CHAPTER – VII
SUMMARY OF FINDINGS, SUGGESTIONS AND CONCLUSION

Economic growth is the expansion in production possibilities that results from increased availability and productivity of economic resources. The availability of new capital is effective in pushing the production possibilities curve outwards. This means that the new capital tends to increase the productivity of available resources. Fisheries sector plays a vital role in Indian Economy through its contribution to the country’s GDP besides being a vital source of livelihood for about four million populations.

Kanyakumari district is endowed with vast marine fishery potentials. Reports suggest that only a small percentage of the marine resources have been harvested by artisanal fishers whose technologies limited their radius and efficiency of operation. Nowadays, initiatives in the marine fisheries sector are focussed to promote deep sea fishing rather than inshore fishing. Various reports confirm the outmigration of mechanised fishing vessels of Kanyakumari district either seasonally or regularly. This situation posed the following questions. Is mechanised fishing economically viable? What are the main problems faced by mechanised fishery sector? and What are the steps to be taken to overcome the existing problems? The present study is an attempt to find fitting answers to the questions that aroused.
Various studies were conducted on Marine Fisheries Economics by researchers and scholars at various times. Stephen (1993), Maria John (1994), Pazhani (1998), Antony Raj (2002), Selva Smily (2007), Stella Bai (2008) and Krishnan (2010) were mainly dealt with the socio-economic conditions of fishermen, fisheries finance, fish marketing, fishermen as well as fisherwomen cooperative societies and fishermen migration.

The prime objective of the present study is to analyse the problems faced by the mechanised boat operators in Kanyakumari district. The study is confined only to the mechanised trawler and gillnet units that are registered under the Tamil Nadu Marine Fisheries Regulation Act, 1983 and Marine Product Export Development Authority (MPEDA) Act, 1972. The other fishing methods such as fishing with traditional crafts, motorized crafts etc. are not part of the present study. The marine fishery infrastructure, state regulations, problems in production and marketing, credit structure and its effect on debt, the costs, earnings and the socio-economic conditions of mechanised boat operator’s households are the main thrust of the present analysis.

There are 47 coastal villages in Kanyakumari district and mechanised fishing crafts are registered from 20 fishing villages. Out of these, Kanyakumari, Colachel and Thoothur are the three fishing villages have been selected on the basis of the proportion of the existing number of registered mechanised fishing crafts. Single day fishing is practiced in Kanyakumari fishing village but multiday fishing is followed in Colachel and Thoothur fishing villages, though it is
prohibited by law. The study used proportionate random sampling technique. Altogether 160 mechanised boat operators (80 trawlers and 80 gillnetters) have been interviewed in the three selected villages. The other information needed for the analysis have been obtained from various published and unpublished reports. Discussions were held with officials of Fisheries Department, Office bearers of Mechanised Boat Owner’s Welfare Societies and senior members of fishermen community. Initially a pilot survey was conducted and on the light of pilot survey observations, necessary changes have been effected in the interview schedule.

The study used the statistical tools such as average, ratio and percentage. The correlation analysis was used to establish the relationship between the technical properties of crafts, the costs and the revenue of the mechanised boat operators. The multiple regression analysis was used to determine the contributory ability of the technical properties of crafts and various items of cost on the total revenue of the boat operators. The correlation and regression coefficient are statistically tested at some desired level of significance by using ‘t’ test. SWOT analysis is attempted to assess the problems and prospects of mechanised fishery sector. The main findings drawn from the study are summarized as follows.

Mechanisation in Fisheries in Kanyakumari district was launched as part of the Second Five Year Plan (1956 – 61) under the leadership of the Congress Chief Minister K. Kamaraj. The mechanised gillnetters were first introduced in Tamil
Nadu through the Colachel Fishermen Co-operative Society in Kanyakumari district.

Bottom trawling had begun in the neighbouring Kerala State as early as 1961 under the auspicious of the Indo Norwegian Project and the Colachel gillnet owners who operated in Kerala, first time saw the profits from trawling for prawn. By 1966 approximately 30 fishermen families of Colachel operated trawler units in Kanyakumari district.

The recent reports envisaged that the trawler units dominate in Kanyakumari and Colachel fishing villages. The trawl nets have a mesh size comparatively much smaller than the mesh size of gillnets. The gillnet units are operated in Thoothur and its surrounding villages. As the mesh size of gillnet units is comparatively larger, the fishes of over a minimum size only be targeted. Therefore it is suggested that the gillnet units satisfy the sustainability principle of the fisheries management policy.

It is estimated that a newly built vessel with necessary fishing gears and other electronic equipments would cost approximately Rs.70 lakhs at current market price. In the selected villages only 35.3 per cent of the sample households own mechanised vessels under individual proprietorship and the remaining are owned under partnership mode. The average value of investment in trawler units was Rs.36.68 lakhs whereas, Rs.32.98 lakhs in gillnet units.
Most of the boat owners have started their career as fishermen in the country crafts. The introduction of mechanised fishing had perceptibly improved the levels of living of boat owner households in the selected villages. The findings on the analysis of socio-economic features of the boat operator households are summarized below:

The boat owner households have a low dependency ratio and comparatively a higher percentage of aged population. This shows a rise in average life expectancy. The sex ratio is in favour of the females.

The boat owner households enjoy a high literacy rate (80%) but most of them have primary level education. The elderly members are mostly illiterates. But they are more concerned about the education of their children and grandchildren. The average family size is 3.77, which is less than the District’s and the States’ average fishermen family size.

The working population in the boat owner households is engaged in fishing and fishery related activities. Some of the educated members engaged in secondary as well as tertiary occupations. The domestic household services is non remunerative and are carried out by the adult female members. Altogether 49.6 per cent follow fishing as their main occupation and 43.1 per cent engaged in domestic household services and the rest engaged in secondary and tertiary occupations.
Most of the sample households reside in their own houses and most of the houses are made of Concrete. All the selected houses in Kanyakumari village have either marble or granite as the floor material but only 45 per cent of the houses in Colachel and 20 per cent of the houses in Thoothur have used marble or granite as floor material.

The size of house on average is small in Thoothur, where 90 per cent of the houses are built with an area covering 1000 sq. ft or less. The Colachel boat owner’s houses are medium in size, where 45 per cent are built with an area covering 1001 and 2000 sq. ft. The average size of house is comparatively larger in Kanyakumari, where 60 per cent of the houses covered between 1001 and 2000 sq. ft. area and 15 per cent of the houses occupied with over 2000 sq. ft area. All the selected houses are electrified.

Own well is the prime source of drinking water in Kanyakumari, whereas public tap is the dominant drinking water source in Colachel and Thoothur. Most of the houses selected are attached with necessary sanitation facilities.

In Kanyakumari and Thoothur, their houses are built on patta land whereas in Colachel some of the houses are built on the land owned by the local church. More than 75 per cent of the sample households in Kanyakumari own all kinds of electrical and electronic home appliances such as TV, Washing machine, Refrigerator, Computer and Motor bikes. Most (95 per cent) of the sample houses in Kanyakumari are installed with air conditioners and 20 per cent own motor car.
Daily consumption, medical, education, electricity, social and religious functions are the main items of their household expenditure. Maximum annual average household expenditure (Rs.3.65 lakhs) is reported in Kanyakumari and minimum expenditure (Rs.2.83 lakhs) in Colachel. Consumption expenditure constitutes the major share of the annual expenditure in all the sample households. 80 per cent of the households spend between Rs.2500 1 and Rs.1 lakh on education and over 60 per cent spend Rs.50000 or less on medical and health.

Chit funds and insurance companies are the major sources of savings. The average savings is Rs.65775 in Kanyakumari, Rs.89343 in Colachel and Rs.102012 in Thoothoor. The fishing assets consist of the craft, gears and the mechanical and scientific equipments installed in the boats for fishing and navigation. Both trawler and gillnet units have almost similar type of fishing crafts and other mechanical and scientific equipments.

Land, Buildings, Gold Jewellery and Motor vehicles are the major items of their non-fishing assets. The unit value of these assets especially land and buildings vary between villages due to location factor. The boat operators of Kanyakumari are reported to own the maximum average value (Rs.31.63 lakhs) of non-fishing assets and the Colachel boat operators own the minimum average value (Rs.23.45 lakhs) of non-fishing assets.

Friends and relatives form the prime source of borrowings of the boat owner households. Money lenders are the least important source of borrowing. The average borrowings in the boat owner households range between Rs.4.98
lakhs and Rs.12.42 lakhs. Thoothur boat owner households have lowest average borrowings and the highest average borrowings is reported in Kanyakumari. The boat owner’s liability as percentage of total assets is 18.04 per cent in Kanyakumari, 10.26 per cent in Colachel and 7.66 per cent in Thoothur. By taking into account of the technical properties of the fishing crafts, the trawler units are larger in all respects and have more engine power than the gillnet units.

In the past, the fishing boats used ice boxes to store the daily catch. The need for fish hold was felt with the introduction of multiday fishing with longer duration. The inboard holding capacity of the trawler units exceeded the gillnet units. Besides, 90 per cent of the boats selected are installed with the necessary navigation and fish finding equipments but only 55 per cent of the boats equipped with life saving equipments.

Depreciation cost on crafts and gears, interest on borrowed capital and insurance premium on crafts are the main items of fixed cost in the mechanised fishery sector. Operating costs include the cost of food, fuel, ice, bata and wage share of crew members, cost of lubricants, auction fee, pure water cost, repair and maintenance cost and cost of loading inputs and unloading catches. A fixed sum of Rs.1000 per head per day is paid as bata to crew members in Kanyakumari whereas, in Colachel and Thoothur Rs.1500 is paid as bata per head per fishing trip. Wage is paid as a share of catch value. It is calculated by deducting the other operating costs excluding labour cost from the total revenue. In Kanyakumari 35
per cent of the catch value after meeting other operating cost is fixed as wage share but in Colachel and Thoothur the wage share is 50 per cent.

Auction fee varies among villages. It ranges from 3 per cent to 5 per cent in the selected villages. The amount so collected as auction fee is shared between the auctioneer and the local church on a predetermined basis.

In Colachel and Thoothur, loading inputs on board and unloading the catches are carried out by the traditional craft operators. The boat operators in these villages spend up to Rs.5000 per trip for loading and unloading. This arrangement reduces the number of fishing trips and increasing the operating expenses as well as the boat owner’s dependence on the traditional sector for fishing operations.

Depreciation on craft is the main item of fixed cost and fuel cost contributed the most in the operating cost. All the costs except depreciation on gears are higher in trawler units compared to gillnet units.

Total revenue (TR) depends upon the price and quantity of catch. The average fish price and quantity of catch per fishing trip vary across the coastal villages of Kanyakumari district. The average fish price per kg and the landings per trip arrived at are Rs.125 and 503 kgs in Kanyakumari, Rs.130 and 3286 kgs in Colachel and Rs.148 and 2435 kgs in Thoothur.

The boat operators of Kanyakumari fishing village received Rs. 12.56 lakhs as annual average family income. In Colachel and Thoothur, it comes to Rs. 18.75
lakhs and Rs. 9.31 lakhs respectively. The annual average total revenue from operating fishing units was Rs. 113.08 lakhs in trawler units and Rs. 66.23 lakhs in gillnet units.

Gross Return (GR) is obtained by deducting operating cost from the total revenue. Net return (NR) is the net gain enjoyed for bearing the risks and organizing the other factors in running the fishing unit. It is derived by deducting the fixed cost from the gross return or by deducting total cost from total revenue. The gross return on average was Rs.17.66 lakhs in trawler units and Rs.11.42 lakhs in gillnet units. On average, the net return in trawler units are Rs.12.84 lakhs but Rs.6.61 lakhs in gillnets units. However, both trawler and gillnet units have almost similar pattern of distribution of costs and returns. Most of the items of fixed and operating cost per fishing effort are much less in gillnet units than the trawler units. But the revenue and returns of trawler units are even doubles the revenue and returns of gillnet units.

The average operating cost per unit man effort was Rs. 23847. In trawler units, it is more than the average and exceeded the operating cost of gillnet units. Despite the higher operating cost per unit man effort, the revenue and returns per unit man effort is much higher is the case of trawler units than the gillnet units.

The study on the capital efficiency indicated that the capital output ratio of trawler units is higher than the gillnet units. In trawler units the ratio of net return to capital is 0.3684, whereas in gillnet units it comes to 0.2246. The cost and returns ratio provides that the rate of net returns on operating cost is higher in
gillnet units (0.1915) than in trawler units (0.1712). Therefore it is claimed that both of the fishing units are economically viable and technically competent, but still, the trawler units are more efficient than the gillnet units.

Marine fishery infrastructure is a major determinant of the growth and prospects of the mechanised fishing industry. The fishing harbour at Chinnamuttom, in the east coast, is the only active fishing harbour in this district. Due to its limited capacity, it cannot provide berthing facility to all the existing number of mechanised crafts operating in this district. But this has made the mechanised crafts in and around the Kanyakumari fishing village have to settle down in their own villages of operation rather than migrating out. The natural harbour at Colachel lacks in minimum facilities required for a fishing harbour.

In the absence of fishing harbour, there will be delay in bringing the catch to the shore and catches that brought to the shore passes through many hands before reaching the auction centre in Colachel, Thoothur and its surrounding villages. The freshness of the catch cannot be maintained as per the expectations of the buyers and thus fetches a low price and low net returns.

Muttom boat repairing unit is the only unit providing repairing and maintenance services to the boats in the entire coast of Kanyakumari district. Only a few neighbouring villages of Muttom are benefited from the unit.

Multiday fishing boats need more than 3000 litres of pure water per trip to clean the gears and to meet the daily water requirements of crew members. The
water has to be purchased as most of the coastal villages in this district experience pure water shortage.

Cold storage helps the operators to maintain a stable income from fishing. It helps to store the surplus catch during glut and releasing them at the time of shortage. Kanyakumari district has very few cold storages which are run under private sector. Their inadequate holding capacity limits the progress of mechanised sector in this district.

Chilling process is followed in mechanised crafts to preserve the daily catch. On average, every multiday fishing boat carry 1800 kgs of ice blocks per trip. In all the selected villages the boat operators are getting regular supplies of ice in adequate quantities, but the high cost of ice imposed additional financial burden on the boat operators.

All the fish landing centres in this district are connected to a good system of road transport. Refrigerated vans, trucks, pickups etc., are operating frequent services to dispose a large part of the landings made by mechanised crafts.

Rough weather constitutes the most important natural barrier. High tides normally occur during July and August. Frequent cyclonic depressions and disturbances particularly between October and December cause interruptions to carry out their routine fishing operations. Besides, shallow continental shelf and vast stretches of rocky sea bed cause severe damages to the crafts and gears.
In marketing, the present study covered only the system followed in the sale of catch. Price spread or marketing efficiency is not part of the study. The landings are usually disposed by auctioning system. Actually the boat owners receive competitive price for their catch but the problem arises when there is a glut in the market or comparatively less number of bidders for fish lots. To solve this problem fish marketing through fishermen co-operatives should be encouraged. The Tamil Nadu Fisheries Development Corporation (TNFDC) should involve in buying and selling fish. The government should announce support price for certain species of fish to avoid price fluctuations.

Inadequate investment funds are a major constraint to the growth of mechanised fishing. In all the selected villages, the local money lenders and the friends as well as relatives are the main source of investment funds. The share of money lenders in the total credit advances was 28.6 per cent. The friends and relatives contribute the main part of lending investment funds (45 per cent) in the mechanised fishery sector of Kanyakumari district.

With regard to the utilization of borrowed funds, 72.7 per cent is utilized on purchasing and repairing of craft and gears, 13.3 per cent is used for investing on non fishing assets such as construction and maintenance of house building and purchase of house sites, 14 per cent is spent on to meet the household expenditure during lean season and to meet the medical and educational expenditures. Thus it is clear that the borrowed capital is mainly utilized for creating and maintaining fishing assets.
Almost all the boat operators have credit default. They have repaid mainly the interest accumulated on their borrowed capital. Mounting fuel cost and declining catch per unit effort are the major reasons for credit default.

The deep sea fishing policy of Government of India, 1991, has led the exploitation of Marine resources of India’s Exclusive Economic Zone by big entrepreneurs with foreign collaborators. This becomes a threat to the domestic mechanised craft operators.

The early stages of mechanisation resulted conflicts and clashes between the fisher groups in Kanyakumari district. Nowadays, the incidents of conflicts become less, but still tension exists among the coastal villagers with regard to the exploitation of marine fishery resources.

The Tamil Nadu Marine Fisheries Regulation Act, 1983, imposed severe restrictions on the operation of mechanised crafts. The various provisions of the act virtually have negative impact upon the prospects of mechanised fishery sector of Kanyakumari district.

Suggestions

With regard to the prospects of mechanised fishing, the boat operators held the view that the mechanisation has brought out several benefits to the marine fishery industry as well as the economy as a whole. The mechanisation initiative has increased the fish production, enhanced the earnings of fishermen, increases the fish exports, more quantity and improved varieties of catch from new fishing
grounds, increased fish consumption and provision of fish at competitive prices are some of the benefits enjoyed due to the mechanisation of fishery sector.

Despite all these benefits, the mechanisation has brought out certain negative impacts upon the marine fishing industry. Deterioration of marine wealth due to the use of over exploitative and destructive production techniques, entry of foreign deep sea fishing vessels, heavy operational and maintenance costs are some of the negative effects due to mechanisation of fishing. The gillnet unit owners have claimed to impose a total ban on trawling to protect the marine wealth from the dangers of over exploitation and exhaustion.

Constant and continuous efforts need be taken to reduce the cost of operation and maintenance of mechanised vessels. Fuel subsidy naturally reduces the operating cost as it is the prime item of operating cost in the mechanised fishing units.

Access facilities to unexplored fishing grounds by introducing special purpose vessels and specially designed fishing gears.

The fisheries department should take initiatives in the establishment of resource centres and provide information to vessel operators regarding fish shoal locations.

Government has to plan the implementation of quota system on the rare species targeted by the mechanised vessels. This may impose some kind of control over the exploitation of scarce marine resources.
The development of marine fishery and marketing infrastructure is the need of the hour for enhancing the production and export of fish. Suitable fishery management policy should be implemented to address the conflicting issues such as exploitation and exhaustion of marine fishery resources.

Special Protection Force to be set up to protect the domestic marine resources from the encroachment of foreign fishing vessels and to safeguard the seamen from the dangers of turbulent deep sea.

Absence of fishing harbour in most part of this region makes the mechanised boat operators to depend more upon the traditional craft operators to carry out the routine fishing operations. Moreover, there will be delay in bringing the catch to the auction centre. Since the catches brought to the shore passes through many hands, the freshness of the catch cannot be reasonably maintained to the expectation of the buyers and then fetches a low price. Recently, Government of Tamil Nadu took initiatives in the building up of three small size fishing harbours along the Kanyakumari west coast.

Only a few fishing villages around Muttom are benefitted from the boat repairing unit of Kanyakumari district. Additional boat repairing unit should be established to serve the needs of the mechanised boats in the Thoothur region.

The influence of money lenders or commission agents is insignificant in the marketing of fish. But the problem arises when there is excess supply in the market or a situation of extremely less number of bidders for fish lot. Government
should announce minimum support price for certain varieties of fish to avoid price fluctuations and ensure a stable level of income to the boat operators.

A few private sector cold storages have been established to cater the current needs of the entire mechanised fishing industry in Kanyakumari district. Building up of more cold storages with sufficient capacity naturally attract more people to invest on mechanised fishing units. Co-operative sector can be encouraged in the setting up and maintenance of cold storages.

Since there is shortage in the supply of ice, procuring ice is too costly in Kanyakumari district. It is suggested that new ice factories should be established under public sector to ensure the regular supply of ice at a subsidised price.

A special fund can be created to provide lean season grant to cover up the minimum operating costs of mechanised crafts.

The complicated legal formalities and procedures involved in investment credit should be replaced with easy credit policy. Moreover, adequate amount of credit on time is the most essential requirement of the progress of the mechanised fishery sector. Subsidy linked credit might relive the boat operators from credit default.

The restrictions imposed by the local authorities on the operation of mechanised boats have to be relaxed. The mechanised boat operators of Chinnamuttom and Kanyakumari fishing villages are demanding the
implementation of multiday fishing operations. This would help the boat operators to reduce the fuel cost.

At present, the various provisions of the Marine Fisheries Regulation Act differ between the Maritime States and the Union Territories. The boat operators of Kanyakumari district demanded the enactment of a uniform Marine Fisheries Regulation Act throughout the Indian sub-continent.

The new deep sea fishing policy of Government of India should be reviewed. No foreign fishing vessels should be permitted to encroach upon the marine resources within the Exclusive Economic Zone of the Indian Sub-continent.

**Conclusion**

The ultimate aim of uplifting the socio economic status of households in the coastal villages of Kanyakumari district is achieved through the development of mechanised fishery sector with its backward and forward linkages which contribute further diversification and strengthening of the marine fishery economy of Kanyakumari district. The observed facts on the socio-economic features indicated that the boat owner households enjoy with a better standard of living compared to the other sections in the fishermen community. The details pertaining to cost and returns, indicate that the gillnet units are operated with lower costs whereas; the trawler units earn much higher net returns and thus it is found that the mechanised craft-gear combination is economically viable and technologically efficient method of fishing in the marine fishery sector of
Kanyakumari district. But it does not mean that every boat owner enjoys a net return. The weaker owners found it difficult to withstand against the strains posed by the nature and pattern of functioning of the mechanised fishing industry in this district.

An increase in the number and duration of fishing trips reduce the total revenue of trawler units. This implies that the law of diminishing returns already sets in the fishing grounds of trawler units. Yet, there are possibilities to increase the fish production and net returns of fishing units by exploiting the unutilised or underutilised marine fishery potentials. The trawler units have to locate their fishing grounds in the far and deeper waters of the Exclusive Economic Zone (EEZ) along the Kanyakumari coast. The study further indicates that the additional number of fishing trips and extension in the duration of fishing trips significantly increases the total revenue of the gillnet units. This means that still there are possibilities of intensive fishing and further exploitation of the underexploited fishing grounds of gillnet units along the west coast of Kanyakumari district.

A technologically efficient fishing method may not always bring economic efficiency. In other words, an increase in productivity in quantity terms may not be reflected in terms of money value. Difficulty of operating trawlers without a harbour and absence of large scale fish exporting companies in the district took most of the mechanised boats of Kanyakumari district to the other parts of the country. Therefore, the benefits of technological efficiency cannot be enjoyed if
the infrastructure and marketing facilities have not improved in par with improvement in technology.

The analysis reveals that the mechanised fishing industry of Kanyakumari district is mainly depending upon the Marine fishery infrastructure and marketing facilities. Well equipped fishing harbours and efficient marketing infrastructures coupled with regional based fishery management policy would help to achieve maximum efficiency in fish production and optimum utilization of marine fishery resources within sustainable limit. Therefore, it is concluded that the prospects of mechanised fishing are bright in Kanyakumari district. There are some weaknesses and threats; still, there are opportunities to overcome the weaknesses and threats through Government intervention and community participation.