

Declaration

Socio-economic condition of small indigenous species beneficiaries at three villages (Baddagati, Daukona and Alka) of Phultala, Khulna

The results presented in the thesis with the above mentioned title are entirely of the candidate's own investigations and no part of the results has been accepted for any degree nor is it being concurrently submitted for any degree.

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DEDICATED
TO
MY BELOVED PARENTS



Table of Contents

	Page
Acknowledgement	i
Abstract	ii
Table of contents	iii- iv
List of tables	v
List of figures	vi
List of abbreviations	vii
 Chapter 1 Introduction	
1.1 Background of the study	1- 3
1.2 Objectives of the Study	4
 Chapter 2 Literature review	 5-6
Chapter 3 Materials and methods	
3.1 Study area	7
3.2 Field survey & observation	7
3.3 Data collection	8
3.4 Data Analysis	8



Chapter 4 Results & Discussion

4.1 Socio- economic condition of SIS beneficiaries

4.1.1 Socio-economic characteristics

4.1.1.1 Age group	9
4.1.1.2 Sex	10
4.1.1.3 Religion	10 - 11
4.1.1.4 Marital status	11
4.1.1.5 Family size	11-12
4.1.1.6 Education	12-13
4.1.1.7 Types of farmer	13
4.1.1.8 Family pattern	13 - 14
4.1.1.9 Housing conditions	14
4.1.1.10 No. of family members	15
4.1.1.11 School going and dropout children	15
4.1.1.12 Causes of school dropout	15-16
4.1.1.13 Electricity facilities	16
4.1.1.14 Occupation	17
4.1.1.15 Agricultural land ownership	17-18
4.1.1.16 Health and sanitation	18
4.1.1.17 Main sources of drinking water	18
4.1.1.18 Defecation Place	18
4.1.1.19 Suffering of diseases during last year	19
4.1.1.20 Types of treatment they have taken	19-20
4.1.1.21 Other assets (livestock and poultry)	20
4.1.1.22 Other product produced at the three villages	20-21
4.1.1.23 Other crops/products on dyke	21
4.1.1.24 Production of vegetables	21

4.2 SIS related information

4.2.1 Harvesting method of SIS	22-23
4.2.2 Small indigenous species sells	24
4.2.3 Price of SIS	24-25
4.2.4 Variation of SIS with season	25-26
4.2.5 Yearly income from SIS	26
4.2.6 Gross annual household income of SIS	26-27

beneficiaries

Chapter 5 Conclusion	28
Chapter 6 References	29-31
Appendices	32-33

List of Tables

Table No	Title	Page no
Table 1	: Different age groups of farmers	10
Table 2	: List of different education groups	14
Table 3	: List of different occupation	19
Table 4	: List of different areas of agricultural land ownership	20
Table 5	: List of different type of places for defecation	21
Table 6	: List of other assets (livestock and poultry)	23
Table 7	: List of different type of products produced at the three villages	24
Table 8	: Places of small indigenous species marketed	29
Table 9	: Price of small indigenous species	29
Table 10	: List of different income group	31

List of Figures

Figure No	Title	Page No
Figure 1	: Percentages of male & female of SIS beneficiaries	10
Figure 2	: Number of religion of SIS beneficiaries	11
Figure 3	: Percentages of marital status of SIS beneficiaries	12
Figure 4	: Percentage of Family size of SIS beneficiaries	13
Figure 5	: Percentages of Family pattern of SIS beneficiaries	15
Figure 6	: Percentages of Housing condition of SIS beneficiaries	16
Figure 7	: Percentages of school dropout boys & girls	17
Figure 8	: Percentage of Electricity facilities of SIS beneficiaries	19
Figure 9	: Percentages of types of disease occurred of SIS beneficiaries	22
Figure 10	: Percentages of types of treatment taken by the SIS beneficiaries	23
Figure 11	: Production of vegetables by SIS beneficiaries	25
Figure 12	: Variation of SIS with season	30
Figure 13	: Gross annual household income of SIS beneficiaries	32



List of Abbreviations

	Title	Page
SIS	: Small Indigenous Species	1
SRS	: Shelf- Recruiting Species	5
DoF	: Department of Fisheries	11
S.S.C	: Secondary School Certificate	14
FMRT	: Fisheries & Marine Resource Technology Discipline	i
GDP	: Gross Domestic Products	6
PRA	: Participatory Rural Appraisal	7
FAO	: Food and Agricultural Organisation	3

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Abstract

The Study was conducted to observe socio-economic condition of small indigenous species beneficiaries at three villages (Baddagati, Daukona & Alka) of Phultala thana. Data were collected through personal visit and interview from the SIS beneficiaries who were gher owner. The study period was conducted from November 2008 to January 2009. By interviewing it was found that there was no small indigenous specie beneficiaries below 20 years of age. Results showed that the highest numbers of small indigenous species beneficiaries were between 31 and 40 years indicating middle age people. Among them 99% male sell SIS & only 1 % female sell SIS. The present study showed that 80% farmers were Muslims and 20 % farmers were Hindus, 86 % were married while the unmarried farmers represented 14 % of the population & 73 % families were single and the rest of 27 % were joint family types. At three villages, 25 (50%) farmers owned 'Kacha' houses, 15 (30%) farmers owned 'Paka' and the rest of them 10 (20%) had tin made houses. It was found that cent percent of the farmers used tube-well water for drinking. Among three villages, 43 (92%) farmers had no electricity facilities and the rest of the farmers 7 (8%) had electricity facilities. Among 96 % of the farmers were literate at various stages of education. However, persons with the ability to just sign were 2 % of the farmers. And 60 % farmers had secondary education and 12 % of the farmers have secondary school certificate. It was also observed that 65 % were school dropout boy and 35 % were girl. During winter, farmers got higher amount of SIS than summer. Among them, 50 % farmers earn more than Tk.30,000 per year.

Keywords: SIS, SIS beneficiaries, Socio-economic condition.

Chapter: One

Introduction



Introduction

1.1 Background of the study:

Bangladesh is a deltaic country endowed with various ponds, lakes, canals, beels, haors, boars, rivers & creeks. Fisheries resources play an important role in the economy of Bangladesh like other developing countries. There are about 12, 80,000 people are engaged in fishing activities in our country. Fisheries resources fulfill the requirements of animal's protein. It also creates the employment facilities of the poor people & helps to earn valuable foreign currency. In khulna region, there are many ghers, beels, where the farmers get extra benefit from these types of species. They also use these fishes for their consumption. The surrounding environment is suitable for fresh water indigenous species. Most of the farmers & other people, who are engaged in fish culture activities, use these small indigenous species not only for selling purpose but also used as their own consumption. There is no extra expenditure applied for these species. Usually, these species enter into the gher through the flow of water during water exchanging. During flood & for some other reasons these species can also enter into the waterbody. No extra investment is required for their stocking & feeding purpose.

The present study has been carried out to know the socio-economic condition of small indigenous species beneficiaries of Phultala thana because socio-economic improvement is considered to be the primary objective of small indigenous species beneficiaries.

In Bangladesh, food intake is closely linked to local food production and fish intake is dependent on fisheries from the local water bodies. Rice is the main crop and the major food of the rural poor, contributing the major part of energy and protein. Nutrients such as vitamin A, vitamin C, calcium, iron and zinc which are not found in rice or found only in small quantities must be supplied by other commonly consumed foods, such as nutrient dense vegetables and fish. Small indigenous species (SIS), since they are eaten whole contribute to the intakes of essential nutrients, especially calcium. Some SIS have high contents of vitamin A and can play an important role in increasing vitamin A intakes. Thus, human nutrition can be greatly improved in rural Bangladeshi by ensuring the protection and enhancement of fish production,

accessibility of fish to the rural poor and fish consumption, especially of nutrient dense SIS,

The Bangladeshi diet is dominated by a single food item, rice. This means that rice is the major source of energy and nutrients in the diet, contributing over 80% of the daily energy intake per person and 60% of the daily protein intake per person (Ahmad and Hossain 1983). However, there are essential nutrients, such as vitamin A, vitamin C, iron calcium, zinc and iodine which are not found in rice or found only in small quantities. These nutrients must therefore be supplied by the other common foods in the diet, such as vegetables and fish. This simple relation between the everyday foods, intakes of energy and essential nutrients must be borne in mind to ensure that food and nutrition security of the rural poor is met.

The old Bangladeshi proverb, "Fish and rice make a Bengali" reflects the importance that fish plays in the diet. The average intake of fish in rural Bangladesh was estimated as 32.0 g raw fish/person/d in 1995-96 (Jahan and Hossain 1998).

Some SIS, for example mola (*Amblypharyngodon mola*), dhela (*Osteobrama cotio cotio*) and kaski (*Corica soborna*) have very high contents of vitamin A. Also, since many SIS are eaten whole, with organs and bones, they contain very large amounts of calcium as well as some iron and zinc. In addition, fish protein has an enhancing effect on the bioavailability of minerals in a meal. In Bangladesh, where anaemia and vitamin A deficiency have remained unchanged during the last three decades and persist to be major public health problems (Ahmed 1999, Ahmed 2000), SIS can play an important role as a rich dietary source of vitamin A, iron and other minerals. For example, less than 20 g of mola per day supplies the daily recommended vitamin A intake of a child.

In a survey conducted in 1995-96, it was estimated that only 43% of the rural population met their daily vitamin A recommendations, 11% met their iron recommendations and 20% their calcium recommendations (Jahan and Hossain 1998). There are no studies at national level about the prevalence of vitamin A deficiency but among pre-school children, adolescents and pregnant women, a high prevalence of ocular signs and symptoms and low serum retinol values have been reported (Ahmed 1999). A prevalence of anaemia of 53% is reported in the Bangladeshi population and pre-school children, adolescent girls, women of reproductive age and pregnant women are most at risk of anaemia (Ahmed 2000). These nutrient deficiencies contribute to increased mortality and morbidity as well as impaired learning capacity in

schoolchildren and reduced work capacity in adults which lead to poor economic development,

Fishers are one of the most valuable communities in Bangladesh. Over the years, the livelihood status of the fishers has further deteriorated. Being an isolated community fishers are deprived of many amenities of life.

Bangladesh is a developing country. Fisheries sector plays an important role as a source of income, employment, nutrition and foreign exchange earnings in Bangladesh. Fish is renewable natural resource and plays a great role for the improvement of socio-economic condition of poor fishers. Bangladesh is blessed with vast water bodies (533265ha) of inland fisheries (DoF, 2003). The inland water bodies are rich in freshwater fish species comprising 260 indigenous, 12 exotic and 24 fresh water prawn species (Rahman, 1989) i.e. fish ranks second to rice as our staple food. In spite of vast fisheries resources the present fish production of Bangladesh is unable to meet the demand of the fish requirement for increasing population of the country. Fisheries sector contributes 63% of an animal protein to our daily diet (DoF, 2003). Per capita per day fish consumption, which was 32g in mid sixties, declined to the level of 20g in mid eighties (FAO, 1985). Fish production has increased significantly over the last few years. This production level reflects per capita per day availability of 25 gm of fish where the minimum requirement is about 38g per day (DoF, 2002). The water resource was very rich in the past but the present production of fish has failed to keep pace with the population size that is increasing in geometric rate-over 130 millions of people of the country. About 12 millions of people are directly or indirectly involved in fisheries sector for their livelihood (DoF, 2002). The competent fisheries manpower can play an important role to bring a change in fisheries production and profitability that have such a crucial place in the national economy, nutrition and employment,

The study intends to investigate the socio-economy of small indigenous species beneficiaries at Phultala Thana with a view to obtain some knowledge about their social and economic condition and to provide some guidelines which would be economically acceptable without reducing the small indigenous species production at the same time.

1.2 Objectives of the study:

- To observe the socio-economic condition of small indigenous species beneficiaries.
- To observe different small indigenous species found at surveyed areas.
- To observe the market price of small indigenous species.

Chapter: Two

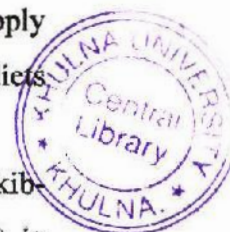
Literature Review

2.0 Literature Review

Dr. M. Niamul Naser (Dhaka University) researched about “The Role of Small Indigenous Species (SIS) on Poverty Reduction and Nutritional Security”. He found that Poverty is not only defined by financial solvency but also with poorness in scholarly thought development, level of higher education, sound health and social structure. Fish, especially the small indigenous species (SIS) of Bangladesh are the sole contributor of nutrient to secure all above criteria. Besides protein, human body needs various essential nutrients for growth and good livings. Omega-3 fatty acids is responsible for brain development, control some arthritis and diabetic etc. Night blindness can be prevented by vitamin A. Micronutrients like, iron, calcium and phosphorous etc for blood and bone formation. Vegetable oils could be the source of some omega-3 fatty acids in diets. However, sis of Bangladesh alone could supply more nutrients like protein, essential fatty acids, vitamins and minerals in human diets than plants.

Dr. M. A. Ohab (Bangladesh Agricultural University), Faruk-ul-Islam and Md. Rakib L-Arif (ITDG-Bangladesh) researched about “ Shelf- Recruiting Species (SRS) in Aquaculture and their role in Livelihoods”. They found that SRS are a valuable resource for the rural poor, which can be synthesized in a set of practical guidelines for aquaculture development and extension practitioners and disseminated through a wide range of direct linkages, are expected to maintain and likely enhance the output of SRS in a range of aquaculture systems and environmental management programs. SRS in aquaculture were evaluated from the perspective of people dependent on them, in terms of well being, gender, resource access and broader livelihoods. Overall SRS are most important to the poorer households. SRS are especially important during the dry season when access to other water bodies becomes limited. Trials show that incorporating SRS into conventional polyculture systems is beneficial overall and has no measurable negative effect on the production of stocked fish.

In a survey conducted in 1995-96, it was estimated that only 43% of the rural population met their daily vitamin A recommendations, 11% met their iron recommendations and 20% their calcium recommendations (Jahan and Hossain 1998). There are no studies at national level about the prevalence of vitamin A deficiency but among pre-school children, adolescents and pregnant women, a high prevalence of



ocular signs and symptoms and low serum retinol values have been reported (Ahmed 1999). A prevalence of anaemia of 53% is reported in the Bangladeshi population and pre-school children, adolescent girls, women of reproductive age and pregnant women are most at risk of anaemia (Ahmed 2000).

In a regional survey, the mean intake in poor rural households was 59 g raw fish/person/d over a 7 months' fish producing period (Roos 2001). Small indigenous fish species (SIS) dominate the rural Bangladeshi diet (ISPAN 1995, Roos 2001).

Md. Naser Uddin Ahmed (director of DOF, Bangladesh) researched about "Role of Fisheries Sector in Socio-Economic Development of Bangladesh". He found that Fisheries sector is playing a very vital role regarding employment generation, animal protein supply, foreign currency earning and poverty alleviation. According to the report of BBS (2003-2004), fisheries sector is contributing 5.71% of the total export earning and 4.92% to the GDP. About 12 million people are directly or indirectly involved in this sector. Labour employment in this sector has been increasing approximately by 3.5% annually. Fish production in ponds, lakes, borrowpits, floodplains, oxbow lakes, and semi-closed water bodies are increasing day-by-day. Fish production has been increased to 21.02 lakhs MT in 2003-04. Which was 17.81 lakhs MT in 2000-2001? Last four years 265,000 farmers received 56.24 crore taka as micro credit from various projects as well as revenue budgets of department of fisheries (DOF). Fish production in some floodplains increased from 150kg/ha to 2000-3000 kg/ha in recent years. Appropriate steps have been undertaken by the department of fisheries & other public & private institutions for the alleviation of poverty, employment generation, & export earning through boosting fish & shrimp production, management of inland fisheries through community participation, infrastructure development, human resource development, sanctuary establishment & need based technology dissemination.

Chapter: Three

Materials and Methods

Materials and Methods

3.1 Study area:

The study period was from November 2008 to January 2009 at three villages of Phultala. The name of three villages were Baddagati, Daukona & Alka. Three villages were located at Phultala thana under Khulna District of Bangladesh.

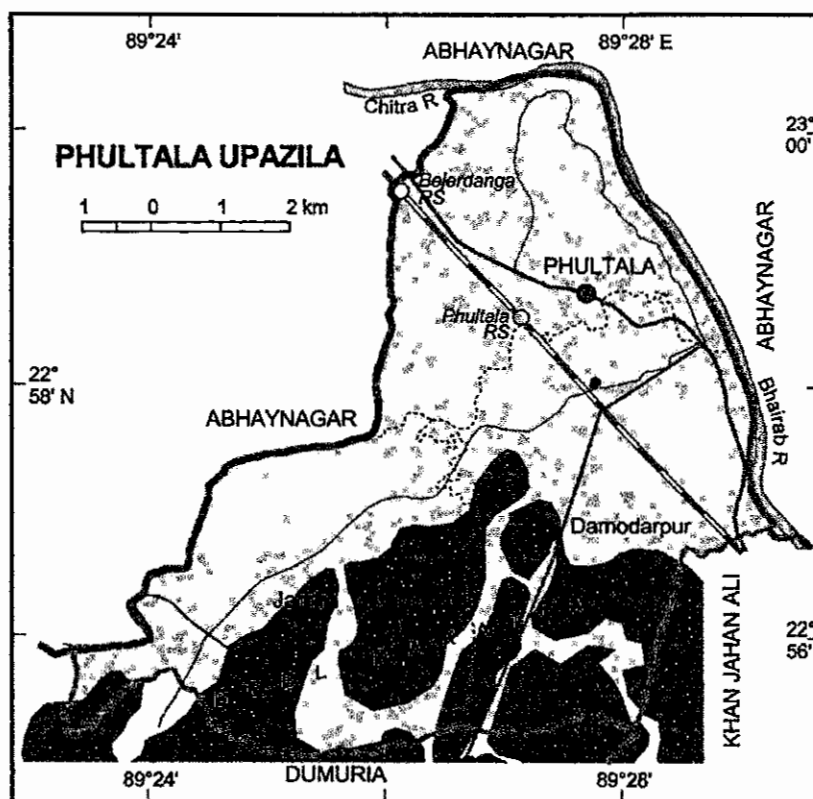


Fig: Map of Phultala Thana

3.2 Field survey & observation:

For collecting data on various aspects on small indigenous species production and of socio-economic condition of fishers' field survey were conducted at three villages of Phultala. There were 50 fisher's respondents who were benefited from small indigenous species. A range of Participatory Rural Appraisal (PRA) and personal interview were applied with different degree of effectiveness.

3.3 Data collection:

Data were collected through personal visit and interview from the SIS beneficiaries who were gher owner. Several visits were made to the study area to collect accurate information related to objectives of the study. After each visit, the collected data were checked for accuracy and clarity. The questionnaire used for collection of information about small indigenous species beneficiaries.

3.4 Data Analysis:

The study used both secondary (published) and field level primary data in conducting the analyses. Collected information obtained from the survey were accumulated, grouped and interpreted according to the objectives as well as parameters of interested. Some data contained numeric and some contained narrative facts. The data were then presented in graphs and tabular forms. For processing and analysis purpose, MS Word, MS Excel & SPSS have been used.

Chapter: Four

Results and Discussion



Results & Discussion

4.1 Socio-economic condition of SIS beneficiaries:

Wide ranges of data were collected on the socio-economic characteristics of the farmers. Their occupation, ownership of the agricultural land, small indigenous species harvesting, small indigenous species marketing.

4.1.1 Socio-economic characteristics:

The relevant data collected on the socio-economic characteristics included age group, sex, religion, marital status, education, family type, no. of family member, school going children and school dropout, causes of school dropout, housing condition, use of electricity, occupation etc.

4.1.1.1 Age group:

To know the age of farmers was important in estimating potential productive human resources. Planning of education, health, and employment generations required sufficient data on relevant age groups. The age distribution of farmers had an important on labor, and also on their perceptions of the future. By interviewing it was found that there were no small indigenous species beneficiaries below 20 years of age. Results showed that the highest numbers of small indigenous species beneficiaries were between 31 and 40 years indicating middle age people (Table-1). Many workers reported age groups of fish farmers to be less than 40 years. 66% farmers in Tangail and 70% in coastal region were under 40 years of age reported by Ahmed (1996) and Ahmed (1999) respectively.

Table 1: Different age groups of farmers.

Age group	Frequency	Percentage
21 – 30	10	20
31 – 40	22	44
41 – 50	11	22
51 – 60	6	12
61 – 70	1	2
Above 71	0	0
Total	50	100

4.1.1.2 Sex:

The survey revealed that out of the total population of 50 small indigenous species beneficiaries' families who were involved in intake & selling of small indigenous species among them 99% male sell small indigenous species & only 1 % female sell small indigenous species. These result implied that the male farmers were more involved in selling of small indigenous species than female ones which also focused on the less involvement of female farmers in selling of small indigenous species in our society. Other studies on the sex composition of the small indigenous species beneficiaries' farmers also support this result (Ahmed, 1996; Mannu 1999; Mahbullah, 1986 and CPP, 1996).

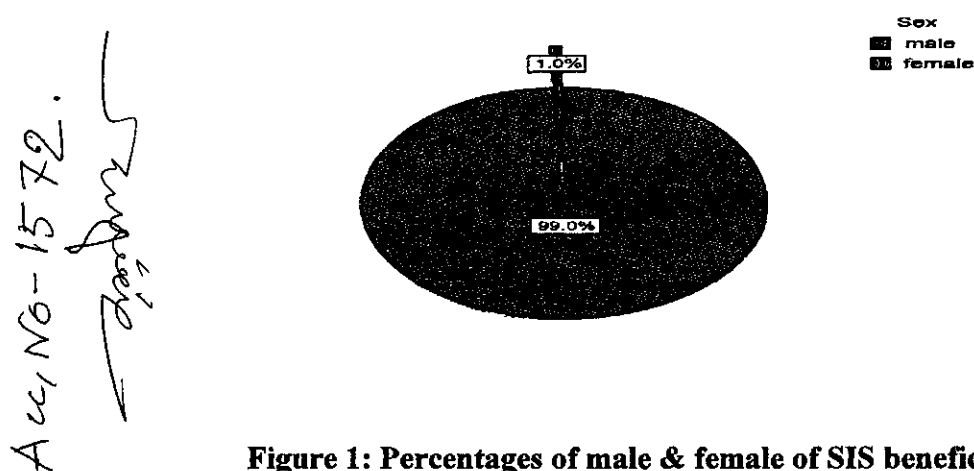


Figure 1: Percentages of male & female of SIS beneficiaries.

4.1.1.3 Religion:

The Muslim farmers make up the majority of the people engaged in small indigenous species selling & intake in many parts of the country and the Phultala Thana was not an exception. The present study showed that 80% farmers were Muslims and 20 % farmers were Hindus. None was found to belong to other religion (Christian/Buddhist/others etc). This result was agreed by other reporters (DOF, 1990; DOF, 1993; and Ahmed, 1996). Alam (2003) noted that amongst other influences, social changes are related not only to economic factors, but also to religious factors. Religion can play a very important role in the socio-cultural environmental life of people of a given area, and can act as a notable constraint or modifies in social change (Cernada and Rob, 1993).

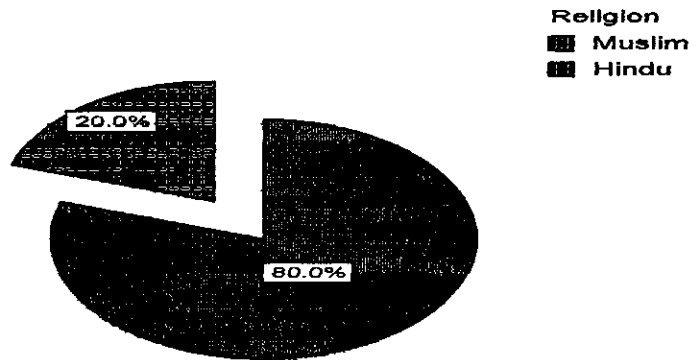


Figure 2: Number of religion of SIS beneficiaries.

4.1.1.4 Marital status:

Survey was made to see the marital status of. Small indigenous species beneficiaries. The study revealed that a majority of the farmers (about 86 %) were married while the unmarried farmers represented 14 % of the population. Reports of Ahmed (1996) in Tangail and Mannu (1999) in Kuakata on marital status of the small indigenous species beneficiaries also support this data which were 94 % and 92 % respectively. Divorced were not found in the present study.



Figure 3: Percentages of marital status of SIS beneficiaries.

4.1.1.5 Family size:

The family size of the surveyed fishers was divided into three groups, which were consisted of the members below 5 group, 5-below 8 and 8 to above. The number of both male and female members the highest family size was in 5-below 8 members group (49%) that was followed by below 5 member group (47%) and above 8 member group (4%) .

This was defined as the number of persons, either working or not, belonging to the same family (Habib *et al.*, 1994). The family size and its composition are related to occupation and income (Islam, 1995), and are likely to have an important influence on fishing practice. Mostly fishers of Goaldah Baor had the family members from 5 to below 8 which is nearly the national average family size of 5.6 persons (BBS, 1997). The family size and its composition are related to occupation and income and are likely to have an important influence on fishing practice (Rahman, 1993).

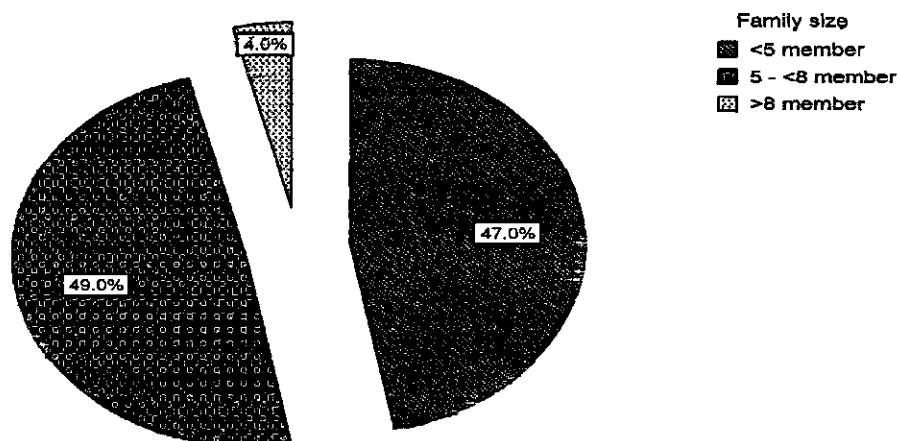


Figure 4: Percentage of family size of SIS beneficiaries.

4.1.1.6 Education:

The survey result presented that 96 % of the farmers were literate at various stages of education. However, persons with the ability to just sign were 2 % of the farmers. 60 % farmers had secondary education and 12 % of the farmers have secondary school certificate. Atapattu (1994) stated that fishers should be properly educated with respect to the importance of management. These findings concur with (Rahman, 1993) who noted that in Bangladesh most of the fishers were illiterate and few had primary level education. A few respondents stated that they did not appreciate the importance of educating their children. Rather, they try to send them for fishing, or engage in other supplementary activities for additional income. There is a strong relationship between society and education. Human resource development is largely a function of literacy and educational attainment. Amongst fishers, literacy and education attainments help develop conceptual skill and facilitate the acquisition of technical skill, which can have direct bearing on income generation, expenditure and saving activities. Fishers should be properly educated with respect to the importance

of management. Education of fishers was also reported to help improve the efficiency of rural household's in production.

Table 2: List of different education groups

Education	Frequency	Percentage
Illiterate	2	4
Can sign	1	2
Class i – v	4	8
Class vi – viii	30	60
Class ix – x	4	8
SSC pass	6	12
Above SSC	3	6
Total	50	100

4.1.1.7 Types of farmer:

Investigations were made to see the types of farmer communities. The study showed that the whole farmers were culturing fish as feeding purpose. None of any farmers was found to culture fish as amateur basis. This implied that fish culture was taken as a profession by majority percent of the people as it was profitable though there was always risk.

4.1.1.8 Family pattern:

In rural Bangladesh, families are classified into two types. One type is single family (married couple with children) and another type is joint family (group of people related by blood and/or by law). The study showed that out of 50 families, 73 % families were single and the rest of 27 % were joint family types. This result showed that the numbers of joint family were declined from time to time in our society though it was not totally eliminated from our society. Day by day the number on single family would be increased more in our society. This effect was also found on the farmers communities. In Bengali culture, the tradition of joint family is very common, but in course of time, the tradition is gradually breaking down. Most of the rural families in Bangladesh are now a days small or single, made of only husband-wife and their kids. Poverty, lack of resources and gradual deterioration of traditional values& also due to the

economic condition of the peoples is the main cause for the formation of single or small family.

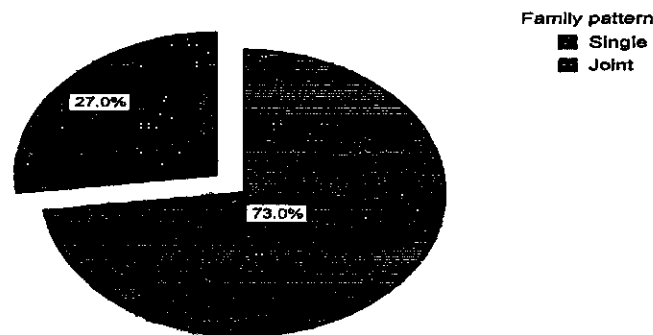


Figure 5: Percentages of family pattern of SIS beneficiaries.

4.1.1.9 Housing conditions:

The study showed that out of 50 families, Among 18 families at Baddagati village, 10 (80%) farmers owned 'Kacha' (made of mud and leaves) houses, 6 (12%) farmers owned 'Paka' (made of brick) houses and the rest 2 (8%) farmers owned tin made houses. Among 16 families at Daukona village, 8 (70%) farmers owned 'Kacha' houses, 6(20%) farmers owned 'Paka' houses and the rest 2 (10%) farmers owned tin made houses, whereas among 16 families at Alka village, 10(88%) farmers owned 'Kacha' houses, 5 (10%) farmers owned 'Paka' houses and the rest 1 (2%) farmers owned tin made houses. It has been found from the study that among 50 farmers interviewed at three villages, 25 (50%) farmers owned 'Kacha' houses, 15 (30%) farmers owned 'Paka' and the rest of them 10 (20%) had tin made houses. Ahmed and Hossain (1998) found that 82.86% farmers owned 'Kacha' house, 14.86% farmers owned 'Paka' and the rest 2.29% farmers owned tin made houses.

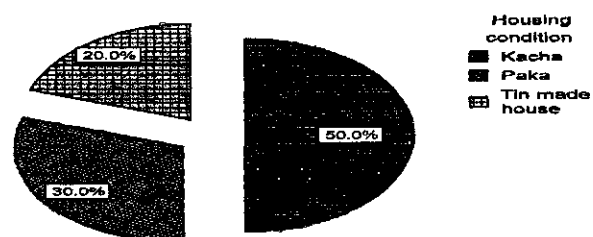


Figure 6: Percentages of housing condition of SIS beneficiaries.

4.1.1.10 No. of family members:

Information on the family size of the farmers was collected. The survey result revealed that 72 % were single family. The average members of single family were 5.32 per household. The average size of joint family was 7.47 per household. The average family members were lower than the national average of 5.6 people per house (BBS, 1994) in case of single family.

4.1.1.11 School going and dropout children:

It was found that the number of school going children was 2.41 per house. Ahmed (1996) found number of school attending children per house at 1.17. The study showed that number of school going boys were higher than that of girls which was supported by the study of Al-muhit (2000). It was also observed that 65 % were school dropout boy and 35 % were girl.



Figure 7: Percentages of school dropout boys & girls.

4.1.1.12 Causes of school dropout:

To find out the causes of the school dropouts the interview was made. The main causes that were found is given below-

- Due to illiteracy
- Some people have economic problem.
- Some children are involved in income.
- Due to unconsciousness of family members.
- Some of children like girls had married, so they were not interested to go to school.

It had been found that maximum children were going to school because of getting various facilities. It was informed that our government had declared scholarship for

the children who were going to school. Besides for the women student, up to HSC level they can take education without giving any fees to the institution. Moreover, they were getting scholarship for continuing their education. It encouraged them to go to school. So due to above mentioned reasons the percentage of school going children were higher than that of school dropout children.

4.1.1.13 Electricity facilities:

Out of 18 farmers of the village of Baddagati interviewed, 17 (94%) farmers had no electricity facilities and the rest of the farmers 1 (6%) had electricity facility. In the village of Daukona of the total 16 farmers 14 (88%) farmers had no electricity facilities and the rest of the farmers 2 (12%) had electricity facility, whereas in the village of Alka, 12 (84%) farmers had no electricity facilities and the rest 4 (16%) farmers had electricity facility. It has been observed that out of the total 50 farmers interviewed in three villages, 43 (92%) farmers had no electricity facilities and the rest of the farmers 7 (8%) had electricity facility. Comparatively Alka village was with more electricity facilities than other villages. Ahmed and Hossain (1998) found that 13.71% farmers had electricity facilities and the rest of the farmers 86.29% had no electricity facility. It was found that rural people of our country didn't get available facilities for the use of electricity though they had the capability of using electricity. It was also found that electricity facilities were comparatively higher. The percentages of farmers who had facilities of electricity were higher than the farmers with no facility.

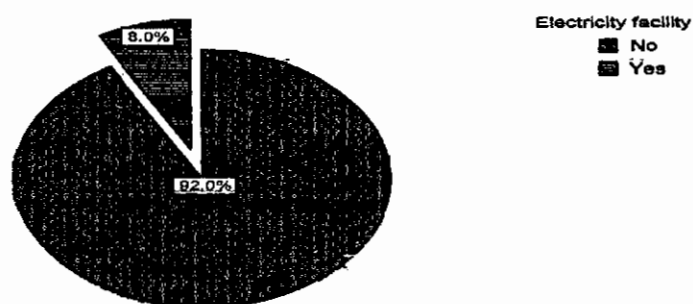


Figure 8: Percentage of electricity facilities of SIS beneficiaries.

4.1.1.14 Occupation:

Here occupation is defined as an activity that the people pursue for earning their living. As the survey focused on the farmers, fishing was obviously their main occupation. Daily labor and others were found but not as a main occupation. It was observed that the occupation of 60% farmers were fish culture, only 10% farmers were agriculture and small number of persons were engaged in daily labor and business (Table -3).

Table 3: List of different occupation

Name	Frequency	Percentage
Fish culture	30	60
Agriculture	5	10
Business	5	10
Daily labor	4	8
Others	6	12
Total	50	100

Fishing cannot provide year round employment, and the income derived therefore may be insufficient to provide adequate means of livelihood. As such, secondary occupations are involved.

4.1.1.15 Agricultural land ownership:

Study was conducted to find out how much agricultural land was owned by the farmers. Agricultural land was one of the most productive assets of them who lived in the villages. It was found that about 65 % farmers had more than 50 decimal land properties. Only 10 % farmers had no land properties and 25 % farmers had less than 50 decimal cultivated lands (Table-4).

Table 4: List of different areas of agricultural land ownership

Area	Frequency	Percentage
No land	11	22
< 50 decimal	14	28
> 50 decimal	25	50
Total	50	100

4.1.1.16 Health and sanitation:

The increasing of profit from small indigenous species had an effect to the farmers on their socio-economic condition in general and on their health. However the relevant data for collecting information on health and sanitation included main source of drinking water, the place used for defecation, suffering of disease in last year, type of treatment they have taken.

4.1.1.17 Main sources of drinking water:

It was found that cent percent of the farmers used tube-well water for drinking. Most of them used community tube-well. Similar result was recorded by DOF (1993). The survey result also focused on their well economic condition. But Ahmed (1999) mentioned that most farmers used pond water due to lack of tube-well in coastal area.

4.1.1.18 Defecation Place:

About 90 % of the farmers used sanitary latrines. No farmers were found who used open field and open holes for defecation and 6 % farmers used katcha latrines (Table 5). Another study conducted by CPP (1996) in Tangail reported that 4 % farmer's household used no latrines.

Table 5: List of different type of places for defecation

Type	Frequency	Percentage
Sanitary	38	76
Open hole	0	0
Open field	0	0
Close pit	5	10
Katcha	7	14
Total	50	100

4.1.1.19 Suffering of diseases during last year:

At the three villages, 74 % of the farmers were suffered with different types of diseases including rumatic fever, dysentery, jaundice, mal nutrition, gastric, diarrhoea, fever etc. It was also found that 26 % farmers were not suffered by any types of diseases last year which was near about one fourth of the total farmers.

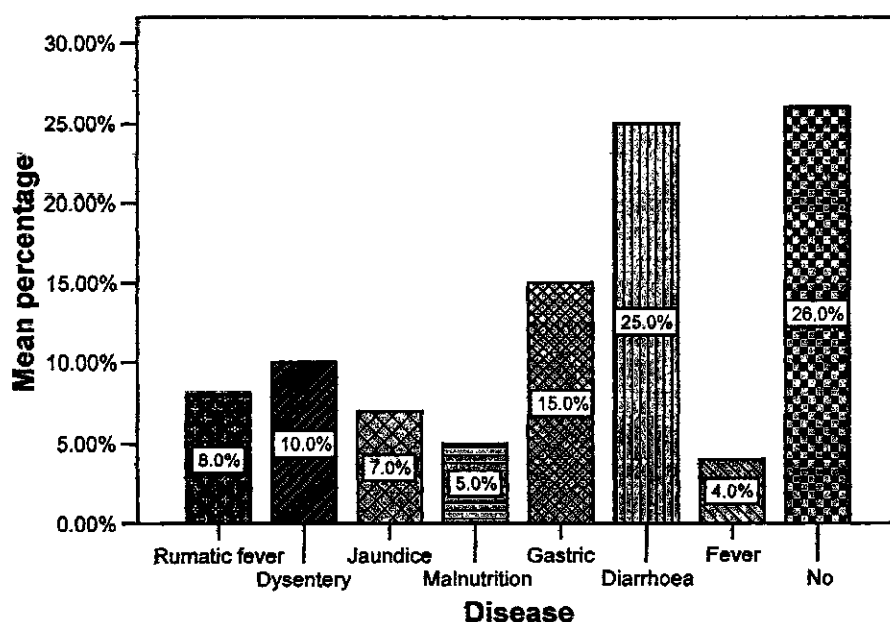


Figure 9: Percentages of types of disease occurred of SIS beneficiaries

4.1.1.20 Types of treatment they have taken:

The farmers availed themselves of treatment facilities like services from allopathic, homeopathic, Kabirazi, and others. About 85 % of farmers took allopathic treatment .The study revealed that most of the farmers were careful about their health and it was proved again their well economic and social condition. Ahmed (1999) in coastal area observed that less than 5 % farmers went to doctors.

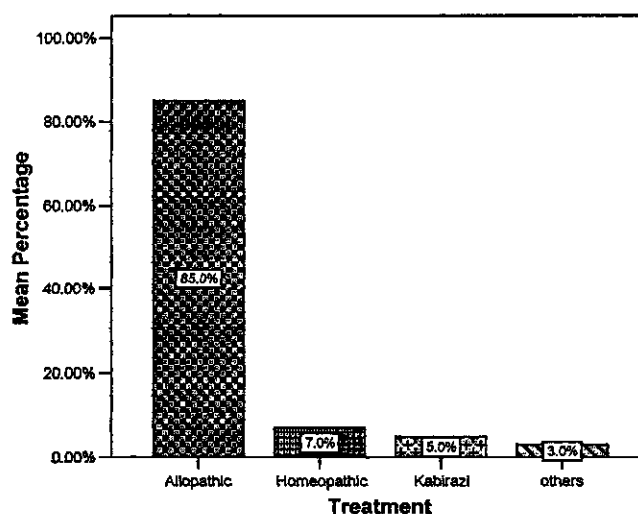


Figure 10: Percentages of types of treatment taken by the SIS beneficiaries.

4.1.1.21 Other assets (livestock and poultry):

The study showed ownership and observed rearing of livestock and 64% of farmers who had possessed cow/goat/hen/duck (Table 6).

Table 6: List of other assets (livestock and poultry).

Name of domestic animal	Frequency	Percentage
Hen / Duck	4	8
Cow	3	6
Goat	6	12
Both Cow/Goat/Hen/Duck	32	64
No asset	5	10
Total	50	100

4.1.1.22 Other product produced at the three villages:

Survey was conducted to find out the other products that were produced at the three villages. The Table-2.7 shows different types of production produced in three villages.. The farmers of three villages were not only used their land for fish production but also can be produced other products.

Table 7: List of different type of products produced at the three villages

Type	Frequency	Percentage
Paddy	10	20
White fish	15	30
Both (Paddy & White fish)	20	40
Other	5	10
Total	50	100

4.1.1.23 Other crops/products on dyke:

In 76% of the dykes of pond various types of products were produced whereas in 24% of the dykes of pond there were not produced any type of products. The various types of products that were produced on the dyke were

- Coconut, Betel nut, and Papaya.
- Various types of vegetable.
- Mango, Guava.
- Mehgoni and Date pulm tree.



4.1.1.24 Production of vegetables:

At the village of Baddagati, out of 18 interviewed farmers, 66% farmers grew vegetables on their pond dyke and 34% farmers did not grow vegetables. Out of 16 interviewed farmers of the village of Daukona, 88% farmers grew vegetables on their pond dyke and 12% farmers did not grow vegetables, whereas at the village of Alka, 70% farmers grew vegetables on their dyke and 30% farmers did not grow vegetables. It has been found from the survey that out of 50 farmers, 74% farmers grew vegetables on their pond dyke and 26% farmers did not grow vegetables on the dyke of their pond.

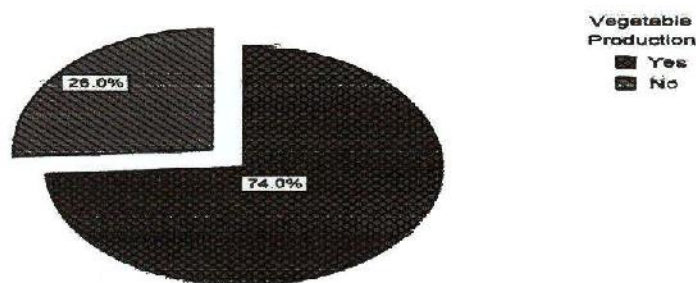


Figure 11: Production of vegetables by SIS beneficiaries

4.2 SIS related information:

4.2.1 Harvesting method of SIS:

Gear for catching SIS:

There are different types of gear that are used for catching small indigenous species in three villages. Their descriptions are given below:

1.)Fash Jal

Koi jal:

The length of koi jal is 10-12m & wide is 0.6-1.0 .The size of koi jal is 3.0-4.5cm.It is mainly used for catching koi.It is used more From June/July to December. It is also used for catching Taki, Magur, Shing & Kholisa. It is also used for catching Taki, Magur, Shing & Kholisa.

Puti jal:

The size of puti jal is 1.0-3.0cm.It is made of nylon. It is mainly used for catching puti but it is also used for catching Tengra, small koi and Kholisa.Generally , it is used in floodplain from June to December .

2.)Khepla jal:

This jal also called Jaki jal, Tura jal.It is made of nylon.The length of thread is 7-8m. For catching fish, fishermen throw this jal from the slope of the pond or shore or boat.

3.) Tola jal:

It is rectangular.The length of the jal is 0.5-1.5. Among different types of tola jal Dormo jal & Veshal jal is remarkable.It is used for catching Taki, Chela, puti, Kajli, Batasi, Tengra, Kholisa,Chingri.

Trap for catching SIS:

1.) Chong Trap

Dugair:

It is made of bamboo.The size of fash is 0.5-1.5cm.It is generally used in small canal.It is used for catching Taki, Puti, Bele, Koi,Chingri etc.

Koi Dugair:

It is made of bamboo. The size of fash is 1.0-2.5cm.It is used from July to November/December. It is used for catching Taki, Puti, Bele, Koi,

Udra:

It is made of bamboo. It is used for catching Taki, Bele, Chingri etc.

Khadom:

It is made of bamboo. It is like as "U". The size of fash is 1.5-2.5cm. It is used from July to January. It is used for catching Taki, Baim etc.

Polo:

It is made of bamboo. The size of fash is 1.0-2.0cm. It is used for catching Taki, Magur, Koi etc.

2.) Box Trap:**Khol sun (Ghuni):**

It is made of bamboo. The size of fash is 2.0-0.5cm. It is rectangular. It is used for catching Chela, Darkina, Puti, Tit Puti, Chanda, Chingri.

Charo:

It is made of bamboo. The size of fash is 1.0-1.5cm. It is rectangular. It is used for catching Magur, Shing, Tengra, Koi, Kholisa etc.

Dubo:

The size of fash is 0.5cm. It is a small size rectangular box. It is used for catching Puti.

Utcha:

It is made of bamboo. It is triangular. The size of fash is 1.0-1.5cm. It is used for catching Tengra, Batcha, Bele, Chandra, Chingri..

Hogra:

It is permanent trap. It is made of bamboo.. It is triangular. It is used for catching Puti, Tengra, Magur, Shing, Koi & Chingri etc.

Hook for catching SIS:**Daon hook (Long line):**

It is consist of 200-250 hooks. earthworm, Kusho & small Chingri are used as a top. It is used for catching Taki, Tengra, Magur, Shing etc. It is also used for catching large fish.

Dap/Nol/Joti hook:

Fisherman set up together 200-300 Dap hook in a line. . It is used for catching Taki, Tengra, Magur, Shing, Koi etc.

4.2.2 Small indigenous species sells:

Some farmers sold their small indigenous species to the depot (garakhola depot) and others sold these to the arotder. Some farmers sold their small indigenous species to the market and dadonder. The owners of depot and arotder sold their small indigenous species to the factory. If any farmer would take loan from dadonder they would give small indigenous species to the dadonder instead of return their loan. It was the system of taken dadon/loan from dadonder. In this system the farmers would not get their appropriate price of small indigenous species.

Table 8: Places of small indigenous species marketed

Place of sell	Frequency	Percentage
Local market	25	50
Arotdar	6	12
Factory	3	6
Wholesale Market	10	20
Dadonder	6	12
Total	50	100

4.2.3 Price of SIS:

The price of the fries of different species varies through the year round. The price is high at the beginning of the season and at the end of the season but the price is comparatively less when the supplies of fries are available. Average price of SIS are shown in Table 9.

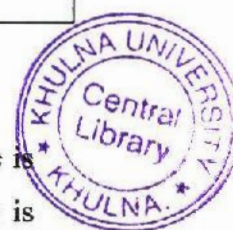


Table 9: Price of small indigenous species

Species (Common name)	Scientific name	Price (Tk/kg)
Kachki	<i>Corica soborna</i>	40-60
Mola	<i>Amblypharyngodon mola</i>	50-70
Chanda	<i>Chanda nama</i>	40-50
Taki	<i>Channa punctata</i>	80-90
Magur	<i>Clarias batrachus</i>	250-300
Shing	<i>Heteropneustes fossilis</i>	200-250
Puti	<i>Puntius sophore</i>	30-40
Koi	<i>Anabas testudineus</i>	200-250
Darkina	<i>Esomus danricus</i>	50-60
Kholisa	<i>Colisha fasciatus</i>	60-90
Golsha Tengra	<i>Mystus bleekeri</i>	40-50

4.2.4 Variation of SIS with season:

Among 18 families at Baddagati village, farmers found higher amount of small indigenous species (90%) during winter and farmers found lower amount of small indigenous species (10%) during summer. Among 16 families at Daukona village, farmers found higher amount of small indigenous species (93%) during winter and farmers found lower amount of small indigenous species (7%) during summer. Among 16 families at Alka village, farmers found higher amount of small indigenous species (98%) during winter and farmers found lower amount of small indigenous species (2%) during summer. The study showed that out of 50 families, farmers found higher amount of small indigenous species (95%) during winter and farmers found lower amount of small indigenous species (5%) during summer. So it can be said that during winter farmers found higher amount of small indigenous species than summer.



Figure 12: Variation of SIS with season.

4.2.5 Yearly income from SIS:

It is difficult to obtain reliable information on yearly income through survey. However, the information on income sources was collected from the respondents very carefully. On the basis of information, sources of income of the farmers are reputed from agriculture, fisheries, business, service and others. Among them, 50 % farmers earn more than Tk.30, 000 per year. Only 10 % farmers were found who were earning less than Tk.10, 000 per year (Table-2.10). It revealed that the families under the study spent more money when their income was more and spent less when their income was less.

Table 10: List of different income group

Taka	Frequency	Percentage
< 10,000	5	10
10,000 – 15,000	12	24
15,000 – 30,000	8	16
> 30,000	25	50
Total	50	100

4.2.6 Gross annual household income of SIS beneficiaries:

Farmer's income is a key measure reflecting economic security, to the extent of adequacy in income to meet basic needs of the household. A household is economically secure when it has the capacity to generate sufficient income to satisfy the basic needs of the family and to maintain or increase the goods necessary for the

stability of the household economy. Fishers family income were categories four groups as below 30000 (44%), 30000 to below 40000 (25%), 40000 to below 50000 (20%) and 50000 to above (11%). The highest (44%) income was found in below 30000 groups whereas the lowest income was found in the 50000 to above group in the surveyed area.

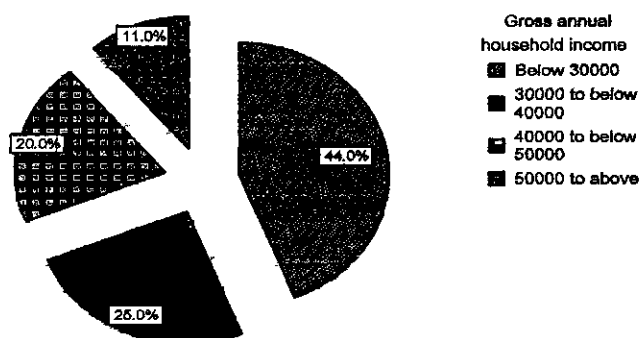


Figure 13: Gross annual household income of SIS beneficiaries.

Chapter: Five

Conclusion

Conclusion

Small indigenous species play an important role in the poverty alleviation of the poor people as well as food protein supply for the country. The study showed farmers got higher amount of small indigenous species (95%) during winter and lower amount of small indigenous species (5%) during summer. So it can be said that during winter farmers got higher amount of small indigenous species than summer. Farmers earned extra income from SIS. There are many problems in these villages. These problems can be solved through the application of scientific culture technology. Farmers of this villages can improve their economic condition from SIS. As a result, fish production will be increased and the livelihood status of that fishers' community will be improved. The study showed that farmer used khepla jal, Dugair, Khadom, Polo, Ghuni for harvesting SIS. Small indigenous species plays an important role in the socio economic condition of the fishers' community. The study showed that some species had high price such as koi, magur, shing. It was observed that maximum farmers live in *kacha* house. It was found that farmers of this villages didn't get available facilities for the use of electricity. There were many school dropout children due to illiteracy, economic problem, Some children are involved in income, unconsciousness of family members, Some of children like girls had married, so they were not interested to go to school. It is essential to immediately take appropriate steps to overcome the problems of the farmers. To overcome the problems, it is required, not only the modern technology but also sympathetic authorities to be increased the production of SIS & hence improve the socio-economic condition of the farmers. Besides, strong farmers' organizations would be needed for their social and economic support. Adequate measures will not only benefit the poor farmers by promoting their social status but also help in sustainable management of fisheries, which will lead to the promotion of national economy.

Chapter: Six

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Appendices

General

1. Date of interview: _____
2. Place/village of interview : Field ☐ Resp/residence ☐ Other Place ☐
3. Name of the farmer: _____
4. Age of the farmer: _____
5. Father/husband name of the farmer: _____
6. Address of the farmer: _____
7. Sex: Male ☐ Female ☐
8. Religion: Islam ☐ Hindu ☐ Christian ☐ Buddha ☐
9. Marital status: Married ☐ Unmarried ☐ Divorced ☐
10. Education: _____
11. Type of farmer: Amateur ☐ Commercial ☐
12. Family types: Single ☐ Joint ☐
13. No of family member: Male ☐ Female ☐
14. School going and dropout children: Boys ☐ Girls ☐ Total ☐
15. Causes of school dropout: Economic problem ☐ other problems ☐
16. Ownership of house: Yes ☐ No ☐
17. House hold assets: Cow ☐ Goat ☐ Hen ☐ Duck ☐
18. Use of electricity: Yes ☐ No ☐
19. Occupation : Agriculture ☐ Business ☐
Daily labors ☐ Others ☐
20. Agricultural land ownership: No land ☐ <50 decimal ☐ >50 decimal ☐
21. Yearly income: <10,000 ☐ 10,000-15,000 ☐ 15,000-30,000 ☐
>30,000 ☐

Health & Sanitation:

1. Main source of drinking water:

Tube well ☐ Well/Indira ☐ Pond ☐ River ☐

2. Defecation place:

Katcha ☐ Close pit ☐ Open field ☐ Open hole ☐ Sanitary ☐

3. Suffering of disease during last one year:

Fever ☐ Diarrhoea ☐ Gastric ☐ Mal nutrition ☐ Jaundice ☐

Dysentery ☐ Rumatic fever ☐ Others ☐ No disease ☐

4. Types of treatment they have taken;

Allopathic ☐ Homeopathic ☐ Kabiraji ☐ Others ☐

Small indigenous species related information

1. Pattern of Small indigenous species harvesting: Full ☐ Partial ☐

2. People involved in Small indigenous species harvesting:

3. Small indigenous species sell: Once ☐ several time ☐

4. Price of SIS :

5. Variation of SIS with season:

6. Production : _____

Others information

1. Other assets (livestock and poultry):

2. Other product produced at the three villages:

3. Other crops/products on dyke:

4. Production of vegetables:

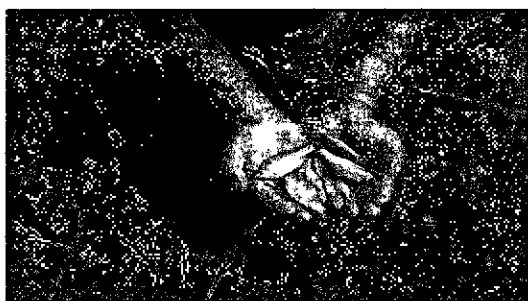


Figure: Small indigenous species harvesting



Figure: Activities during SIS

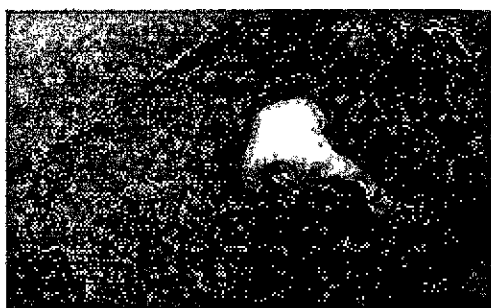


Figure: Activities during SIS harvesting



Figure: Activities during SIS harvesting



Figure: Fisherman kept SIS in this pot.



Figure: Activities during SIS harvesting