

**Present Status and Future Potential Fish Production
of Jhenaidaha Sadar Upazila, Jhenaidaha**

**A Thesis
By**

Md. Ashraf-ul-Islam

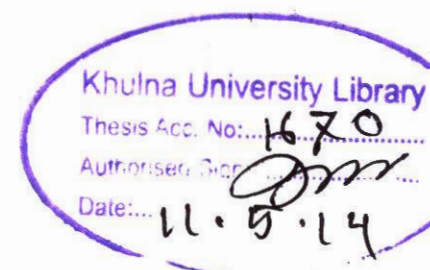
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**Present Status and Future Potential Fish Production
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Approved as to style and content by



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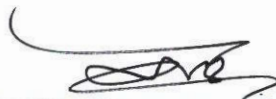
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DECLARATION

The results submitted in this thesis are entirely of the candidate's own investigations 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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DEDICATED TO

My Elder Brother and Sister



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Md. Ashraf-ul-Islam

ABSTRACT

An investigation on the present status and future fish production plan of Jhenaidaha Sadar Upazila, Jhenaidaha was carried out from July 2001 to June 2002. Jhenaidaha Sadar Upazila is endowed with a large variety of water bodies that can produce a considerable amount of fishes. The present investigation was undertaken to know about the present condition, area and production of different types of water body, aquaculture technology applied by the local fish farmer was also taken under consideration in relation to fish production. The total fish production of all the water bodies of Jhenaidaha Sadar Upazila during the investigation period was 1276.05 MT. Analyzing the present status of fish production, a five year fish production plan has been prepared. After five year the fish production plan estimated was 3251.988 MT. For proper utilization of the available fisheries resources of the Upazila to attain the fish production plan, some recommendations have also been provided.

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CHAPTER

ONE

1. INTRODUCTION

Bangladesh is blessed with vast and varied inland waters in the form of ponds, canals, ditches, floodplain, haors (natural depression), baors (ox-bow lake), river, estuaries etc. covering an area of 4.34 million hactres in which perennial and seasonal water constituting an area of about 2.83 million hactres and 1.51 million hactres respectively. The country has water body in the form of rivers and estuaries 1031563 hactres, flood plain 2832792 hactres, ponds 151916 hactres and beels and baor 119649 hactres (BBS, 1996). The bulk of national fish production (79% of the total fish production) comes from inland waters (Fish Fortnight, 10-24 August, 2001-2002).

Fish production during the year 2000 – 2001 has been estimated 1.78 million metric tons of which 0.69 million metric tons come from open water capture fisheries and 0.79 million metric tons from open water culture fisheries and 0.38 million metric tons from marine fisheries. Average annual growth rate of fish production is around 7% inland open water is the major source of fish productions in the country. But production from closed water bodies is increasing very sharply due to dissemination of adaptive technologies and effective extension services rendered by Department of Fisheries (DoF). The fisheries resources of Bangladesh are among the richest in the world and the country ranks third among world's inland fish producing countries (Islam, 1989).

The contribution of fisheries to the economy of Bangladesh is substantial particularly with reference to food consumption, nutrition, employment and export this sector contribute 5.3% to national GDP and 5.77% to foreign exchange earning through export (Brief on Department of Fisheries, Ministry of Fisheries and Livestock, June, 2002).

In Bangladesh per capita annual consumption which was 12kg during mid 1960's declined to 7.7 kg in 1988 (Islam, 1989), 7.4 kg in 1995 (EPB, 1996) and 12kg in 2001-2002. In this country fisheries sector plays a vital role in socio-economic development and supplies 63% animal protein as a principal food to her people. Fisheries sector provides employment to over 1.4 million full-time fishermen in addition to 11 million part-time fishermen (BBS, 1996).

According to ODA Fisheries Mission Report (1990) some three million people are directly or indirectly employed in aquaculture activities in Bangladesh including fish and shrimp culture, the production or collection of seed, distribution, processing, export, financial and technical support (Ahmed, 2002).

Bangladesh is a country blessed with generous aquatic resources. It is commonly viewed by outsiders as a country where fish are produced in abundance and consumed at every meal. And in the past this was so. Now, however fish has become scarce. Traditionally, the people of Bangladesh followed a system of capture fisheries from naturally produced stocks. They never developed or employed fish culture technologies to augment their production. During the last decade, inland open water capture fisheries have declined. As a result people are now looking towards increasing fish production through the application of intensive aquaculture.

Sadly, although aquatic resources in Bangladesh are ubiquitous the proper development of these resources has not been emphasized. This is most likely due to lack of awareness among policy makers and planners of the important role which aquaculture can play in national development. It was also been seen that farmer themselves are not aware of the benefits that aquaculture has to offer them. If farmers are properly motivated and trained, they can use aquaculture to increase their income, employment and improve their nutritional intake. For these reasons, all involved in national development should work towards promoting aquaculture as a professional occupation in rural Bangladesh.

Successful attempt on pond fish culture in the sub-continent was made by Hora, (1932-1947). Subsequently during 1947-1960 Dr. Nazir Ahmed contributed for the development of carp culture and introduction of doubled-well cloth hapa (1948) for hatching of fertilized carp eggs collected from natural stocks in various stages of development. Late sixties to early seventies attempts were made to breed Indian major Carps with the use of pituitary extracts and was successful in 1965 (Ali, 1967). Due to introduction of Chinese Carp introduction of Chinese Carp Hatchery on a pilot basis at Freshwater Fisheries Research (FRI) station during 1985 a major break through inbreeding of Indian Major Carps and transfer of breeding technology to the private sector achieved. Government of Bangladesh has recognized aquaculture as an important

activity for the development of rural economy, poverty alleviation, employment generation and foreign exchange earning (Ahmed, 2002).

To mitigate the present national demand of fish, production of fish must be increased. A preliminary analysis of present day supply and demand for fish and fishery products have shown that aquaculture is an effective means of filling the gaps in current and future supplies of many of the favored aquafoods. The role of aquaculture in integrated rural development should be widely recognized and the development of rural communities that depend on aquaculture as the main economic activity, should receive active consideration by our planners engaged in preparing fish production plan. But to prepare a fish production plan for a definite area, we must have to know the present condition of available water bodies and current fish production rate of the area. It is not possible to prepare a fish production plan without knowing the present status of fish production.

The total fish production of Bangladesh in 2000-2001 fiscal year was 17.81 lac tons. At the end of sixth five year plan (from 2002-2003 to 2006-2007), the fish production target has been fixed up at 24.05 lac tons (Fish Fortnight, 2002). To achieve this target, Department of Fisheries (DoF) has undertaken different management and development activities for different types of water bodies. This national fish production target can be achieved by adopting proper aquaculture management technologies in all types of water bodies of each and every part of Bangladesh. This target can not be achieved by partial management plan of a certain area of Bangladesh. As Jhenaidaha sadar Upazila is enriched with a large variety of water bodies, a production plan for this Upazila is very much needed to share with the achievement of the national target. If every Upazila has a definite production plan, then the production target of the country will be achieved easily. For this reason, the present study was very much crucial and thus it was undertaken by the investigator.

CHAPTER

TWO

2. REVIEW OF LITERATURE

A great deal of literature exists in the field of fresh water fish culture but very little information is available on the resource exploration, assessment and their documentation. Literature on the present status of our pond resources is very scarce and scanty. As such a review of the available literature relating to the present study are presented below.

Ali and Rahman (1986) investigate the socioeconomic and technical problems in ponds fish culture in two districts namely Mymansingh and Rangpur of Bangladesh. The result of the study identified a number of major socio-economic and technical problems in pond fish culture in the areas surveyed. These problems were non-availability of fish fries, lack of capital, joint ownership of ponds, lack of scientific knowledge, problems of theft of fishes, attack of fish diseases, lack of marketing facilities, sandy soil of ponds, lack of care of fish culture and over flooding in rainy season and insufficient technical advice by the fisheries personnel.

Ali *et al.*, (1982) stated that there are about 17 lakh ponds covering 3 lakh acres in rural Bangladesh. A survey of 297 ponds in Mymansingh district revealed that a vast majority of the owners did not practice scientific fish culture mainly due to multiplicity of ownership, lack of knowledge, unavailability of improved fish fries. Consequently fish output per acre was very low. They concluded that production of fresh water could be increased to considerable extent by ensuring scientific utilization of existing fishponds.

Ali *et al.*, (1995) studied the use of inputs and culture practices in pond fish culture on 449 pond owners /fish farmers having 593 ponds in the eastern region of Bangladesh (Chittagong district). The study revealed that 73% farmers never used supplementary feed in their ponds. Among the user 21% used rice bran, 18% used oilcake and 5% used wheat bran. None of the farmers used fishmeal. Stocking density and proper species combination of fish seed were not maintained. Stocking of with indigenous major carp, Rohu (*Labio rohita*), Catla (*Catla catla*), and Mrigal (*Cirrhina*

mrigala) was practiced by 51% of the farmer in the region. Fish farmer of eastern Bangladesh were follow the same tradition.

Chowdhury (1981) reported that lack of fund for re-excavation of ponds ranked first among all the problems faced by the fish farmer. He also point out some other problems such as, non availability of improved variety of fish fries, lack of scientific knowledge, attack of predators and thieves, joint ownership and non availability of fertilizer.

D'silva *et al.*, (1995) studied twenty two groups covering 475 beneficiaries spreading over 16 villages in distant locations in Bangladesh for evaluation of there performance in pond fish culture. Pond training, funding and organizational capability were provided as resources for fish cultivation to the beneficiaries. Prior to farming the pond, the beneficiaries were motivated to form a group comprising of 15-30 people. Each project was managed as instructed. As a result an average fish production was 2452.72 kg/ha, returns on investment 135%, loan repayment 84% and profit per member Taka 565.88. Landless and subsistence farmers, youth and man and woman proved that pond fish culture was a viable venture if certain minimum inputs were provided and there was a follow up of their activity. The profit they earned was an additional income to there daily wages.

Gill and Motahar (1982) undertook a study to determine the social and economic constraints to fish culture in Bangladesh. They noted that multiple ownership was a major problem hindering the growth of pond aquaculture. Other problems identified were non-available of fish fry, lack of technical training for the farmers, shortage of investment capital and the theft of fish or their deliberate poisoning due to rivalry, enmity or even jealousy. Areas for farther research are outlined.

Islam (1975) surveyed the fisheries resources of Keyokhai union of Mymensingh district and noted that 92% of the pond owners want to culture fish and all of them were in favour of carp culture.

Islam and Dewan (1986) describe the production practices of pond fish culture in their study. Pond fish production in the sample areas was mainly based on stocking of fish

seed, use of fertilizer and feed and human labour for different operations and management. The majority of farmers reared various species of indigenous and exotic carps and produced 1700 to 3889 kg/ha/year in different location. However, higher yield was not only the factor for higher net return. Net return was influenced by the price of the output and economic use of both material inputs and labour.

Khan (1986) reported that fishery resources in pond represent two separate issues. One related to raising the existing traditional fish farming practices to a semi-intensive level. Pond ownership and pond use pattern as the two most important factors affecting the fisher use of pond. The latter part explained the role of different factors in raising the intensity of fish farming. His study suggested that family income, level of education; types of ownership are important socioeconomic factors affecting utilization of ponds for fish farming. Other important factors were size of pond and stocking rate. Cultural factor and marketing facilities also effect fish farming of ponds.

Mollah (1980) reported that through providing technical knowledge how, and supervision could improve the pond productivity in Dhaka district.

Mollah *et al.*, (1986) determined the inputs and outputs relationship in existing pond fish culture operations and examined the impact of different pond size on fish production. Returns on per pond basis under different pond sizes had a direct and positive relationship with input use, but on the basis of per unite area, pond efficiency was greater in medium size.

Rahaman (1986) described the role of socio-economic status of fisherman, village power structure. Village moneylenders in fishery credit, ownership pattern of ponds and control the public water bodies and the government regulations on the development of fisheries resource.

CHAPTER

THREE

3. MATERIALS AND METHODS

3.1 Study Area

There are six Upazila in the Jhenaidaha district, Jhenaidahaa sadar Upazila is situated in the middle of the district. Shailkupa and Horinakundu Upazila are in the northern side, Kaligong and Kotchandpur Upazila are in the southern side of the Jhenaidaha Sadar Upazila, Maguara sadar and Sreepur Upazila of Magura district are in eastern side of Jhenaidaha Sadar and Chuadanga sadar of Chuadanga district is in the western side of Jhenaidaha sadar Upazila. Jhenaidahaa sadar Upazila is located in between $23^{\circ}26' N'$ and $23^{\circ}36' N'$ latitude and $88^{\circ}57' E'$ and $89^{\circ}20' E'$ longitude. (Fig-3.1)

The area of Jhenaidaha Sadar Upazila is 471.31 sq. Km. It consists of one Paurashava and 17 Unions within 316 villages. According to population census 2001, the total population of Jhenaidaha sadar Upazila is 3, 95,637 (Male- 2, 04,957, Female- 1, 90, 680).

3.2 Data Collection

Jhenaidaha sadar Upazila is enriched with a variety of water bodies. A large number of perennial and seasonal ponds, road side ditches, beels, baors, haors, cannels, rivers, floodplains, culturable paddy fields, flood control and irrigation projects etc. are found in this Upazila. Measurement of area of all the water bodies available, the present status of the water bodies whether that are cultured or culturable or repairable and the fish culture technology applied constitute the study materials. Present status of production of different types of water bodies is also constituted the study material. The study has been conducted for duration of one year from July 2001 to June 2002.

The investigator along with the Assistant Fisheries officer (AFO) & Field Assistant (FA) of Jhenaidaha Sadar Upazila and with the help of three other local surveyor collected data regarding the area, present status with production of different type of water bodies. All the surveyor has been informed earlier about the survey forms. The District Fisheries officer (DFO), Jhenaidaha and Senior Upazila Fisheries Officer (SUFO), Jhenaidaha

Sadar have given us important guidelines in preparing survey forms and in collecting information.

All the surveyors have been divided into three different groups and information of each and every water body of every village under every union (including Jhenaidaha Paurashava) has been collected. Data regarding village wise water bodies (according to types) has been accumulated to find out data of each union/Paurashava. Fish production data of the unions and of the Upazila as a whole has been analyzed according to types of water body, aquaculture technology followed etc. The questionnaire form is given in the Appendix.

District: Jhenaidaha Upazila: Sadar

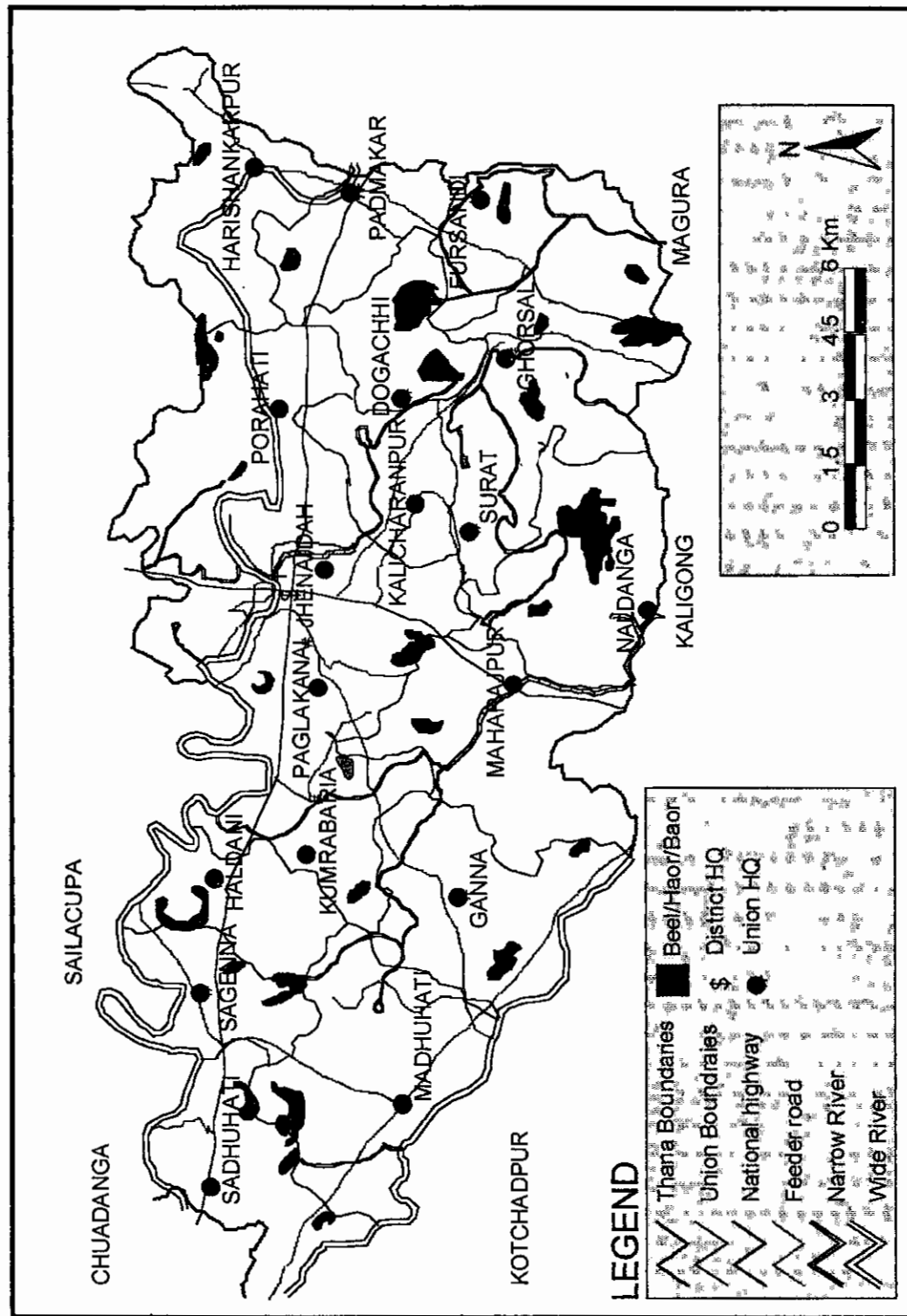


Fig-3.1: Location of the study area

CHAPTER



4. RESULTS

4.1 Union wise water bodies and production

The area covered under the present survey have
been enriched with a variety of water
bodies and

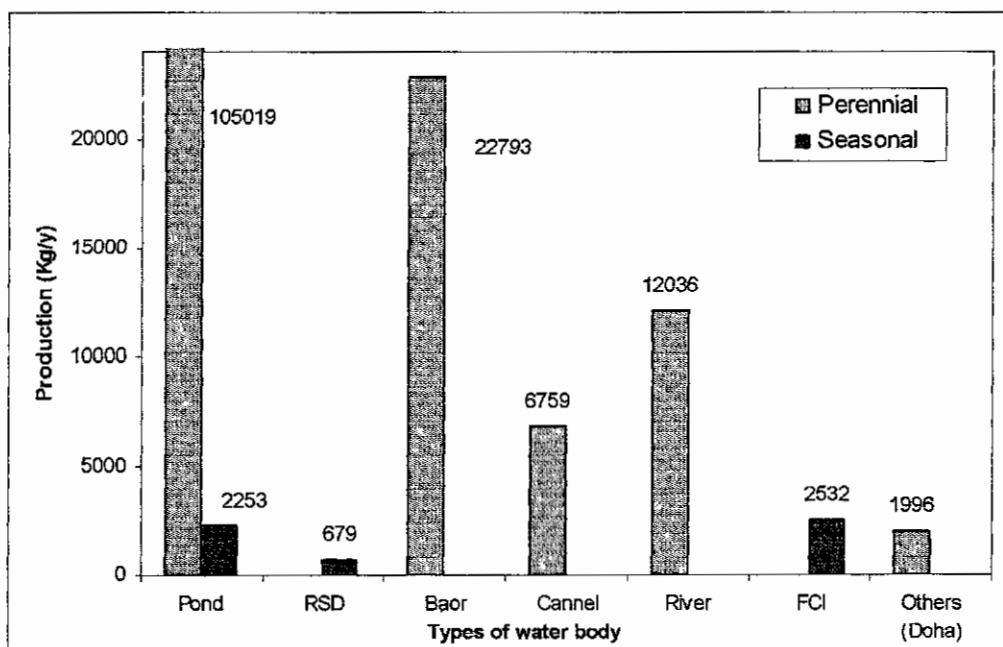


Fig-4.2: Water body wise production in Paurashava

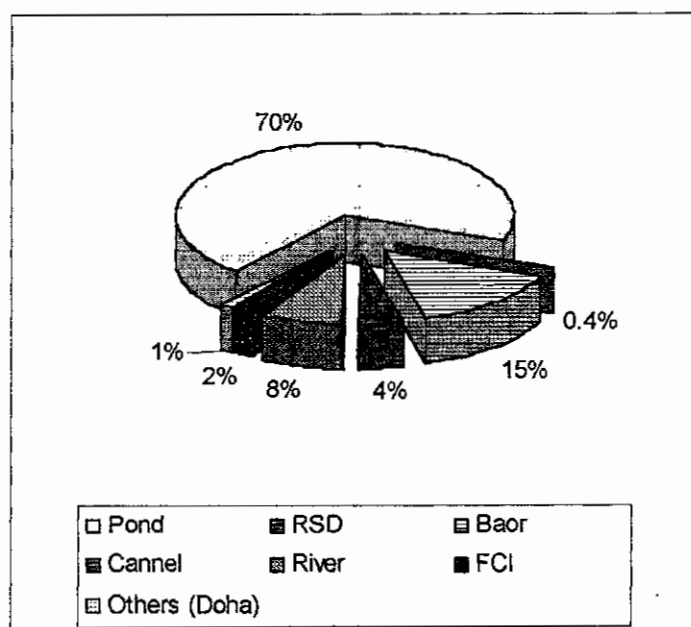


Fig-4.3: Percentage of production in Paurashava

4.1.2 Sadhuhati

The number of water bodies and area covered under the present survey have been summarized in Table 2. Sadhuhati is enriched with a variety of water bodies. Beel covered highest portion of culturable and cultured water bodies and Flood control and irrigation project occupied the highest position in repairable water bodies. Other water bodies like road side ditches, ponds were not in consideration (Fig-4.4).

Perennial and seasonal ponds produced 15754 kg and 1408 kg of fish respectively and perennial ponds contribute the highest production. Beel produced 14998 Kg/year which was the second highest portion (Fig-4.5).

It has been showed from the pie chat (Fig-4.6) that 44 percent of the total fish production in Sadhuhati union has come from ponds. Rest of the water bodies like Beel, Flood Control and Irrigation Project (FCI) and Cannels has contributed percent, 12 percent and 6 percent respectively.

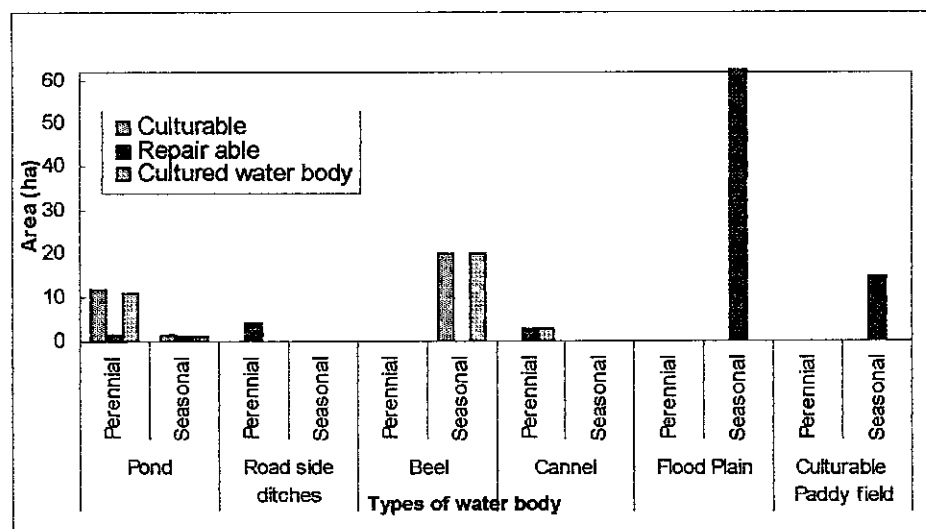


Fig-4.4 : Area of water body in Sadhuhati union

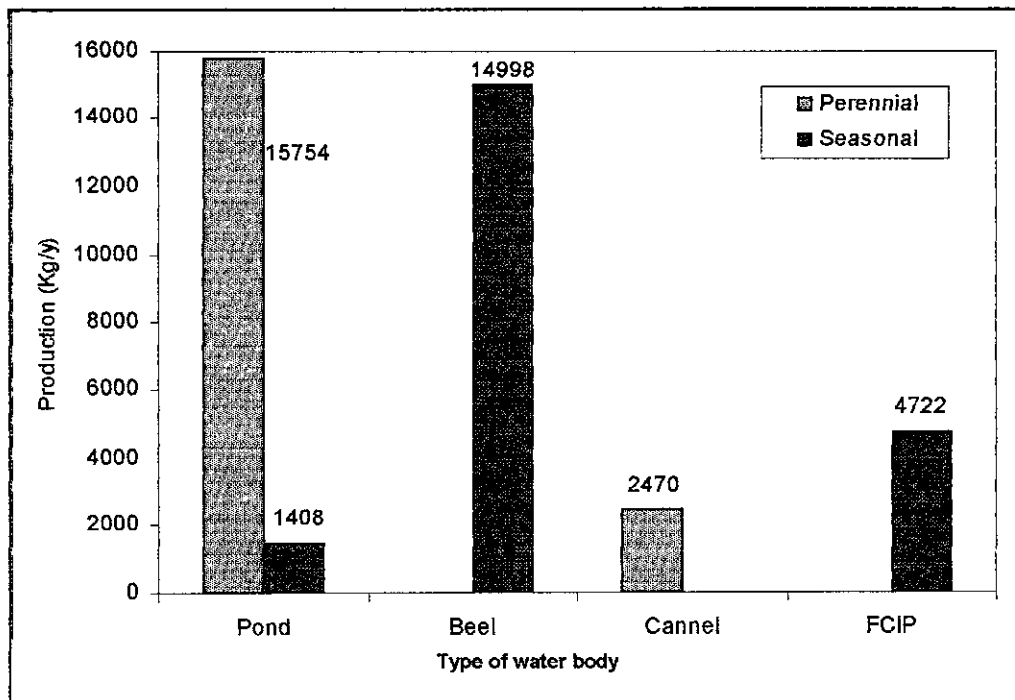


Fig-4.5: Water body wise production in Sadhuhati union

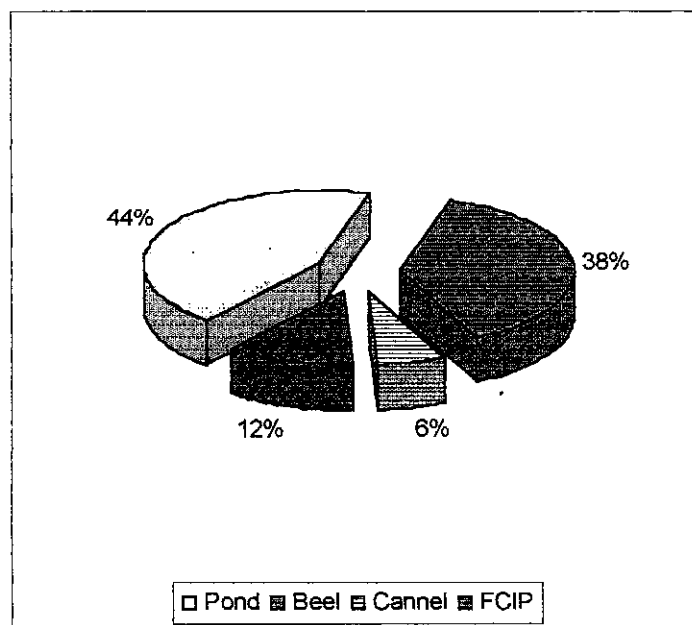


Fig-4.6: Percentage of production in Sadhuhati union

4.1.3 Madhubati

The number of water bodies and area covered under the present survey have been summarized in Table 3. Madhubati union is enriched with a variety of water bodies. Ponds covered highest portion of culturable and cultured water bodies and Baors occupied the highest position in repairable water body (Fig-4.7).

Perennial and seasonal ponds produced 36235 kg and 3664 kg of fish respectively and perennial ponds contributed the highest production. Baor produced 5730 Kg/year which was the second highest portion (Fig-4.8).

It has been showed from the pie chat (Fig-4.9) that 79 percent of the total fish production in Madhubati union has come from ponds. Rest of the water bodies like baor and Beel has contributed 11 percent and 10 percent respectively.

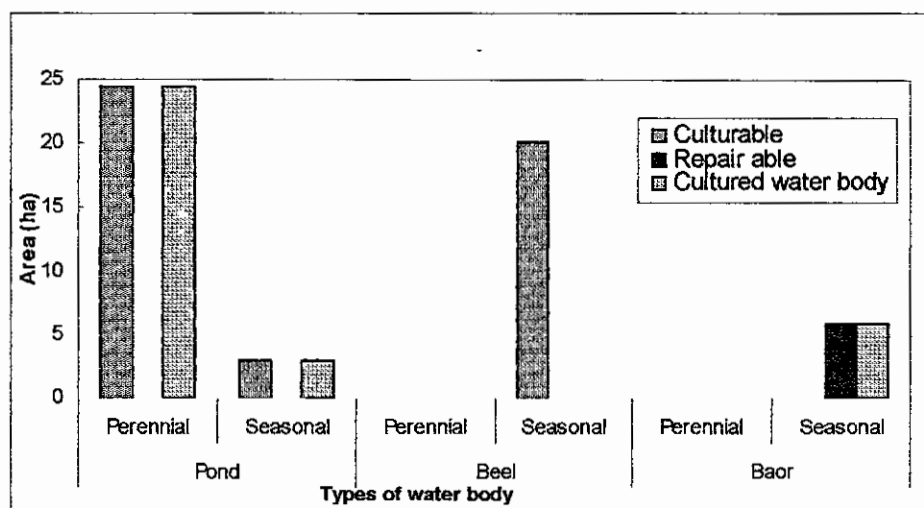


Fig-4.7: Area of water body in Madhubati union

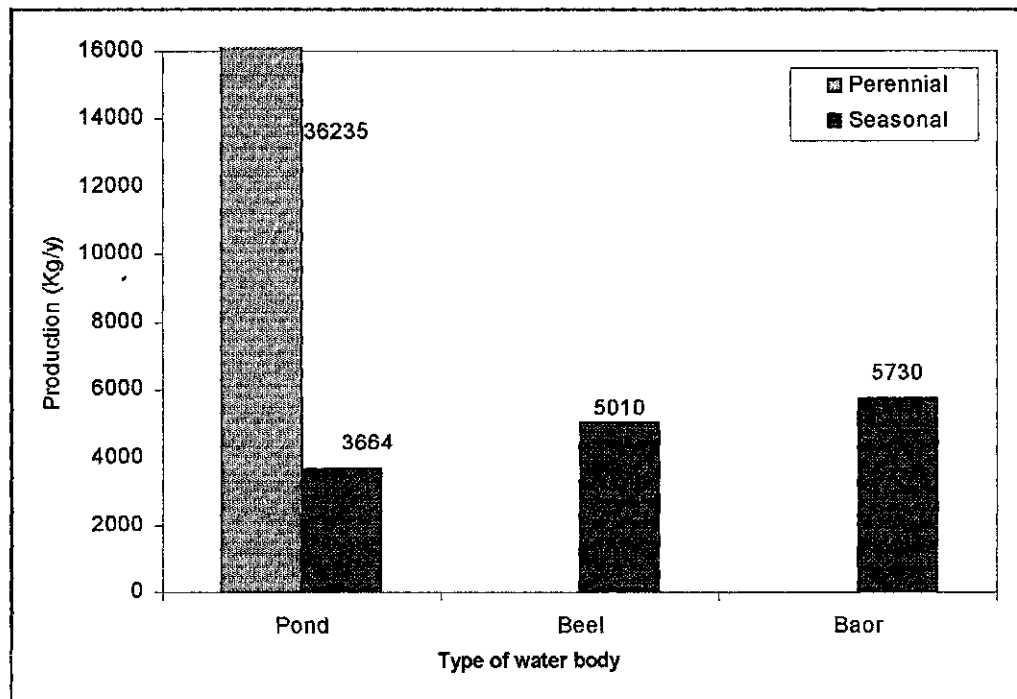


Fig-4.8: Water body wise production in Madhuhati union

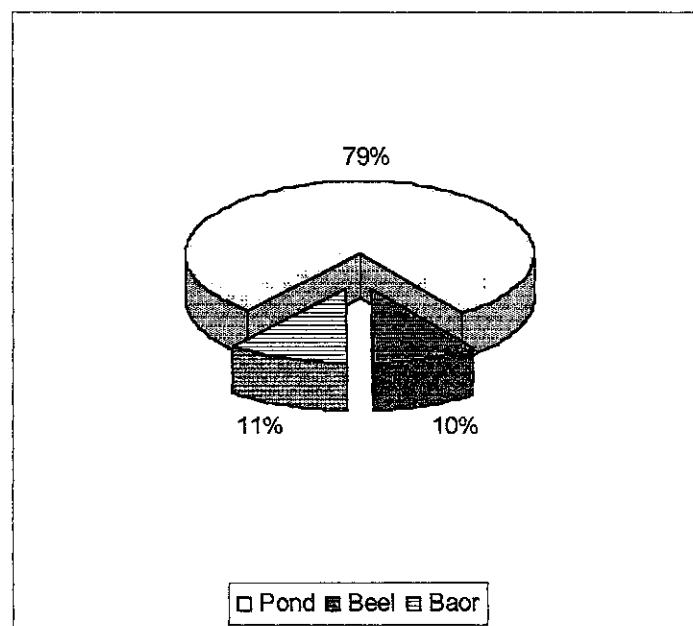


Fig-4.9: Percentage of production in Madhuhati union

4.1.4 Sagenna

The number of water bodies and area covered under the present survey have been summarized in Table 4. Sagenna union is enriched with a variety of water bodies. Ponds covered highest portion of culturable and cultured water bodies and channel occupied the highest position in repairable water body (Fig-4.10).

Perennial and seasonal ponds produced 24700 kg and 741 kg respectively and perennial ponds contributed the highest production. Fish production from the channel was 2344 Kg/year that was the second highest portion (Fig-4.11).

It has been showed from the pie chat (Fig-4.12) that 82 percent of the total fish production in Sagenna union has come from ponds. Rest of the water bodies like Beel and Channel has contributed 11 percent and 7 percent respectively.

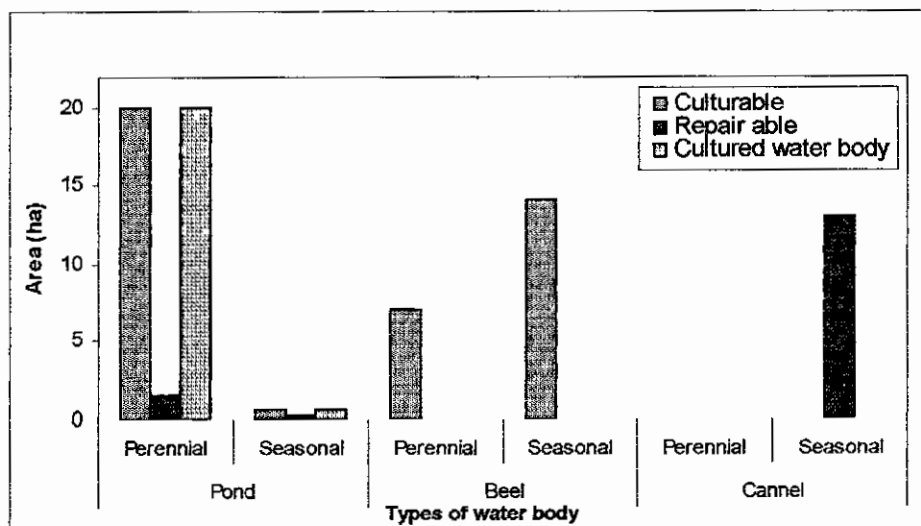


Fig-4.10: Area of water body in Sagenna union

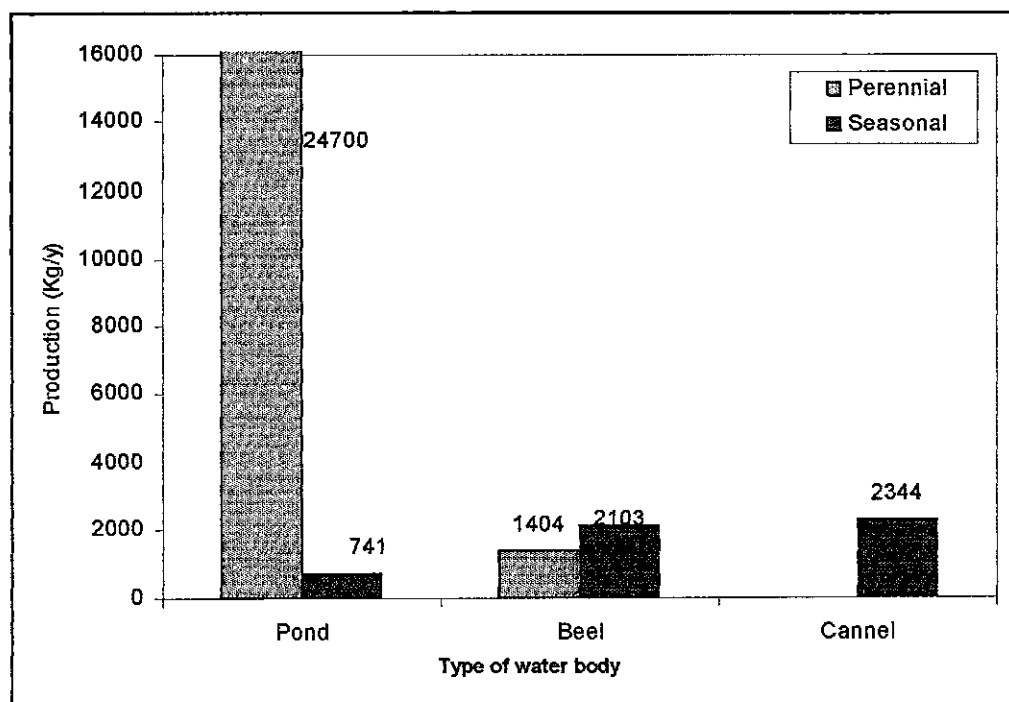


Fig-4.11: Water body wise production in Sagena union

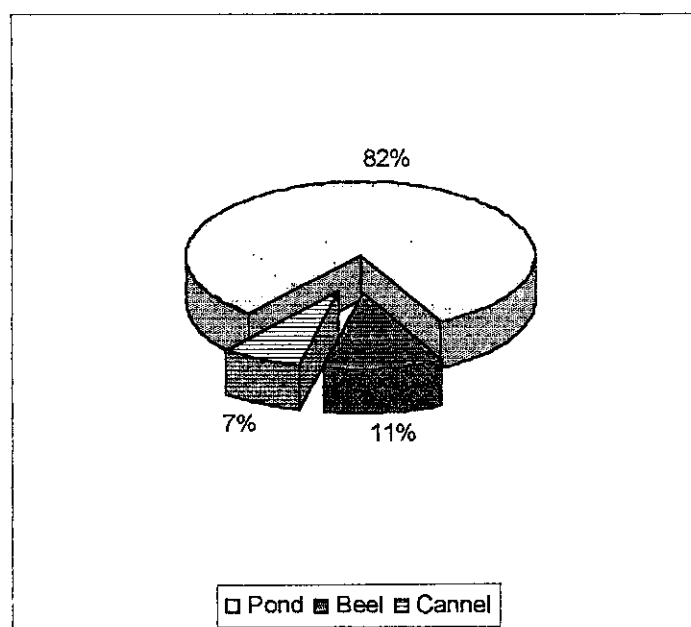


Fig-4.12: Percentage of production in Sagena union

4.1.5 Haldani

The number of water bodies and area covered under the present survey have been summarized in Table 5. Haldani union is enriched with a variety of water bodies. Baor covered highest portion of culturable and cultured water bodies and Flood control and irrigation project occupied the highest position in repairable water body (Fig-4.13).

Fish production from Baors was 61200 kg/year which contributed the highest production. Flood control and irrigation project produced 9000 Kg/year which was the second highest portion (Fig-4.14).

It has been showed from the pie chat (Fig-4.15) that 64 percent of the total fish production in Haldani union has come from baors. Rest of the water bodies like pond and Flood control and irrigation project has contributed 20 percent and 10 percent respectively.

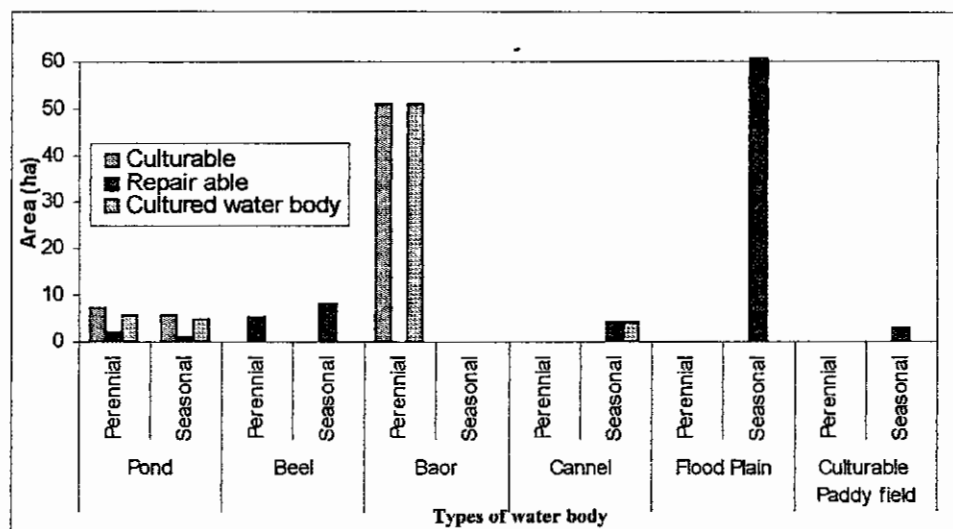


Fig-4.13: Area of water body in Haldani union

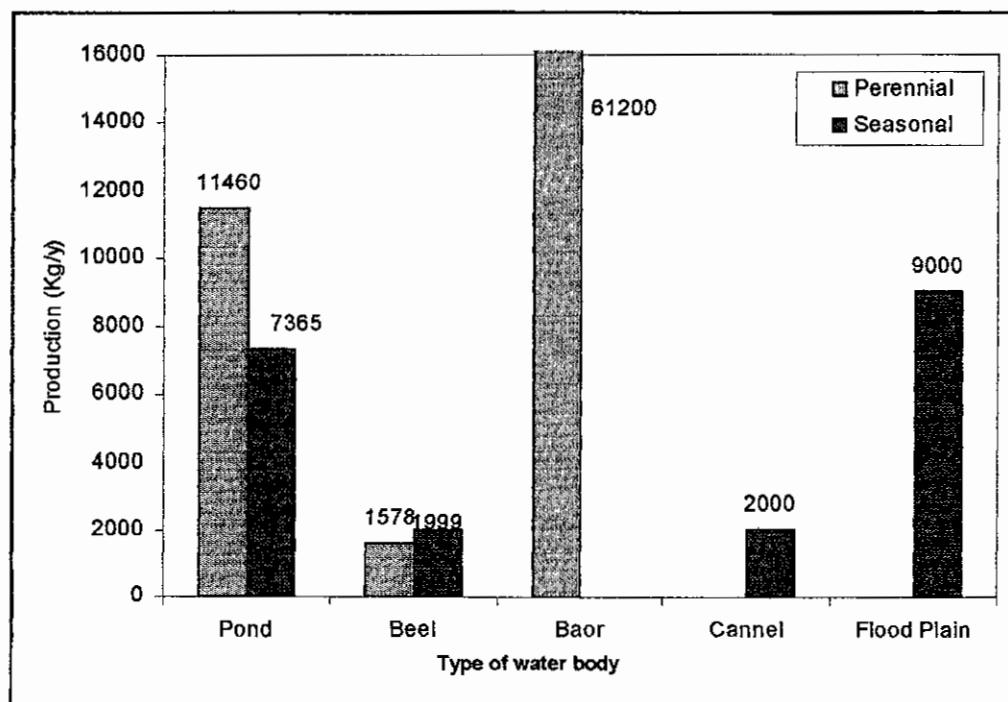


Fig-4.14: Water body wise production in Haldani union

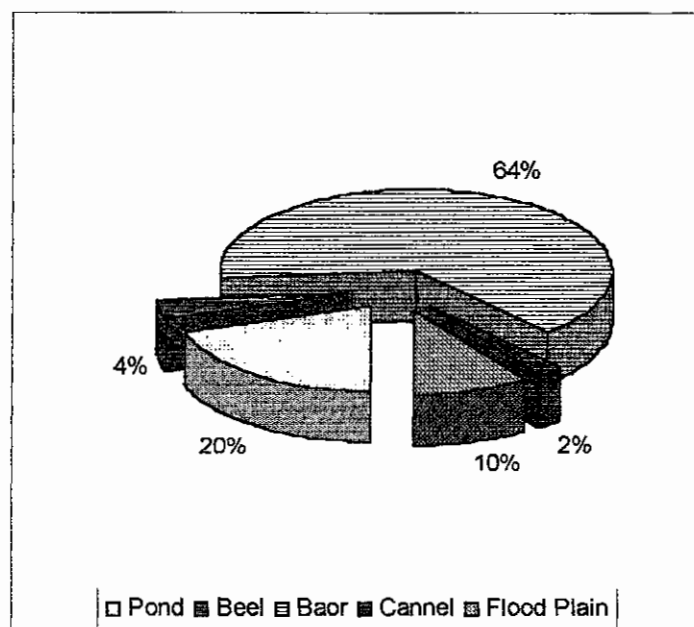


Fig-4.15: Percentage of production in Haldani union

4.1.6 Kumrabaria

The number of water bodies and area covered under the present survey have been summarized in Table 6. Kumrabaria union is enriched with a variety of water bodies. Ponds covered the highest portion of culturable and cultured water bodies and Flood control and irrigation project occupied the highest position in repairable water body (Fig-4.16).

Perennial and seasonal ponds produced 25823 kg and 4952 kg of fish respectively and perennial ponds contribute the highest production. Beel produce 2274 Kg/year which was the second highest portion (Fig-4.17).

It has been showed from the pie chat (Fig-4.18) that 86 percent of the total fish production in Kumrabaria union has come from ponds. Rest of the water bodies like beel and Flood control and irrigation project has contributed 6 percent and 5 percent respectively.

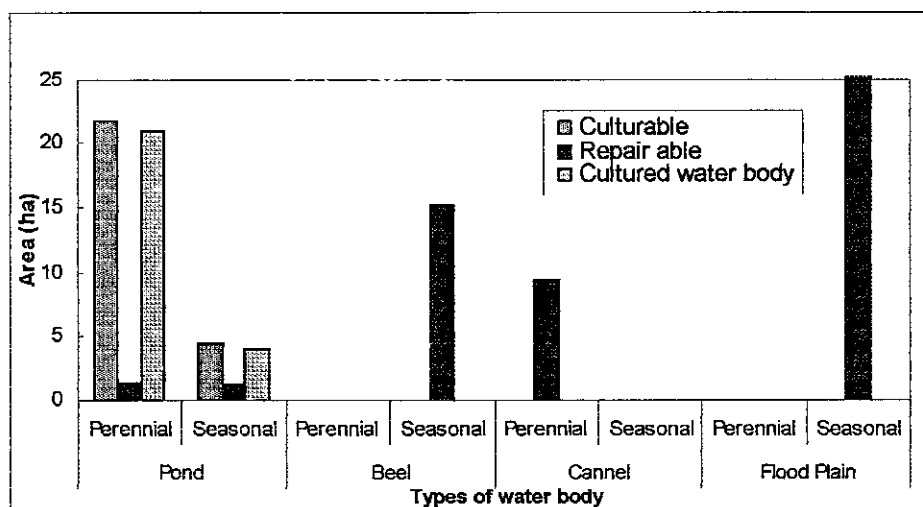


Fig-4.16: Area of water body in Kumrabaria union

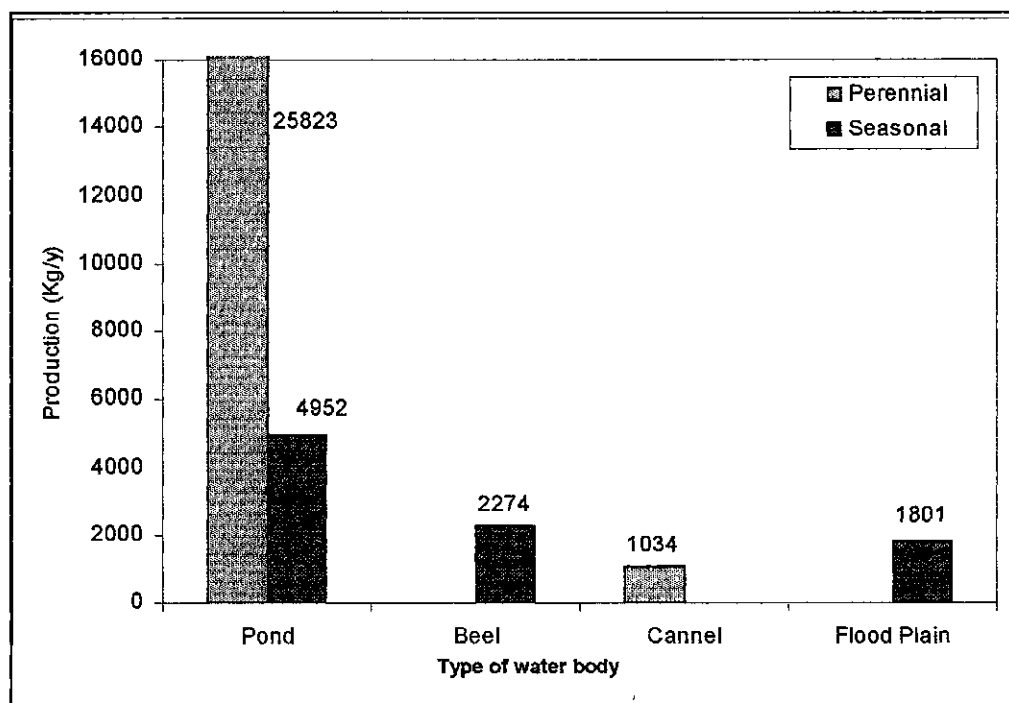


Fig-4.17: Water body wise production in Kumrabaria union

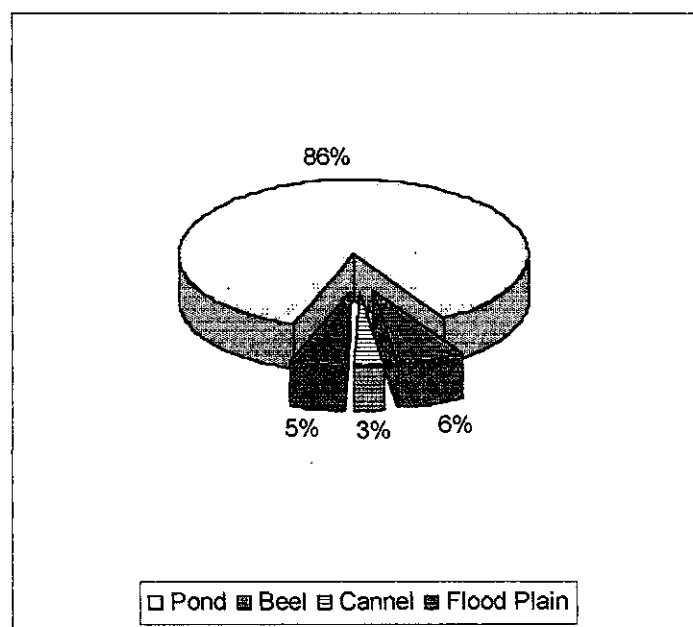


Fig-4.18: Percentage of production in Kumrabaria union

4.1.7 Ganna

The number of water bodies and area covered under the present survey have been summarized in Table 7. Ganna union is enriched with a variety of water bodies. Flood control and irrigation project covered highest portion of culturable water bodies and pond occupied the highest position in cultured and repairable water body (Fig-4.19).

Perennial and seasonal ponds produced 17784 kg and 3972 kg of fish respectively and Flood plain produced 3601 Kg/year which was the second highest portion (Fig-4.20).

It has been showed from the pie chat (Fig-4.21) that 75 percent of the total fish production in Ganna union has come from ponds. Rest of the water bodies like Flood plain and beel has contributed 12 percent and 7 percent respectively.

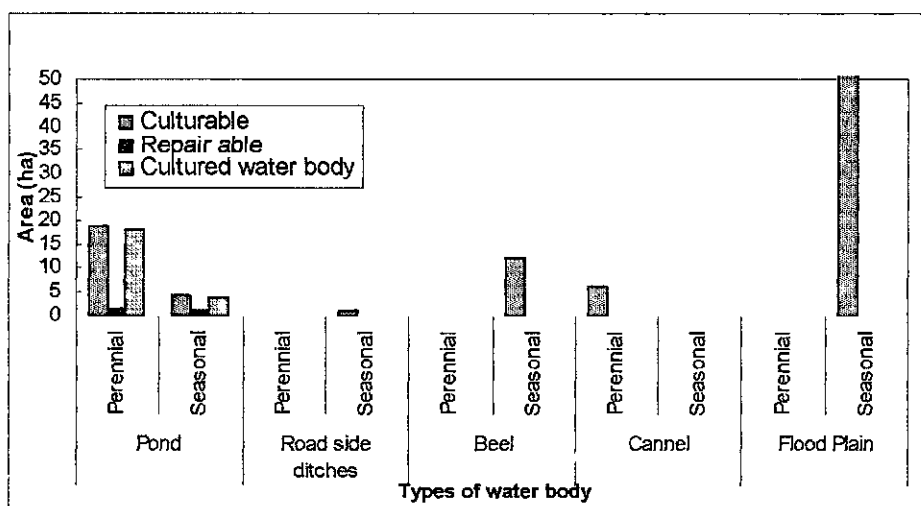


Fig-4.19: Area of water body in Ganna union

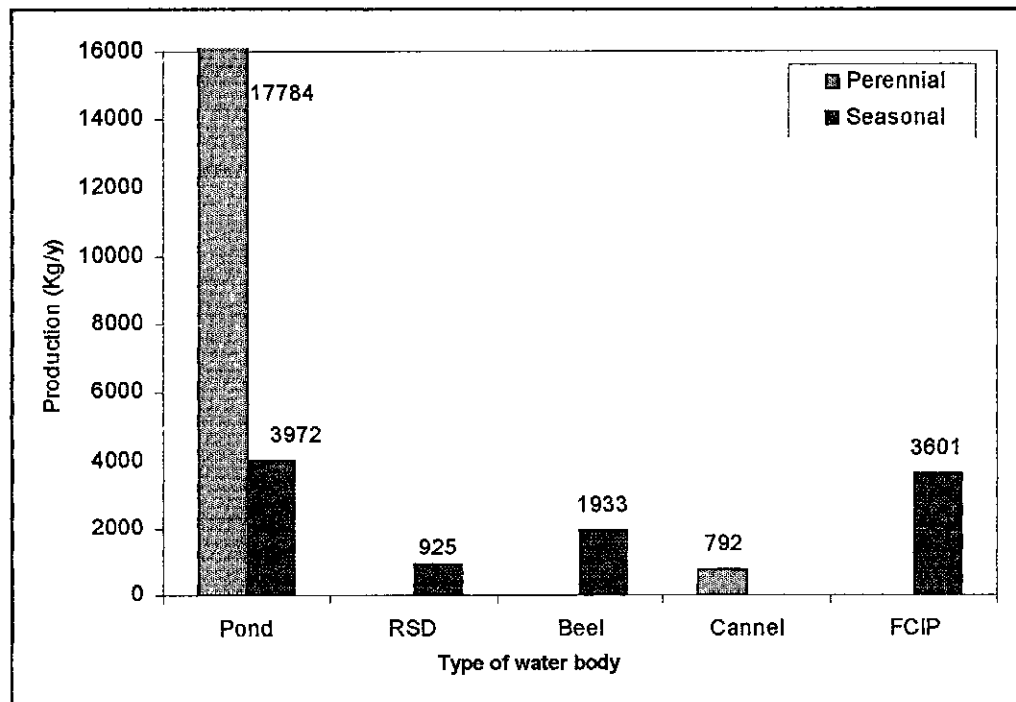


Fig-4.20: Water body wise production in Ganna union

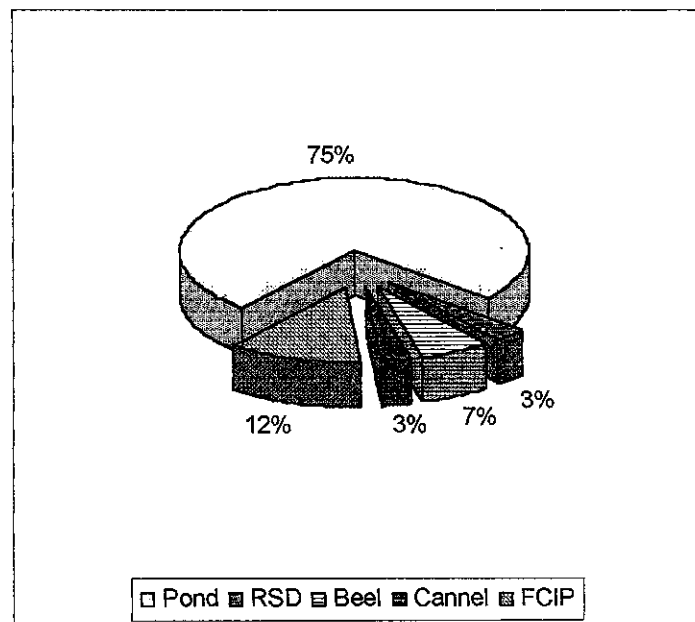


Fig-4.21: Percentage of production in Ganna union

4.1.8 Maharajpur

The number of water bodies and area covered under the present survey have been summarized in Table 8. Ponds covered highest portion of culturable and cultured water bodies and Flood plain occupied the highest position in repairable water body (Fig-4.22).

Perennial and seasonal ponds produced 70419 kg and 1482 kg of fish respectively and Flood plain produced 6477 Kg/year which was the second highest portion (Fig-4.23).

It has been showed from the pie chat (Fig-4.24) that 74 percent of the total fish production in Maharajpur union has come from ponds. Rest of the water bodies like river and Flood plain has contributed 15 percent and 10 percent respectively.

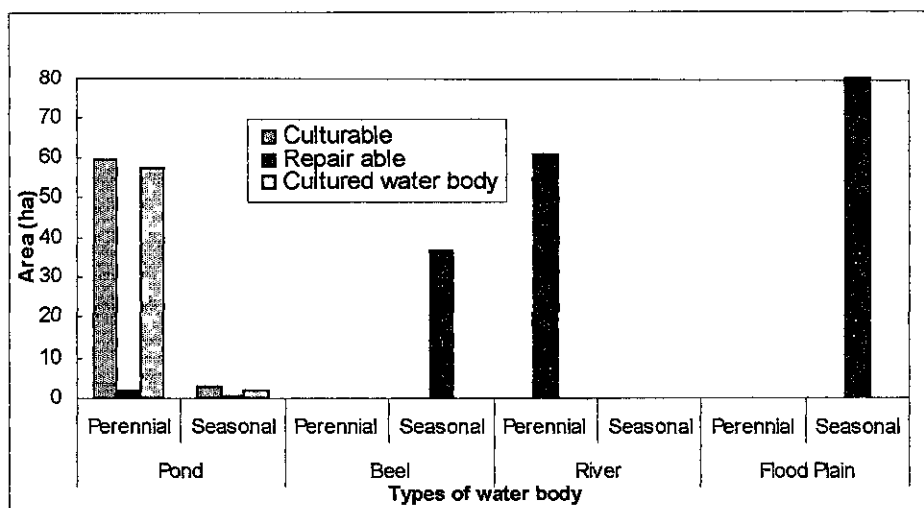


Fig-4.22: Area of water body in Maharajpur union

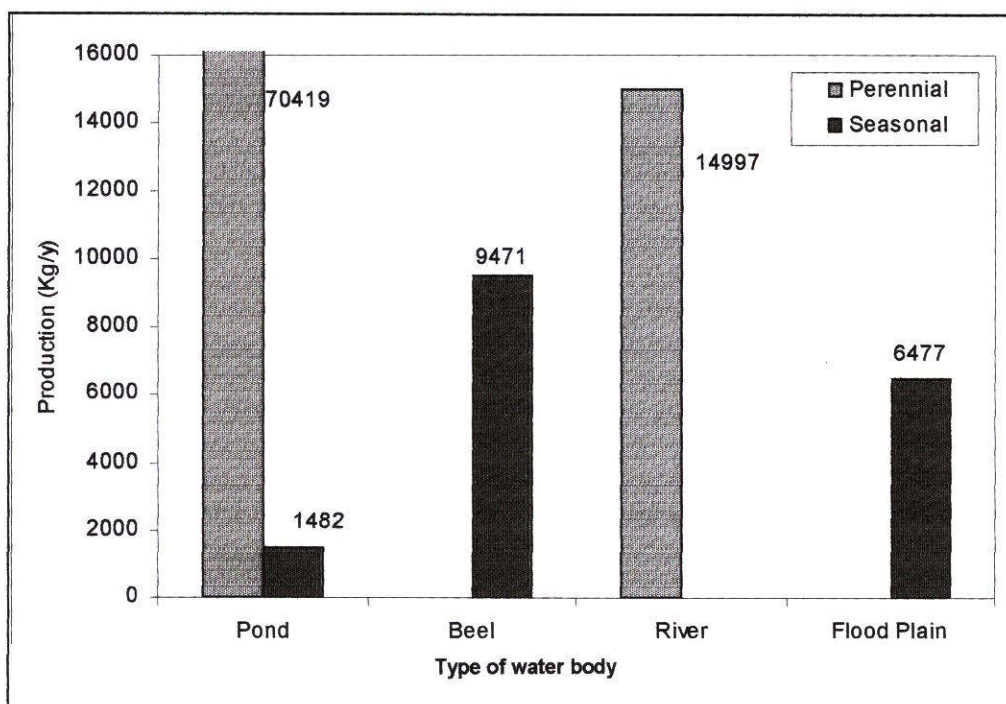


Fig-4.23: Water body wise production in Maharajpur union

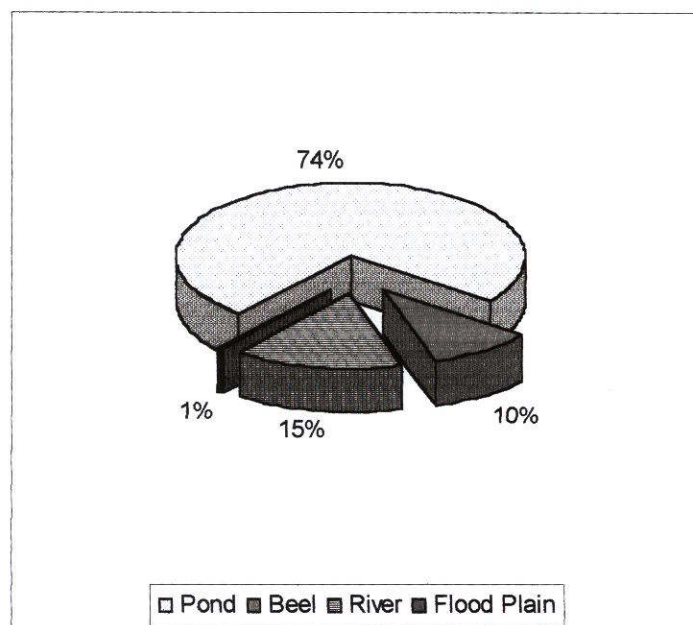


Fig-4.24: Percentage of production in Maharajpur union

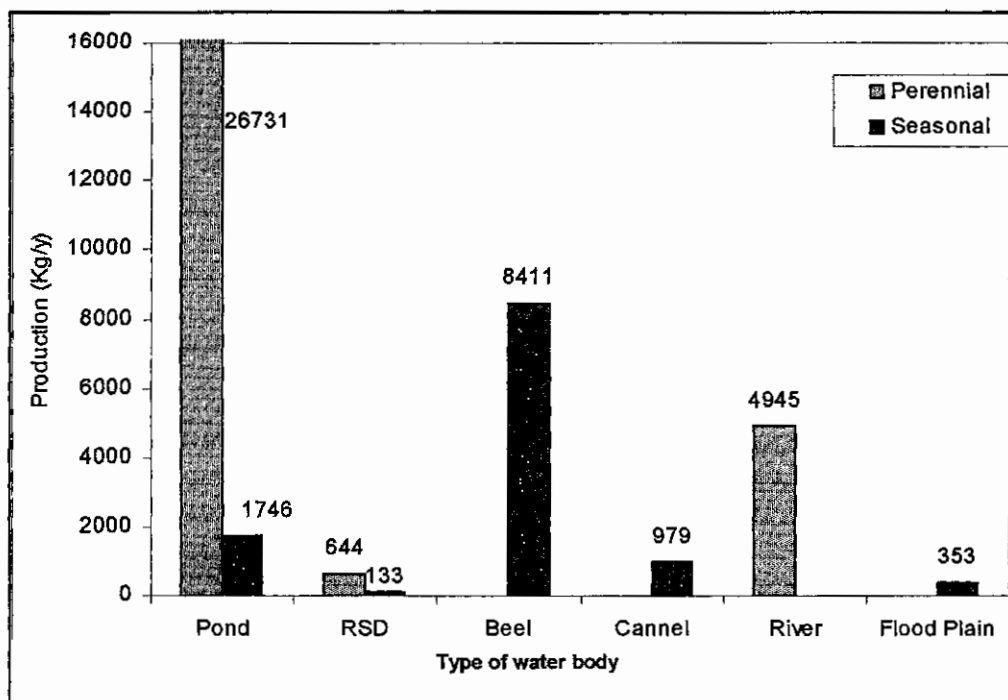


Fig-4.26: Water body wise production in Paglakanai union

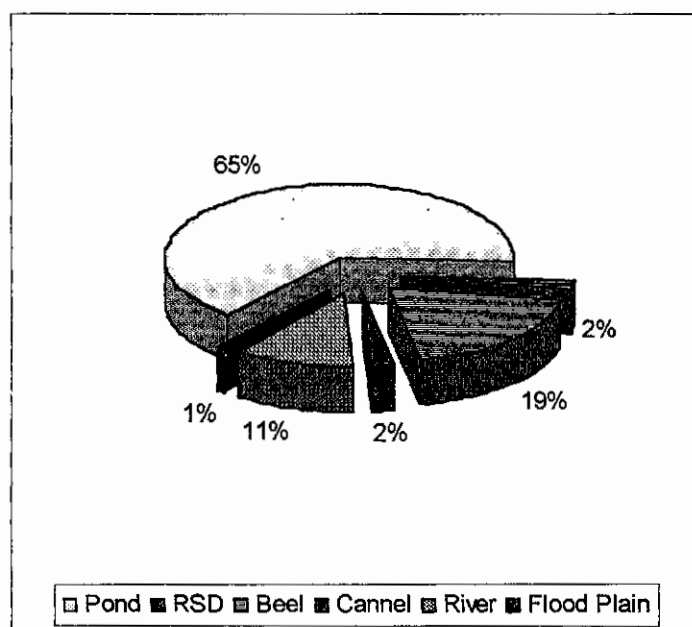


Fig-4.27: Percentage of production in Paglakanai union

4.1.10 Porahati

The number of water bodies and area covered under the present survey have been summarized in Table 10. Porahati union is enriched with a variety of water bodies. Ponds covered highest portion of culturable and cultured water bodies and river occupied the highest position in repairable water body (Fig-4.28).

Perennial and seasonal ponds produced 52208 kg and 2480 kg of fish respectively and river produced 7410 Kg/year which was the second highest portion (Fig-4.29).

It has been showed from the pie chat (Fig-4.30) that 77 percent of the total fish production in Porahati union has come from ponds. Rest of the water bodies like river and beel has contributed 11 percent and 8 percent respectively

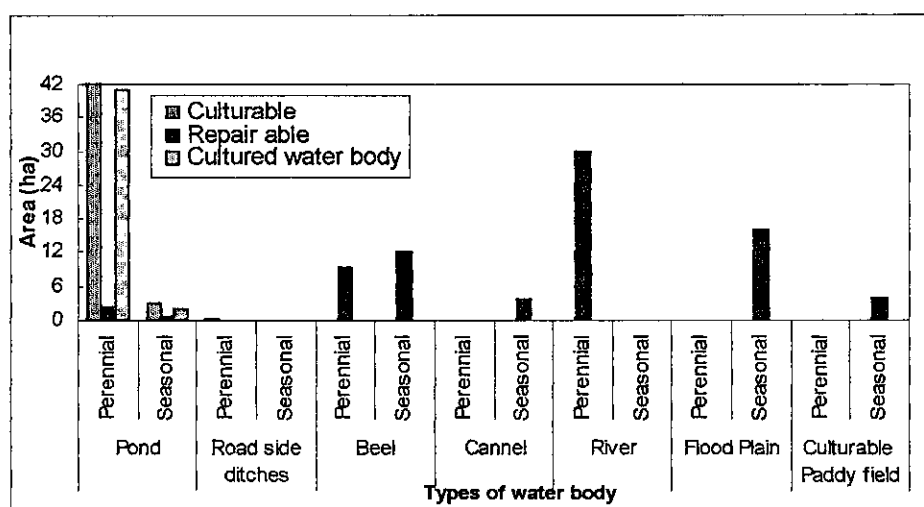


Fig-4.28: Area of water body in Porahati union

4.1.11 Harishankarpur

The number of water bodies and area covered under the present survey have been summarized in Table 11. Ponds covered highest portion of culturable and cultured water bodies and Flood plain occupied the highest position in repairable water body (Fig-4.31).

Perennial and seasonal ponds produced 35582 kg and 12374 kg of fish respectively and river produce 3717 Kg/year which was the second highest portion (Fig-4.32).

It has been showed from the pie chat (Fig-4.33) that 82 percent of the total fish production in Harishankarpur union has come from ponds. Rest of the water bodies like river and beel has contributed 6 percent and 5 percent respectively.

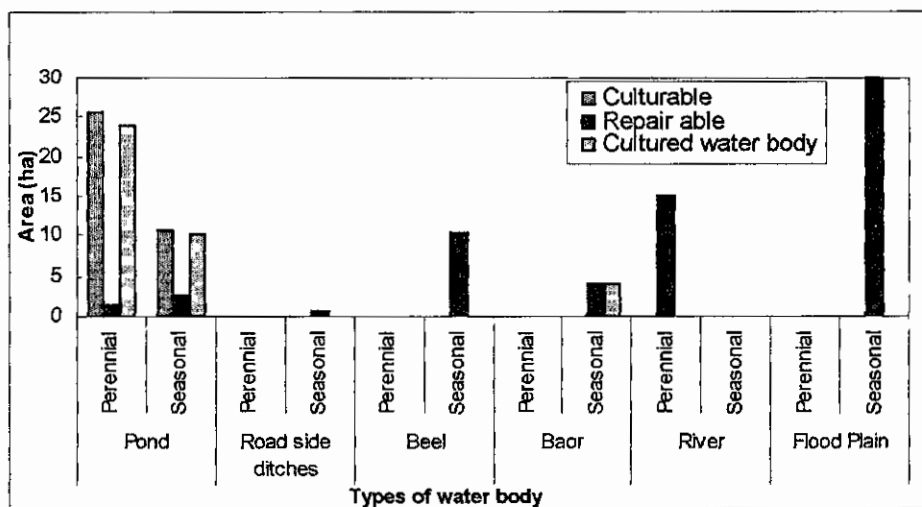


Fig-4.31: Area of water body in Harishankarpur union

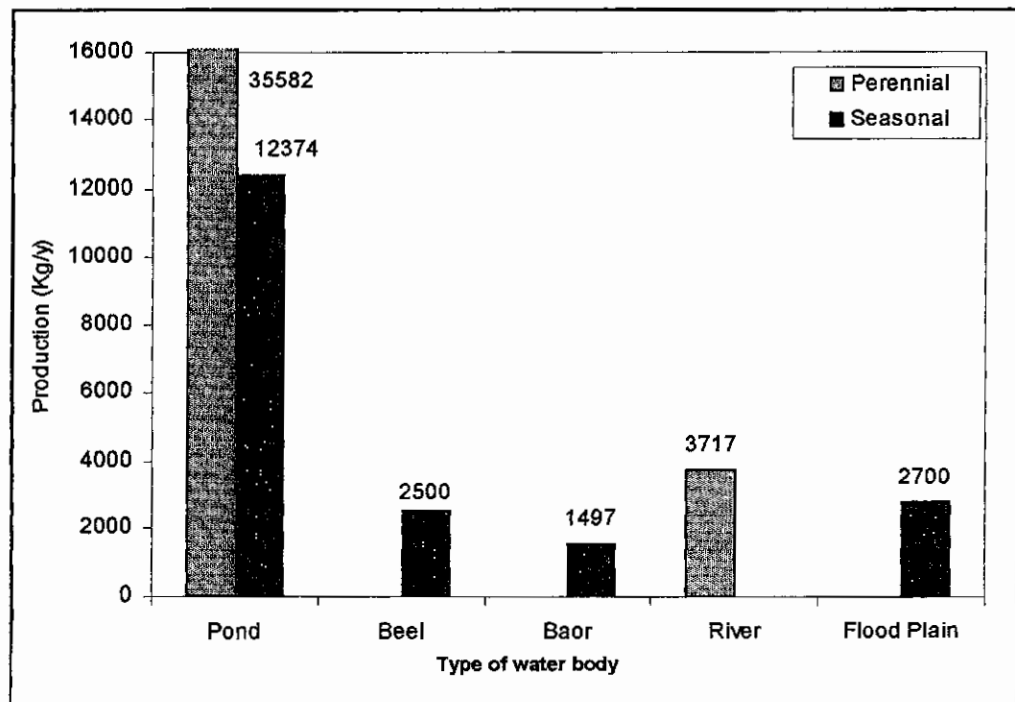


Fig-4.32: Water body wise production in Harshakarpur union

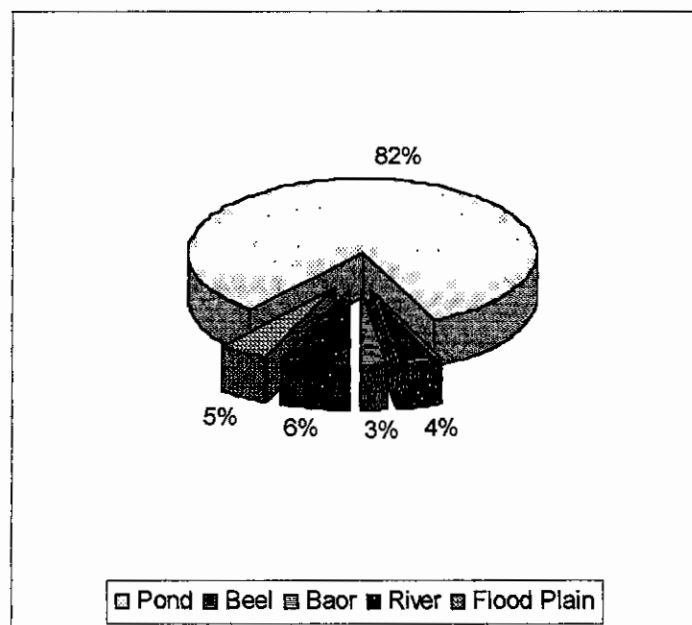


Fig-4.33: Percentage of production in Harshakarpur union

4.1.12 Padmakar

The number of water bodies and area covered under the present survey have been summarized in Table 12. Ponds covered highest portion of culturable and cultured water bodies and Flood plain occupied the highest position in repairable water body (Fig-4.34).

Perennial and seasonal ponds produced 27027 kg and 3149 kg of fish respectively and beel produced 6290 Kg/year which was the second highest portion (Fig-4.35).

It has been showed from the pie chat (Fig-4.36) that 72 percent of the total fish production in Padmakar union has come from ponds. Rest of the water bodies like beel and river has contributed 15 percent and 7 percent respectively.

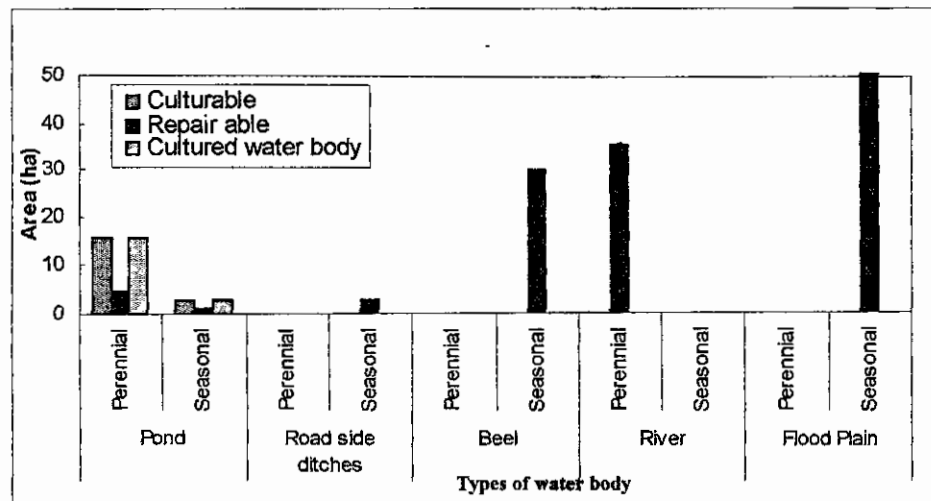


Fig-4.34: Area of water body in Padmakar union

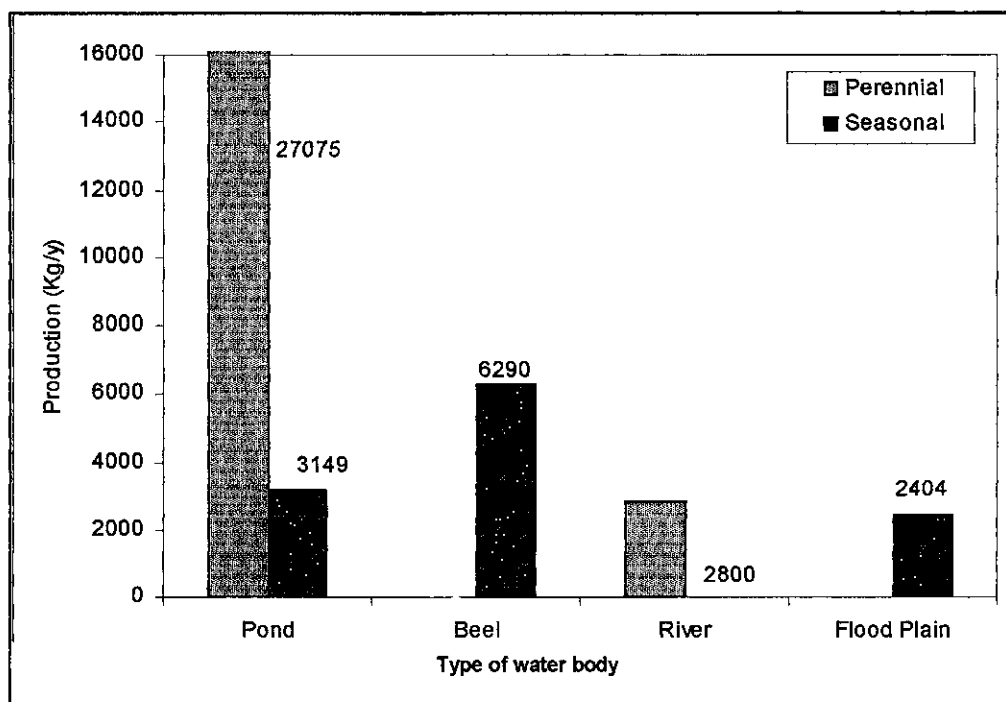


Fig-4.35: Water body wise production in Padmakar union

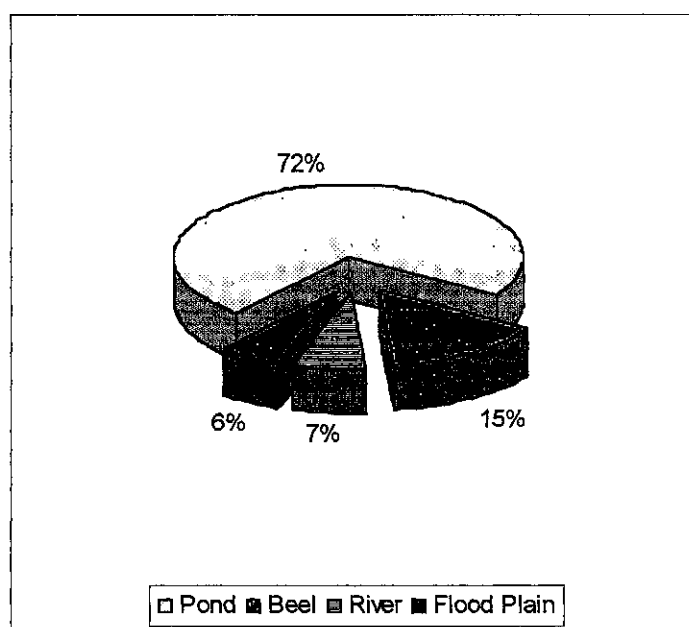


Fig-4.36: Percentage of production in Padmakar union

4.1.13 Dogachhi

The number of water bodies and area covered under the present survey have been summarized in Table 13. Dogachhi union is enriched with a variety of water bodies. Ponds covered highest portion of culturable and cultured water bodies and Flood plain occupied the highest position in repairable water body (Fig-4.37).

Perennial and seasonal ponds produced 32618 kg and 6212 kg of fish respectively and beel produced 5197 Kg/year which was the second highest portion (Fig-4.38).

It has been showed from the pie chat (Fig-4.39) that 79 percent of the total fish production in Dogachhi union has come from ponds. Rest of the water bodies like beel and Flood plain has contributed 10 percent and 8 percent respectively.

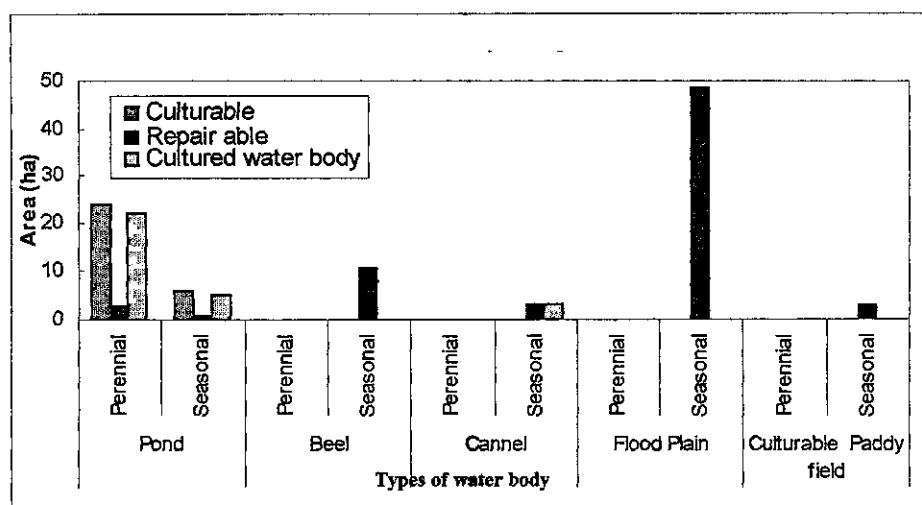


Fig-4.37: Area of water body in Dogachhi union

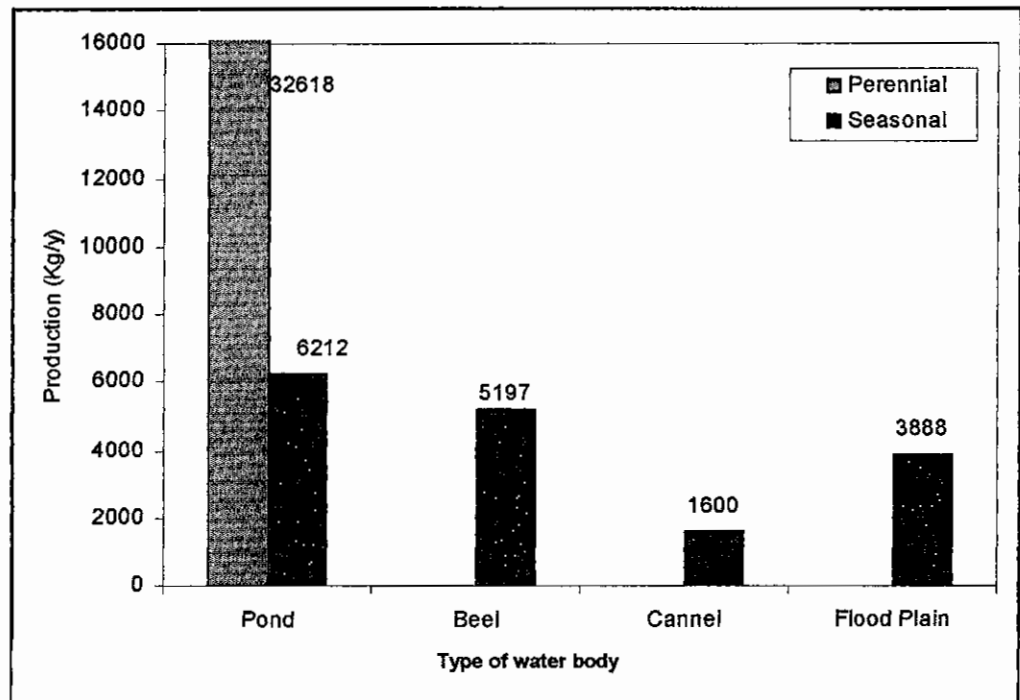


Fig-4.38: Water body wise production in Dogachhi union

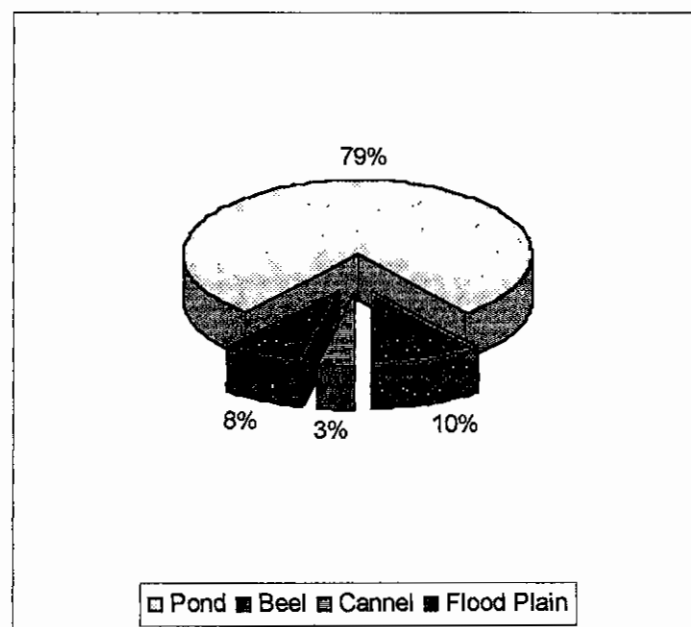


Fig-4.39: Percentage of production in Dogachhi union

4.1. 14 Fursandi

The number of water bodies and area covered under the present survey have been summarized in Table 14. Ponds covered highest portion of culturable and cultured water bodies and Flood plain occupied the highest position in repairable water body (Fig-4.40).

Perennial and seasonal ponds produced 54848 kg and 11480 kg of fish respectively and Flood plain produced 12160 Kg/year which was the second highest portion (Fig-4.41).

It has been showed from the pie chat (Fig-4.42) that 75 percent of the total fish production in Fursandi union has come from ponds. Rest of the water bodies like Flood plain and beel has contributed 14 percent and 4 percent respectively

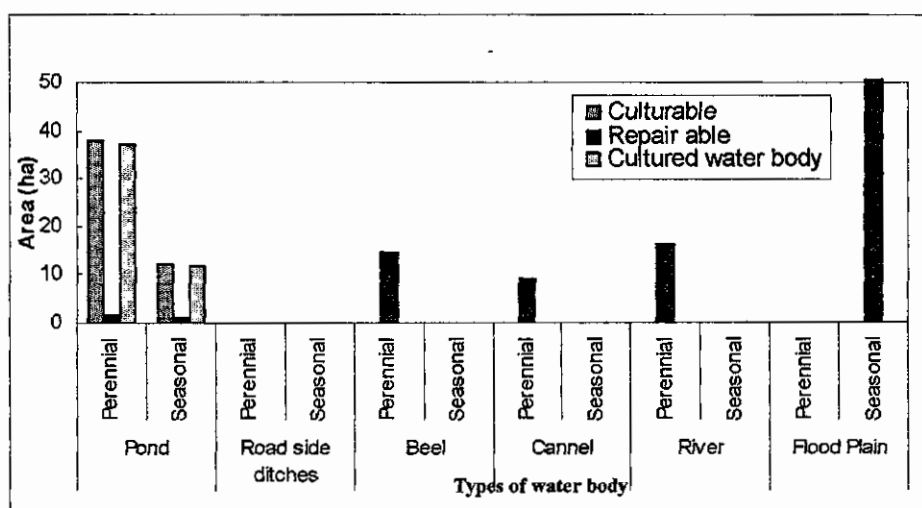


Fig-4.40: Area of water body in Fursandi union

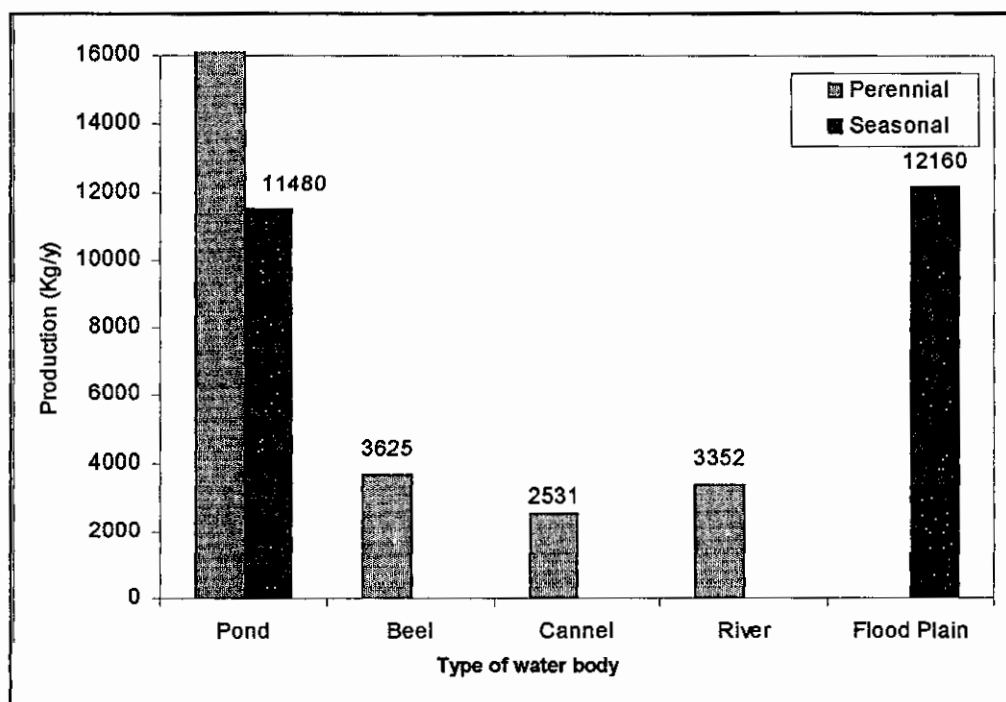


Fig-4.41: Water body wise production in Fursandi union

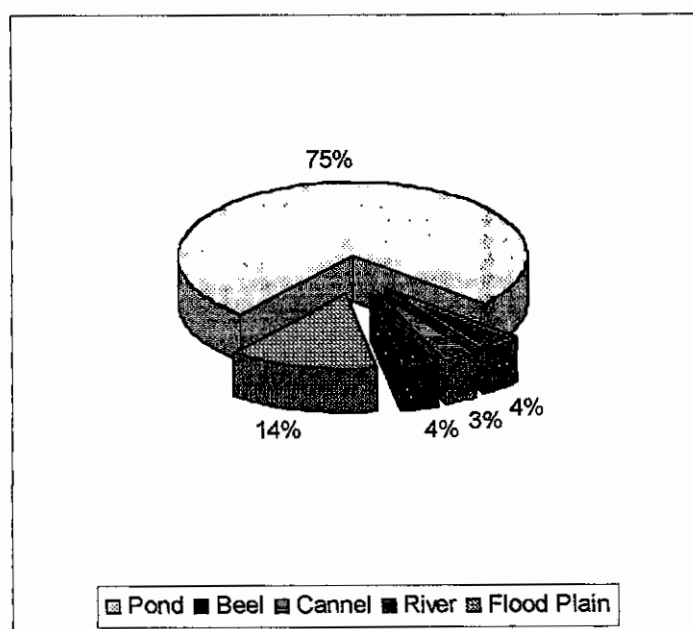


Fig-4.42: Percentage of production in Fursandi union

4.1.15 Ghorsal

The number of water bodies and area covered under the present survey have been summarized in Table 15. Ghorsal union is enriched with a variety of water bodies. Ponds covered highest portion of culturable and cultured water bodies and beel occupied the highest position in repairable water body (Fig-4.43).

Perennial and seasonal ponds produced 16788 kg and 7410 kg of fish respectively and beel produced 8892 Kg/year which was the second highest portion (Fig-4.44).

It has been showed from the pie chat (Fig-4.45) that 48 percent of the total fish production in Ghorsal union has come from ponds. Rest of the water bodies like beel and Flood plain has contributed 29 percent and 13 percent respectively

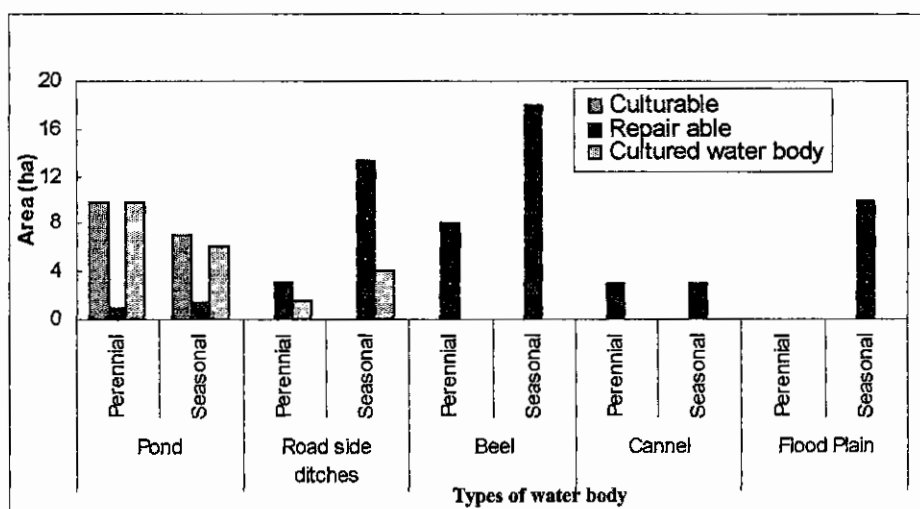


Fig-4.43: Area of water body in Ghorsal union

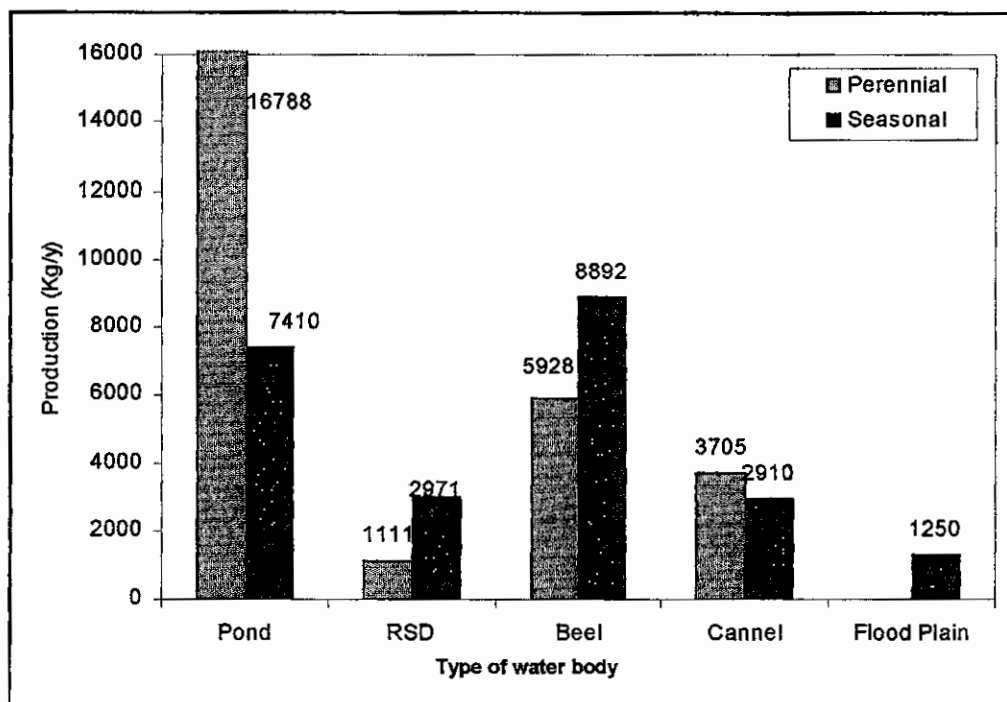


Fig-4.44: Water body wise production in Ghorsal union

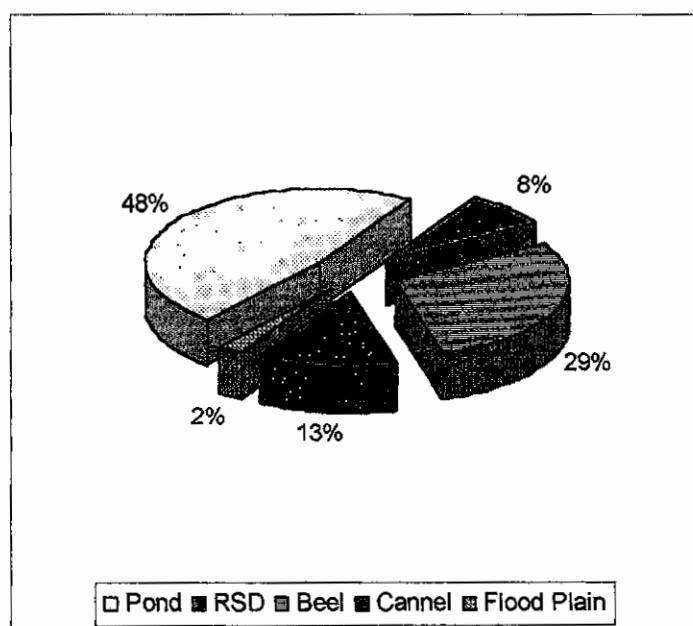


Fig-4.45: Percentage of production in Ghorsal union

4.1.16 Kalicharanpur

The number of water bodies and area covered under the present survey have been summarized in Table 16. Ponds covered highest portion of culturable and cultured water bodies and Flood occupied the highest position in repairable water body (Fig-4.46).

Perennial and seasonal ponds produced 24052 kg and 12103 kg of fish respectively and beel produced 2012 Kg/year which was the second highest portion (Fig-4.47).

It has been showed from the pie chat (Fig-4.48) that 86 percent of the total fish production in Kalicharanpur union has come from ponds. Rest of the water bodies like beel and cannel has contributed 5 percent and 4 percent respectively

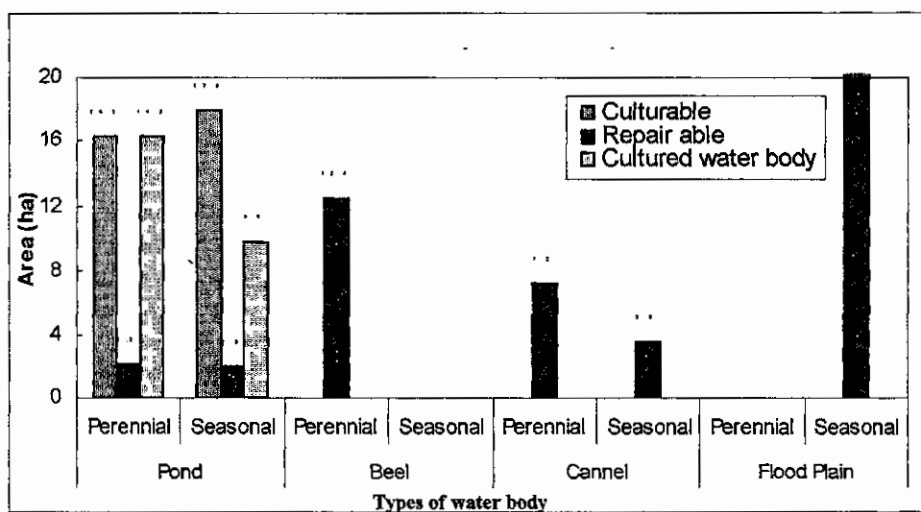


Fig-4.46: Area of water body in Kalicharanpur union

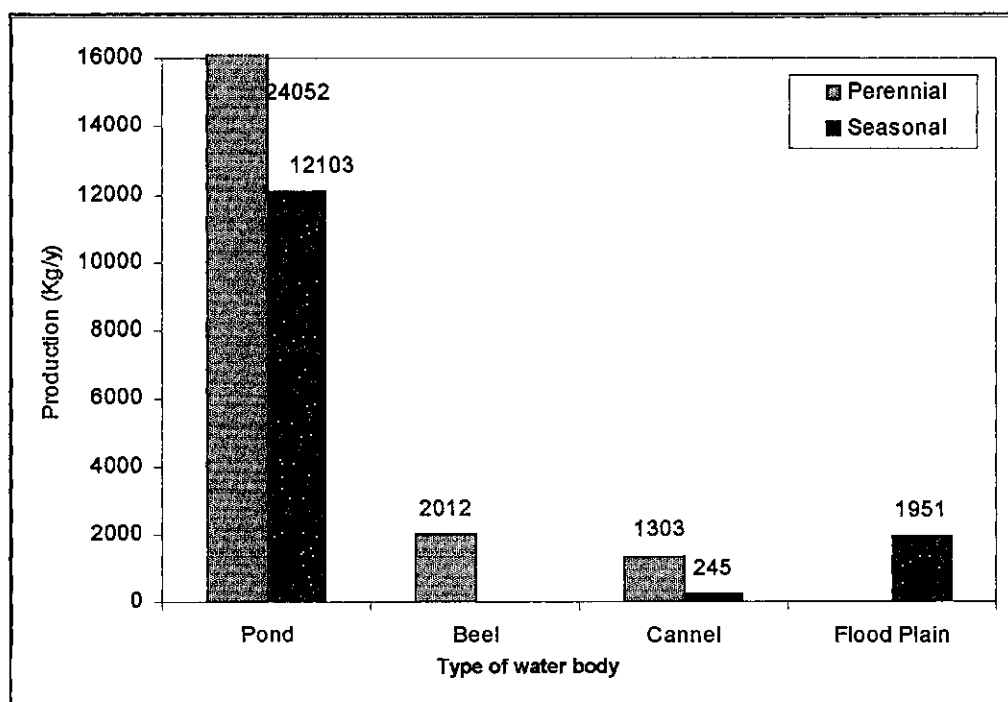


Fig-4.47: Water body wise production in Kalicharanpur union

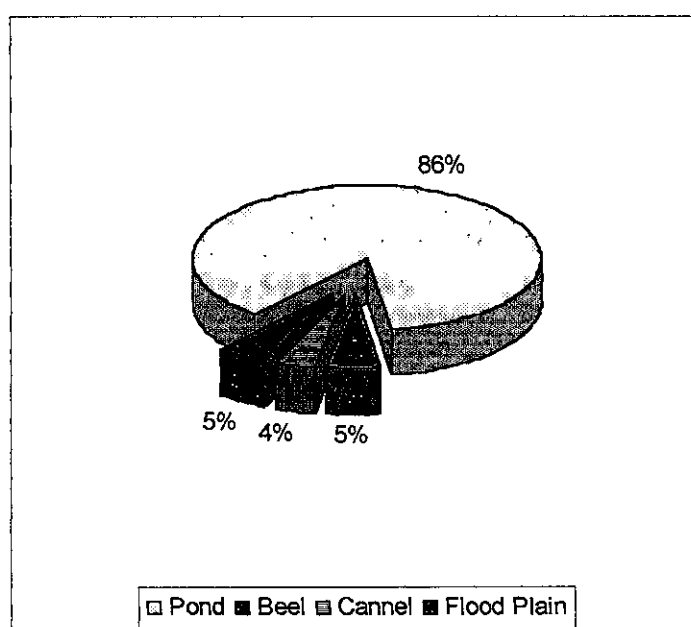


Fig-4.48: Percentage of production in Ghorsal union

4.1.17 Surat

The number of water bodies and area covered under the present survey have been summarized in Table 17. Surat union is enriched with a variety of water bodies. Ponds covered highest portion of culturable and cultured water bodies and ponds also occupied the highest position in repairable water body (Fig-4.49).

Perennial and seasonal ponds produced 79793 kg and 12362 kg of fish respectively and beel produced 2850 Kg/year which was the second highest portion (Fig-4.50).

It has been showed from the pie chat (Fig-4.51) that 95 percent of the total fish production in Surat union has come from ponds. Rest of the water bodies like beel and Flood plain has contributed 3 percent and 1 percent respectively.

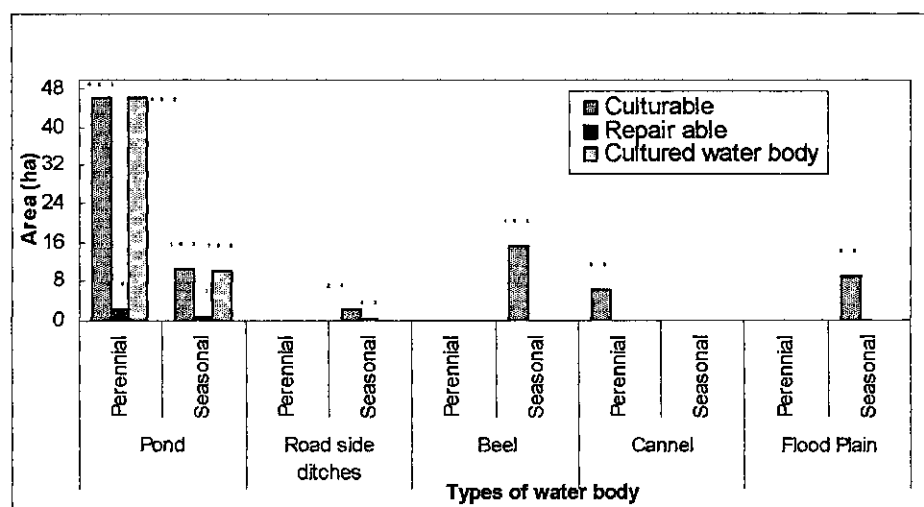


Fig-4.49: Area of water body in Surat union

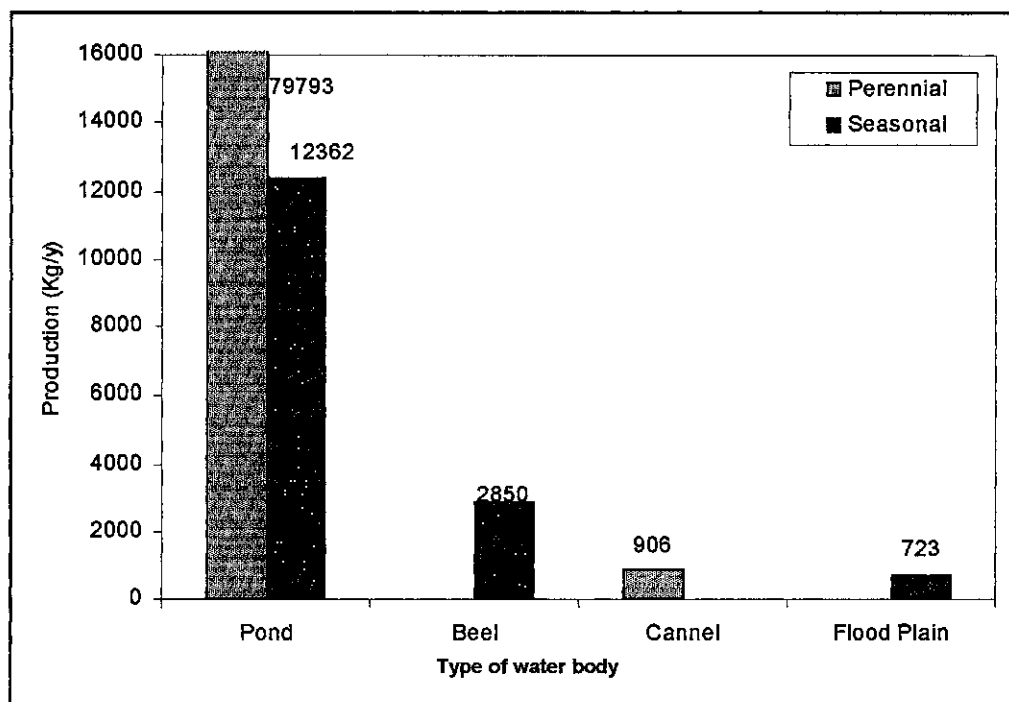


Fig-4.50: Water body wise production in Surat union

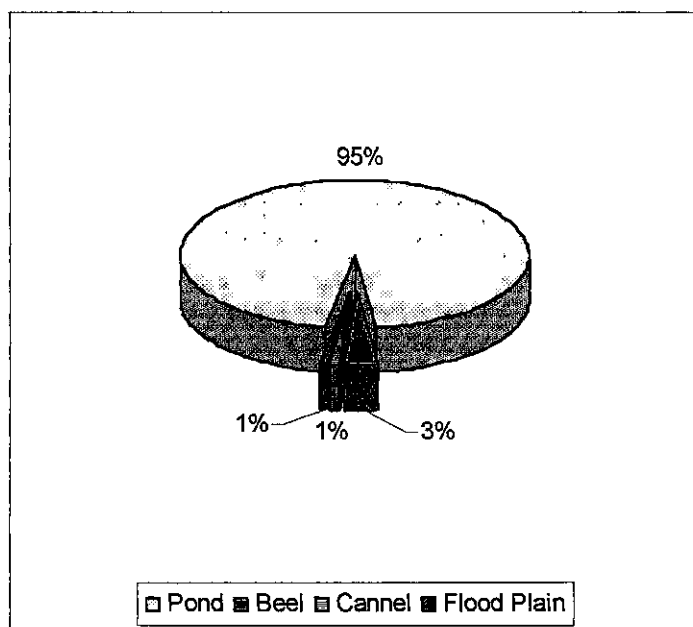


Fig-4.51: Percentage of production in Surat union

4.1.18 Naldanga

The number of water bodies and area covered under the present survey have been summarized in Table 18. Naldanga union is enriched with a variety of water bodies. Ponds covered highest portion of culturable and cultured water bodies and river occupied the highest position in repairable water body (Fig-4.52).

Perennial and seasonal ponds produced 77088 kg and 5700 kg of fish respectively and river produced 47424 Kg/year which was the second highest portion (Fig-4.53).

It has been showed from the pie chat (Fig-4.54) that 52 percent of the total fish production in Naldanga union has come from ponds. Rest of the water bodies like beel and river has contributed 29 percent and 18 percent respectively.

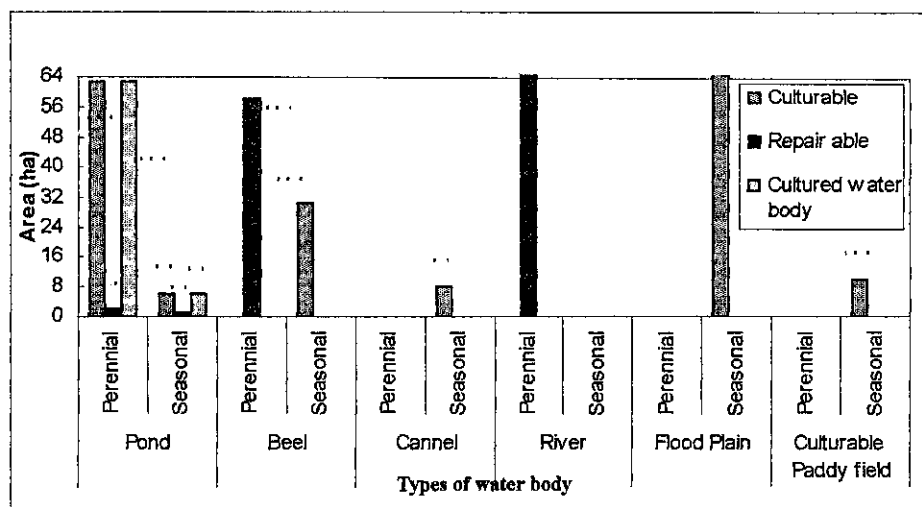


Fig-4.52: Area of water body in Naldanga union

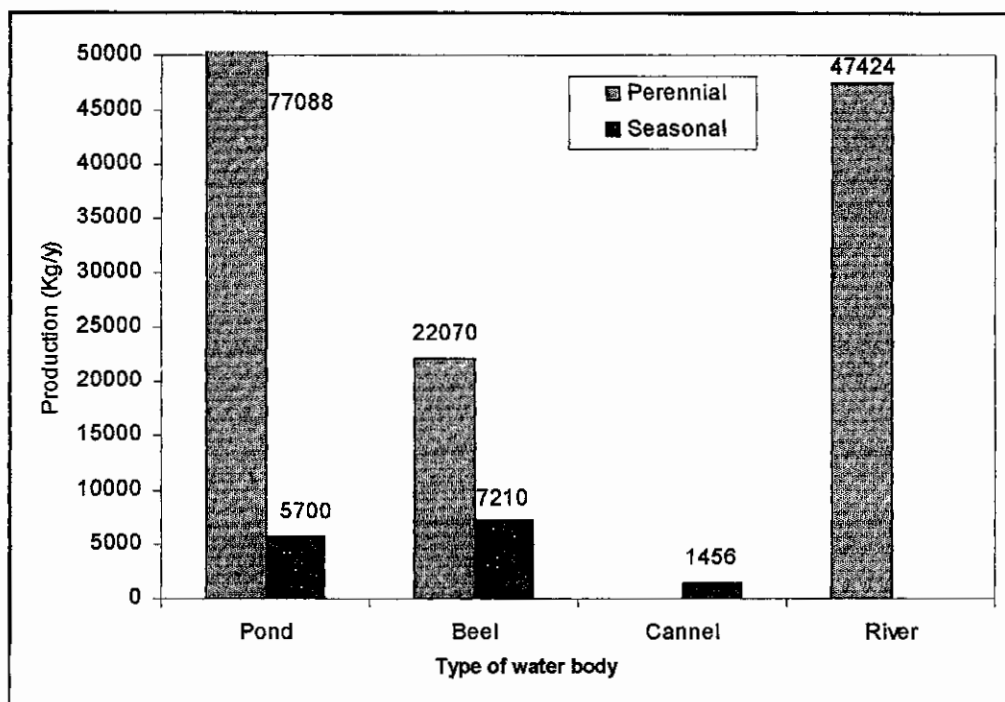


Fig-4.53 : Water body wise production in Naldanga union

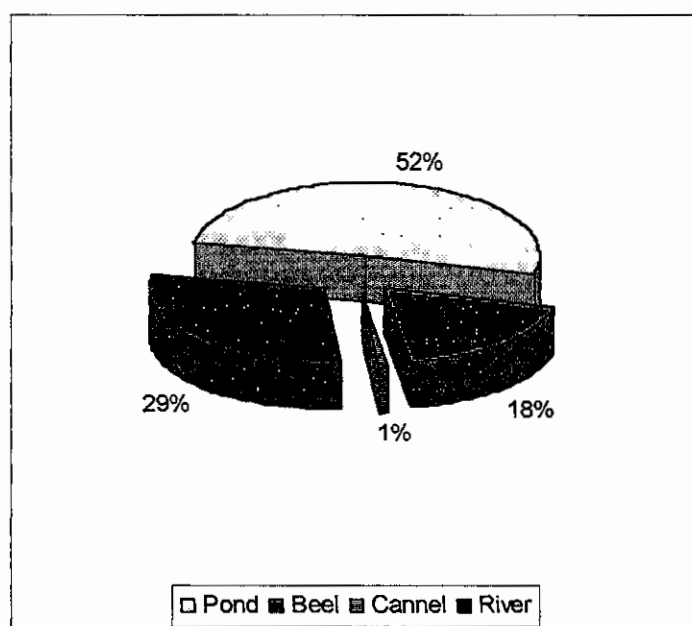


Fig-4.54: Percentage of production in Naldanga union

4.2. Applied aquaculture technologies

Among 30 new advanced aquaculture technologies invented by Directorate of Fisheries (DoF) and Fisheries Research Institute (FRI), only six aquaculture technologies were practiced in Jhenaidaha Sadar Upazila. These six aquaculture technologies were carp polyculture, Culture of pangus, Culture of sar puti, Integrated culture, Carp culture with golda and Tilapia culture in the pond. But these six technologies were not strictly and appropriately practiced. Their ponds were not properly prepared. If the fish farmers properly prepared their ponds (De-weeding and eradication of unwanted fish and animals, liming, manuring, stocking, feeding and disease control) fish production must be increased.

Union wise fish production in relation to aquaculture technologies applied has been shown in Table-19 (Appendix).

4.3. Total production and area

It has been showed from the Fig-4.55 that the total water bodies and total fish production in 17 unions with paurashava of Jhenaidaha sadar upazilla. The researcher found that the total production of fish was 12,75,990 kg/year in Jhenaidaha sadar upazilla. It was found that the highest production (1,85,892 kg/year) which was observed in Naldanga union and lowest (29,007 kg/year) which was in Ganna union. Fig-4.55 also revealed that the highest (505.27 ha) area of water bodies was observed in Naldanga union. But the lowest (53.26 ha) one was in Kumrabaria union.

Union wise data of different types of water bodies was complied in table-19 and specific number and area of culturable, repairable and cultured water bodies were recorded in Table-20 & 21 (Appendix).

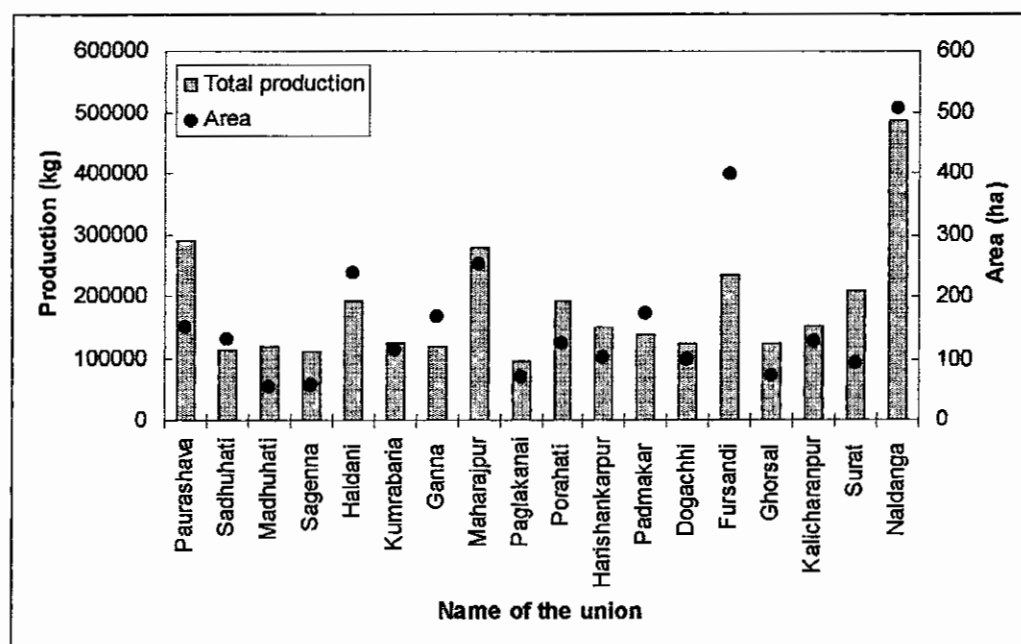


Fig 4.55: Total production and total area of water bodies in Jhenaidaha Sadar Upazila

4.4. Target production

The present investigation was aimed at knowing the present situation and fish production of different types of water body in Jhenaidaha sadar upazila. After analyzing the data of fish production in relation to types of water body and aquaculture technology applied, a five year fish production plan has been prepared. The target was fixed up on the basis of present fish production and suitable environmental condition for fish culture in Jhenaidaha sadar upazila. Here, researcher found that large number of fisherman produced 18-20 kg/dec fish. Among them, the fish farmer like Md. Ansar Ali (Kashimpur , Harishankarpur union), Md. Sariful Islam (Noroharidra, Harishankarpur union), Md. Musfikur Rahaman Lulu (Mothurapur , paurashava) , Mr. Mostofa Mahabub Al Hasan (Muraridaha , paurashava) , Anawar Hossain (Saila , Haldani union) and Md. Abdul Kader (Pakka , Ghorsal) who produced 18-20 kg/dec/year fish in their pond and nationally awarded by DoF. The steps in case of better aquaculture technologies were not followed by the cited farmers and all other farmers of the upazila. If all the farmers strictly maintain the proper procedures of culturing fish, the production will be expected to increase two or three times. It was also found that fish production applying methods other than carp polyculture in ponds was exceptionally low as the technologies (e.g., roads side ditches, culturable paddy field, river, cannel, flood plain etc.) were highly neglected. But the researcher think ideal fish production in that water bodies shows that production can be increased many times in that water bodies if proper technologies are followed. Mentioned fish farmers as well as other fish farmers, District fisheries officer (DFO), Senior Upazila Fisheries Officer also agreed with these findings. From the discussion, fish production plan has been expected to increase from the production during investigation is shown in fig 4.56.

Analyzing the present status of the fish production in different water bodies, a five year fish production plan has been prepared. The fish production plan has been presented in Table-22: Part-I & Part-II (Appendix).

Selected farmers received training at appropriate time. Overhanging tree branches on the pond banks were first cut back to increase sunlight penetration to the ponds. aquatic weeds, floating and macrophytic were therefore removed manually and then

both predatory and indescribable fish species were poisoned with rotenone (Derris root powder). Rotenone powder was added at the range of 20 –30 gm/decimal for each foot of water depth. One week after poisoning ponds were limed because it kills pathogenic organisms and increase water hardness and alkalinity, it helps to build the scale and bone of fish and also helps to clean the water. Lime applied at a rate of 1 kg/decimal pond water. One week after liming, the inputs of cowdung, TSP and urea were added to promote and maintain phytoplankton production. Selected farmers uses the basal doses of manure, urea and TSP were as follows:

Name of fertilizer	Basal doses
Cowdung	5-7 kg/decimal
Urea	100-150 gm/decimal
TSP	50-75 gm/decimal

One week after fertilization 5-6 inches of species were stocked. Species density in pond fish polyculture are given below:

Species name	Scientific name	Number of fish/decimal
Silver carp	<i>Hypophthalmichthys molitrix</i>	8 – 10
Catla	<i>Catla catla</i>	4 – 6
Rui	<i>Labeo rohita</i>	8 – 10

Selected farmers used fertilizer and supplementary feeding oil cake, rice bran, duck weed, soft grass, vegetable leaves etc were also used. After rearing 8 months they produced 25 kg/decimal fish in their ponds.

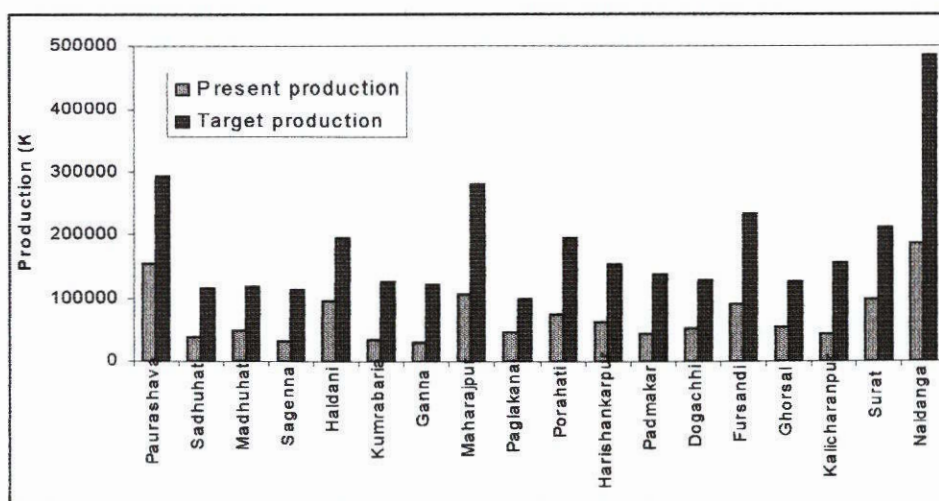


Fig-4.56: Present production and target production in Jhenadaha sadar upazila.

CHAPTER

FIVE

5. DISCUSSION

The present investigation was aimed at knowing the present situation and fish production of different types of water body in Jhenaidaha sadar upazila. After analyzing the data of fish production in relation to types of water body and aquaculture technology applied, a five year fish production plan has been prepared.

Based on different survey conducted by Fisheries Resources Survey System (FRSS) 1978-79, Bureau of statistics in 1982 and Space Research and Remote Sensing Organization (SPARSO) in 1984, the total area of ponds may estimated 1,61,943 ha. The size of common ponds varies from 20-33 decimals (Rahman, 1989). According to the survey of 1986-87, the estimated production from ponds was 1,42,876 metric tons which is approximately 17% of the total fish production of the country. The average annual production of fish from cultured, culturable and derelict ponds are 1161 kg/ha, 296 kg/ha and 185 kg/ha respectively (Rahman, 1989).

The average fish production of ponds in Jhenaidaha sadar Upazila found was 1411 kg/ha or 5.71 kg/ decimal. Our five year fish production plan in ponds was estimated to attain the present production into 2,964 kg/ha or 12 kg/ decimal. The first and foremost needed thing is to train up the fish farmers and fishermen. Then credit facilities must have to be ensured to poor fish farmers/ fishermen to achieve the target.

As majority of the fish farmers are very much poor, they cannot buy aquaculture inputs, such as, lime, fertilizer, supplementary feeds, fish fingerlings etc. So, interest free or with minimum interest credit facilities should be given by DoF or by Banks or by private organizations. In such case, fish production must be increased.

To attain the planned fish production target, modern aquaculture technology must be applied. Traditional aquaculture methods should be diverted into modern methods or at least improved traditional methods. At least one demonstration pond or farm for each aquaculture technology should be established in each union. Seeing higher fish production by the modern technology applied in demonstration pond/ farm, the

general fish farmers will be motivated to follow the modern technology. As a result fish production of the whole upazila must be increased.

A larger number of road side ditches are available in Jhenaidaha sadar Upazila. On a biological production sense, the ditches were not very suitable for aquaculture because they retain water only during monsoon and then dried up. The present fish production of road side ditches in Jhenaidaha sadar Upazila was about 968 kg/ha or 3.92 kg/decimal. Our five year fish production plan in road side ditches was estimated to attain 1,729 kg/ha or 7 kg/ decimal. To attain the target, ditches should be cleaned up and fast growing fish species should be stocked.

Haors and beels are local terms for low laying natural depression on a flood plains. There is no clear cut distinction between haors and beels, larger one are being called as haors and smaller ones as beels. Haor are normally connected with the neighbouring river system but do not represent dead rivers or cut-offs, MPO (1985) defined beels as any definable water body or old river beds except ox-bow lakes.

Data on haor/baors now being analyzed by the fisheries resources survey system (FRSS) indicates that the estimated average production from dewatered beels can be as high as 1890 kg/ha/yr. (Rahman, 1989). During the study period the production of beels in Jhenaidaha sadar upazila was about 315.35 kg/ ha. The five year production plan estimated was 1235 kg/ ha or 5kg/decimal. To achieve the target, fast growing fish species should be stocked as the beels and haors are seasonal. Public awareness should be created against application of agricultural pesticides as pesticides highly hamper in fish production. Indiscriminate fishing of juveniles and egg bearing fish should be stopped.

Most of the baors are located in the district of Jessore, Kushtia and Faridpur. The average production from baors which are under fish culture ranges from 150-170 kg/ha, with the highest 582 kg/ha in Government owned Baluhar baor in Jessore (Rahman, 1989).

There are 5 baors available in Jhenaidaha sadar upazila. The production of the baors estimated during the study period was about 1018 kg/ha. The five year production

target has been fixed up at 1976 kg/ ha or 8 kg/ decimal. To achieve the target, monitoring of baor management activities by group members of baor management group is required. DoF should give proper training to the group members about baor management procedures. Large scale poaching of fishes if the baors should be strictly controlled.

According to preliminary estimates the flood plain produced about 2,35,000 metric tons of fish in 1979-80, the rate of production being 84 kg/ ha/ yr. By 1986-87 the production from flood plain has come down to 1,83,796 metric tons and the rate of production 65 kg/ ha/ yr. which was significantly lower than that of 1979-80 period (Rahman, 1989).

A vast area of the country is flooded during the monsoon and normally remains under water for 3-6 months. Thirty eight floods plains are available in Jhenaidaha sadar upazila. The flooded area serves as feeding, growing and spawning ground for many fish species. These areas are productive and provide sufficient food for fishes. The production of fish of flood plains in Jhenaidaha sadar upazila was very much low. The five year production target estimated was 125 kg/ ha. To achieve the target, Directorate of Fisheries (DoF) should release a considerable amount of fingerlings in the floodplains. Under sized fishing and fishing of egg bearing fishes should be prohibited strictly and public awareness should be created in this regard.

Thousands of hactres of low laying fresh water areas where fields get inundated and retain sufficient water during rainy season. These low laying paddy fields offer excellent production possibilities for fish culture as well. These could provide 10 times higher economic returns than the paddy. The production of fish in culturable paddy fields in Jhenaidaha sadar upazila was not considerable. The five-year production target estimated 1,235 kg/ ha. To achieve the target, in the month of July when the rain water starts accumulating in the paddy field and the depth of waters in the waterway becomes sufficient, the fishes may be stocked in this system. The species ratio may be 25% surface feeders preferably Catla which is readily available, 30% column feeders i.e., Rohu and 45% bottom feeders i.e., Mrigal or Omnivores like Common carp. *Puntius* spp. has also been observed to grow well in paddy-cum-fish culture plots. To augment growth, supplementary feed comprising mustard oil cake

and rice bran in 1: 1 may be given to fishes daily at the rate 2.5% of their body weight particularly after the harvest of paddy. (Nuruzzaman, 1990).

The network of rivers and their tributaries support a large fishery and contribute greatly to the production of the country, but the catch from the rivers is on decline due to various environmental & man-made reasons. The fish usually spawn at the headwaters of streams, making the best use of the flood water run-off during the monsoon season for dispersal of their off springs. The inundated basins and fields provide rich feeding grounds for augmenting growth during the warmer season. The Nabaganga river and other river tributaries are available in Jheniadhaha sadar upazila. The production of the river during the investigation period was about 232 kg/ha. The five year fish production plan estimated was 400 kg/ha. To achieve the target, under-sized fishing and fishing of egg-bearing fish should be strictly prohibited. Over fishing must also be stopped. Public awareness should be created in this regard. Fish sanctuary will have to be established in some parts of the rivers & their tributaries. Some suggestions and recommendations are given in below.

1. First we will have to identify why some of the water bodies are derelicted. If the uncultured and repairable water bodies are taken under cultivation, then the fish production will be increased.
2. The specific reason behind the reduction of fish production should be identified. The entire problem should be solved through discussion with the local elite people and by the govt. for the maximum utilization of the water bodies.
3. Fish should be cultured by proper fish cultivator through the formation of local fisherman committee/co-operative and or local farmer committee/ co-operative. A committee/ co-operative leader should be selected by the local fisherman/fish farmer through discussion. Because proper leadership can change the fate of the real fish farmer.
4. Majority of the fisherman of our country are very much poor. Due to the lack of money, they can not prepare pond and can not stock fish fingerlings and other input needed for fish culture. As a result fish production is reduced or

not optimum. So, loan with free interest or with minimum interest should be ensured to poor fisherman for smooth running of fish culture activities in proper time.

5. The most ancient and national problem of Bangladesh fisherman is multiple ownership of water bodies. Many of the water bodies are uncultured due to multiple ownership of influential people. For increasing fish production multiple ownership problem should be solved through well national policy in this respect.
6. All fish farmer upto village level should be trained up about modern fish culture technology. Men and women should be equally selected for training. Woman should be motivated especially for the great improvement of fish culture.
7. About 30 fish culture technologies have been discovered by DoF and BFRI which should be established on the basis of water bodies. Fish farmer should be informed about the new culture technologies and implementation of the technologies by them should be ensured through proper technical support.
8. At least one demonstration pond for each technology should be established at each village through which fish farmer can be motivated and fish production/decimal will be increased. Knowledge of district and upazila level fish culture specialists should be involved during preparation of demonstration pond.
9. Waste materials of the villagers should be preserved which can be used as fertilizer or as food for fish, so the fish production cost will be reduced and on the other hand proper utilization of the waste materials will also be ensured.
10. Establishment and proper management of fish hatchery and nursery should be given importance so that the fish farmer can get fish fingerlings in proper time and at lower cost.
11. Following paddy cultivation methods in dry season, fish can also be cultured year round by using underground water.

CHAPTER

SIX

6. SUMMARY AND CONCLUSION

The present investigation was undertaken to know about the present status of fish production of different water bodies of Jhenaidaha sadar upazial and to prepare a five year fish production plan of the upazila. Fisheries resources of the upazila have been identified through survey programmes which are very much needed for preparing a production plan. The total number of ponds of the upazila was 7,270 whose area was 672.88 ha, total number and area of road side ditches were 303 and 34.88 ha respectively, total number and area of baors were 5 and 102.22 ha respectively, total number and area of culturable paddy fields were 16 and 41.71 ha respectively, total number and area of beels were 60 and 385.72 ha respectively, total number and area of canal were 31 and 99.97 ha respectively, total numbers and area of river were 8 and 409.34 ha respectively, total number and area of flood plain were 38 and 1156.34 ha respectively.

The fish production of ponds of the upazila during the investigation period was 8,35,831 kg and the five year production target estimated was 19,94,417 kg, the fish production of road side ditches during the investigation period was 5864 kg and the five year production target estimated was 60,307 kg, the fish production of Beel during the investigation period was 1,21,637kg and the five year production target estimated was 476363kg, the fish production of Baor during investigation was 1,04,064 kg and the five year production target estimated was 2,01,987 kg, the fish production of canal during investigation period was 32,329kg and the five year production target estimated was 1,48,155 kg, the fish production of rivers during investigation period was 94,939 kg and the five year production target estimated was 1,63,736 kg, the fish production of flood plain during the investigation period was 76858kg and the five year production target estimated was 1,48,292kg, the production of flood control and irrigation project was 2,532kg and the five year production plan target estimated was 4224kg, and the five year fish production target estimated of culturable paddy field and others (Doha) was 51,513 kg and 2,994 kg respectively.

The grand total fish production of all the water bodies of Jhenaidaha sadar upazila during the investigation period was 1,276.05 MT and the five year fish production plan estimated was 3,251.988 MT.

The present investigation might not have been able to explore the actual area and production of different types of water bodies as the data collected sometimes was interview basis. Extensive survey with technical trained man power may result the actual figure of fisheries resources of the upazila.

However, it is hoped that this work may serve as a stimulus for further study which will throw much needed light on each and every fisheries resources of any area. If such types of survey occur all round the country, the fish production plan of the country can be prepared knowing the present status of production.

CHAPTER

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7. REFERENCE

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CHAPTER

EIGHT

Table – 1: Types of Water body, Area & Production of Jhenaidaha Paurashava

Name of the Paurashava	Types of Water body			Culturable		Repair able		Cultured water body			
				No.	Area (ha)	No.	Area (ha)	No.	Area (ha)	Present production	
										Kg/ha.	Total product ion (kg)
Jhenaidaha Paurashava	1	Pond	Perennial	252	62.24	33	5.34	247	60.74	1729	105019
			Seasonal	4	1.52	7	2.12	4	1.52	1482	2253
	2	Road side ditches	Perennial								
			Seasonal	3	0.55	5	2.50	3	0.55	1235	679
	3	Beel	Perennial								
			Seasonal								
	4	Baor	Perennial	1	15.38			1	15.38	1482	22793
			Seasonal								
	5	Haor	Perennial								
			Seasonal								
	6	Cannel	Perennial	1	14.17					477	6759
			Seasonal								
	7	River	Perennial	1	40.39					298	12036
			Seasonal								
	8	Flood Plain	Perennial								
			Seasonal								
	9	Culturable Paddy field	Perennial								
			Seasonal								
	10	Flood control & irrigation project	Perennial								
			Seasonal	2	2.85			1	2.05	1235	2532
	11	Others (Doha)	Perennial	1	2.02			1	2.02	988	1996
			Seasonal								
Total				265	139.12	45	9.96	257	82.26		154067

Table – 2: Types of water body, Area & Production of Sadhuhati Union

Name of the Union	Types of Water body			Culturable		Repair able		Cultured water body			
				No.	Area (ha)	No.	Area (ha)	No.	Area (ha)	Present production	
										Kg/ha.	Total production (kg)
Saduhati Union	1	Pond	Perennial	115	11.63	25	1.37	110	10.63	1482	15754
			Seasonal	40	1.12	16	0.80	35	0.95	1482	1408
	2	Road side ditches	Perennial			7	4.00				
			Seasonal								
	3	Beel	Perennial								
			Seasonal	2	20.24			2	20.24	741	14998
	4	Baor	Perennial								
			Seasonal								
	5	Haor	Perennial								
			Seasonal								
	6	Cannel	Perennial			2	2.50	2	2.50	988	2470
			Seasonal								
	7	River	Perennial								
			Seasonal								
	8	Flood Plain	Perennial								
			Seasonal			2	67.47			70	4722
	9	Culturable Paddy field	Perennial								
			Seasonal			4	15.14				
	10	Flood control & irrigation project	Perennial								
			Seasonal								
	11	Others (Doha)	Perennial								
			Seasonal								
Total				157	32.99	61	95.28	149	34.32		39352

Table – 3: Types of water body, Area & Production of Madhuhati Union

Name of the Union	Types of Water body			Culturable		Repair able		Cultured water body			
				No.	Area (ha)	No.	Area (ha)	No.	Area (ha)	Present production	
										Kg/ha.	Total product ion (kg)
Madhubani Union	1	Pond	Perennial	302	24.45			302	24.45	1482	36235
			Seasonal	49	2.97			49	2.97	1235	3664
	2	Road side ditches	Perennial								
			Perennial								
	3	Beel	Perennial								
			Seasonal	2	20.04					250	5010
	4	Baor	Perennial								
			Seasonal			1	5.80	1	5.80	988	5730
	5	Haor	Perennial								
			Seasonal								
	6	Cannel	Perennial								
			Seasonal								
	7	River	Perennial								
			Seasonal								
	8	Flood Plain	Perennial								
			Seasonal								
	9	Culturable Paddy field	Perennial								
			Seasonal								
	10	Flood control & irrigation project	Perennial								
			Seasonal								
	11	Others (Doha)	Perennial								
			Seasonal								
Total				353	47.46	1	5.80	352	33.22		50639

Table – 4: Types of water body, Area & Production of Saganna Union

Name of the Union	Types of Water body			Culturable		Repair able		Cultured water body			
				No.	Area (ha)	No.	Area (ha)	No.	Area (ha)	Present production	
										Kg/ha.	Total production (kg)
Saganna Union	1	Pond	Perennial	201	20.00	14	1.41	201	20.00	1235	24700
			Seasonal	10	0.61	3	0.21	9	0.57	1235	741
	2	Road side ditches	Perennial								
			Seasonal								
	3	Beel	Perennial	1	7.02					200	1404
			Seasonal	3	14.02					150	2103
	4	Baor	Perennial								
			Seasonal								
	5	Haor	Perennial								
			Seasonal								
	6	Cannel	Perennial								
			Seasonal			3	13.02			180	2344
	7	River	Perennial								
			Seasonal								
	8	Flood Plain	Perennial								
			Seasonal								
	9	Culturable Paddy field	Perennial								
			Seasonal								
	10	Flood control & irrigation project	Perennial								
			Seasonal								
	11	Others (Doha)	Perennial								
			Seasonal								
Total				215	41.65	20	14.64	210	20.57		31292

Table – 5: Types of water body, Area & Production of Haldani Union

Name of the Union	Types of Water body			Culturable		Repair able		Cultured water body			
				No.	Area (ha)	No.	Area (ha)	No.	Area (ha)	Present production	
										Kg/ha.	Total production (kg)
Haldani Union	1	Pond	Perennial	170	7.09	24	1.94	157	5.80	1976	11460
			Seasonal	95	5.77	12	0.63	87	4.97	1976	7365
	2	Road side ditches	Perennial								
			Seasonal								
	3	Beel	Perennial			2	5.26			300	1578
			Seasonal			4	8.09			247	1999
	4	Baor	Perennial	1	51.0			1	51.0	1200	61200
			Seasonal								
	5	Haor	Perennial								
			Seasonal								
	6	Cannel	Perennial								
			Seasonal			1	4.05	1	4.05	494	2000
	7	River	Perennial								
			Seasonal								
	8	Flood Plain	Perennial								
			Seasonal			3	150			60	9000
	9	Culturable Paddy field	Perennial								
			Seasonal			3	3.00				
	10	Flood control & irrigation project	Perennial								
			Seasonal								
	11	Others (Doha)	Perennial								
			Seasonal								
Total				269	64.08	50	223.97	246	65.82		94602



Table – 6 : Types of water body, Area & Production of Kumrabaria Union

Name of the Union	Types of Water body			Culturable		Repair able		Cultured water body			
				No.	Area (ha)	No.	Area (ha)	No.	Area (ha)	Present production	
										Kg/ha.	Total product ion (kg)
Kamrabaria Union	1	Pond	Perennial	296	21.57	17	1.38	291	20.91	1235	25823
			Seasonal	83	4.37	14	1.20	80	4.01	1235	4952
	2	Road side ditches	Perennial								
			Seasonal								
	3	Beel	Perennial								
			Seasonal			3	15.16			150	2274
	4	Baor	Perennial								
			Seasonal								
	5	Haor	Perennial								
			Seasonal								
	6	Cannel	Perennial			1	9.40			110	1034
			Seasonal								
	7	River	Perennial								
			Seasonal								
	8	Flood Plain	Perennial								
			Seasonal			3	60.02			60	1801
	9	Culturable Paddy field	Perennial								
			Seasonal								
	10	Flood control & irrigation project	Perennial								
			Seasonal								
	11	Others (Doha)	Perennial								
			Seasonal								
Total				379	25.94	38	87.16	371	24.92		35884

Table – 7: Types of water body, Area & Production of Ganna Union

Name of the Union	Types of Water body			Culturable		Repair able		Cultured water body			
				No.	Area (ha)	No.	Area (ha)	No.	Area (ha)	Present production	
										Kg/ha.	Total production (kg)
Gannan Union	1	Pond	Perennial	195	18.94	17	1.65	192	18.00	988	17784
			Seasonal	79	4.47	10	1.02	73	4.02	988	3972
	2	Road side ditches	Perennial								
			Seasonal	19	1.07					864	925
	3	Beel	Perennial								
			Seasonal	3	12.08					160	1933
	4	Baor	Perennial								
			Seasonal								
	5	Haor	Perennial								
			Seasonal								
	6	Cannel	Perennial	3	6.09					130	792
			Seasonal								
	7	River	Perennial								
			Seasonal								
	8	Flood Plain	Perennial								
			Seasonal	2	120.03					30	3601
	9	Culturable Paddy field	Perennial								
			Seasonal								
	10	Flood control & irrigation project	Perennial								
			Seasonal								
	11	Others (Doha)	Perennial								
			Seasonal								
Total				301	162.68	27	2.67	265	22.02		29007

Table – 9: Types of water body, Area & Production of Paglakanai Union

Name of the Union	Types of Water body			Culturable		Repair able		Cultured water body			
				No.	Area (ha)	No.	Area (ha)	No.	Area (ha)	Present production	
										Kg/ha.	Total production (kg)
Paglakana Union	1	Pond	Perennial	201	15.46	11	0.40	201	15.46	1729	26731
			Seasonal	15	1.01			15	1.01	1729	1746
	2	Road side ditches	Perennial	21	1.61	2	.26			400	644
			Seasonal	11	0.69	9	1.48			193	133
	3	Beel	Perennial								
			Seasonal	3	19.16					441	8411
	4	Baor	Perennial								
			Seasonal								
	5	Haor	Perennial								
			Seasonal								
	6	Cannel	Perennial								
			Seasonal	2	4.08					240	979
	7	River	Perennial	1	20.02					247	4945
			Seasonal								
	8	Flood Plain	Perennial								
			Seasonal	1	5.04					70	353
	9	Culturable Paddy field	Perennial								
			Seasonal								
	10	Flood control & irrigation project	Perennial								
			Seasonal								
	11	Others (Doha)	Perennial								
			Seasonal								
Total				255	67.07	24	2.14	216	16.47		43942

Table – 10: Types of water body, Area & Production of Porahati Union

Name of the Union	Types of Water body			Culturable		Repair able		Cultured water body			
				No.	Area (ha)	No.	Area (ha)	No.	Area (ha)	Present production	
										Kg/ha.	Total production (kg)
Porahati Union	1	Pond	Perennial	352	41.87	23	2.25	345	41.11	1207	52208
			Seasonal	28	2.83	5	0.75	21	2.01	1235	2482
	2	Road side ditches	Perennial	5	0.46						
			Seasonal								
	3	Beel	Perennial			1	9.35			370	3454
			Seasonal			4	12.14			200	2428
	4	Baor	Perennial								
			Seasonal								
	5	Haor	Perennial								
			Seasonal								
	6	Cannel	Perennial								
			Seasonal			2	3.50			370	1295
	7	River	Perennial			1	30.0			247	7410
			Seasonal								
	8	Flood Plain	Perennial								
			Seasonal			4	16.00			80	1280
	9	Culturable Paddy field	Perennial								
			Seasonal			1	4.10				
	10	Flood control & irrigation project	Perennial								
			Seasonal								
	11	Others (Doha)	Perennial								
			Seasonal								
Total				380	44.70	41	78.09	367	52.47		70557

Table – 11: Types of water body, Area & Production of Harishankarpur Union.

Name of the Union	Types of Water body			Culturable		Repair able		Cultured water body			
				No.	Area (ha)	No.	Area (ha)	No.	Area (ha)	Present production	
										Kg/ha	Total production (kg)
Harishankarpur Union	1	Pond	Perennial	180	25.50	10	1.41	165	24.01	1482	35582
			Seasonal	87	10.56	22	2.67	85	10.02	1235	12374
	2	Road side ditches	Perennial								
			Seasonal			3	0.61				
	3	Beel	Perennial								
			Seasonal			2	10.22			247	2500
	4	Baor	Perennial								
			Seasonal			1	4.04	1	4.04	370.5	1497
	5	Haor	Perennial								
			Seasonal								
	6	Cannel	Perennial								
			Seasonal								
	7	River	Perennial			1	15.02			247	3717
			Seasonal								
	8	Flood Plain	Perennial								
			Seasonal			1	30.00			90	2700
	9	Culturable Paddy field	Perennial								
			Seasonal								
	10	Flood control & irrigation project	Perennial								
			Seasonal								
	11	Others (Doha)	Perennial								
			Seasonal								
Total				267	36.06	40	63.97	251	38.07		58370

Table – 12: Types of water body, Area & Production of Padmakar Union

Name of the Union	Types of Water body			Culturable		Repair able		Cultured water body			
				No.	Area (ha)	No.	Area (ha)	No.	Area (ha)	Present production	
										Kg/ha	Total production (kg)
Padmakar Union	1	Pond	Perennial	215	15.66	71	4.59	215	15.66	1729	27075
			Seasonal	46	2.55	7	1.02	46	2.55	1235	3149
	2	Road side ditches	Perennial								
			Seasonal			44	2.67				
	3	Beel	Perennial								
			Seasonal			5	29.95			210	6290
	4	Baor	Perennial								
			Seasonal								
	5	Haor	Perennial								
			Seasonal								
	6	Cannel	Perennial								
			Seasonal								
	7	River	Perennial			1	35.00			80	2800
			Seasonal								
	8	Flood Plain	Perennial								
			Seasonal			3	80.14			30	2404
	9	Culturable Paddy field	Perennial								
			Seasonal								
	10	Flood control & irrigation project	Perennial								
			Seasonal								
	11	Others (Doha)	Perennial								
			Seasonal								
Total				263	18.45	131	153.37	261	18.21		41896

Table – 13: Types of water body, Area & Production of Dogachhi Union

Name of the Union	Types of Water body			Culturable		Repair able		Cultured water body			
				No.	Are a (ha)	No.	Area (ha)	No.	Area (ha)	Present production	
										Kg/ha.	Total production (kg)
Dogachhi Union	1	Pond	Perennial	195	23.68	23	2.60	190	22.01	1482	32618
			Seasonal	98	5.95	17	0.89	85	5.03	1235	6212
	2	Road side ditches	Perennial								
			Seasonal								
	3	Beel	Perennial								
			Seasonal			2	10.52			494	5197
	4	Baor	Perennial								
			Seasonal								
	5	Haor	Perennial								
			Seasonal								
	6	Cannel	Perennial								
			Seasonal			2	3.24	2	3.24	494	1600
	7	River	Perennial								
			Seasonal								
	8	Flood Plain	Perennial								
			Seasonal			3	48.60			80	3888
	9	Culturable Paddy field	Perennial								
			Seasonal			4	2.57				
	10	Flood control & irrigation project	Perennial								
			Seasonal								
	11	Others (Doha)	Perennial								
			Seasonal								
Total				293	29.63	51	68.42	277	30.28		49515

Table – 14: Types of water body, Area & Production of Fursandi Union

Name of the Union	Types of Water body			Culturable		Repair able		Cultured water body			
				No.	Area (ha)	No.	Area (ha)	No.	Area (ha)	Present production	
										Kg/ha.	Total production (kg)
Fursandi Union	1	Pond	Perennial	322	37.80	16	1.61	317	37.01	1482	54848
			Seasonal	144	12.24	15	1.32	136	11.62	988	11480
	2	Road side ditches	Perennial								
			Seasonal								
	3	Beel	Perennial			3	14.50			250	3625
			Seasonal								
	4	Baor	Perennial								
			Seasonal								
	5	Haor	Perennial								
			Seasonal								
	6	Cannel	Perennial			2	9.04			280	2531
			Seasonal								
	7	River	Perennial			1	16.19			207	3352
			Seasonal								
	8	Flood Plain	Perennial								
			Seasonal			5	304.00			40	12160
	9	Culturable Paddy field	Perennial								
			Seasonal								
	10	Flood control & irrigation project	Perennial								
			Seasonal								
	11	Others (Doha)	Perennial								
			Seasonal								
Total				466	50.04	42	346.66	453	48.63		87996

Table – 15: Types of water body, Area & Production of Ghorsal Union

Name of the Union	Types of Water body			Culturable		Repair able		Cultured water body			
				No.	Area (ha)	No	Area (ha)	No.	Area (ha)	Present production	
										Kg/ha.	Total production (kg)
Ghorsal Union	1	Pond	Perennial	200	9.71	23	1.00	200	9.71	1729	16788
			Seasonal	215	6.96	47	1.33	205	6.00	1235	7410
	2	Road side ditches	Perennial			25	3.04	12	1.50	741	1111
			Seasonal			95	13.26	40	4.01	741	2971
	3	Beel	Perennial			1	8.0			741	5928
			Seasonal			4	18.0			494	8892
	4	Baor	Perennial								
			Seasonal								
	5	Haor	Perennial								
			Seasonal								
	6	Cannel	Perennial			1	3.00			1235	3705
			Seasonal			2	3.00			970	2910
	7	River	Perennial								
			Seasonal								
	8	Flood Plain	Perennial								
			Seasonal			2	10.0			125	1250
	9	Culturable Paddy field	Perennial								
			Seasonal								
	10	Flood control & irrigation project	Perennial								
			Seasonal								
	11	Others (Doha)	Perennial								
			Seasonal								
Total				415	16.67	193	56.63	458	29.22		50965

Table – 16: Types of water body, Area & Production of Kalicharanpur Union

Name of the Union	Types of Water body			Culturable		Repair able		Cultured water body			
				No.	Area (ha)	No.	Area (ha)	No.	Area (ha)	Present production	
										Kg/ha.	Total production (kg)
Kalicharanpur Union	1	Pond	Perennial	211	16.23	30	2.15	211	16.23	1482	24052
			Seasonal	260	17.90	21	1.95	140	9.80	1235	12103
	2	Road side ditches	Perennial								
			Seasonal								
	3	Beel	Perennial			4	12.42			162	2012
			Seasonal								
	4	Baor	Perennial								
			Seasonal								
	5	Haor	Perennial								
			Seasonal								
	6	Cannel	Perennial			1	7.24			180	1303
			Seasonal			1	3.51			70	245
	7	River	Perennial								
			Seasonal								
	8	Flood Plain	Perennial								
			Seasonal			3	65.03			30	1951
	9	Culturable Paddy field	Perennial								
			Seasonal								
	10	Flood control & irrigation project	Perennial								
			Seasonal								
	11	Others (Doha)	Perennial								
			Seasonal								
Total				471	34.13	60	92.30	351	26.03		41666

Table – 17: Types of water body, Area & Production of Surat Union

Name of the Union	Types of Water body			Culturable		Repair able		Cultured water body			
				No.	Area (ha)	No.	Area (ha)	No.	Area (ha)	Present production	
										Kg/ha.	Total production (kg)
Surat Union	1	Pond	Perennial	380	46.12	30	2.42	380	46.15	1729	79793
			Seasonal	170	10.32	11	0.66	169	10.01	1235	12362
	2	Road side ditches	Perennial								
			Seasonal	50	2.42	4	0.26				
	3	Beel	Perennial								
			Seasonal	3	15.0					190	2850
	4	Baor	Perennial								
			Seasonal								
	5	Haor	Perennial								
			Seasonal								
	6	Cannel	Perennial	3	6.04					150	906
			Seasonal								
	7	River	Perennial								
			Seasonal								
	8	Flood Plain	Perennial								
			Seasonal	3	9.04					80	723
	9	Culturable Paddy field	Perennial								
			Seasonal								
	10	Flood control & irrigation project	Perennial								
			Seasonal								
	11	Others (Doha)	Perennial								
			Seasonal								
Total				609	88.97	45	3.34	549	56.16		96634



Table – 18: Types of water body, Area & Production of Naldanga Union

Name of the Union	Types of Water body			Culturable		Repair able		Cultured water body			
				No.	Area (ha)	No.	Area (ha)	No.	Area (ha)	Present production	
										Kg/ha.	Total production (kg)
Naldanga Union	1	Pond	Perennial	701	62.42	22	1.96	701	62.42	1133	77088
			Seasonal	95	5.77	15	0.91	95	5.77	988	5700
	2	Road side ditches	Perennial								
			Seasonal								
	3	Beel	Perennial			1	58.08			380	22070
			Seasonal	5	30.04					240	7210
	4	Baor	Perennial			1	26.00	1	26.00	494	12844
			Seasonal								
	5	Haor	Perennial								
			Seasonal								
	6	Cannel	Perennial								
			Seasonal	4	8.09					180	1456
	7	River	Perennial			1	192.00			247	47424
			Seasonal								
	8	Flood Plain	Perennial								
			Seasonal	2	110.0						
	9	Culturable Paddy field	Perennial								
			Seasonal	2	10.0						
	10	Flood control & irrigation project	Perennial								
			Seasonal								
	11	Others (Doha)	Perennial								
			Seasonal								
Total				809	22632	40	278.95	798	152.27		185892

Table-19: Union wise fish production according to aquaculture technologies applied in Jhenaidaha sadar Upazila

Name of the Municipality/ Union	Culture of Pangus		Culture of Sarputi		Integrated Culture		Carp culture with Golda		Culture of Tilapia	
	Area (ha.)	Production (kg)	Area (ha.)	Production (kg)	Area ha.	Production (kg)	Area (ha.)	Production (kg)	Area (ha.)	Production (kg)
Municipality	0.20	293			3.64	79040			1.20	2075
Sadhuhati									0.20	296
Madhuhati										
Sagenna			0.06	90	6.19	10650			1.12	1245
Haldani			0.40	593					1.16	1575
Kumrabaria	0.45	1332	1.21	1494			0.40	1087	2.57	6639
Ganna										
Maharajpur										
Paglakanai										
Porahati			1.32	1793					4.48	1778
Harishankarpur										
Padmakar			0.36	771			0.40	798		
Dogachhi	0.81	2000	3.88	5760					3.76	4644
Fursandi	4.1	6076	3.30	4075					6.17	7619
Ghorsal	3.04	5256	2.53	3749					0.72	978
Kalicharanpur	3.64	6294	2.91	4312					1.15	1420
Surat			0.78	963					6.43	8735
Naldanga	2.43	4201	5.95	10287					1.55	2290
Total	14.67	25452	22.70	33887	9.83	89690	0.80	1875	20.51 1	39301

Table – 20: Union wise number and area of water body found in Jhenaidaha Sadar Upazila at a glance

Name of the Paurashava/ Union	Pond		Road Side ditches		Baor		Culturable paddy field		Flood control & irrigation project		Beel		Cannel		River		Flood plain		Others (Doha)		Total	
	No	Area ha.	No	Area ha.	No	Area ha.	No	Area ha.	No	Area ha.	No	Area ha.	No	Area ha.	No	Area ha.	No	Area ha.	No	Area ha.	No	Area ha.
Paurashava	296	71.22	8	3.05	1	15.38			2	2.85			1	14.17	1	40.39		00.00	1	2.02	310	149.08
Saduhathi	196	14.92	12	8.00			4	15.14			2	20.24	2	2.50			2	67.47			218	128.27
Maduhathi	351	27.42			1	5.80					2	20.04		00.00				00.00			354	53.26
Sagenna	228	22.23									4	21.04	3	13.02				00.00			235	56.29
Haldani	301	15.43	3	0.22	1	51.00	3	3.00			6	13.35	1	4.05			3	150.00			318	237.25
Kumrabaria	410	28.52									3	15.16	1	9.40			3	60.02			417	113.10
Ganna	301	26.08	19	1.07							3	12.08	3	6.09			2	120.03			328	165.35
Maharajpur	653	64.60					2	6.90			2	36.43		00.00	1	60.72	1	80.97			659	249.32
Pagalaknai	227	16.87	45	4.04							3	19.16	2	4.08	1	20.02	1	5.04			279	69.21
Porahati	408	47.70					1	4.10			5	21.49	2	3.50	1	30.00	4	16.00			421	122.79
Harishankarpur	299	40.14	3	0.61	1	4.04					2	10.22		00.00	1	15.02	1	30.00			307	100.03
Padmakar	339	23.82	46	2.91							5	29.95		00.00	1	35.00	3	80.14			394	171.92
Dogachhi	333	33.12					4	2.57			2	10.52	2	3.24			3	48.60			344	98.05
Fursandi	497	52.97									3	14.50	2	9.04	1	16.19	5	304.00			508	396.70
Ghorsal	485	19.00	113	12.30							5	26.00	3	6.00			2	10.00			608	73.30
Kalicharanpur	522	38.23									4	12.42	2	10.75			3	65.03			531	126.43
Surat	591	59.55	54	2.68							3	15.00	3	6.04			3	9.04			654	92.31
Naldanga	833	71.06			1	26.00	2	10.00			6	88.12	4	8.09	1	192.00	2	110.00			849	505.27
Total	7270	672.88	303	34.88	5	102.22	16	41.71	2	2.85	60	385.72	31	99.97	8	409.34	38	1156.34	1	2.02	7734	2907.93

Table - 21: Culturable, Repairable & Cultured water body found in Jhenaidaha Sadar Upazila at a glance.

Name of the Upazila	Types of water body	Culturable water body		Repairable water body		Cultured water body		Total water body		Present production (kg)		
		No.	Area (ha)	No.	Area (ha)	No.	Area (ha)	No.	Area (ha)	Production	Total production	
Jhenaidaha Sadar	Pond	Perennial	5076	519.91	409	35.34	4985	507.32	5485	555.25	733976	835831
		Seasonal	1559	99.91	226	17.72	1370	84.84	1785	117.63	101855	
	Road side ditches	Perennial	26	2.07	34	7.30	12	1.50	60	9.37	1289	5864
		Seasonal	83	4.73	160	20.78	43	4.56	243	25.51	4575	
	Beel	Perennial	1	7.02	14	144.04	3	75.43	15	151.06	47530	121637
		Seasonal	21	130.58	24	104.08	2	20.24	45	234.66	74107	
	Baor	Perennial	2	66.38	1	26.00	3	92.38	3	92.38	96837	104064
		Seasonal	00	00.00	2	9.84	1	9.84	2	9.84	7227	
	Cannel	Perennial	7	26.30	7	31.18	2	2.50	14	57.48	19500	32329
		Seasonal	6	12.17	11	30.32	3	7.29	17	42.49	12829	
	River	Perennial	2	60.41	6	348.93	0	00.00	8	409.34	94939	94939
		Seasonal	00	00.00	00	00.00	0	00.00	00	00.00	00	
	Flood plain	Perennial	00	00.00	00	00.00	0	00.00	38	00.00	00	76858
		Seasonal	8	244.11	30	912.23	0	00.00	2	1156.34	76858	
	Culturable paddy field	Perennial	00	00.00	2	6.90	0	00.00	14	6.90	00	00
		Seasonal	2	10.00	12	24.81	0	00.00	00	34.81	00	
	Flood control & irrigation project	Perennial	00	00.00	00	00.00	0	00.00	00	00.00	00	2532
		Seasonal	2	2.85	00	00.00	1	2.05	2	2.85	2532	
	Others (Doha)	Perennial	1	2.02	00	00.00	1	2.02	1	2.02	1996	1936
		Seasonal	00	00.00	00	00.00	0	00.00	00	00.00	00	
	Total		6796	1188.46	938	1719.47	6426	809.97	7734	2907.93	1275990	1275990



Table - 22 (Part-I): Union wise five years fish production plan of Jhenaidaha Sadar Upazila

Name of the Paurashava/ Union	POND				Road side water body				BAOR				Culturable Paddy field				Flood control & irrigation project			
	No.	Area ha.	Prod/ ha. (Kg)	Total prod. (Kg)	No.	Area ha.	Prod/ ha. (Kg)	Total prod. (Kg)	No.	Area ha.	Prod/ ha. (Kg)	Total prod. (Kg)	No.	Area ha.	Prod/ ha. (Kg)	Total prod. (Kg)	No.	Area ha.	Prod/ ha. (Kg)	Total prod. (Kg)
Paurashava	296	71.22	2964	211096	8	3.05	1729	5273	1	15.38	1976	30391					2	2.85	1482	4224
Saduhati	196	14.92	2964	44223	12	8.00	1729	13832					4	15.14	1235	18698				
Madhuhati	351	27.42	2964	81273					1	5.80	1976	114061								
Sagenna	228	22.23	2964	65890																
Haldani	301	15.43	2964	45735	3	0.22	1729	380	1	51.00	1976	100776	3	3.00	1235	3705				
Kumrabaria	410	28.52	2964	84533																
Ganna	301	26.08	2964	77301	19	1.07	1729	1850												
Maharajpur	653	64.60	2964	191474									2	6.90	1235	8522				
Paglakani	227	16.87	2964	50003	45	4.04	1729	6985												
Porahati	408	47.70	2964	141383									1	4.10	1235	5064				
Harishankarpur	299	40.14	2964	118975	3	0.61	1729	1055	1	4.04	1976	7983								
Padmakar	339	23.82	2964	70602	46	2.91	1729	5031												
Doguchihi	333	33.12	2964	98168									4	2.57	1235	3174				
Fursandi	497	52.97	2964	157003																
Ghosal	485	19.00	2964	56316	113	12.30	1729	21267												
Kalicharanpur	522	38.23	2964	113314																
Surat	591	59.55	2964	176506	54	2.68	1729	4634												
Naldanga	833	71.06	2964	210622					1	26.00	1976	51376	2	10.00	1235	12350				
Total	7270	672.88		1994417	303	34.88		60307	5	102.22		201987	16	41.71		51513	2	2.85	1482	4224

Table – 22 (Part-II): Union wise five years fish production plan of Jhenaidaha Sadar Upazila

Name of the Paurashava/ Union	Beel			River			Cannel			Flood Plain				Others (Doha)			Total		Total prod. (kg)
	No	Area ha.	Prod/ ha. (kg)	Total prod. (kg)	No	Area ha.	Prod / ha. (kg)	Total prod. (kg)	No	Area ha.	Prod/ ha. (kg)	Total prod. (kg)	No	Area	Prod/ ha. (kg)	Total prod (kg)	No.	Area ha.	
Paurashava Saduhati	-	-	-	-	1	40.39	400	16156	1	14.17	1482	21000		00.00	1482	2994	310	149.08	291134
Maduhati	2	20.24	1235	24996					2	2.50	1482	3705		67.47			228	128.27	113888
Sagenna	2	20.04	1235	24749						00.00							354	53.26	117483
Haldani	4	21.04	1235	25984					3	13.02	1482	19296		00.00			235	56.29	111170
Kumraboria	6	13.35	1235	16487					1	4.05	1482	6002		150.00			318	237.05	191835
Ganna	3	15.16	1235	18723					1	9.40	1482	13931		60.02			417	113.10	124689
Maharajpur	3	12.08	1235	14919					3	6.09	1482	9025		120.03			328	165.35	118099
Paglakarai	2	36.43	1235	44991	1	60.72	400	24288						80.97			659	249.62	279396
Porahati	3	19.16	1235	23663	1	20.02	400	8008	2	4.08	1482	6047		5.04			279	69.21	95336
Harishankarpur	5	21.49	1235	26540	1	30.00	400	12000	2	3.50	1482	5187		16.00			421	122.79	192174
Padmakar	2	10.22	1235	12622	1	15.02	400	6008						30.00			307	100.03	150393
Dogachhi	5	29.95	1235	36988	1	35.00	400	14000						80.14			394	171.82	136638
Fursandi	2	10.52	1235	12992					2	3.24	1482	4802		48.60			334	98.05	125211
Ghoreal	3	14.50	1235	17907	1	16.19	400	6476	2	9.04	1482	13397		304.00			508	396.70	232783
Kalicharapur	5	26.00	1235	32110					3	6.00	1482	8892		10.00			608	73.30	123385
Surat	4	12.42	1235	15339					2	10.75	1482	15931		65.03			531	126.43	152713
Naldanga	3	15.00	1235	18525					3	6.04	1482	8951		9.04			654	92.31	209746
Total	6	88.12	1235	108828	1	192.00	400	76800	4	8.09	1482	11989		110.00			849	505.27	485715
	60	385.72		476363	8	409.34		163736	31	99.97		148155		1156.34			7734	2907.93	3251988