Fisheries are a very important source of food, livelihood and trade surplus in many developed as well as developing countries of the world. Globally the sector provides nearly sixteen percent of total animal protein supplies and an estimated food supply of 17 Kg per capita, direct employment to 45 million people and about forty percent of fish output is traded internationally (FAO 2010). Global capture fisheries production recorded continuous increase through the late 1980’s; largely due to technological improvements and investment in capacity creation. But thereafter the growth of capture fisheries production has slowed down considerably. Global production from capture fisheries was stagnant around 90 million tons during the past one and half decade. The fish stock around the world is under heavy pressure of overexploitation and depletion. It is estimated that, as much as eighty percent of global marine fish stocks are now fully exploited, over exploited or depleted (FAO 2010). It leaves limited scope for further enhancement in capture fisheries production.
It is against the background of stagnation in production from traditional fisheries that aquaculture is promoted world-wide to sustain and increase the supply of food-fish and raw materials for trade in fish and fish products. Aquaculture continues to be the fastest growing animal-food-producing sector in the world and is considered as the only engine of growth in food-fish production. Aquaculture production was less than one million tons in the early 1950’s, and it has increased to 55.1 million tons in 2009, recording an average annual rate of around 7 percent. Aquaculture now accounts for nearly thirty eight percent of global food fish production. The share of aquaculture in total food-fish production (for human consumption) is nearly fifty percent and is set to overtake capture fisheries as a source of food fish in recent future (FAO 2010).

India is endowed with vast marine and inland water resources with high potential for fisheries production. Production form capture fisheries in the country have also shown a tendency to slow down in the past one and a half decade. The trend is visible in the case of both inland and marine fisheries production Total fish production from capture fisheries in India fluctuated in between 3.5 to 4.0 million tons during the last one and a half decade. Production of shrimp, the main stay of marine product exports from India and the most severely exploited fishery resource in natural waters of the country, has also shown a similar trend. Harvest of shrimp/prawn from capture fisheries in the country hovered around 0.3 to 0.4 million tons over the past fifteen years (Appendix – 1).

India has a long history in aquaculture as a means of food-fish production. Traditionally it was practiced mainly as a sustenance activity and it’s up gradation to commercial production is a recent phenomenon. The development of aquaculture was facilitated by the progress in the field of
biotechnology in formulating commercially viable and feasible technological models of fish/shrimp culture. It was supported by institutional, technological and financial assistance from international organizations like the World Bank, Food and Agriculture Organization (FAO) of the UN, National and State Governments, various Research Institutions and Universities in the country etc. Enhancement of food security, creation of employment opportunities, generation of income and surplus for trade in fish and fishery products were the declared objectives of promotion of aquaculture. Since 1970s, aquaculture production in the country has been showing consistent growth, though at a very moderate rate. In aquaculture production India is a world leader, occupying the second place, after China.

Aquaculture production in India, which was just 0.037 million tons in 1980, has increased to 3.8 million tons in 2009 (Appendix – II). In fact commercialization of aquaculture in India began with the development of scientific shrimp culture in the late 80s and early 90s. Export oriented shrimp culture is promoted in the country, since 1980s, in the context of stagnating production from traditional fisheries sector. Shrimp aquaculture is considered as a potential source of raw material for the marine products export industry in the country. Shrimp aquaculture in India recorded very fast growth since 1990s, the period that coincide with liberalization and globalization of the national economy. Aquaculture production of shrimp and prawn in India increased from 0.005 million tons in 1981 to 0.104 million tons in 2009 (Appendix – II).

Production of shrimp under aquaculture has contributed significantly to support the marine products exports from the country but with a declining trend in its contribution. In terms of quantity, the contribution of cultured shrimp to total export of shrimp from the country reached the peak
level of 76 percent in 2006-07 and then declined to 41.39 per cent in 2008-09. In terms of value the share of cultured shrimp in total shrimp export from the country was 88.8 per cent in 2001-02 and thereafter gradually declined to 50.35 per cent in 2008-09 (MPEDA, Annual Reports).

Kerala is one of the leading fish producing states in India. Kerala too is endowed with abundant marine and inland resources for fish production. Fisheries sector of the state supported a total fishermen population of 11.0 lakh and contributed about 1.54 percent of state net domestic product at current prices. The state accounted for 19 per cent of the marine products exported from the country in terms of quantity and 17.36 per cent in terms of value, in the year 2007 (Kerala Fisheries at a Glance 2007). In Kerala also marine fish landings, which accounted for nearly 90 per cent of total fish production of the state, has shown a tendency to stabilize around 0.6 million tons since 1995 (Appendix – III). Similar tendency is observed in the marine harvest of shrimp, the major component of state’s fish production and export in terms of value. Marine shrimp landing in the state ranged between 0.05 – 0.06 million tons since 1995 (Appendix – III).

Aquaculture is promoted in the state also in the backdrop of stagnation in production from capture fisheries. Kerala is very rich in resources for the development of aquaculture. The total extent of inland water areas in Kerala is estimated to be of the order of 3, 60,535 ha. Of this the brackish water sprawl over 2, 42,600 ha and fresh water areas amount to 1, 17,935 ha. Of this potential only a small proportion is being utilized now. Fish culture, which was a traditional activity in the state, has grown into a high-value activity practiced not only by small and marginal farmers but also by commercial entrepreneurs. The change is more visible in the case of coastal aquaculture, where shrimp culture constituted the major
component both in terms of area under culture and value of output. The shrimp culture scenario in the state is also confronted with many environmental, social and economic constraints which limit further advancements in the field.

1.1 Statement of the Problem

As against capture fisheries, which involves fish hunting in wild water bodies, in aquaculture fish is cultured and harvested in artificially created water bodies or in natural water logged areas converted in to farms. The field of production has shifted from common property resource to private landed property. Investment in aquaculture was taken up by a group of entrepreneurs from non-fisheries, non-agriculture communities as a profitable avenue of investment for their surplus funds. Development of aquaculture marks the beginning of commercialization of inland fisheries in Kerala.

Under aquaculture, the culture side of the production process gains importance and harvesting becomes less significant. Fish culture reduces the uncertainty in production also. The output consists of only preferred species, which enjoy high demand in world markets. All these enhanced the returns from aquaculture.

But development of aquaculture has increased the competition for natural resources (land and water) that supported livelihood activities and employment of many traditional users. On many occasions development of commercial aquaculture is said to cause deprivation of traditional communities from their means of livelihood and their marginalization and became the basis of social tensions and conflicts.
Aquaculture interacts with environment. Unplanned and unregulated growth in aquaculture has many implications that often lead to the degradation or depletion of environmental resources, jeopardizing the livelihood activities of many. Very often the negative feedback effects of environmental degradation cause serious hardships for the industry itself.

The present study is an attempt to examine the course of development of aqua farming in Kerala and the various socio-economic aspects of changes in culture practices. Though a lot of research work has been done about the biological aspects of fish/shrimp farming, very little attention has been paid to its socio-economic aspects. The present study would therefore be to fill this lacuna, and to throw more light on the socio-economic aspects of development of aquaculture in Kerala.

1.2 Objectives of the study:

The specific objectives of the study are the following.

1.2.1 To examine the course of development of aquaculture in Kerala. The emphasis is on the shift from capture fisheries to culture fisheries and the transition from traditional methods to modern practices.

1.2.2 To analyze the organization of production and production relations under aquaculture.

1.2.3 To analyze the economics of fish production under aquaculture and its profitability.

1.2.4 To study the pattern of employment generation and income distribution under aquaculture.

1.2.5 To examine the social aspects of the development in aquaculture.
1.3 Hypotheses

The study hypothesizes the following:

1.3.1 Development of aquaculture involves a shift in emphasis from traditional capture fisheries to modern culture fisheries.

1.3.2 Development of aquaculture benefits the economy in terms of output; export earnings, employment and income generation.

1.3.3 But the development is lopsided in the sense that the traditional fisher folk and layman are not benefited in terms employment and availability of fish.

1.4 Scope and Significance of the Study

The aquaculture scenario in the state is dominated by coastal aquaculture, the main component of which is shrimp culture. Even though other forms of aquaculture like fin fish culture, mussel culture, crab culture, ornamental fish culture etc are also practiced in the state; they remain very small-scale operations and sporadic. In terms of area under cultivation, output and employment generation and integration with international markets, shrimp culture is far ahead of these other components of aquaculture in the state. Shrimp culture is an age old activity in Kerala thrived on the high demand for dried shrimp from countries in the Far East. Currently shrimp is the main stay of marine products exports from the country and makes significant contribution to the foreign exchange earnings. During 1990s with the introduction of scientific culture practices, shrimp farming recorded rapid progress in the state with many socio-economic impacts on the social fabric of the coastal areas. Therefore development of shrimp culture is selected as the main focus of the study in order to assess the socio-economic aspects of aquaculture in the state.
In India as well as in Kerala, shrimp farming is promoted during 1980s, mainly as a supplementary source of employment, income and raw material for the sea food exporting industry. The industry recorded very fast growth in terms of area under culture and output in the early years of 90s and contributed significantly to the foreign exchange earnings of the country. However, many socio-economic and environmental forces began to constrain the development of the industry in late 90s and early years of the twenty first century. The industry suffered its first set back in the form of an outbreak of viral diseases in the late 1990s, mostly attributed to environmentally unsustainable shrimp culture practices. The public interest litigation in the Supreme Court of India following environmental and social problems associated with shrimp farming in Tamil Nadu and the judgment of the Honorable Court in December 1996, which ordered demolition of shrimp farms that have come up with in Coastal Regulation Zone (CRZ) area, served a serious blow to the industry. The court order was the most crucial among the factors that caused the development of new area in brackish water aquaculture come to a stand still. (Appendix – IV).

The situation was further aggravated by the decline in shrimp price caused by developments in international market for shrimp. “The increased production of shrimp propelled by the spread of ‘vannamei’ culture in the Asian region resulted in glut in global shrimp markets, resulting price decline since 2001. The imposition of anti-dumping duties by the United States Administration on supplies from selected Asian countries, including India, was another significant event that influenced farm gate prices. The problems on account of antibiotic issues in aquaculture also came to forefront and considering the food safety issues farmers have started realizing poor prices for the products” (Bhat, B. Vishnu., 2007).
It follows that a detailed study of the development of aquaculture is required to assess its socio-economic impacts and to identify the factors that limit its progress. Such an attempt will be helpful in the formulation policies intended to promote aquaculture on sustainable basis.

1.5 Methodology

The Study is based on an empirical investigation of shrimp farming in Kerala. Both primary and secondary data are used for the analysis of development of shrimp farming in the state. This section is concerned with sources of data, sample design and technique, collection of data and its classification, presentation and analysis.

1.5.1 Sources of data

The study is based on both primary data and secondary data. The primary data is collected on the basis of a sample survey conducted among shrimp farmers in the state. Secondary data was collected from various sources. Main sources of secondary data were FAO, MPEDA, Fisheries Dept of Government of Kerala, Books, Journals and other published sources.

1.5.2 Sample design

1.5.2.1 Universe

The universe of the present study is the shrimp farmers registered with the Agency for the Development of Aquaculture in Kerala, Regional Office Ernakulam, which has jurisdiction over Thrissur, Ernakulam and Alapuzha Districts in Kerala, which account for more than 85 per cent of total area under shrimp culture in the State.
1.5.2.2 Sample size

From the list of farmers registered with ADAK, Ernakulam, in the year 2008-09, a sample of twenty five percent was selected. Total number of shrimp farmers included in the sample size is sixty three.

1.5.2.3 Sampling technique

The sample was selected applying the technique of stratified sampling. Farmers were divided into three groups on the basis of size of the farm and from each stratum twenty five percent farmers were selected at random.

1.5.2.4 Tools for data collection

The primary data was collected from shrimp farmers included in the sample on the basis of a structured questionnaire (Appendix – V). Personal interviews and discussions, with various stake holders in shrimp farming, were conducted to elicit information on various quantitative and qualitative aspects of development of shrimp culture in the state.

1.5.2.5 Presentation and Analysis of data

After collection, the data was properly classified, processed, tabulated analyzed and presented with the help of statistical techniques like averages, percentages, correlation analysis, pie diagrams, bar diagram etc.

1.6 Plan of the Study

The study is arranged in eight chapters. A brief description of the content of each chapter is given below:

1.6.1 Chapter – I

The first chapter introduces the topic of research and presents the research problem, objectives of the study, hypotheses and methods used for
collection of data. It also describes the methodology of research and statistical techniques used for the presentation and analysis of data.

1.6.2 Chapter – II

The second chapter presents a review of existing literature on the topic and related areas, based on scholarly works of various researchers. The available literature is arranged in three groups: literature with international dimension, national dimension and regional dimension and are presented in chronological order.

1.6.3 Chapter – III

The third chapter gives a detailed account of aquaculture systems and the course of development of different aquaculture systems in the state, with special emphasis on the development of shrimp farming. The transition from traditional shrimp filtration to the modified extensive method is the focus of the study.

1.6.4 Chapter – IV

The fourth chapter presents the nature of organization of production under different shrimp culture systems practiced in the State. In this chapter an attempt is made to make clear the economic and social implications of the transition from traditional shrimp filtration to modern shrimp culture.

1.6.5 Chapter – V

The fifth chapter deals with the generation of employment and wage income in shrimp farming. A comparative analysis of employment and wage income under the two systems of shrimp culture is attempted with the objective to work out the change in the pattern of employment and wage
income and the social implications there of. The analysis is based on the quantitative data collected from the sample survey.

1.6.6 Chapter – VI

The sixth chapter analyzes the economic viability of shrimp farming in terms of profitability. A comparative analysis of profitability of shrimp farming under traditional and scientific methods is presented. The chapter is based on the micro level study conducted by the researcher.

1.6.7 Chapter – VII

The seventh chapter concentrates on the social and ecological aspects of shrimp farming in the state. This chapter is based on quantitative information collected by conducting the sample survey as well as information collected from secondary sources, personal discussion, interviews and observations made by the researcher.

1.6.8 Chapter – VIII

The eighth chapter summarizes the study and presents important findings along with conclusion and suggestions to make shrimp farming more sustainable.

1.7 Limitations of the study

Even though many studies were conducted on the scientific aspects of aquaculture, its socio-economic aspects are relatively less studied and quantified. Shortage in the availability of secondary data with regard to total production under aquaculture and its contribution to the State domestic product, employment generation etc seriously constrained the study.
Shrimp culture is an age old activity operating in the informal sector. This made definition of population and sample size difficult, forcing the investigator to limit the population to shrimp farmers registered with ADAK, the major agency in the State working for the development of aquaculture in the State.

On many occasions shrimp farmers were reluctant to reveal information on yield and income. Generally they showed a tendency to exaggerate the cost of farming and to under report the revenue. In such situations the researcher has to apply his own judgments, based on other related information, to arrive at reasonable estimates.

References


