# CHAPTER-3
# METHODOLOGY AND COLLECTION OF DATA

## 3.1. INTRODUCTION:

Investigation about fishculture as a means of employment and income generation in Assam with special reference to Barpeta district has been made in four major parts. First of all, role of fishculture in the generation of employment and income in Assam has been analysed. Thereafter, spatio-temporal variation of table and seed fishculture in Assam has been described. Next, a brief discussion on the scope and role of different financial agencies and Government (Central and State) in the development of fishculture as a whole in Assam have been provided. Finally, problems and means to solve the problems of fishculture for its future development in Assam have been highlighted.

## 3.2 FISHCULTURE AS A MEANS OF EMPLOYMENT AND INCOME IN ASSAM:

The role of fishculture in the generation of employment in India and Assam and spatio-temporal variation of it has been analysed in this chapter. First of all, production of fish (i.e. supply) from macro to micro level has been shown. Here, fish production in the world both in marine and inland has been discussed including the relative ranks of top fish producing countries of both marine and inland fish. It is followed by a discussion on overtime production of fish in India and across the states and UTs both in marine and inland fish. Next, production of seed fish across the states and UTs in 2014-15 is presented in tabular form. Over time changes in contribution of fishculture to Gross Domestic Product (GDP) at current prices of India has been discussed. Later, contribution of fishery to NSDP at current prices of Assam has been focused. In case of employment in fishery sector also, region-wise employment in the world from 2000 to 2004 has been highlighted. It is followed by a discussion on the contribution of fishculture to the generation of employment in India and across the states and UTs and also in Assam. Average annual exponential growth rate of employment in Assam during 2001 to 2016 has been measured running regression in the form of $LnY_t = a + b.t + U_t$, where $Y_t$ represents

employment at time t; t is the time in year; a and b are the two parameters. Here, U is the random disturbance term and b represents the annual exponential rate of growth of the employment. Lastly, overtime export and import of fish from India and from Assam has been analysed. Here also, average annual exponential growth rate of demand for fish and production of fish in Assam during 1996 to 2015 have been measured by applying the same regression method $LnY_t = a + b.t + U_t$, where $Y_t$ represents production of fish and demand for fish in Assam at time t; t is the time in year; a and b are the two parameters. Employment and income generation from fishculture in Assam, cost of production and profitability of fishculture are supported by primary data collected from the district of Barpeta.

## 3.3. DISTRICT WISE VARIATION IN FISHCULTURE IN ASSAM:

In this chapter, first of all, district-wise variation in contribution of table fish production to total state production of table fish during 1995-96 to 2015-16 has been discussed. Thereafter, district-wise variation in contribution of seed fish production to total state production of seed fish during 1995-96 to 2015-16 has been discussed. Lastly, reasons behind the district wise variation in fishculture in Assam have been analysed. Proportional contribution of each district and its variation overtime has been computed by using tabular method. Inter-district disparity in contribution of fish production to state total is measured by co-efficient of variation. District-wise variation in contribution of table as well as seed fish to total state production during 1995-96 to 2015-16 is also presented with bar diagram. Then impact of various socio-economic factors on the variation in production of fish has been analysed by the multivariate regression equation in the form of $Y_i = \beta_1 + \beta_2 X_{2i} + \beta_3 X_{3i} + \beta_4 X_{4i} + \beta_5 X_{5i} + \beta_6 X_{6i} + \beta_7 X_{7i} + \beta_8 X_{8i} + \beta_9 X_{9i} + U_i$. Here, $X_{2i}$, $X_{3i}$, $X_{4i}$, $X_{5i}$, $X_{6i}$, $X_{7i}$, $X_{8i}$, and $X_{9i}$ are number of hatchery for the production of fish seed, population density, number of registered bill fisheries, number of registered river fisheries, proportion of rural population, rural literacy, proportion of Muslim population, per capita net district domestic product (NDDP) and annual average rainfall of $i^{th}$ district respectively in 2011. $Y_i$ is per capita production of fish in the $i^{th}$ district during 2011-12. $U_i$ is the random disturbance term having usual classical linear regression properties. Here, all the variables are expressed in logarithmic term and thus each coefficient represents the elasticity of the respective variables.

**3.4. ROLE OF GOVERNMENT AND FINANCIAL AGENCIES IN DEVELOPING FISHCULTURE IN ASSAM AND PROBLEMS OF SEED AND TABLE FISHCULTURE AND ITS SOLUTIONS IN ASSAM:**

First of all an overview of different financial sources (both institutional and non-institutional) operating in Assam is given in chapter-6. It is followed by a brief description of the institutional sources and non-institutional sources operating in the district of Barpeta. Thereafter, the role of different sources of credit among the sample households has been analysed. Lastly, the role of Central and State government in providing financial assistance to the fishculturists in Assam as well as in the district of Barpeta is discussed. Tabular method has been used in presenting the different source of finance to fishculturists.

Problems of seed and table fishculture and its solutions in Assam have been discussed in chapter-7. Educational level of the members of both table and seed fishculturist families, problems like attitude of the society, poor enforcement of law, flood, lack of finance, etc. faced by the fish rearers is discussed by tabular method. Lastly, probable solutions to the problems are also discussed.

**3.5 COLLECTION OF DATA:**

The study is based on both primary and secondary data. For the purpose of analysis, secondary data on production of table fish and seed fish, number of people engaged in fish culture, government benefit to rearers, etc. have been collected from various Live stock Census Reports, Directorate of Fishery, Government of Assam, Directorate of Economics and Statistics, Government of Assam, Economic Survey, Government of India, Ministry of Agriculture, Government of India, Food and Agriculture Organisation (FAO) and other Official Reports. Consultations with the experts of the said fields were also made for gathering relevant information.

Also for the study, primary data have been collected from 120 seed fish rearing families and 90 table fish rearing families chosen by multistage sampling procedure from the district of Barpeta[1]. There are 11 Community Development (CD) blocks in the district. Fishculture is practised in all blocks, but mainly concentrated

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[1] Among all the districts of Assam, Barpeta district ranked 4th in the production of table fish and 3rd in the production of seed fish in 2015-16. It is that district which has been able to occupy consistently among the three top producer of seed fish district and among the five top table fish producing district in Assam since 1995-96.

in the CD blocks of Bhabanipur, Mandia and Pakabetbari. Therefore, these three CD blocks were selected out of these total 11 CD blocks of the district of Barpeta. Within these three CD blocks, nine villages namely Dabaliapara, Dhakaliapara and Kajirmill from Bhabanipur CD block, Kayakuchi, Keotpara and SakirBhita from Pakabetbari CD block and 1 No. Bardoloni, Digirpam and Nalirpar from Mandia CD block were selected by stratified random sampling method. From the nine villages, total 120 seed fish sample families and 90 table fish sample families are selected on the basis of the proportion of families of the three blocks engaged in such activities in the respective villages. From each village, the sample families are picked by simple random sampling without replacement from all the families practising fishculture.

From each selected family, information regarding production of fish and seed fish in a year, number of people engaged in this occupation, working hours used in rearing, cost of appliances of rearing, price of seed fish and table fish at which these are sold, labour hour required in production, cost of production, the problem faced by rearers, other occupations of the family members, total annual family income, their educational status, etc. have been collected through a pre-tested questionnaire. Interview method was adopted in the collection of data. The survey was conducted during November 2016 to December 2016. Several subsequent visits were also made to some of the sample households to clarify some doubts and confirm some findings.

## 3.6 LIMITATION OF DATA:

Majority of rearers have provided some quantitative information such as figures of annual fish production, annual sales proceeds from fish culture, amount of investment, etc. from their memory other than from books of accounts. The rearers whether rich or poor are found to be unwilling to disclose some basic information relating to grants received from government and have a tendency to exaggerate their poverty. Some of them even are not aware of the modern weight and measures system. Most of the rearers have not maintained proper books of accounts. Great care was, however, taken to smoothen to these tendencies in filling up the questionnaires.

# Map-3.1
## Map of India



INDIA
States and Union Territories

N

TAJIKISTAN
AFGHANISTAN
PAKISTAN
CHINA
NEPAL
BHUTAN
BANGLADESH
MYANMAR

JAMMU & KASHMIR
Srinagar
Jammu
HIMACHAL PRADESH
Shimla
Chandigarh
PUNJAB
HARYANA
UTTARAKHAND
Dehradun
DELHI • New Delhi
Jaipur
RAJASTHAN
UTTAR PRADESH
Lucknow
SIKKIM
Gangtok
ARUNACHAL PRADESH
Itanagar
ASSAM
Dispur
Shillong
MEGHALAYA
NAGALAND
Kohima
Imphal
MANIPUR
BIHAR
Patna
JHARKHAND
Ranchi
WEST BENGAL
Kolkata
Agartala
TRIPURA
Aizawl
MIZORAM
Gandhinagar
GUJARAT
Bhopal
MADHYA PRADESH
CHHATTISGARH
Raipur
ODISHA
Bhubaneswar
DAMAN & DIU
Daman
Silvassa
DADRA & NAGAR HAVELI
Mumbai
MAHARASHTRA
Hyderabad
TELANGANA
Yanam (Puducherry)
ARABIAN SEA
Panaji
GOA
KARNATAKA
ANDHRA PRADESH
Bengaluru (Bangalore)
Chennai
Mahe (Puducherry)
PUDUCHERRY (Pondicherry)
LAKSHADWEEP (INDIA)
Kavaratti
TAMIL NADU
Karaikal (Puducherry)
KERALA
Thiruvananthapuram
SRI LANKA
MALDIVES
INDIAN
OCEAN
BAY OF BENGAL
ANDAMAN & NICOBAR ISLANDS (INDIA)
Port Blair

LEGEND
International Boundary
State Boundary
□ Country Capital
• State/UT Capital

40

**Map-3.2**
**Map of Assam Showing Sample District**



Study Area

ASSAM (ASOM)
ROAD MAP

CHINA

ARUNACHAL PRADESH

BHUTAN

Dhemaji
Dibrugarh
Tinsukia
52
37
38
North Lakhimpur
37
Sibsagar
52
Baksa
Udalguri
Jorhat
31C
152
52
Tezpur
37
Kajalgaon
Nalbari
37
Kokrajhar
Bongaigaon
Darrang
Nagaon
Golaghat
31B
Barpeta
Marigaon
39
31
Goalpara
DISPUR
37
NAGALAND
Dhuburi
Goroimari
MYANMAR
Diphu
MEGHALAYA
27
Haflong
Karimganj
Silchar
BANGLADESH
Hailakandi
MANIPUR
154
Map not to Scale
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(Updated on 17th July 2012)
TRIPURA
MIZORAM

LEGEND
International Boundary
State Boundary
District Boundary
National Highway
Major Roads
District Boundary
State Capital
District Capital

41