

## EXECUTIVE SUMMARY

Karnataka, India's eighth largest state covers an area of 1,91,791 square km and accounts for 5.83 per cent of the total geographical area of the country (measured at 3,288,000 km<sup>2</sup>). Coastal ecosystem of Karnataka is a mosaic of monsoon wetlands, beaches and mountains, some as high as 2000 meters, stretched along its 300 km long shoreline. More than 75 per cent of the commercial fish catch is dependent on estuaries for part of their life cycle (Bhatta & Bhat 1998). Sand bars have been developed in most of the estuaries. Karnataka has a monsoon tropical climate with bulk of rainfall being received during southwest monsoon period. All these natural phenomena create conducive conditions that attract fish and other marine organisms to inshore waters. A shallow continental shelf, wet lands and mangroves provide rich breeding and feeding grounds for fish and other marine species (Nandakumar & Nayak 2010). Coastal Karnataka has 191 marine fishing villages spread over the three districts which make it one fishing village, each covering about 1.6 km of the coastal line on an average. In addition to marine fisheries, coastal Karnataka also has a large potential for brackish water fisheries. Marine fish production from Karnataka coast has shown considerable variation over the years. Fisheries are a sunrise sector of this state. It emerged as an important commercial activity during 80s from subsistence, supplementary status. The economic importance of the fisheries sector to the economy may be identified under three main areas: (1) as a source of animal protein for human consumption (2) as a source of income and employment, and (3) as a source of foreign exchange earnings (Bhatta, Sagarad & Rao 2000). Till late 1950s fishing operations were largely of traditional, non-mechanised, small scale and subsistence nature. Gears such as *rampani*<sup>1</sup> (*giant shore-seine*), *kai-rampani*<sup>2</sup> (*mini shore-seine*) *bisana* (throwing conical nets), and *patte-bale*<sup>3</sup> (*encircling gillnet*), were prominently used in harvesting only pelagic species. Fisheries gained momentum with the onset of post-independence economic planning in India (Kurien 1991). The planned marine fisheries development had multifaceted objectives such as, increasing the fish harvest, improving the socio-economic conditions of fisher folk, increasing export earnings and generating new employment opportunities. These objectives were achieved through the State initiated mechanisation by introducing two shrimp trawlers (12 ft length with Yanmar engine) in 1957-1958. At present two types of trawlers are operating in Karnataka coast *i.e.*, single day trawlers with a size of 30-32 feet over-all-length (OAL) and multiday trawl boats with OAL > 32 feet. Single day trawlers operate in inshore waters and their main catch composition consists of soles, penaeid prawns and croakers. Whereas, multiday trawlers operates in deep sea waters up to 300 m depth and their main catch consists of ribbonfish, cuttlefish, squids, pink perch, cephalopods, carangids, lizard fish etc. The landmark in the development of Karnataka marine fisheries is the introduction of purse-seines in 1975-76. Karnataka was the first state in the country to introduce purse-seiners. This increased the fishing capacity to the capture-

fisheries sector and resulted in over exploitation of marine resources. The number of purse-seiners increased from 2 in 1975-76 to 232 in 2012-2013. By 2012-'13, there were about 2825 mechanized boats (232 purse seiners, 2593 trawlers (including gillnetters), 6335 motorized boats and 6923 traditional boats operating in the State. The OAL of purse-seiners increased from 43 feet to 60 feet. This resulted in 'Blue-Revolution' off the Karnataka coast by increasing the annual average catch from 85,000 tones prior to 1976 to about 160,000 after 1976 (Jayaraj 1983). The fish production during 2012-13 was 3.57 lakh metric tons and 0.96 lakh metric tons of marine products worth Rs.854.00 crore were exported from the State. The marine Fish production has increased from 0.53 million tonnes in 1950-51 to 3.78 million tons in 2013 -14. And subsequently by year 2014-15 and 2015-16 the state marine fish production has increased to 3.89 million tons and 4.11 million tons respectively.

In order to improve the income realization by mechanized fishing vessels and with a view to encourage fishermen to go to deeper waters for fishing, the Government felt the need to subsidize the diesel being used by these fishing vessels. Hence, in 1985-86 the State Government introduced a scheme of providing subsidy on diesel purchased for the fishing purpose by exempting the State sales tax which was about Rs.0.52 per liter at that time. Subsequently, on the demand from the fisher folk, the Government decided to do away with back end subsidy and instead provided "*at source sales tax exemption*" for the diesel being purchased for mechanized fishing boats.

In order to cater to these needs, the Government of Karnataka facilitated the establishment of government approved diesel outlets (bunks) in fishing harbours and fish landing centers. These bunks are supplied with sales tax exempted diesel from Oil Companies based on the permission letter issued by the fisheries department. At present the sales tax exemption on the diesel comes to around Rs.8 per litre. The scheme of subsidized diesel and kerosene for the fishing boats started in the year 1985-86 to improve the economic realization by mechanised / motorised fishing vessels and with a view to encourage fishermen to go to deeper waters for fishing. Presently the subsidy on the liter of diesel is around Rs.8/- per liter with a maximum quantity of 90,000 liters per annum and kerosene subsidy is Rs.40/- per liter with a maximum quantity of 2250 liters.

The finance department annually releases certain quantity of State sales tax exempted diesel under Section 5 of Karnataka Sales Tax Act 1957. To this effect every year, a Government order is issued by the finance Department. Presently 30 approved Diesel Bunks are located in fishing harbours and fish landing centres. These bunks are procuring diesel from Indian Oil Corporation (IOC), Bharat Petroleum Company (BPC) and Hindustan Petroleum (HP) oil companies and supplying the same to mechanised fishing vessels as per guidelines issued by the department of Fisheries. As per Karnataka

Marine Fisheries Act 1986, the benefit of tax exemption is given to boats having fishing license and identity cards. The diesel is procured from any of the department approved bunks. Sales tax free diesel can be procured by Karnataka Fisheries Development Corporation, District Co-operation Fish Marketing Federation and Primary Fisheries Co-operative Societies from the 30 department approved bunks only. The diesel is distributed to boats as per maximum limit fixed based on the engine capacity (HP) of the boats.

Similarly subsidized kerosene is provided for fitting motorized ~~engs~~ the engine capacity varying between 9.8 to 20 HP. There are 4514 motorized boats of which 990 are there in Uttara Kannada 2610 in Dakshina Kannada and 914 in Udupi districts. The kerosene is given to these boats at the rate of Rs. 16.50 per ltr. This is distributed through 25 fair price shops and other institutions. The number of motorised boats operating in the district is identified by conducting a joint inspection by officers of the Department of Fisheries and Food and Civil Supplies Department. After this, each motorised boat is provided with a permit for procuring subsidized kerosene through PDS.

A detailed evaluation of the this tax exempted diesel and kerosene to fishing boats in Karnataka scheme was needed to assess the need and utility of the scheme, the process of its implementation, the organizational and administrative problems and loopholes if any, the economics and operational efficiency of mechanised boats after the implementation, whether the Scheme has impacted on employment and earnings and levels of the fisher folk, need of continuance of the Scheme and modifications recommended and the overall impact of the Scheme on the marine fish production and fish population of Karnataka.

The evaluation study was conducted in three districts of Udupi, Uttara Kannada and Dakshina Kannada. Data was gathered from at least 10% of the boat owners (in mechanized this should be boat power wise) in each of the three districts under the Scheme through structured questionnaire schedules. In addition discussions and personal interviews of Scheme benefitted boat owners, boat owners not covered under the Scheme, discreet personal interviews of departmental staff, retired employees and knowledgeable Scientists of Central Marine Fisheries Research Institute and/ or the Fisheries College in Cochin (one office is in Karwar) and Mangalore respectively were carried out. Inputs were also taken from Academicians of the department of Marine Biology, Karnatak University, based in Karwar. The team in all total interviewed 325 beneficiaries of mechanised fishing boats, 600 beneficiaries of motorized fishing boats and 100 people from the non-fishermen, fish merchants, fish labourers and retired government officials and academicians from the different fisheries institutions. Primary and secondary data obtained from all the 3 districts by above mentioned data collection

strategies were analysed and results were categorized as per requirements expected from the objectives of the evaluation.

It was observed that the >130 HP boats spends 3.5 times more expenditure and average catch per effort (trip) on diesel compared to <70HP boats. Thus diesel consumption is distributed towards higher fishing capacity boats. The average return per effort is also highest for higher capacity boats due to higher fishing intensity. It was also observed in Udupi harbour that it has reported maximum number of boats involved in harvesting 'others' which are procured by the fish meal/oil plants which could have formed rich fish biodiversity and is feed for other commercial fisheries. 61 fishing boats in Malpe and Mangalore have reported that they mostly harvest others indicating the vulnerability of the destruction of marine biodiversity here where maximum number of high speed boats operates. It was reported that the HP which determines speed and fishing intensity has increased enormously during the recent years. The annual quantity of diesel drawn was 6376 liters per unit which was highest in Malpe with 7860 liters per unit. The results indicate that the fishing boats on an average enjoy an average fuel subsidy of Rs 51,000. The overall fuel subsidy per fishing season would be around Rs. 432,432 per season/boat with an average of 244 fishing days fuel subsidy per fishing day would be around 1772 per boat.

The study reported that most of the beneficiaries who responded were aware of subsidized fuel supply being used in their fishing vessels. Renewal of fishing license was known to most of the fishers. Further, majority of the fishers have accepted that the direct benefit transfer of subsidy amount to bank account is a good modification to the scheme. Overall, fishers' assessment of the quantity supplied was positive and there were very few of complaints. Distribution of subsidized fuel to unregistered boats and/or non-fishing purposes was not reported by sampled fishers. It is interesting to note that most fishers agreed that subsidy has led to increase in income but not necessarily catch. Obviously, everybody agrees with the need for continuation of the subsidy scheme. All of them reported that fuel subsidy has led to increase in income, employment and also to some extent catch and hence it should be continued beyond 20 years.

Similarly it was observed that the average quantity of subsidized kerosene drawn varies between 234-263 liters/month. The total consumption of kerosene for one season per boat varies between 2094-2340 liters which is equal to Rs.90, 000 /subsidy/season/boat. Interestingly the consumption of kerosene per trip decreases from 83 to 54 liters/trip as HP increases from 10 to 20. The storage capacity of boats decreases from 125 liters for  $\leq 10$  HP boats to 88 liters for  $\geq 20$  HP engines. Similarly the average catch per effort also decreases from 52kgs to 43 kg as the HP increases. Similarly the average gross return decreases substantially when the HP increases from  $\leq 10$  to  $\geq 20$  HP. No beneficiary reported selling of any surplus kerosene to other users. Most of them wanted the existing scheme to

continue in the same form with some minor modifications. The diversion of subsidized kerosene for non-fishing purpose was not reported by any beneficiary. 8% of them observed that they are aware of subsidy component in buying the kerosene. All beneficiaries unanimously expressed that the present subsidy limit is not enough. Further, they agree that the direct benefit transfer of subsidy amount is good and should be continued. Unlike in the case of diesel a substantial part of kerosene was supplied manually. Almost everybody agrees that the supply of subsidized kerosene has helped in increasing fish production.

It was observed that the gross subsidy was 7.65 lakhs for >130HP boats whereas it was only 2.30 lakhs for smaller boats. Thus, the subsidy component is higher for richer fishing units. Around 60% of total subsidy is diverted to the >130HP boats which consume more diesel due to higher fishing capacity. These boats are also highly capital intensive with an average invest of Rs. 90.00 lakhs on capital and Rs. 1.70 crore on operational expense per year. It is suggested that the present method of providing subsidy is counterproductive and regressive. Since it encourages excessive fishing capacity and involves destructive fishing practices. Hence, based on our field observations it is suggested that the rate of subsidy for every liter of fuel consumed by higher capacity engines could be reduced to maintain equity in the distribution and gradually the subsidy could be minimized.

In regards to the process of implementation of the scheme, it was observed that there is due compliance to the process of distribution of subsidized diesel and kerosene at all levels. In some of the diesel bunks automation Instrument is provided by the Oil Companies to monitor the supply of diesel, quantity of diesel in the storage tank and the distribution of diesel to the fishing boats. This instrument is computer based and all the above mentioned parameters can be observed in finger tip. Further, these informations can be observed at their respective divisional or sub-divisional offices. It was observed by the team that this instrument is very useful to get the information on the diesel accurately.

The major recommendations based on various observations and interviews with the beneficiaries would be that the subsidy on diesel to mechanized fishing boats is justifiable and need to be continued with more of supervision. Also in some of the diesel bunks automation Instrument is provided by the Oil Companies to monitor the supply of diesel, quantity of diesel in the storage tank and the distribution of diesel to the fishing boats. This instrument is computer based and all the above mentioned parameters can be observed in finger tip. Further, these informations can be observed at their respective divisional or sub-divisional offices. It is observed by the team that this instrument is very useful to get the information on the diesel accurately. The department may insist all the diesel outlets to install this instrument compulsorily. All the assistant directors of fisheries (grade-1) / grade-2) who are working in the coastal areas are entrusted with the supervision of the scheme and to

observe any loopholes in the implementation of the scheme by inspecting the concerned diesel bunks. It is observed that the assistant directors of fisheries are not getting sufficient time for the supervision as they have to implement other regular schemes of the department. It is therefore suggested to give additional hands or to fill up all the vacant posts of the assistant directors of fisheries in the coastal area so as to strengthen the supervision of this scheme. At present all the Fishing boats owned by family members are eligible for subsidized diesel. In the existing modalities of the scheme, there is no mention of one family-one subsidy. Government may think of introducing one family-one subsidy in the years to come.

With regards to the subsidized kerosene scheme the kerosene is distributed to the authorized outlets in the middle of the month and they have to distribute the same to the beneficiaries within 7-10 days. If the beneficiary is not able to collect the subsidised kerosene within such time due to any reasons, the quota allotted to such boat lapses. It is recommended to supply the subsidised kerosene to the authorised outlets in the beginning of the month and continue up to the last week of the month. (Up to 28th of the month).

The team after carrying out the evaluation of the distribution of tax exempted diesel and kerosene to the fishing boats were of the opinion that, these 2 schemes needs to be continued with the above modifications on the schemes. But additionally It is felt by the team that other measures like zonation of fishing, mesh size regulation, ban on bull trawling, catching cuttle fish by unnatural methods and other management measures are to be integrated for checking the over exploitation of fishery resources. Only subsidised diesel/kerosene alone will not stop the over exploitation of fishery resources.