



FISH AND FISHERIES

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CRAB FATTENING - A MASSIVE POLLUTION SOURCE

Crab fattening - a traditional method of culturing water crabs into fleshy marketable size in 15 to 30 days period. In this method the crab farmers fix pens in running narrow waters with the help of iron meshes and nylon meshes. Gravity flowing creeks are exclusively selected for this purpose for assuring a good water exchange. Water crabs are fed with trashed finfish meat and groundnut oil cake in large amounts without any feed consumption controls. They are ever fed 10% of total weight of their body weight and there are no controls over survival rate, feeding regimes, FCR etc. by which unutilised fish meal decays into organic pollution which pollutes 1 to 1½ km of that particular body. It is noticed by a fishy bad smell prevailing on that source. This pollutant catalyses bacterial infections in crustaceans.

(e.g.) This may be noticed by the following incident. In Ponneri Taluk a crab farmer got heavy loss in culture diversion of crab to shrimp which indicated the mass pollution in that particular crab pens. This is also a considerable problem against the shrimp survival. So the feeding technology of crab fattening has to be streamlined now, otherwise we will be facing some problems in ecobased sustainable aquaculture development. For taking diversion from this slowly emerging pollution, the Aquaculture Societies should assure the easy availability of floating/sinking feed pellets as in European and Southeast Asian countries.

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TECHNOLOGY FOR MARINE FISH HATCHERY*

Considering the depleting wild marine fish stocks and increasing market demand for fisheries products, several countries are trying to promote farming of commercially valued marine food fish. Access to a reliable marine fish hatchery technology is important for the success of marine fish farming industry as well as for the expansion of aquaculture ventures.

Recent advances in the hatchery technology has made it possible to breed and produce fry of several commercially important marine fish species. Conventional hatcheries produce fry of groupers, sea breams, sea bass, milkfish, mullet, flounder turbot, mahimahi, tilapia etc. The marine groupers are the most desired species for aquaculture in Southeast Asia and in the Middle East.

Hatchery technology begins with spawning the desired fish species under controlled conditions. From a technological point, type of spawning method could be categorized as natural spawning, induced maturation and spawning and spontaneous spawning through physiological, nutritional, ecological and endocrinological manipulations.

Since various fish species require different types of live food organisms for initial feeding, successful hatchery production depends on the ability to produce adequate quantities of nutritionally enriched desired live feeds and larval tank management practices. Production of the microalga *Nannochloropsis* and the 'S' and 'L' type rotifers are the critical components for larviculture. Some hatcheries use oyster trochophores for first feeding the larvae. *Artemia* nauplii are also extensively used. Nutritional enrichment of live feed with docosahexaenoic acid (DHA) is mandatory to enhance the fish larval growth rate and survival. Application of intensive automated live food production systems using the principles of chemostats is recommended.

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Abstract of the paper presented at the Seminar on 'Fisheries - a Multimillion Dollar Industry' held during August 17-19, 1995 at Madras.

DAVIDSON THOMAS



Many of us have taken 'Fisheries' as our career and fully engaged in R & D and restricting our activities from 'Lab to land' and came out as Technocrats, Scientists and Administrators. But seldom we see a person like DAVIDSON THOMAS who has shown aptitude in sea going and spent the prime of his life in international waters.

After graduation in 1946, Davidson Thomas took Diploma in Fisheries Science and joined the Madras Fisheries Department in 1949 as Inspector of Fisheries (Deepsea Fishing). Seeing his interest and enthusiasm the Department has sent him for training in M.T. *Taiyo Maru 17* for 6 months. On his return he was posted as Inspector of Fisheries (Tellicherry) where attempts were made with motorised vessels in fishing. One such vessel M.V. *Ajit* sank in a gale off Adiramapattinam and Thomas along with his local crew salvaged the same with no mechanical aid. For this act of bravery he was awarded by the Department 3 red entry service records and two advance increments.

In 1953, the Chief of Fishing Gear section of UN/FAO, Rome, Mr. Kristjohnson visited Tellicherry and studied the activities with sea trips. Proposals for developing inshore fishing were drawn with Thomas and Mr. Illugason, the reputed FAO Master fisherman from Iceland. Thomas was assigned as counterpart/understudy to Mr. Illugason for 4 years. They both operated individual vessels side by side and exploratory fishing with shrimp trawls, high opening 'Vinge' trawls, set gill nets and long lines was done.

From February 1958, Thomas was awarded the FAO Fellowship for 8 months for studies in 'Improved fishing gear and methods' in Iceland USA, Germany, Denmark and Italy. In Iceland he took a certificate course at Fisheries Navigation School, Reykjavik. As skipper of the fishing vessels he had an extensive fishing trips in Iceland off Akranes and Hafnarfirdi. In the USA he studied shrimp trawl and trawl door design and construction along with practical shrimp fishing at Pascagoula and Biloxi (Gulf of Mexico). Fishing gear materials and midwater trawls were studied in Germany with study of echosounders in fish finding. At Skagen, Denmark practical construction of high opening 'Vinge'

trawls was studied with practical fishing in pair trawling. 'Light fishing' technique was studied in Italy. On return Thomas was posted to Rameswarm Inshore Fishing Station as Superintendent.

From 1962 April, Thomas was deputed by the Government to serve FAO and his first assignment was in Lake Chad, the large shallow lake in north Nigeria. As the FAO Master fisherman the terms of reference for Thomas was to introduce effective fishing gear and improved methods of fish processing acceptable in Nigeria. This was 140 miles from the nearest town, Maiduguri, where a hospital and shops were available and took 10-14 hours in 4-wheel drive vehicles through the Savana Country. Often herds of wild elephants, wild dogs, pouches of 'Heyena', ostriches and herds of Guinea fowl were seen enroute. The lake was filled with 'papyrus' reeds and the 'Buduma' fishermen who lived on the floating reeds used bundles of 'papyrus' as fishing raft which disintegrated in 8-10 weeks. Unbaited hooks and harpoons were the fishing gear used. Wooden boats to satand the rough were suggested. Set gillnets and baited hooks also were found to be effective. Often 'Nile perch' 4'6" long and weighing around 60 lbs. were landed. After training, a batch of 2 fishermen were given 3 nets (25 fathom long and 2 fathom deep) and on the average they landed 200 lbs. of fish per day. 'Fish smoking kilns were built for demonstration and good improved pieces of smoked fish (Banda) acceptable to the people was produced. Soon the Government built a number of smoking kilns (about 30) along the Nigerian shores of the lake. Dry salted fish was not acceptable. Thomas states: 'Apart from rich fish wealth, this lake also harboured a good number of 'Hippopotamus'. The sandy shore of the lake was full of cobras, vipers and large scorpions. Tents and huts were the accommodation. This lake is also a large bird sanctuary during winter when millions of different kinds of water birds were seen'. FAO had issued an 'inflatable' rubber raft and out-board engines for the use of Thomas. On completion of the project, Thomas was moved to the coastal survey project at Lagos. Survey of existing fishing gear, vessels and fish catches were made. 6 Spanish trawlers of 60-70' size operated the Mediteranian trawls, when occasionally a few pieces of large prawns were found

in the catches. Hence Thomas tested selected grounds with a 60' 'semi-balloon shrimp trawl' for about a month from one of the vessels when about 250 lbs. of large prawns (20-25 count) were landed each day. The USAID fish marketing project sent one consignment of this prawn headless (tails) frozen and in standard packs in cartoons labelled as 'Product of Nigeria'. This created lot of interest among 'shrimp fishing' countries. and soon double-rig shrimpers from Gulf of Mexico, Japan and Baharain arrived at Lagos and a large shrimp trawling industry with export started. Same time FAO asked Thomas to test fish off Ghana with his shrimp trawls. Using the Ghana project vessel, selecting suitable grounds with 'try net' and sounding lead in 11-12 fathoms depth Thomas made two hauls with the 60' shrimp trawl which landed 920 lbs. of shrimp *Metapenaeus* sp. A commercial shrimp fishing started here, where it was belied earlier that no shrimp was available. A training course for 16 teachers of the Fishermen Training Centre in Africa was organised by FAO for 3 months at Freetown and Thomas was sent as the Instructor in fishing gear and methods. At this time (1965) Thomas was promoted as the Fishing Gear Technologist and the 'Programme Appointment' (Permanency) was granted to him. Hence he resigned his Madras Government post. During 1966 Thomas was sent with a team of FAO consultants and a few senior Fisheries Officers from developing countries to the USSR for 6 weeks to study fishermen training curricula. The Nigeria Project awarded 8 fellowships for training and upgrading the skills of Fisheries Department Officers. The Project ended by July 1968. After this, Thomas was sent as the Director of the FAO/SPFC (South Pacific Fisheries Council). Training programme for 4 months for the Micronesians, Melonesians and Polynesians at Korar and Palau (US Trust Territories) which consisted of around 300 coral islands, most of them uninhabited. During this period Thomas also participated in two project review missions for short periods in Indonesia and Zambia. A fishermen training project was negotiated for Malaysia and Thomas was promoted and sent there as the Project Manager. An exploratory fishing project for the Kingdom of Tonga on the 'Date Line' became operational from 1976 for 2 years. Thomas was made the Project Manager there. Thomas made the following observations: "Often during the winter months fishing trips 'hump back' whales used to follow the boat playing around and brushing the boat gently. This created lot of fun though initially we were scared much. Tongans are very fond of raw fish. They used to cut fresh fish pieces and wash in sea water and eat. However, at their homes, very fresh fish, cleaned free of slime and blood were marinated for some two hours with coconut milk, lime and salt.

It is very tasty and you don't feel that the fish is uncooked raw and Japanese raw fish 'Sashimi' which is marinated with soya sauce is not tasty as this. Tongans are fun loving and happy go lucky. They believe in 'take it policy'. They are very friendly and never think of taking vengeance". This project ended in 1977. As requested by the UNDP/FAO Project for the Emirates (UAE) Thomas was deputed to Dubai for study of the existing fishing gear and suggest improvements on a consultancy for 3 months. Thomas travelled throughout the Emirates and Baharain studying the fishing gear in use. The most important gear was the underwater trap, the GURGUR of wire mesh which was very large and unwieldy for use. Collapsible traps were suggested. Another popular gear was the encircling gillnet. It was suggested that the hanging ratio be changed with the ground rope 5% longer. The crew were all from Kerala (India). The fishing officers of the Emirates and Baharain were very cooperative and helpful.

Subsequently Thomas was given 3 short term consultancies for periods of about 3 months each. First in Egypt, it was to prepare a project for fishermen training. This project proposal did not come off due to lack of financial support from donors. Three months consultancy in Ethiopia was given along with two more experts to plan the rebuilding of the fishing industry along the Red Sea Coast which was destroyed in internal war. Subsequently, a consultancy was granted in Somalia as Advisor to the Minister of Fisheries. These were completed by April, 1984. By now he had made his request for premature retirement (18 months early) and happily retired from 31.12.1984, declining an assignment in Libya (Fishing Harbour project).

Thomas had served the FAO/UN for 23 years in various projects and countries in fishing gear development, exploratory fishing and fishermen training. He had worked in harmony supervising and coordinating the work of FAO specialists of different nationalities. He had also earned the reputation in FAO as one capable of working among various ethnic groups and in countries of Africa, Asia, Middle East, Far East and the South Pacific. Throughout the period of his FAO service, he had enjoyed the cooperation, support and friendly help from the senior FAO officials in Rome.

Though Nazareth was his playground during the childhood, Davidson Thomas is now happily settled with his family in St. Thomas Mount near Madras. He is hard working and jovial by nature. Even at this age of 71 he is very active. His experiences are wide and varied. This column is not enough to give full coverage. Only a catch in the net is given and not the entire stock of the ocean.

M.V.N.

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The annual subscription for 1996 - 1997 falls due on 1.4.96 with the beginning of the new year.

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Kindly note the annual election of office bearers for the year 1996-97 is due . As per Sec. 621 2(1) (2) (3). No member shall be allowed to be a candidate or vote at any election unless he/she. has paid his/her subscription in full.

M.V. NATARAJAN
Secretary

K. CHIDAMBARAM
Chairman

CONDOLENCE

The members of the Fisheries Technocrats Forum observed two minute silence during their monthly meeting on 10-2-96 to condole the death of Dr. C. V. KULKARNI, former Director of Fisheries, Maharashtra who passed away in early January, 1996.

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