



FISH & FISHERIES

NEWS LETTER OF THE FISHERIES TECHNOCRATS FORUM - MADRAS

No. 49 & 50
No. 51 & 52

July - Sept & Oct -Dec, 2006
Jan - Mar & Apr -June, 2007

LARGEST AQUARIUM IN CHICAGO, USA

World's largest indoor aquarium has been established in the city of Chicago on the banks of great Michigan Lake. It has both freshwater and saltwater live fish exhibits, which is something of a first for an inland aquarium. At a later date, it acquired an Oceanarium and very recently a wild reef for tropical fish and corals. It is named as Shedd aquarium after its benefactor, John G. Shedd. He is a retired President of a retail supermarket called Marshall Field. The aquarium which was started 75 years ago in the year 1930 with a gift of \$3 million from Mr. Shedd and on completion, its cost stood at \$3.25 million. Initially Shedd Aquarium Society was formed, comprising of volunteer business and community leaders, which was responsible for its expansion, maintenance and operation.

At the start, it had 300 feet diameter, octagonal shaped building using white Georgian marble. The building has six galleries of tanks radiating from a central rotunda. The rotunda houses forty feet sunken tropical swamp. The swamp was replaced in 1971 with a Caribbean reef at a cost of \$12 million. In 1991, an addition of 1,70,000 sq.ft Oceanarium was added to house dolphins and whales. In 2003, a wild reef was built in an underground wing. It has an area of 27,000 sq. ft with 26 interconnected habitats.

In 2004, the building underwent another renovation. The roof of the buildings (144703 sq.ft) was covered by a material made from soybeans. Since the Michigan lake is butting on one side and the city on the other side, they are contemplating to build 1,80,000 sq. feet underground for more live exhibits and the estimated cost would be around \$65 million.

At present, the aquarium is housing around 21,000 animals representing 1,500 species. Oceanarium features Dolphin demonstrations, with an accommodation for 1,200 spectators. The aquarium has a research vessel stationed in Caribbean Ocean for 'refreshing' the collection. It employs 250 persons and 600 volunteers who help in various activities. When the aquarium was started, admissions was free with support from City Park District. Today, it operates on a budget of about \$38 million with Chicago Park district and other government entities contributing about 13 % of that amount. Now admissions, food sales and gift shop receipts fund about 65% and the rest is being raised from private sources. At present, the aquarium's endowment is around \$ 100 million but that principle is rarely tapped. The admission cost for a family of four \$78 (\$58 for city residents). As the attraction of tourists is very essential, there is constant effort to keep admission fees competitive. When the Oceanarium was first formed, salt water was shipped from the ocean via rail cars. Now it is making the ocean water on the site. Up to 1980,

three to five collection trips per year was undertaken by the research ship. Now it is enough to take a trip once in a year due to better care of animals, their breeding and maintenance of water quality. It had six sea otters and it is hoping to breed them in captivity.

The aquarium is a home to variety of spiders, birds, turtles, eels and morays. The management says that they are highlighting an eco-system and the whole food chain of that environment. All these particular animals have some connection to water (spiders need to drink and some fish eat the spiders). As per the management "there is a reason that these animals are here for education, research and entertainment. Animals in captivity are ambassadors for all other animals in the world. Pollution and over-fishing are the current major problems in marine and freshwater fisheries. When people watch these animals, especially dolphins and whales, they get a bigger picture of conservation. The aquarium has the responsibility not only to take care for the animals but also to teach people about animals and what future holds". The aquarium takes a recourse to modern technologies to care for the animals. A Queensland grouper underwent chemotherapy for a cancerous tumor in its head. A sea turtle which was brought to the aquarium after being hit by a boat off Florida was found to have a nickel blocking her throat. The nickel was removed by surgery. The popularity of Shedd Aquarium is growing day by day as more tourists having a glimpse of a whale of live animals.

P. MOHANAKRISHNAN

RETURNING THE BIG ONES TO KEEP THE FISHERIES HEALTHY

The general theory among people connected with fisheries is that "throw the little ones back". The idea is to enable the little ones to grow and breed at least once before being caught. The essence behind this theory is that the stock of population will get stabilized and will not dwindle. But an experiment conducted proved this theory wrong.

An experiment was conducted in Marine Sciences Research Centre at Stony Brook University, U.S.A. A batch of wild silversides (small, usually fast growing fish) were brought to laboratory in 1998. From this batch, six generations were raised, each time removing 90% from one group, the smallest 90% from another group and a random 90% from a third. By 2002, the experiment showed that killing off the largest fish has a dramatic effect. Individuals in that group were only about 70%, the average weight of their randomly harvested counterparts and they were only 55% the weight of survivors in the group where, only the largest individuals were spared. Because, the compared fish were of the same age, they could attribute the shrinkage to selection of genes for slower growth. Further, the slower growth came with a suit of deficiencies. Fifth and sixth generation fish revealed that members of large-harvested group were less willing to forage for food and less able to outwit predators. They also produced smaller and fewer eggs and lesser portion of those eggs grew into healthy offspring.

The study proved that how evolution can work against long term fitness of population and so against our interests. They have drawn the conclusion that letting some big fish along with the little ones is probably a smart strategy.

P. MOHANAKRISHNAN

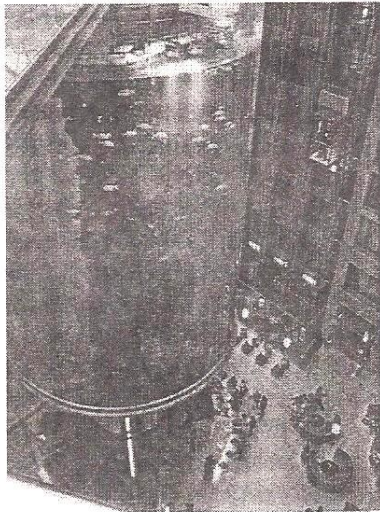
SEA WEED – A NEW DIMENSION FOR COASTAL LIVELIHOOD

In the recent issue of The Hindu of Kerala edition, there was a news item saying that Kerala has developed the potential to become a major supplier in the booming global market for seaweed extracts. Seaweeds have a wide application and their usage in food, pharmaceutical and chemical industries are significant. Recently commercial cultivation of the seaweed has been encouraged by Central Marine Fisheries Research Institute through a demonstration project, which would help Indian firms to substitute costly imported raw material. Unemployed youths from coastal village panchayats were selected to take up cultivation

of the red seaweed *Kappaphycus alvarezii*. This exotic species procured from the Philippines was known for its high yield. A pilot study had indicated that the species could be acclimatised for cultivation in the coastal waters off Vizhinjam. This project was designed to provide supplementary income for the poor families in the coastal belt, which would help in their economic uplift. The village panchayats were able to mobilise self-help groups (SHGs) and the project personnel is imparting training for SHGs. However, more than 7,000 families in the coastal areas of Tamil Nadu were already involved in red seaweed cultivation. Indigenous varieties of seaweed are also being cultivated on an experimental basis along the coast. People believe that a buy-back arrangement with industry could help the project to take off in a big way. Value-addition of the harvested seaweed would surely enhance the prospects of a bright livelihood for coastal communities.

A.GOKUL

THE WORLD'S LARGEST CYLINDRICAL AQUARIUM IN GERMANY



A 25-meters high cylindrical Aqua-Dom, the largest ever built aquarium is placed at the lobby of the Radisson SAS Hotel in Berlin, Germany. It is filled with about 900,000 liters of seawater and contains some 2600 fish of 56 species. Combined with a vast amount of

sandblasted glass, the giant Aqua-Dom gives a transparent-like feeling to the lobby. Guests and visitors are able to travel through the aquarium in a glass-enclosed elevator to reach a sight-seeing point and restaurant under the glass roof. Two full-time divers are responsible for the care and feeding of the fish and maintenance of the aquarium. Some of the interior rooms and suites look out over the atrium, offering a "ocean view" of the Aqua-Dom. The Aqua-Dom was opened in December 2003. It costs about 12.8 million euros (equivalent to Rs. 70.4 crores). The acrylic glass cylinder was constructed by the U.S. company Reynolds Polymer Technology. The outside cylinder was manufactured on-site from four pieces; the inside cylinder for the elevator was delivered in one piece. The Aqua-dom is the largest acrylic glass cylinder in the world, with a diameter of over 11 meters, built on a 9 meters tall concrete foundation.

M. SURENDRAN

COASTAL MANAGEMENT ZONE – A NEW DEBATE

As many as 37 groups, including fishermen's federations and unions demanded that the Government of India should implement the CRZ notification in its original 1991 form, until a new comprehensive legislation is enacted that satisfies the requirements of the fishing communities. Most of the educated fishermen considered the "Inundation" mentioned in the draft CMZ, may be a ploy to move coastal fishing communities from their existing traditional habitat away from the sea. The fishermen federations demanded that the interests of other communities traditionally depending on coastal resources for their livelihood should also be considered while enacting the new legislation. The demands of civil society groups state that all violations committed under the CRZ Notification 1991 be penalised according to the Environment Protection Act. According to them, the newly formed CMZ is a setback, which will completely nullify the protection to the coast gained by the 500 metres and 200 metres restrictions of the

CRZ and also will help commercialization of the coast.

The federations people argued that under the new CMZ, India may also violate the Convention on Biological Diversity, Ramsar Resolution and the 1995 FAO Code of Conduct for Responsible Fisheries. The National Fish workers Forum (NFF) has announced a nationwide agitation, alleging that the new law will threaten the marine environment and affect the livelihood security of thousands of fishermen. Scientists fear that a spurt in development activities in the coastal areas will threaten estuaries, salt marshes, lagoons, mangroves, mudflats, sand dunes and coral reefs. Fish workers organisations report that the Ministry had earlier proposed the demarcation of a vulnerability line to define the permissible limit for commercial activities. But there has been no clarification on how the line will be drawn. The overall voice of the fishermen federations and NGO's expressed that the draft law will pave the way for unsustainable developmental activities in large areas of the coastal zone. They contend that the shift in focus from regulation to management is an attempt to dilute the regulatory aspects of the 1991 notification. The inclusion of coastal zone to the existing 12 nautical miles territorial waters under the new concept may either advantageous or disadvantageous to the livelihoods of fishing communities, which will be realized only in future.

A. GOKUL

GHOST CRABS OF SANDY BEACHES

The sandy beaches are a well known sensor for biological as well as ecological disturbances. The ghost crabs act as an effective ecological indicator of the sandy beaches. Out of 8,100 km of the main land coast of India, the length of the sandy beach and dunes was estimated at 1465 km² and 2509 km². Generally, the Indian sandy beaches have swash zones excluding some areas in southeastern coast.

These beaches seem to provide an apparent outline on various disturbances in the offshore as well as onshore.

Ghost crabs are largely nocturnal feeder in nature. The nocturnal habitat, which reduces predation by visual predators like shore birds and gulls that might otherwise be capable of exerting considerable pressure on populations of these crabs. They do seldom leave their burrow during day light with their ability to change color to match the sand and thus they are not able to be seen by the predators.

They are found in the burrows in the inter-tidal zone of the beaches. The burrows dug by ghost crabs may be up to 1.3 m deep (4 feet). Their habits of periodically closing the burrow with sand and opening them during the hottest part of the day and of remaining within the burrow through the colder months provide sufficient protection from the climatic extremes that fully aquatic species rarely encounter. They possess interesting burrow zones. A distributional gradient based on crab age is typical for these zones, the younger crabs generally burrowing closer to the shore than older individuals.

In general the crabs can reach relatively large sizes of over 50 mm carapace width. They are omnivorous and mostly feed on animals such as small bivalve mollusks, crustaceans and fishes found in the inter-tidal region. There is also evidence that their prey include eggs and hatchlings of the marine turtles. In a recent study conducted in North Carolina, the "hardening" the shoreline by construction of seawalls and groins, demonstrated a clear impact, not only on the population of ghost crabs but also on the abundance of their principal prey items. The ghost crabs have long been considered as beach scavengers. However, The future research might include the ghost crabs as a probe to study the status of the sandy beaches.

A. GOKUL