Central Institute of Fisheries Education, Mumbai

10th Convocation

9 April 2011

Address by

Prof M S Swaminathan, FRS

I am happy to be here on an occasion when young women and men are taking their degrees from this nationally and internationally famous University. I am glad the rank holders will be deputed abroad for further specialization with support from the Tata Endowment Fund. I congratulate and thank the parents of those taking the Master's and Doctoral Degrees for their support and encouragement to their daughters and sons. I congratulate those taking their degrees today and complement you on your dedication to both science and to the welfare of the fisher communities. Your vision to become a global player in specialized human resource development in fisheries and be counted among the best for academic excellence is an inspiring

one. The challenge now is to convert this vision into practical accomplishment. I am confident that the outgoing alumni will do everything possible to help CIFE to reach greater heights of achievement in the research, education and out reach spheres. When I decided to transfer CIFE to ICAR in 1979, I had hoped that CIFE will become a Deemed-to-be- University soon. I am glad this happened ten years later. I congratulate the Vice Chancellor, Board of Management and Faculty on the high academic standards they have maintained.

Three years after the establishment of the CIFE University, a global conference was held at Rio de Janeiro, Brazil, for promoting environmentally sustainable development in all spheres of human activity. At this UN Conference on Environment and Development, generally referred to as the Earth Summit, an Agenda 21 was adopted to provide guidelines for mainstreaming ecology in all major research and development programmes. Among Agenda 21, pride of place has been given to the management of aquatic resources from

both the quantitative and qualitative aspects. 2012 marks the twentieth anniversary of the Rio conference. It will be useful for the faculty and scholars of CIFE to prepare a balance sheet indicating where we have succeeded and where we have failed in implementing Agenda 21 in the area of inland and marine fisheries, as well as integrated coastal zone management.

Lessons from the recent triple tragedy in Japan

Nearly twenty five percent of our populations live near coastal areas. The devastating earthquake and tsunami which affected parts of Japan on 11 March 2011 underline the importance of giving greater attention to enlarging the coping capacity of coastal communities to natural calamities. The Tohoku earthquake of a magnitude 9.0 in the Richter scale moved the Honshu Island by two to four meters. This is the fourth largest earthquake in the world. This triggered a 23 feet high tsunami. The Japanese are used to earthquakes and tsunamis. What was new this time is the impact of the tsunami on several nuclear power plants located in the Fukushima – Daiichi area. Mr

Naoto Kan, Prime Minister of Japan, recently remarked, “In the sixty five years after the end of the second world war, this is the toughest and most difficult crisis for Japan”. **The damage done to the nuclear power reactors emphasizes the fact that the power of nature could trump technology**. CIFE scientists and scholars should give thought to methods of enhancing the coping capacity of coastal communities to such mega-disasters. They should also develop a plan of action for promoting sustainable capture and culture fisheries both along the coast and in inland waters.

There are three important lessons we can learn from the Japanese experience. First, we should develop and introduce educational tools which can promote high synergy societies. Ms Nobuko Horibe of UNFPA has recently explained why the Japanese have the admirable capacity to withstand natural or manmade calamities. To quote her, “From Kindergarten to elementary school and onward, the performance of students is measured by how a group performs” (The Hindu, 27 March

2011). A group which performs very well is asked to help others so that all become equal in their capacity. **The Japanese system of early childhood education instills the habit of caring for others and helps to foster high social synergy.** This strengthens the coping capacity of the people in times of disasters as well as their ability to convert a calamity into an opportunity for greater progress. I hope CIFE will organize non-degree training programmes for fisher communities on methods of group cooperation. We should promote high synergy fishing communities.

A second lesson we should learn from the Japanese experience is that it is only through harmony with nature, we can minimize the damage arising from natural disasters. While watching the Television pictures of threats to the nuclear power plants caused by the titanic tsunami, my memory went back to 1989 when as the then President of the International Union for the Conservation of Nature and Natural Resources (IUCN), I had a discussion with Japanese scientists on the regeneration of

mangroves along the coasts in Japan. Some scientists belonging to the older generation recalled the beneficial role played by mangroves in reducing the fury of coastal storms and tsunamis. We then decided to establish with the help of UNESCO an International Society of Mangrove Ecosystems (ISME) in Okinawa, where once there were dense mangrove forests. I was the Founder President of ISME.

During the tsunami which affected Tamil Nadu and other southern states on December 26th 2004, the coastal communities observed that dense mangrove forests served as a speed-breaker, reducing the damage done. Dense mangrove forests reduce the fury of tidal waves. We therefore launched a programme both in India and Sri Lanka to plant mangrove and non-mangrove bio-shields.

There is now public concern about the safety of nuclear power plants located along the coast such as Kalpakkam and Kudankulam in Tamil Nadu. In my view, in addition to

appropriate steps in reactor design and engineering, we should promote bio-shields comprising mangrove and non-mangrove species in the coastal areas adjoining nuclear power plants. For this purpose, it may be worthwhile declaring such areas as Critically Vulnerable Coastal Areas (CRZ-1). This will help to plant and protect mangrove and non-mangrove bioshields, in addition to rejuvenating degraded mangrove wetlands.

Thirdly, while earthquakes and tsunamis are no strangers to the Japanese people, the new threat which has created the greatest fear is the damage done to nuclear power plants. Ever since nuclear power was harnessed after World War II, there have been three major accidents

- UK’s windscale fire of 1957
- Partial Meltdown at Three Mile Island, Pennsylvania, USA, 1979
- Radioactive plume drifting across Europe after the explosion at Chernobyl in Ukraine, 1986

The Fukushima – Daiichi disaster of 2011, which is the fourth most serious nuclear accident, has lead to a serious discussion on the establishment of nuclear power plants in seismically active areas. The global setback for nuclear energy, that is likely to follow the Fukushima tragedy, will probably encourage greater investment in alternate low carbon and non-carbon energy sources. However, Nuclear power is environmentally benign and hence we should continue to explore fail safe methods of nuclear power generation. Also, the Atomic Energy Regulatory Board (AERB) should be an autonomous one and should not be controlled by those whom the board has to regulate. Our Prime Minister has recently announced that AERB will be given complete autonomy and that it will be free from the control of the Atomic Energy Commission. It is only such autonomous regulatory mechanisms that can inspire public, political, professional and media confidence.

Agenda 21

Articles 17 and 18 of the Rio Agenda 21 relate to

- Protection of the oceans and coastal areas and the conservation and sustainable use of their living resources (Article 17)
- Protection of the quality and supply of fresh water resources; application of integrated approaches to the development, management and use of water resources (Article 18)

Both the above action points are important for sustainable fisheries. We should also harness modern technologies for helping our fisher communities. For example, mobile telephony is a transformational technology with reference to small scale fisheries. The Indian National Centre for Ocean Information Services (INCOIS) provides data on wave heights from different distances from the shoreline. Data are also available on the location of fish shoals. The M S Swaminathan Research Foundation (MSSRF) started in 2007, in partnership with Qualcomm, Tata Teleservices, Astute Technology System, and

Village Panchayats and Fishing Communities, a Fisher Friend Project to take relevant information to the fisher communities before they enter the sea in their small boats. MSSRF created a system of information flows whereby fishermen can gain access to fishing related information such as wave heights, weather forecasts, high potential fishing zones and market prices. This service has helped to revolutionize the lives and livelihoods of fisher communities. Induced breeding is another area where Indian fisheries scientists have made significant contributions.

I request the scholars who are taking the degrees today to develop more such transformational technologies. For this purpose, CIFE should also initiate an Inquiry-Based Instruction. The Journal *"Science"* has recently instituted a new prize to recognize contributions in the field of inquiry-based teaching. According to Dr Bruce Alberts, Editor-in-Chief, Science, "the new award has been stimulated by the fact that the world badly needs a revolution in science education – a revolution that must begin at the college level". CIFE can organize classes for fisher

communities on the objectives of the Coastal Regulation Zone Notification, 2011, which replaces the 1991 notification. Unlike the 1991 notification, the 2011 regulation takes into account both the seaward and landward sides of the coast. This will help to keep the coastal water free of pollution. The disposal of wastes and effluents into coastal water is a prohibited activity. Also for the first time, a separate draft Island Protection Zone Notification has been issued in the case of Andaman and Nicobar and Lakshadweep group of Islands. The provision under CRZ-1 has been strengthened in order to cover all ecologically sensitive areas, such as mangrove wetlands, corals and coral reefs, national parks, etc.

Gandhiji and Seawater as a social resource

2010 marked the 80th anniversary of the Salt Satyagraha launched by Mahatma Gandhi in 1930 at Dandi in Gujarat. Nearly, 97 percent of the world's water is sea water. By protesting against the imposition of a tax on salt manufacture, Gandhiji emphasized that sea water is a social resource. Water

will be one of the key limiting factors in food production in the coming decades. Hence, on the occasion of the 80th anniversary of the Dandi March, as well as a similar one organized by Shri C Rajagopalachari at Vedaranyam in Tamil Nadu, MSSRF organized a "**Sea Water Farming for Coastal Area Prosperity"** programme. The technology involves agro-forestry systems involving integrated tree-fish farming. Besides Mangroves, other salt tolerant trees and shrubs like *Salicornia, Atriplex, Sesuviun, Casuarina,* etc. can be cultivated along with fish ponds. In the Kuttanad area of Kerala, farmers have been cultivating rice at 2.6 meters below mean sea level for over a century. Rice-fish (either carps or giant prawn) farming system is now becoming popular in this area. **Thus, both sea water farming and below sea level farming are feasible.** The unique below sea level farming system of Kuttanad is being proposed for recognition under FAO's Globally Important Agricultural Heritage sites. Also, a **Genetic Garden of Halophytes** is being developed. Halophytes offer opportunities for converting sea

water into a valuable source for producing products of agricultural and human nutrition value.

A Fish for All Research and Training Centre has been established at Kaveripoompattinam in the Nagapattinam district of Tamil Nadu. This area was affected by the tsunami on December 26, 2004. At this centre, training is imparted in all aspects of fish capture, culture, processing and marketing. Food safety aspects receive particular attention in the training programme. Such capacity building centres based on concurrent attention to all links in the capture / culture to consumption chain are needed all over the country.

The 2010 collapse of the Bolivian fisheries is a wake-up call relating the potential impact of climate change on marine fisheries. Climate change led to the mass death of fish in rivers and in the Antarctic Ocean. An estimated 6 million fish and thousands of alligators, turtles and river dolphins perished due to a sudden change in water temperature. The water temperature

in Bolivian rivers is normally about 15°C. But last July the temperature fell to 4°C. It is not unlikely that the extreme weather conditions in July might have been related to El Nino-Southern Oscillation (Nature, Vol 467, 2 Sept 2010).

We can expect similar catrostophies more frequently in the future since extreme and unpredictable weather conditions are now becoming common. **CIFE scientists should develop an anticipatory research programme to checkmate the multiple adverse impact of unfavourable weather on capture and culture fisheries.**

I congratulate you for choosing CIFE for your studies and research. CIFE is at the cutting edge of technological progress in all areas of fisheries. 2010-20 has been declared by our Government as the **Decade of Innovation**. I hope you will explore new areas where there are opportunities for innovation. You can apply your mind to developing transformational technologies for enhancing the productivity, profitability and

sustainability of capture and culture fisheries. Above all, you can spread quality literacy among fisher families as well as among those involved in the post-harvest management of fishes.

Land is a shrinking resource for food production. Fortunately, we have vast oceans as well as rich inland water resources. This will help us to foster a **“fish for all and for ever”** movement. Conservation and sustainable and equitable use of fish genetic resources will be important for promoting climate-resilient fisheries. Low external input sustainable aquaculture (LEISA) will be important to avoid ground water pollution in both coastal and inland areas. Recombinant DNA technology offers opportunities for generating novel genetic combinations for facing the challenge of climate change and global warming. However, we need a large number of women and men trained in the biosafety and biosecurity aspects of genetic modification. We need an autonomous, professionally led National Biotechnology Regulatory Authority which inspires confidence

that the precautionary principle will be the bottom line of regulatory policies.

I am glad CIFE has initiated several non-degree training programmes. It would be useful to train one woman and one male member of every Panchayat as **Fish for All Warriors**. They should receive training in *codex alimentarius* standards of food safety, as well as in the techniques of sustainable fisheries.

The opportunities before you are as vast as the oceans. It is appropriate that the distinguished former Director of CIFE, Dr S Ayyappan is now heading the Indian Council of Agricultural Research. I am sure he will give concurrent attention to the terrestrial and aquatic components of food and nutrition security. I wish you all similar opportunities in your life. Always remember your humanity and try your best to make a difference for the better in the lives of the socially and economically under-privileged fisher communities. You have my best wishes.