CMFRI

Winter School on
Impact of Climate Change on Indian Marine Fisheries

Lecture Notes

Part 2

Compiled and Edited by

E. Vivekanandan and J. Jayasankar

Central Marine Fisheries Research Institute (CMFRI),
(*Indian Council of Agricultural Research*)
P.B. No. 1603, Cochin - 682 018, Kerala

(18.01.2008 - 07.02.2008)

SOME COMMENTS ON THE CLIMATE CHANGE IMPACTS ON KERALA FISHERIES SCENARIO

36

K. S. Purushan
College of Fisheries, Panangad, Kochi 682 506

Introduction

The climate change-induced global warming is a matter of grave concern to the administrators and people at large around the world. The available data on the increasing temperature caution an impending danger to the survival of all creatures and to the very existence of humankind. In this context, the outcome of a recent WTO workshop dealing with diversified impacts of climate change on the agricultural sector in tropical countries is worth noting (Rao and Alexander, 2007). Fishery scientists have warned that increase in temperature off Kerala will drastically alter the spawning and distribution of pelagic fish especially sardine, forcing it to migrate to higher latitudes thereby reducing the catch subsequently (Anon, 2007a). Climate warriors Al Gore and IPCC through their series of research and studies have come out with the observation that the situations of climatic upheaval, if continue in an imbalanced and unbridled manner, would exterminate all the animate things in the universe in course of time (Anon, 2007b). They have also sounded the alarm over global warming aimed at spreading awareness on how to counteract it (Anon, 2007c). Both have won Nobel Peace Prize for 2007 for their important findings and outstanding contributions towards guiding the globe towards healthy and acceptable directions.

UN Initiative

Understanding the seriousness of the situation, the heads of states of various nations under the auspices of UN assembled at Bali during December 2007 with a view to coming out with consensus on mitigating the continued impacts and ill-effects of global warming. Although the gravity of the problem was discussed in detail for 5 days together by the dignitaries, no acceptable formula could be evolved. However, some consensus has been arrived at for drawing a road map giving due regard to the conditions of the 1997 Kyoto protocol to 2009. This will help the developed and developing nations to make introspection and apply control on emitting greenhouse gases to the minimum. Such an attitude and approach unfolded after taking stock of the situation would help achieve the cardinal aspect of the common agenda of the Millennium Development Goals promising equal opportunities and quality living to every person in the universe.

GHG Impact

The uncontrolled developmental strategy followed by developed and developing nations resulted in the evolution and discharge of many a toxic gas to the atmosphere detrimental to the natural resources and human beings. The highly developed and advanced nations such as USA, Australia, England, some countries of European Union and Japan are immensely contributing to the havoc. Resultantly, the nature and life supporting systems are subjected to unprecedented pollution hazards. It is likely that the highly poisonous gases and other toxic substances as byproduct of industrialization pervade everywhere including the aquatic medium. The greenhouse gases such as carbon dioxide, methane, nitrous oxide, ozone, chloroflurocarbon and water vapour are increasing. This, in turn, trigger air temperature to rise beyond limits of tolerance. This may cause heavy rain, flooding, storms, cyclones and other calamities. Naturally, its repercussions on coastal and inland fisheries negating the livelihood and food security of millions would be inexplicable.

Earth crest changes

At times, the surprising climatic variations will bring the water columns abnormally down in the earth's crest leading to desertification on one hand and unusual saline incursion to the hinterland on the other. It may not be possible for the aquatic organisms to tide over such eventualities often ending in devastation and extinction. This will again be the causative factor for the distorted functioning of the

ecosystem and equilibrium imbalances challenging the existence of biodiversity and fish faunal assemblages. This will deprive the livelihood avenues of the fisherfolk and affect the food security of the masses.

Sea level rise

Now-a-days there is an apprehension that the trend of climatic changes might rise the sea level further at an average of 8 to 9 mm/year. If the same trend continues, it is possible that the sea level may rise 30 to 40 cm within 50 years. Such situations would be detrimental to the Indian peninsula in general and the geographically low-lying coastal state of Kerala in particular. The vulnerability of coastal systems due to the rapidly warming global environment is adequately highlighted pointing out the concerns of inundation of islands in Sunderbans (Anon, 2006). Sea erosion and inundations would destroy the coastal areas, fertile wetlands and habitation, forcing dislocation of the coastal population. The confluent situations will destroy the traditional paddy fields, and the 90,000 ha shrimp and fish ponds and farms in coastal Kerala. The negative impact on the livelihood and food security of the coastal populace of Kerala as well as on the rural economy would be severe.

Fisheries scenario

The annual marine fish production potential of Kerala is estimated at 9 lakh tonnes. However, over the last 5 years, an average of 6 lakh tonnes is realized every year in addition to 75,000 to 80,000 tonnes obtained from inland fishery sources (Harikumar and Rajendran, 2007). The biodiversity is very rich in Kerala, and the fishery landings comprise about 240 species including 60 species supporting major fisheries (Pillai and Ganga, 2007). There are 2.54 lakh active fisherfolk in Kerala in addition to an equal number engaged in ancillary fishery activities such as vending, processing and marketing. Thus, including their families, almost 3% of the population is fully dependent on this resource. Kerala earn foreign exchange worth Rs.1523.55 crores exporting 1,08,577 tonnes of seafood during 2006-07 (Anon, 2007d). Since Kerala's economy is largely dependent on fishery wealth, any undesirable impact on the resource would be damaging the progress of the State.

Mangrove bio-shield advantage

Fishing activities in 272 marine and 113 inland fishing villages are located in 200 gram panchayats, 1 municipality and 4 corporations of the state with a coastline of 590 km. Most of these are prone to severe sea erosion during monsoon when the vagaries of the sea, associated swells and tidal inundations cause peril to the coastal dwellings. After the tsunami havoc of December 2004, the rehabilitation of the affected fishers and coastal dwellers is still underway. It is suggested that establishment of mangrove bio-shield will be able to mitigate the damage and offer protection to the coastal belt (Purushan, 2005; Swaminathan, 2005, personal communication). In addition, its unusual capacity would enhance carbon sequestration process enormously reducing CO_2 level substantially. Furthermore, it would also contribute to the nutrients and detritus supply to the ambient medium enriching coastal fishery sustainably (Purushan, 1991).

Safeguarding coastal resource

There is a need to adopt precautionary measures to safeguard the coastal wealth and fishery resources from the ill effects of climatic changes. Even though global thinking and consensus are highly warranted towards combating this vital issue, regional and state level interventions are important to bring down the maladies. In the emerging Kerala scenario, it is high time to intervene on the unscientific developmental approaches of paddy field conversions and wetland reclamations for unproductive purposes. Similarly, the felling of forests and denudation of mangroves are rampant, which are tilting environmental equilibrium depriving the chances of resource tapping and livelihood means. It would be wise to protect the coastal belt establishing mangrove bioshields (Swaminathan, 2005; personal communication). Coastal afforestation using selected plant species giving emphasis to its amazing capacity to utilize greenhouse gases for carbon sequestration and other chemical processes are advisable. While conserving nature and natural resources, resorting an integrated coastal zone management strategy would be worthwhile to maintain environmental

equilibrium and ecosystem. Environment-friendly techniques orienting on organic farming need to be encouraged for enhanced production.

Conclusion

An appropriate strategy adopted for eco-restoration, coastal zone management and resource utilization alone would help Kerala Fisheries to successfully tide over the crisis arising out of climatic challenges. Thus, it is quite clear that sustainable development of Kerala fisheries will also be exclusively depending on the extent of control of green house gases impacting environmental balances. Let us be optimistic to evolve an acceptable strategy to help reap the palatable fishery resources sustainably for the welfare of posterity by taking advantage of the technological advancements and consensus, not too late.

Acknowledgement

I wish to express my sincere thanks to Shri K.R.Viswambharan IAS, Hon'ble Vice-Chancellor, Kerala Agricultural University, Vellanikkara, Thrissur for constant encouragement and kind guidance for preparing this paper. I am also grateful to all my colleagues at the College of Fisheries, Panangad, Kochi for their various help and assistance.

References

Anon, 2006. Coastal concerns, the Hindu, Sunday December 10, 2006.

Anon, 2007a. Global warming will drive out sardine off Kerala coast, say fishery scientists. The Hindu, Tuesday, June 12, 2007.

Anon, 2007b. Intergovernmental Panel on Climatic Change (IPCC) 4th assessment Report. 2007.

Anon, 2007c. Policy responses. The Hindu, Survey of the Environment, 2007.

Anon, 2007d. MPEDA, Cochin. Release on seafood exports during 2006-07.

Harikumar,G. and G.Rajendran, 2007. An overview of Kerala Fisheries with particular emphasis on aquaculture. In: Spear heading Quality Fish Processing, Integrated Fisheries Project Souvenir, 2007 pp 21-29.

Pillai,N.G.K. and U.Ganga, 2007. Pelagic Fisheries of India, In: Spearheading Quality Fish Processing. Integrated Fisheries Project Souvenir, 2007 pp 63-70.

Prasad Rao, GSLHV and D.Alexander, 2007. Proceedings of the WTO workshop: Impact of climate change on the agriculture sector in tropical countries, sponsored by WTO Cell, Dept. of Agriculture, Govt. of Kerala and organized by the Kerala Agricultural University, 14th December, 2007 p. 80.

Purushan,K.S. 1991. Prospects of fish production from mangrove ecosystems. "Fishing Chimes" Vol. II, No.3, June, 1991, pp 24-26.

Purushan,K.S. 2005. Impact of Tsunami on the coastal areas of Ernakulam district with special reference to the significance of mangroves at Puduveypu, Cochin, Kerala. In: International Conference on Tsunami Disaster Management and Coastal development, 2005, Madras Development Society, pp 101-106.