CHAPTER-VII

SUMMARY AND CONCLUSIONS
The fisheries sector plays a vital role in the agro-economic development of the country. The sector has been recognized as a powerful instrument to generate income and employment as it stimulates growth of a number of subsidiary industries and is the source of cheap and nutritious food in addition to being a good foreign exchange earner. Fish is one of the most important food item of non-vegetarian dishes. Due to higher growth rate of population in the country and increasing problem of malnutrition considerable attention needs to be given to enrich the biological value of different food items.

The Government of India, through its policy interventions made this sector to contribute in the development of the country specially for the purpose of producing nutritive food and to generate income and employment to the rural people. The inland fisheries projects run by World Bank also indicate the importance of fisheries in the several states of India. For reducing the pressure of population on land (specially in cropping sector), it is essential to increase income and generate employment through other source such as inland fisheries, poultry, dairy, piggery etc.

Keeping this in view the present study was initiated at micro level i.e. district level. Allahabad, one of the most populous district of the state of Uttar Pradesh, the largest and one of the most populated states of the country was considered the tract for this study.

The present study entitled "Potential and Sustainability of Fish Production in Allahabad District, U.P." would be as a humble effort in this direction which has be carried out with the following specific objectives:

1. To study the existing practices and resource use pattern in inland fishery on sample fish farms;
2. To work out the economics of fish production by category of ponds;
3. To analyse the trend of growth of fish production in the area under study;
4. To analyse various problems an constraints faced by farmers and assess the scope of increasing income and employment through inland fisheries in the study area; and
5. To suggest specific policy measures emerged from the findings of the study.
The study, with above objectives, has been led by the following hypotheses:

1. Fish production in Allahabad district, is growing at a positive rate;
2. Use of improved variety fingerlings has a significant impact on income from the fish production; and
3. Better feeding gives better yield in terms of income from fish production.

The study bases on both the secondary and the primary data. Secondary data related to agro-economic setting of the district Allahabad, its natural endowments and infrastructural background, area under ponds, its production and productivity, market and other infrastructure etc. were collected from documentary sources. For collection of primary data sample survey method was used to select fish farmers. In selection of fish farmers multistage sampling technique with stratified random sampling at the ultimate stage was used. In the district, there are twenty development blocks, out of these five blocks from the top ranking 50 percent blocks, were selected randomly. Name of selected development blocks are Koraon, Shankargarh, Karchhana, Handia and Jasara.

A list of the villages with commercial fish ponds in each sample block was prepared. It was found that there were 10 villages in each of Koraon and Shankargarh blocks while 9, 11 and 14 villages in Handia, Jasara and Karchhana blocks respectively. Thus, a total of 54 villages have been obtained and all were selected for the study because they had very limited number of fish ponds in them. At the last stage of sampling, a village-wise list of all the fish farmers was prepared for each sample village. The lists were tried to categories into 4 main categories of fish farmers as proposed in the synopsis i.e. (i) Fisheries department (ii) Other institutions (iii) Village society (Gram Samaj) and (iv) Private owners. Unfortunately, it was observed that the category two and three were not in existence in the study area. Only the first category and fourth category were in existence but the number of ponds in them were very small. So the ponds of gram samaj of different villages were distributed (on patta basis) to fishermen or schedule caste or schedule tribe fish farmers for a period of 10 years. They are doing fish farming just like private fish farmers. For this reason they were merged with the private fish farmers. The total number of private fish farmers after merger became 80. There were 15 fish farmers in first size-group while in second and third size-groups they were 29 and 36 respectively. This grouping was done on the basis of size of pond area owned or leased in by the private fish farmers. The first size-group includes the fish farmers with upto 0.125 ha. pond while the second and third include
those with 0.125 to 0.250 ha. and above 0.250 ha. respectively. Departmental fish ponds were only 7 in number.

All the sample fish farmers were contacted and interviewed repeatedly to collect reliable data mainly on their family back-ground, resource-structure, number of ponds, production of fish, cost involved in relation to fish production, prices, wages and other necessary information's. Specially prepared and pretested schedule and questionnaires were used for collecting the important information's from them.

Secondary data related to district pertain to the period from 1995-96 to 2006-07 while the primary data pertain to a two agricultural years i.e. for 2005-06 and 2006-07 and averaged of both years were used for analysis. Data thus collected were tabulated and analyzed with the help of appropriate mathematical and statistical tools.

Allahabad, as per census 2001 was the most populous district in the state of U.P. During the last decade the population rose by 27.02 percent. The district as a total population of 49,36,105 of which 26,26,448 are male and 23,09,657 are female accounting for 53.21 percent male and rest are female according to 2001 census. Rural population of the district was 37,29,320 accounting for 75.55 percent and urban population was 12,06,785 accounting for 24.45 percent.

According to census 2001 only 62.11 percent of the population was literate in the district and its distribution by sex reveals that 75.81 percent of the male population and 46.38 percent of the female population was literate. Literacy level in the sample blocks was lower than the district figure which indicates that the literacy in rural area was relatively low than the urban area. Further, the female literacy was relatively very low as compared to the male literacy both in the district and in the sample blocks. Sex-ratio for the district was 879 female against one thousand male, which is a matter of great concern. In five sample blocks it was more or less around the district average with Handia at peak (911) and Karchhana and Jasara (871) at bottom. Population density of the district was 900 persons per sq.km. Among the five sample blocks Handia was densely populated (1,065 persons per sq.km.) while Shankargarh, Koraon and Jasara had least density because of their geographical situation. In the district population handicapped was 2.4 percent.

Total working population in the district was 16,71,349 which was 33.86 percent of the total population. In the five sample blocks it was 42.92, 40.32, 33.77, 32.40 and 33.76 percent respectively of the total population of the respective area.
Summary and Conclusions

Maximum part of the total work-force is engaged in agriculture and allied activities where as a minimum part of it was engaged in household industries. About 23.90, 9.37, 6.04, 33.79 and 26.90 percent of the total work-force in the district were engaged in farming, agricultural labour, household industries, marginal works and other works respectively. In the group of other workers includes government and private services, different types of construction works, trade, grocery, tanga and richsaw pulling, poultry, piggery, diary etc.

As per available records it may be concluded that the district of Allahabad is rich enough in its natural endowments. As per census 2000-01 there were 5.33 lakhs farmers operating on 4.02 lakhs hectare of land which averaged to the land availability of 0.7542 hectare per farm. But, its size-wise distribution was not very appreciable as over 81.11 percent of the farmers (category-I) commanded only 40.24 percent of the land while only 0.26 percent (category-V) commanded 5.46 percent of the land. Soil is quite fertile and about 76.85 percent of the land received assured irrigation. Irrigation statistics of the five sample blocks was also good and in Jasara it was better than the district average.

The total geographical area of the district was 5.55 lakhs hectare of which net sown area account for 58.41 percent and area sown more than once account for 53.62 percent. Cropping intensity in the district was 153.62 percent and in the sample block it was maximum in Koraon which was 171.03 percent and minimum in Shankargarh which was 124.10 percent. Infrastructural setup such as input supply system banking facilities, market etc. are satisfactory except the power supply in rural area.

Growth trend in pond area under fish production of departmental ponds is in below one percent and negative also in both the trends. For production and yield, growth rate was positive and 6.14 percent and 6.57 percent respectively in linear trend and 4.53 percent and 4.92 percent respectively in exponential trend. Coefficient of determination i.e. $R^2$ for both the trends was almost equal in area but for production and yield it was higher for linear trend.

In private ponds the growth rate in area and production was positive and below one percent in both the trends. For yield it exhibits a negative and below one percent in both the trends. Coefficients of determination i.e. $R^2$ for both the trends was almost equal in area, production and yield.
Summary and Conclusions

From all sources the growth rate in of fish production was positive and 5.20 percent in linear trend and 4.12 percent in exponential trend which are positive. Coefficient of determination i.e. $R^2$ for both the trends was not equal. Thus, fish production in the district registers an increasing trend but there are ample opportunities to cover the additional area for increasing the fish production.

Projected value for the year of 2020 for pond area, fish production and yield for departmental ponds would reach to 534.55 ht., 431.62 quintals and 0.76 quintal respectively in linear trend and in exponential trend it would reach to 536.43 ht., 490.70 quintals and 4.92 quintals respectively. For private ponds projected value for same year for pond area, fish production and yield would reach to 419.50 ht., 5,201.20 quintals and 12.38 quintals respectively in linear trend and in exponential trend it would reach to 421.32 ht., 5,215.90 quintals and 12.38 quintals respectively. Projected value for same year for fish production from all sources in the district would reach to 13,394.16 mt. tonnes and 16,106.35 mt. tonnes in linear and exponential trends respectively.

With the existing growth rates it was estimated that other things remaining the same, the fish production in the district by 2020 would reach to 16,106.35 mt. tonnes from all sources. The scope of increase through inland culture fishery on private ponds is relatively higher. But, private fishermen face a land crunch for adding new ponds or expanding the existing ones. It is the major threat to the sustainability of fisheries in the district.

Analysis of the primary data reveals that total expenditure on preparation and maintenance of ponds was maximum for fish department which was Rs. 14,886 and for first size-group which was Rs. 3,073 because it included largest portion of the establishment cost. On the other hand it was very nominal for second and third size-group which was Rs. 303 and Rs. 461 respectively because the ponds of this size-group already in existence. Total labour charges was maximum for fish department which was Rs. 17,421 and Rs. 4,386 for first size-group. In the second size-group it was accounted to Rs. 2,325 and Rs. 3,293 for third size-group. Total material input costs was maximum for fish department which was Rs. 59,204 against the lowest Rs. 3,986 for the first size-group. In the second size-group it was Rs. 8,611 and Rs. 13,973 for third size-group.

The highest total cost i.e., Rs. 76,625 was accounted for the fish department against the lowest i.e., Rs. 8,372 for the first size-group. In the second size-group it was accounted to Rs. 10,936 and for third size-group it was Rs. 17,266. The highest total
output value i.e., 2,85,429 was accounted for fish department against the lowest i.e., 29,666 in the first size-group. In the second and third size-group it was accounted to Rs. 46,953 and Rs. 73,639 respectively.

The highest net profit i.e., Rs. 2,08,803 was accounted for fish department against the lowest i.e., 21,294 in the first size-group. In the third size-group it was accounted to Rs. 56,373 while in the second size-group it was accounted to Rs. 36,018. The input-output ratios were comparatively higher accounting 1:4.29 and 1:4.26 respectively on the second and third size-group. For first size-group it was 1:3.54 and for fish department it was 1:3.72.

The maximum total income i.e. Rs. 1,37,853 was accounted for third size-group against the minimum i.e. Rs. 90,866 in the first size-group while for the second it was Rs. 98,681. The total income was reported to be increasing with the increase in size of ponds. The highest employment days i.e. 516 were generated in the third size-group against the minimum i.e. 190 in the first size-group while in the second size-group it was generated 413 days.

The correlation analysis reveals that in first size-group the correlation between return and the factors like pond area, human labour, manure and feed were positive while that for fingerlings was negative. But, only human labour was significantly correlated with the return. In second size-group on all the explanatory variables/factors were positively correlated with return. But, the coefficient for human labour and feed only were significant. In third size-group the return was positively correlated with all the factors expect manure. The correlation coefficient for human labour and fingerlings were significant at one percent and for others as 5 percent. For all farms the correlation coefficient between return and expenditure on all the explanatory variables/factors were positive and significant at one percent expect manure.

The regression analysis considering linear production function reveals that in first size-group the human labour and improved variety fingerlings had significant effect on return. It also indicates that the variables included in the equation explain the variation of about 69.70 percent in the dependent variable. In second size group the variables considered for the analysis explained 66.40 percent of variation in the dependent variable i.e. fish production but among them only the human labour and feed had significant effect. In third size-group apart from human labour and manure also had significant effect on return. Explanatory variables included in the analysis altogether explained 43.90 percent variation in fish production. The cumulative effect
when analysed for all farms situation, behaved like third size group with the human labour and manure having significant effect on return. Here the independent variables considered explained 71.60 percent variation in the dependent variable.

On analysis using Cobb-Douglas production function it was found that in first size-group the explanatory variables explained 72.20 percent of variations in the value of gross return. The coefficient of elasticity for human labour was positive while that for improved variety fingerlings was negative and both had significant effect on fish production. In second size-group 41.40 percent of variations in the value of gross return was explained by the considered variables. The coefficient of elasticity for human labour turned out to positive and effect on fish production was the significant. In third size-group the explanatory variables explained 45.60 percent of variations in the value of gross return. The coefficients of elasticity for human labour and manure turned out to be positive and negative respectively and both had significant effect. For all farms situation analysis to the value of the coefficient of multiple determination $R^2$ indicates that 76.40 percent of variations in the value of gross return was due to considered independent variables. The coefficients of elasticity for pond area and human labour were positive and that for improved variety fingerlings was negative but all had significant effect on fish production.

The selected fish farmers of all size-groups including fish department were facing a major constraints of uncertainty of power supply. Without regular power supply fish production in the area is affected adversely. They also face serious problems like lack of water, while water is the life of fishes, unavailability of improved variety seeds and feeds. Sometimes these inputs are not available at the proper time in proper quantity which negatively affects the fish production.

Insecurity and fear of theft and damages are the other serious problems which fish farmers had to face. Most of the times anti-social element of the area steal the fishes with the help of net or other sources during nights. Sometimes they pore in poisonous substances in the ponds. This kind of bad practices have adverse effect on fish production and ultimately it result in major loss.

All the fish farmers of the area were facing a problem of storage of their produce after it was taken out of pond. No adequate storage for their produce in the area was available. Fish by virtue of its nature has very short shelf life. Speedy degradation starts just after its fishing. Thus, the scope of losses after fishing is
Summary and Conclusions

relatively more than the fields crops. Marketing of fishes is another serious problem observed during the course of present study. Due to poor marketing infrastructure farmers were bound to suffer a loss. Also they face mischievous behavior of other market functionaries in the market yard. As observed and also reported by the farmers, there is no role of producer in fixation of prices. Policies of market regulation and marketing norm are not properly implemented. Many types of deduction viz. dharmada, charity, and other malpractices are also prevalent in the market. Also, producers face the problems related to adequate transport and communication.

It was observed that the credit facilities available to the fish farmers were not sufficient to meet their requirements for making effective use of available resources for higher production and proper selling of fishes. The fish farmers face crunch of agencies and a lot of problems in the process of sanctioning the credits. They do not get it at the time of their requirements. They are bound to face non-availability of funds and the mischievous behavior as well at the funding agencies.

For boosting the fish production in the area government should come forward with adequate policies for strengthening infrastructures such as seed and feed supply system, proper transport and communication, adequate cool chain arrangements during transport and storage, multiagency financial arrangements, adequate market and marketing arrangements etc. Also, farmers should have their due say while fixation of prices for their produce. Power supply and timely supply of seeds and feeds in proper quantity also be taken care of by the local government. Also, the arrangements for training in modern technology and other technology support is the requirement of the days.

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