as electric supply, water supply, drainage facilities and the law order situation.

Shortage of capital was one of the major problems of fry marketing as pointed out by 75% of local depot proprietors. Price fluctuation and political instability were another problem that was encountered by 50% of local depot proprietors.

Table 17: Problems faced by the local depot proprietors in fry marketing

Reported problems	Local depot proprietors	
	Number of respondents	Percentage
<u>Marketing problems</u> (Load shedding, Inadequate water supply, Improper drainage facilities)	18	90
Shortage of capital	15	75
Political instability, Price fluctuation	10	50

3.3.8. Measures Suggested by local depot proprietors

Maximum (more than 90%) of the local depot proprietors suggested that continuous electric supply, water supply and proper drainage facilities should be provided.

The local depot proprietors proposed the provision of supplying of credit from institutional sources on easy terms. Fifty percent local depot proprietors suggested that political situation should be improved and price should be stable.

3.4. Central depot proprietors

Generally the central depots are situated at a central place of farming activities. Hence, these proprietors play a vital role in the whole chain. Central depot proprietors send their representatives to the local depot proprietors and buy galda fry. Then proprietors sell their fry to the farmers. If some of the fry are unsold then they nurse those in their own nursery ponds. When the fry get comparatively bigger size and when there are the demand from buyers, they are harvested. Central depot proprietors are the last link of intermediaries in fry marketing chain.

3.4.1. Age structure

The selected central depot proprietors were grouped into three categories in accordance with their age. The first category includes persons between 18-30 years age, second category includes between 31-49 years and thirds category includes persons between 50-65 years of age. From local depots galda fry were accumulated to the depot in the supply area that is named as central (secondary) depot.

Table 18: Central depot proprietors' age category

Area	Age category	Number	% of total
Chuknagar	18-30	3	20.0
	31-49	10	66.7
	50-65	2	13.3
	Total	15	100.0
Dumuria	18-30	2	13.3
	31-49	9	60.0
	50-65	4	26.7
	Total	15	100.0
Fakirhat	18-30	2	20.0
	31-49	5	50.0
	50-65	3	30.0
	Total	10	100.0
Mollerhat	18-30	2	20.0
	31-49	6	60.0
	50-65	2	20.0
	Total	10	100.0

The above table also shows that 18.3 % of the central depot proprietors were in the age category of 18-30 years, 59.2 % the central depot proprietors were in the age category of 31-49 years and the remaining 22.5 were in the age category of 50-65 years in the central depots.

3.4.2. Level of education

The selected fifty central depot proprietors were grouped into four categories according to their level of education. The first category includes illiterate (who did not know how to read and write), the second category includes those who read upto primary level, the third category includes those who read upto secondary level of education and the fourth category includes those who were above secondary level.

In accordance with the level of education of the proprietors in the central depots, Table 19 shows that 64 % were illiterate, 24 % were educated upto primary level and 12 % were educated upto secondary level. No proprietors were found educated above secondary level. It is observed that most of the proprietors (45 out of 70) were illiterate. The literate proprietors could easily be adapted with the new techniques and systems than the illiterate persons.

Table 19: Central depot proprietor's level of education

Level of education	Number	% of total
Illiterate	32	64
Upto primary level	12	24
Upto secondary level	6	12
Above secondary level	0	0
Total	50	100.0

3.4.3. Annual income of the central depot proprietors

The selected central depot proprietors were grouped into three categories according to the level of their annual income. The first category includes the proprietors having annual income upto Tk. 50,000.00 the second and third categories include Tk. 50,001.00 to Tk. 1,00,000.00 and Tk. 1,00,001.00 and above respectively.

Regarding the annual income of the selected central depot proprietors, Table 20 reveals that the annual income of 40 % of the proprietors was upto Tk. 50,000.00 while 50 % of the proprietors had annual income ranging from Tk. 50,001.00 to Tk. 1,00,000.00 and 10 % of proprietors had income of Tk. 1,00,001.00 and above. The majority of the central depot proprietors had annual income ranging from Tk. 50,001.00 to Tk. 1,00,000.00.

Table 20: Annual incomes of the central depot proprietors

Level of income(Tk.)	Number	% of total
Upto Tk. 50,000.00	20	40.0
Tk. 50,001.00 to Tk. 1,00,000.00	25	50.0
Tk. 1,00,001.00 and above	5	10.0
Total	70	100.0

3.4.4. Condition of the depots

3.4.4.1. Building materials

In terms of construction materials, the depots were categorized into 'Kancha' (made of bamboo, bamboo-fence with earthen floor), 'Semi-pacca' (made of bamboo, wood and tin roof with concrete floor), and 'Pacca' (made of bricks, RCC and concrete). Building materials of the prawn fry central depots are shown in the table no. 21.

The physical condition of the majority of the central depots in Chuknagar, Dumuria, Fakirhat and Mollerhat were Semi-pacca (66 %) followed by Kancha (20 %) and pacca (14 %).

Table 21: Building materials of the prawn fry central depots in Chuknagar, Dumuria, Fakirhat and Mollerhat

Condition	Location				Total	%
	Chuknagar	Dumuria	Fakirhat	Mollerhat		
<i>Kancha</i>	3	2	2	3	10	20
<i>Semi-pacca</i>	10	12	6	5	33	66
<i>Pacca</i>	2	1	2	2	7	14
Total	15	15	10	10	50	100

3.4.4.2. Size of the central Depots

In terms of size the central depots are categorized into three types small (area below 150 square feet), medium (area between 150 to 200 square feet) and large (area more than 200 square feet). The size of central depots in Chuknagar, Dumuria, Fakirhat and Mollerhat are shown in the figure no. 4.

Medium size depots in all the regions are maximum in numbers whereas large size depots are minimum in number. Out of the 50 central depots surveyed, the number of small, medium and large size in the study area were 16, 27, 7 respectively.

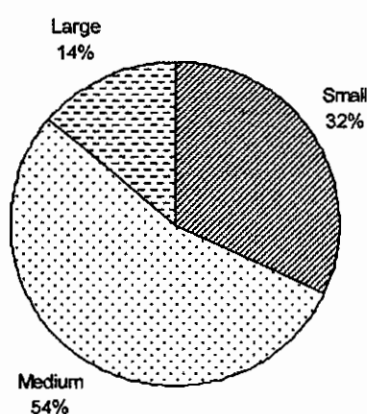


Figure 4: Size of central depots in the study area

3.4.5. Mortality and Transportation of fry

Generally the central depots are situated at the nearby markets of galda or farming areas. At the depots enough care is taken that no mortality occurs. The depot owners try their best to sell their lots before any mortality occur. Sometimes if they cannot sell in proper time then they nurse the fry in their own gher. At the convenient time when there are demands, the seed are sold to the farmers. At this stage the mortality is very low being average at up to 5%. Table 22 shows the range of mortality and the percentage of the central depot proprietors in the area.

Table 22: Mortality percentage of fry according to the central depot proprietors

Range of mortality percentage	No. of the central depot proprietors	Percentage
0-2	13	26
>2-4	25	50
>4-5	12	24
Total	20	100

The various modes of transportation used by the central depots proprietors are shown in Table 23.

Table 23: Percentage of various modes of transportation used by fry collectors and intermediaries

Mode of transportation	Central depot distributors
Train	3
Truck	12
Pick-up van	18
Nocimon	17
Total	50

3.4.6. Pricing (Buying & Selling)

In Dumuria Bazar and Chuknagar Bazar, on an average central depot proprietors purchased entire fry from local depot proprietors and sold to farmers entirely. On the other hand, in Fakirhat and Mollerhat Bazar, on an average central depot proprietors purchased entire fry from local depot proprietors and sold to farmers entirely. In Jessore BRAC Galda Hatchery and Bagerhat BRAC Galda Hatchery, on an average Depot proprietors purchased 60% of fry from commission agents and rest 40 % from hatchery directly. They sold entire (100 %) fry to farmers.

3.4.7. Problems faced by the central depot proprietors

The central depot proprietors were asked to mention the problems faced by them in fry marketing. Table 24 shows the problems that were reported by them. They encountered a variety of marketing problems relevant to marketing facilities such as electric supply, water supply, drainage facilities and the law order situation.

Shortage of capital was one of the major problems of fry marketing as pointed out by 80% of central depot proprietors. Price fluctuation and political instability are another problem that was encountered by 40% of central depot proprietors respectively.

Table 24: Problems faced by the central depot proprietors in fry marketing

Reported problems	Central depot proprietors	
	Number of respondents	Percentage
Marketing problems (Load shedding, Inadequate water supply, Improper drainage facilities)	45	90
Shortage of capital	40	80
Political instability, Price fluctuation	20	40

3.4.8. Measures Suggested by the central depot proprietors

Maximum (more than 90%) of central depot proprietors suggested that continuous electric supply, water supply and proper drainage facilities should be provided. The central depot proprietors proposed the provision of supplying of credit from institutional sources on easy terms. Forty percent of central depot proprietors suggested that political situation should be improved and price should be stable.

3.5. Farmers

Farmers are the ultimate consumer in fry marketing. They purchase fry from the central depot proprietors. Sometimes they purchase fry directly from the local depot proprietors also. Due to the intermediate stage of this trade the farmers had to pay more than the actual price of the fry and eventually they are losing their benefits. After comparatively bigger size of fry the farmers release the fry from nursery pond to culture pond.

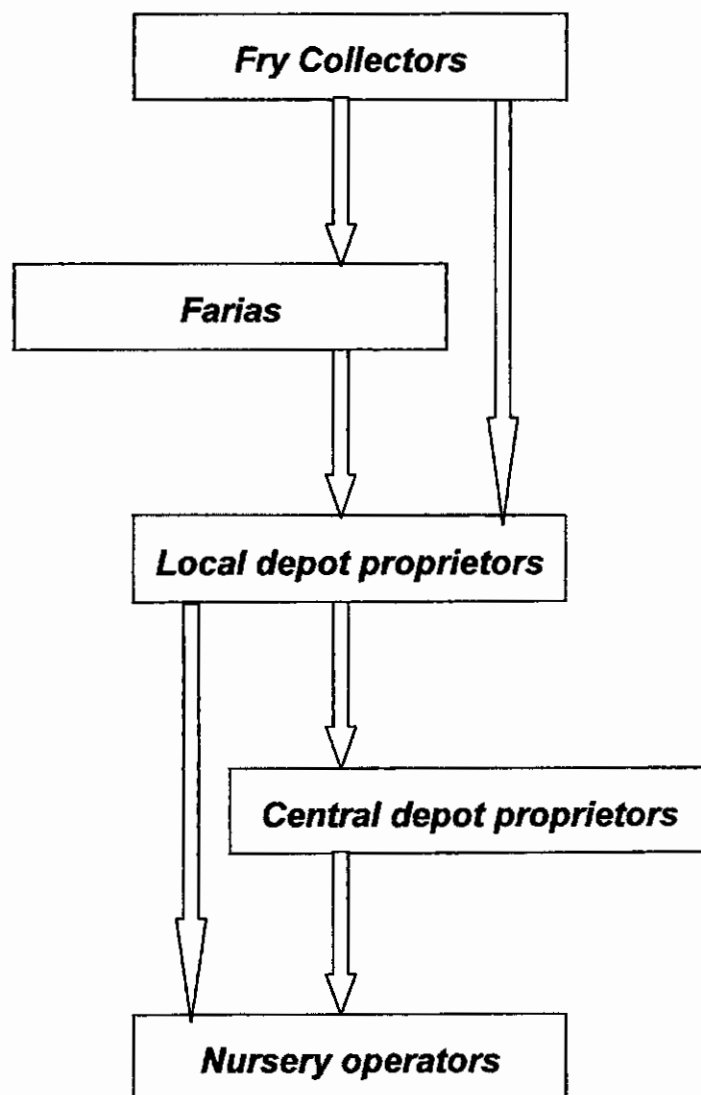


Figure 5: Marketing Channel of natural galda fry in surveyed area

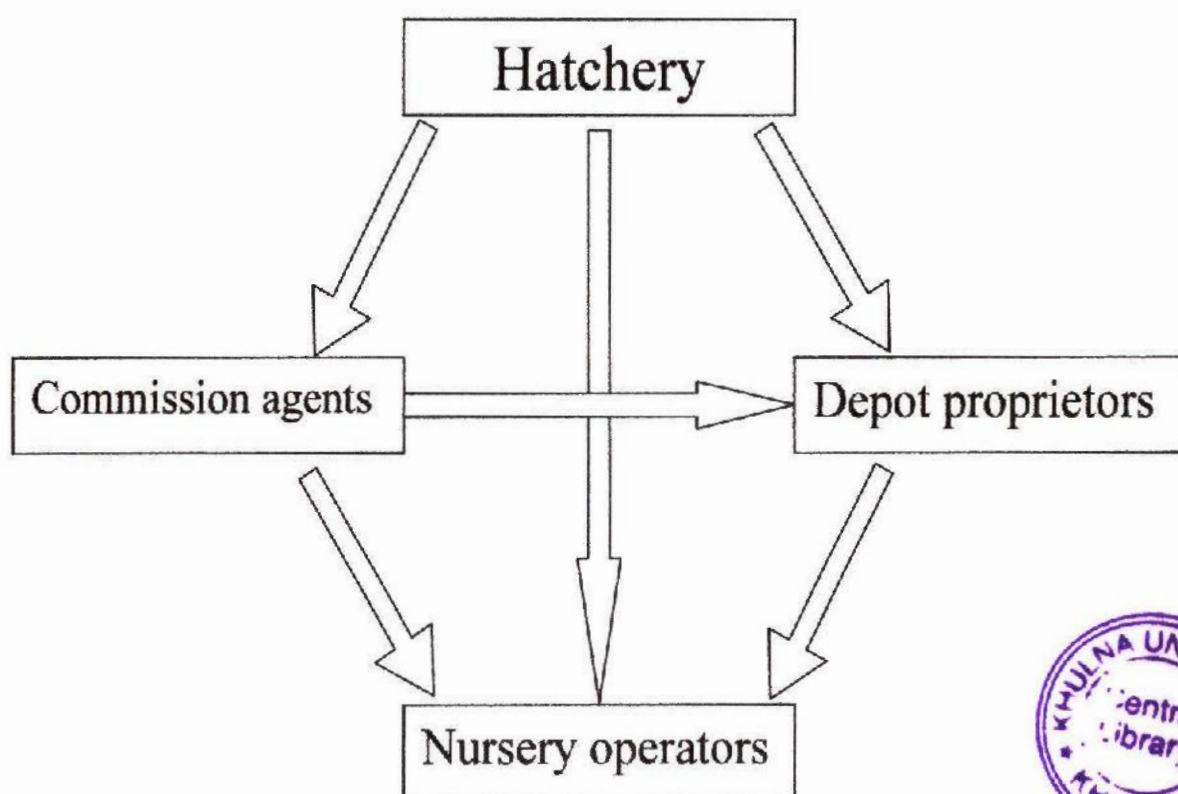


Figure 6: Marketing Channel of hatchery galda fry in the surveyed area

Table 25: Percentage of galda fry transacted by fry collectors and intermediaries in Dumuria and Chuknagar Bazar

Intermediaries	Purchased from (%)					Sold to (%)				
	Fry collectors	Farias	Local depot proprietors	Central depot proprietors	Farmers	Fry collectors	Farias	Local depot proprietors	Central depot proprietors	Farmers
Fry collectors							90	10	-	-
Farias	100							100	-	-
Local depot proprietors	10	90							70	30
Central depot Proprietors	-	-	100							100
Farmers	-	-	20	80						

In Dumuria Bazar and Chuknagar Bazar, on an average farmers purchased 80 % fry from central depot proprietors and rest 20 % fry from depot proprietors.

Table 26: Percentage of galda fry transacted by fry collectors and intermediaries at Fakirhat and Mollerhat Bazar

Intermediaries		Purchased from (%)					Sold to (%)			
	Fry collectors	Farias	Local depot proprietors	Central depot proprietors	Farmers	Fry collectors	Farias	Local depot proprietors	Central depot proprietors	Farmers
Fry collectors							80	20	-	-
Farias	100							100	-	-
Local depot proprietors	20	80							70	30
Central depot Proprietors	-	-	100							100
Farmers	-	-	10	90						

In Fakirhat and Mollerhat Bazar, on an average farmers purchased 90 % fry from central depot proprietors and rest 10 % fry from depot proprietors.

Table 27: Percentage of galda fry transacted by marketing officer (hatchery) and intermediaries at Jessore BRAC Galda Hatchery and Bagerhat BRAC Galda Hatchery

Intermediaries	Purchased from (%)				Sold to (%)			
	Hatchery personnel (RSS)	Commission agents	Depot proprietors	Farmers	Hatchery personnel (RSS)	Commission agents	Depot proprietors	Farmers
Hatchery						70	10	20
Commission agents	100						60	40
Depot proprietors	40	60						100
Farmers	10	50	40					

In Jessore BRAC Galda Hatchery and Bagerhat BRAC Galda Hatchery, on an average farmers purchased 50 % fry from commission agents, 40 % from depot proprietors and rest 10 % fry from hatchery directly.

CHAPTER FOUR
RECOMMENDATION

4.0 Recommendation

For improving galda fry marketing following things should be considered:

The natural collection should be stopped for the conservation of biodiversity in the area, or if it let continue, the collectors should be given proper training.

The intermediaries in the trade should be lessened for upliftment of the collectors.

Provision should be made for sufficient facilities for water supply, electricity supply as well as drainage facilities at the market place to keep a healthy atmosphere for fry trading.

Credit supply is one of the important issues in galda fry trade. Government should take step for easy disbursement of loan.

CHAPTER FIVE

CONCLUSION

5.0 Conclusion

The study was conducted in an area which has come out as one of the promising galda cultivation area in the country- Khulna and Bagerhat. It was interesting to see how the trade on galda seed in the area. Four market places viz. Dumuria, Chuknagar, Fakirhat and Mollerhat were surveyed for galda fry trade. There were five stakeholder groups in the production and marketing of galda seed. All these stakeholder groups were seen to have various problems. The seed collectors are the poor communities; they do not get the proper price, because of the intermediary groups. There is high mortality for lack of transport facilities, shortage of capital, price fluctuation are the principal problems. For removing these problems natural collection should be stopped for conservation of biodiversity in one hand, on the other, the intermediary groups should be lessened for upliftment of the collectors. Proper market facilities and credit supply to the stakeholders from govt. or non govt. sectors should be provided.

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APPENDIX

QUESTIONNAIRE

1. Name of the depot:
2. Year of establishment:
3. Physical infrastructure of the depot (Kacha/Semi-pacca/Pacca)
4. Size of depot:
5. No. of manpower in Depot:
6. Sources of fry:

Nature (%)	Hatchery (%)

7. Major problems in Fry Business:

- Capital:
- Law and order:
- Mortality of the fry:
- Irregular supply:
- Transportation:
- Marketing:
- Taxation:
- License:
- Others:

8. Prawn fry trading and type of business of the Depot:

Trading instruction	From where you collect		To Where you supply
	Places	Persons	Farmers
No. of persons/places			
What % of your			

9. Season of business

Peak from.....to.....

Lean from.....to.....

10. Where do you obtain the fry from ?
11. What is the survival rate ?
12. What is the preferable size of fry ?
13. Do you receive any claim from customer ?
14. What is the nature of claim ?
15. Do you receive any facility from Govt. ?
16. What kind of facility you expect from Govt. ?
17. Do you have any technical training ?
18. What kind of training do you expect ?
19. What is your marketing system ?
20. What should be your marketing system ?
21. Who are the buyers of your nursery / Where do they come from ?
22. How is the fry transported /means of transport ?
23. What is the amount of investment ?
24. Source of capital:
 - i. Inherited.....
 - ii. Own.....
 - iii. Credit.....
 - iv. Others
25. Where has the loan taken ?
26. What is the rate of interest ?
27. Do you have any record keeping system ?
28. What is in your opinion are the constraints in this trade?