5. SUMMARY

Elasmobranchs constitute about 4% of the marine fish landings of India. Shark is the main constituent of this fishery. Sharks are widely distributed along the west and east coasts of India and are available in all seasons although a peak is observed during December - January. At present in India sharks are mainly used for making dried meat and dried fins. Presently an organised effort for the utilization of this resource is not available. A good number of people are still reluctant to include shark meat in their regular diet. If proper attention is given, valuable fishery products can be produced from shark. While comparing to other bony fishes, the main difference is that the entire shark can be utilized economically in one way or other.

The present study is the result of work carried out for 5 years, during the period from April, 1983 to March 1988. The materials were collected from the catches of the Government of India vessels, operated along the south west coast of India and landed in the Integrated Fisheries Project, Cochin-16. The sharks were caught by different types of gears such as bottom trawls, pelagic trawls, long line etc. A number of species of sharks were landed during this period and three species were selected for the present study namely Scoliodon palasorra (Bleeker 1853, Grey shark), Carcharhinus limbatus (Valenciennes 1839, black tip shark) and Centrophorus granulosus (Bloch and Schneider 1801, Spiny shark).
The entire catches of shark landed at Integrated Fisheries Project were utilized for the production of various diversified fishery products like Dressed shark, Shark fillets and Salted dried sharks for domestic market. Products like Dried shark fins and Shark fin rays were also produced for the export market. In addition to this a lot of products like Dressed shark, Shark fillets, Battered and breaded fillets, Minced meat, Frozen fish cakes, Fish balls, Fish pickles, Smoked shark fillets, Smoked minced meat, Canned cooked and smoked shark meat and fish balls, Salted and dried shark, Shark liver oil, Dried shark fins, Shark fin-rays, Shark leather and silage were made from the above selected species.

During this study period the quantity of shark utilized was 2,55,942 kg out of which 9.71% used for the production of Dressed shark; 36.21% for the production of Fillets; 49.09% converted into Dried shark and 4.99% was domestically marketed as whole form. Besides this 526 kg of dried shark fin and 289.25 kg of shark fin rays were produced.

Dressed shark was made from small sized sharks of the species _S. palasorrai and the yield percentage of the product varied from 60.93% to 66.66% and the product was mainly marketed in the frozen form. Shark fillets were made from all the three species and yield percentage of fillets varied according to the species and size. Battered and Breaded Fillet was produced during the study period. Production of minced meat was also carried out using a Bone separator.
Fish cakes and fish balls were made from the minced meat and marketed in frozen form. The minced meat from shark, mixed with other fish meat in different percentage for the production of both fish cakes and fish balls and the quality of the product was as good as the products made from other lean fishes. Pickles were made from the minced meat and the shelf life of the product was observed.

The effect of smoking of shark fillets and minced meat at different temperature were also studied during this period.

Canning of cooked shark meat, smoked fillets and fish balls were carried out in media like brine, vegetable oil, tomato sauce etc. The quality of smoked fillets in vegetable oil was found superior to other canned products from shark meat.

Dried shark meat were prepared from all the three species after salting. The yield varied depending on the size and moisture content in the final product. The yield percentage of shark liver oil was found highest for C. granulosus with high squalene content.

Fins collected from C. limbatus were dried and preserved. The dried fin as well as fin rays were marketed according to the demand of the products. Shark fin rays is one of the most important marine products from shark and is mainly exported to Singapore and Hongkong where it is used for making shark fin soup which is an internationally accepted marine delicacy.
Hides of _C. limbatus_ separated from the meat; salted and tanned. The leather obtained were found superior to other animal leather. The hides can be properly processed instead of discarding them as practiced in India.

The offals obtained in the shark processing was easy to convert into fish silage and further processed into poultry or cattle feed after mixing it with rice bran, tapioca or other suitable ingredients. It need only very less investment comparing with fish meal production and the silage made by the fishermen can be used by themselves for feeding their poultry and cattles.

During this study an attempt was also made to evaluate the commercial processing of shark resources and found feasible.