Brief Report of IDB-2012 Celebration and National Conference on "Marine Biodiversity"

organized by U.P. State Biodiversity Board, Lucknow on22nd May 2012

Uttar Pradesh State Biodiversity Board celebrated the International Day on Biological Diversity (IDB-2012) on 22nd May 2012 at Dr. Ram Manohar Lohia National Law University Campus, Lucknow. On this occasion, a National Conference on **"Marine Biodiversity"** was organized in which more than 350 delegates including various research organization/ institute, universities, officers from U.P. Forest Department and other state as well as NGO's etc participated. The aim of the conference was to create awareness about oceans and to inspire action to conserve marine wilderness and biodiversity. The conference was inaugurated by **Dr. Syed Azmal Khan**, Professor Emeritus, Centre of Advanced Study in Marine Biology, Annamalai University, Parangipettai, Tamil Nadu.

Shri J.S. Asthana, Principal Chief Conservator of Forests, U.P. welcomed all the dignitaries and delegates of the conference and delivered the welcome address. He said that presently, so far 2,30,000 species available in the marine ecosystem have been identified but still information on thousands of species is yet to be explored. He expressed the concern about increasing pollution load on seas and the need of the hour to spread the awareness in this regard..

Shri Rajesh Kumar Singh, Secretary (Environment and Forests) and Chairman, U.P.State Biodiversity Board, in his talk stated that this year, the International Day for Biological Diversity is being celebrated on the theme of "Marine Biodiversity". About 65% of grasses and habitats in coastal areas have almost been

destroyed. Approx. 80% of sea fish stock has either been exploited or over exploited. He further added that the aspect of biodiversity conservation should be introduced as a subject in study course of students of class VI to XII.

Dr. J.K. Jena, Director, National Bureau of Fish Genetic Resources, Lucknow delivered his guest lecture on marine fish biodiversity and its management. Giving the brief account of marine resources, he said that coast line of India extends upto 8129 km with EEZ as 2.02 million km^2 the fishery potential of our county is 3.9-4.2 million tones. He said that the Arabian Sea is known as one of the world's most productive oceanic region- upwelling, broad continental shelf area and wind-driven mixing. He informed that as far as aquatic diversity of India is concerned, there are 2508 fishes (7.4% of world species), 2934 crustaceans (7.4% of world species), 5070 molluscs (6.0% of world species), 765 echinoderms (10.9% of world species), 486 sponges, 842 cnidarians (8.4% of world species), 844 seaweeds (4.2% of world species). According to him, the major threats to the biological resources in aquatic ecosystems include: extensive use of non-selective gears, indiscriminate capture of juveniles and sub-adults, onboard discards of low value fishes, coastal pollution, and habitat alteration. Besides, climate change and natural calamities are posing serious threats to the marine biodiversity.

In his presentation, Dr. Jena also showed some beautiful slides on biodiversity utilization such as edible oyster, pearl oyster, mussels, echinoderms-sea cucumbers, corals, sponges, marine mammals sea turtles and sea weeds. He said that there are 844 species of seaweeds in Indian seas. The important species under farming include *Gracilaria edulis* and *Gelidiella arerosa* in beds of Gulf of Mannar, Gulf of Kutch and Lakshadweep islands. He further added that the Lakshadweep and Andaman group of islands, Gulf of Mannar, Palk Bay and Gulf of Kutch are known to be rich in ornamental fishes. Damsel fish, clown fish, wrasses, sturgeons, butterfly fish, moorish idol, squirrel fish, trigger fish, rabbit fish, parrot fish, goat fish and puffer fish are the major marine ornamentals represented by nearly 180 species. Throwing some light on conservation and management of fish genetic resources, he said that the majority of the genetic resources for food still come from the wild due to low domestication level in fisheries sector, environmental degradation has been causing damage to habitat and biodiversity, damage to biodiversity has been from loss of genetic diversity in populations and even to extinction of species.

He emphasized that conservation of fish genetic resources need holistic approaches-information on the biology, status of the target species as well as its habitat, documentation of such information becomes a prerequisite for suitable conservation strategies. *In situ* conservation of fish is useful where genetic diversity exists and also where wild forms are present. Establishment of Marine Parks is perhaps the best way for *in situ* conservation of marine finfish, shellfish and coral resources.

Speaking on this occasion, **Shri Pawan Kumar**, Secretary, U.P. State Biodiversity Board, Lucknow focused on the importance of the year 2012 for India as India is hosting COP-11 (Conference of Parties) of CBD in Hyderabad during this year. This year is also the 20th Anniversary of the Rio Conference on Environment and Development, 20th Anniversary of Convention on Biological Diversity (CBD) and the 40th Anniversary of the 1992 first UN Conference on the Human Environment held in Stockholm in 1972. Throwing the light on the connection between Aichi targets and marine biodiversity, he gave the detailed overview of Target 6, Target 10 and Target 11 of the Aichi targets. As far as the marine biodiversity is concerned, he emphasized on the diversity of genes, species and eco-system diversity followed by an introduction about phytoplankton and zooplankton. His presentation was also focused on the uses of marine biodiversity as food and medicines of tomorrow. During his talk, he drew the attraction of the audience towards the role of the ocean, which acts as carbon sink in balancing the carbon di-oxide emissions generated by us and also providing us minerals and many more advantages which are not been taken into account. While concluding his presentation, he expressed his concern to save marine biodiversity and discussed some important critical ocean issues to be taken care of *viz.* overfishing, pollution, ocean acidification, global warming, habitat loss, deep water drilling.

As a chief guest, **Dr. Syed Azmal Khan**, Professor Emeritus in his talk gave on account of potential values of biodiversity as food fodder, species and aromatics, fibres in textiles, fuel supply etc. He said that more animal phyla exist in oceans than on land. He informed the audience that of 35 marine phyla, 14 are endemic whereas rare phyla contain only few species. Focusing his talk on significance of sea food, he said that seafood is superior to all the other animal protein sources. He also described important marine habitat e.g. corals, mangroves, sea grass beds, seaweed stretches, rocks

and sand dunes. Dr. Khan also showed the beautiful slides of marine biodiversity such as coral, coral reefs, butterfly fishes, angel fishes, cardinal fishes and groupers etc. He further added that seventy percent of the modern medicines come from biodiversity. The sea is a source of many bacteria that are useful as antibiotics. Besides, the marine biodiversity provides 90% of oxygen in our atmosphere due to phytoplankton which spin food web in the sea and 30% carbon fixation in sea is due to them. Further, he highlighted the various benefits of seafood as a good source of vitamin complexes, prevention from Osteoporosis, bone diseases and cure of diabetes etc.

In the first technical session of the conference, **Shri Samir Sinha**, from Dehradun, gave a brief account of illegal life trade in marine biodiversity. He discussed the potential values of wild life trade and informed that the most wildlife trade is probably within national borders, but there is a large volume of wildlife in trade internationally. According to the United Nations Food and Agriculture Organization (FAO), more than $100 billion worth of fish were traded and nearly $200 billion timber in 2009, he added.

Mr. Sinha focused on different species of marine ecosystem which are being extensively used in trade such as:- Marine Turtles, Corals, Sea shells, Sea Horses, Sharks, Whale Sharks, Sea cucumbers, Live Reef Fish. He further, emphasized on the threats of some important marine species. According to him, Sharks are particularly vulnerable to overexploitation because of their biological characteristics of maturing late, having few young and being long-lived. Action on sharks by FAO, internationally treaties such as the CITES (Convention on International Trade in Endangered Species of Wild Fauna and Flora), regional fisheries management organizations (RFMOs) and shark catching countries and entities has been prompted by increasing international concern about shark stocks as many shark species are threatened and continuing to decline because of unregulated fishing. He suggested ten principles to be included in a National Plan of Action:

- Ensure all shark catches are sustainable
- Assess threats, protect critical habitats, and implement harvesting strategies consistent with the principles of biological sustainability and long-term economic use.
- Special attention to vulnerable or threatened sharks.
- Effective consultation involving all stakeholders in research, management and education initiatives within and between States.
- Minimize the unutilized incidental catches of sharks.
- Contribute to the protection of biodiversity and ecosystem structure and function.
- Minimize waste and discards from shark catches.
- Encourage full use of dead sharks.
- Facilitate improved species-specific catch and landings data and monitoring of shark catches.

- Facilitate the identification and reporting of species-specific biological and trade data.

Mr. Sinha also informed that the internet now has become a tool for the internet provides quick and extensive information to a vast and interconnected audience, many of which can be anonymous or use fake identities, with much of the exchange focused on commerce. Illegal wildlife trade is gaining ground on the internet, as evidence by the burgeoning number of websites where wildlife goods are offered, often with clearly suspect origins. A wide range of species are available and openly advertised on popular websites around the world, including those derived from 'high profile' animal species, such as elephants, rhinoceroses, the tiger and marine turtles. While wildlife law enforcement has made gains in policing physical markets for wildlife, the internet presents a set of new challenges via 'virtual' markets that have yet to be properly regulated.

Dr. K.C. Gopi, Senior Scientist, Zoological Survey of India, Indian Museum Complex, Kolkata delivered his guest lecture on "Coastal and Marine Biodiversity of India." He presented the status of marine environment of India incorporating 10 maritime states with 800 km stretch of coastal region having 2 island groups and 3 gulf areas. He reported that 2.66% (4,827 sq. km) of world's mangroves exist in India. Describing the various coastal and marine ecosystems, Dr. Gopi informed that mangrove ecosystem possesses 420 and 1862 species of flora and fauna respectively. Talking about the associated biodiversity in seagrass ecosystem, he said that there are 153 microalgae, 359 macroalgae, 178 invertebrates live as epiphytes and as associated organisms, fishes. About 340 animals feed on seagrasses, green turtles partially feed on seagrasses. Besides, 844 species of seaweeds he also exist in marine ecosystem of India. Further, he added that estimated total biodiversity of the world is 3-10 million in which only 1.7 million species have been identified where as total marine species in the world are estimated to be 3 lakhs out of which about 80,000 (3.12%) species have been identified so far. India contributes 5.33% (15,000 spp.) of the world's estimated marine species.

Dr. Gopi said that 2577 spp (8% of the world spp) of protozoans are known form Indian seas. Of the seven protozoan phyla, one viz. Labyrinthomorpha has not yet been reported from India. During his presentation, Dr. Gopi also gave an account of distribution of coral reefs in India, diversity of crustacea (2430) mollusca (3370 spp) echinoderms (765 spp), insects and arachinds (12 spp), fishes (2546 spp), marine birds (250+species), marine mammals (25 species) etc. Expressing concern about the human threats, he said that population explosion, poverty and illiteracy, overexploitation illegal mining/poaching of coral, sand etc, pollution, global climate change, alien

invasive species are the major threats to marine biodiversity, Besides, turbidly and sedimentation also poses serious threats to inhabitation of marine flora and fauna. He further added that sincere efforts should be made to extend awareness through Govt. museums, forest department, ZSI, BSI, CMFRI, Universities, NGO's, navy and coast guard etc. regarding conservation of marine and coastal ecosystems and sustainable use of marine resources.

Dr Alok Saxena, Addl. Director, Indira Gandhi National Forestry Academy, Dehradun spoke on Marine Diversity in India conservation and Management issues (with special reference to A & N islands). He stated that sea waters cover about 70% of Earth's surface and account for 99% of volume known to sustain life. The total number of recorded marine species (both plants and animals) is less than that of terrestrial habitats mainly because marine diversity has not been fully understood due to logistic constraints in explorations and collection of specimen. Nearly all phyla are found to occur in the sea while only about half of the total number of phyla is represented by land animals. 21 phyla are exclusive marine. Similarly, marine plant life forms also show greater survival strategy.

Focusing on India's rich marine biodiversity he said that coastal waters along East and West Coast and also around two island groups have a plethora of marine species. Marine floral diversity includes 844 species of marine alga (sea weeds) belonging to 217 genera, 14 species of sea grasses and 69 species of mangroves. Marine faunal diversity includes 451 species of sponges,>400 species of corals, >2900 species of crustacean, 3370 species of marine mollusks, > 200 species of bryozoans,765 species of echinoderm, 47 species of tunicates, more than 1300 marine fishes, 26 species of sea snakes, 5 species of sea turtles and 30 species of marine mammals including dugong, dolphins, whales etc. In addition a wide variety of sea birds can be observed around the coast.

Talking about the mangrove ecosystem in particular, he said that mangroves are salt tolerant forest ecosystems found mainly in tropical and sub-tropical inter-tidal regions of the world. They are trees or shrubs that have the common trait of growing in shallow and muddy salt water or brackish water, especially along quiet shorelines and in estuaries. They exhibit remarkable capacity of salt water tolerance. Mangroves protect shoreline from the action of waves, storms and cyclones, thus prevent coastal erosion. They provide shelter and breeding grounds to a wide variety of marine life forms and also act as nursery to juveniles and larvae of many marine animals. They also play important role in the economy of people living around the coastal areas by providing wide variety of goods and services including wood, fuel and support for fishing, aquaculture and tourism.

Focusing on island ecosystems, he told those island ecosystems are fragile, small size islands are more fragile. Small size islands are more fragile as they are highly susceptible to minor ecological changes and prone to greater exposure to waves and winds. Some unique features of island biodiversity are: endemism, gigantism and also dwarfism and abundance, he added. The major problems of island biodiversity are: invasive alien species, tourism development, climate change and variability, natural disasters, Overexploitation and unsustainable uses and pollution and waste disposal.

He further said that extinction rate of species in islands are very high. Of the 724 species of animals and plants known to have gone extinct, 351 species were island species. Only 4 species of marine mammals and a limpet have gone extinct from the vast ocean.The main causes of extinction include agriculture, hunting, introduction of exotics, burning of savannahs and endemism.. While concluding his talk, Dr. Saxena suggested that for the effective conservation and management of biological diversity of A&N islands, some major issues like: endemism, invasive alien species-Deer, Elephants, influx of population, tourism, encroachment, sand mining etc. should be very well addressed and taken care of.

Dr. Dhruv Sen Singh, Department of Geology, University of Lucknow delivered his talk on "Climate Change, Global Warming and Marine Biodiversity.".The planet earth is also diversified and consists of various continents and oceans. Our nation India is the classical example of diversification in terms of geography, language, caste, religion etc. India hosts 2 biodiversity hotspots; the Western Ghats and the Himalayas. These hotspots have numerous endemic species. Expressing the views on marine biodiversity,

Dr. Singh said that marine organisms play a crucial role in almost all biogeochemical processes that sustain the biosphere, and provide a variety of products (goods) and functions (services) which are essential to humankind's well-being. He opined that climate change is natural but pollution is anthropogenic. The conservation of natural things will sustain the biodiversity. He shared his experiences of his Arctic expedition and presented a different opinion on climate change. He concluded his lecture by saying that we should think and act to preserve the natural resources without which we cannot survive, so that we can handover our generation a neat, clean and green earth.

Dr. S. Balachandran, Deputy Director, Bombay Natural History Society, Mumbai delivered his guest lecture on "Avian diversity in coastal wetlands of India and their conservation needs". He described the role of coastal birds in the ecosystem as: recycling the nutrients back to the ecosystem, enriching the nutrients through guano deposition and enhance the fisheries, scavenging by feeding on the fishery wastes and feeding harmful insects-vector control.

He told that there are 25 wetlands in India identified as Ramsar Sites out of which one belongs to Uttar Pradesh. So far in U.P., there are 20 potential Ramsar sites with diversified flora and fauna. Talking about the water birds in coastal ecosystem, he informed about the number of shore birds (58), ducks (20), terns (21), gulls (10) and flamingos (2) in coastal habitats. He also gave a brief account of important migratory species and their numbers in the wetlands of Tamil Nadu. Presenting the scenario of threatened birds, he told that out of critically endangered species of world (181), India possesses 9, endangered species of world (351), India has 12 and out of 674 world's vulnerable species, there are 59 species in India itself. Talking about the conservation issues and major threats to the coastal birds, he spoke that less of coastal birds habitat due to degradation of coastal mudflats and conversion into saltpans, mangrove plantation, aquaculture, weed invasion, mismanagement, disturbances to shoreline due to construction of port and unsustainable exploitation and disturbance to birds by fishermen. He further added that the conservation strategies should be focused on inventory of coastal bird habitats, and their linkages with other wetlands, awareness programme for fishermen and professional bird trappers on the significance of conservation of wetlands and their habitats, co-ordination among the Central Asian Flyway countries, documentation of site specific threats and their impact, law enforcement to control poaching. The major challenges for the conservation of coastal birds include: estimation of national species-wise waterbird population through a network of birdwatchers (professional and amateurs), rehabilitation of professional bird trappers to protect a few critically endangered and vulnerable species from extinction and impact of climate change on the migratory pattern of coastal birds.

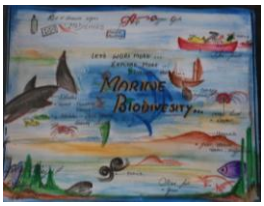
He suggested that there are good opportunities in the field of conservation of coastal birds such as: remote sensing and geographical information system (GIS) to analyze the

loss/degradation of intertidal areas and changes in water bird population, Systematic studies on the ecology of intertidal zone with reference to coastal birds. Analysis of long term data on migratory water bird population available for the selected wetlands (Point Calimere, Chilika and Gulf of Mannar) can be analyzed to understand the impact of climate change on the migratory pattern.

Dr Ved Mohan Lal Jaiswal from the National Ayuvedic Institute, Jaipur spoke on the importance of pearls, red coral, conch shell, oysters, cuttle fish bone, Cowries in ayurvedic medicine.

In the inaugural session, a souvenir on the theme of the conference was also released. It carried twenty two articles on marine biodiversity in 180 pages. Besides, U.P. State Biodiversity Board had celebrated marine biodiversity day on may 14th 2012 by holding different competitions such as poster competition on **"Uses of Marine Biodiversity"**, quiz competition on **"Marine Biodiversity"** and power point competitions on **"Illegal Trade in Marine Biodiversity"** with the help of Lucknow University, Zoology Department of the Regional Science City, Aliganj Lucknow. The prize distribution of different competitions was also carried out by the chief guest. The winners of the quiz competition were : Dhruv Dixit, Abhinav Pradeep and Nilesh Gupta. The winners of power point competition on *"Illegal Trade in Marine Biodiversity"* were: Vishnu Gupta, Kastubh Tandon, Pragati Yadav and Levin Roy where as the prize winners of poster competition on *"Uses of Marine Biodiversity"* were: Avani Vikram Singh, Vishal Verma, Umama Fatima and Vishakha Chaudhary and that of essay competition include: Shehil Srivastava and Charu Singh.

Result of Poster Competition

Sl No	Name of Student	Name of School	Rank	Posters
1	Avani Vikram Singh	Central Academy Sr. Sec School, Indira Nagar Lucknow	Ist	
2	Vishal Verma	Bright Land College, Lucknow	IInd	
3	Umama Fatima	Central Academy Sr. Sec School, Sect-9, Indira Nagar Lucknow	IIIrd	
4	Vishakha Chaudhary	Central Academy Sr. Sec School, Sect-9, Indira Nagar Lucknow	Consolation