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Biodiversity issues in the trade of Wildlife fauna and Flora-The way forward in the Indian context

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Introduction

Biodiversity is defined as the variability among living organisms from all sources including iteralia terrestrial, marine and other aquatic systems and the ecological complexes of which they are part (CBD). It means the variability of biological resources from genes to ecosystems. Three major components of this diversity are species diversity, ecosystem diversity and genetic diversity. A clear distinction has to be made between biological diversity and biological resources. A biological resource is a given example of a gene, species or ecosystem. From the definition it may be clear that biodiversity is a complex because of diversity is multidimensional and involves several components. The CBD seeks the goal of (i) the conservation of biological diversity (ii) sustainable use of its components (iii) the fair and equitable sharing of the benefits arising from the use of genetic resources. Determining the priorities for conservation of the biological resources, a thorough knowledge about diversity is essential.

Fishes and marine organisms in the ecosystem provide number of ecosystem goods and services to humans. Fish serve as food, medicine, ornamental purposes and used for recreational purpose also. The fauna and flora of marine ecosystems provides services such as water and air purification, seed dispersal, flood control, shoreline protection, nutrient cycling, waste decomposition and transformation. Ecosystem services are directly related to biodiversity present in the natural system. The abundance or depletion of a species from the system eliminates the ecosystem services that species provides.

Marine Biodiversity of India

India is blessed with vast regions of mangroves along the coast of West Bengal, Orissa, Andhrapradesh, Tamilnadu, Maharashtra, Gujarat and the Andaman islands with a total area of about 682000 ha. Coral reefs are found in the Gulf of Kutch along the Maharashtra coast, Kerala coast, in the Gulf of Mannar, Palk Bay, the Wadge Bank, the Tamilnadu coast and around the Andaman and Lakshadweep islands. These regions support very rich fauna and flora and constitute rich and varied floral and faunal assemblages. The coastal areas all along the country's coastline are rich in biodiversity. Most of these regions face grave threats due to increasing human intervention characterized by pollution, deforestation. indiscriminate exploitation, dredging quarrying and other activities\ leading

to environmental degradation, which in turn affects biodiversity. After the 1992 Rio UN Conference on Environment and Development (UNCED), increasing attention is being paid to protect biodiversity all over the world. The ability to address the needs of biodiversity conservation and protection depends largely on the knowledge of taxonomy of the flora and the fauna constituting the biodiversity the species interactions and ecology. In order to achieve improved returns while protecting the environment, a suitable policy needs to be formulated to exploit the resources on sustainable levels, to extract the drugs indigenously, basically for domestic use and for limited export. There is a natural urge for intensive exploitation of exportable commodities, but the country cannot lose sight of the need to protect biodiversity and meet domestic requirements in its bid to increase foreign exchange earnings.

The Government of India has brought into force a number of laws for conservation of living organisms and their habitats. There are several species of sponges and gorgonids occurring along the Indian coast which yields chemical compounds of economic importance. Indian Wild life Protection Act, 1972 with its subsequent amendments accords the protection to all the marine mammals, five species of marine turtles, 50 species of molluscs, ten species of elasmobarnchs, all species of seahorses, holothurians, gorgonids and corals. Various Marine Fisheries Acts (MFRA) were enacted by the maritime states of the country under a government of India order in 1979 aims to safeguard the marine resources through craft and gear regulation and licensing of fishing activity. Also the state governments impose ban on trawling lasting two months during monsoon to protect spawners and juveniles.

International trade of Wildlife

International trade of wildlife is estimated to be worth billions of dollars which involves live animals, plants and a vast array of wild life products derived from them. Some of the animal and plants are heavily exploited for the high trade in them, faces natural problem of habitat loss, depletion of population leads to extinction of the species. Some of the species are not endangered now, but existence of an agreement to ensure the sustainability of the trade is important to protect these resources for the future generations. The WTO and other agreements increase the international trade of many biological resources including the fishery resources during the last decade. At the same time there are several international organizations and conventions which control the international trade of vulnerable and endangered species to avoid biodiversity loss which ends in the extinction of the species. Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) is an international agreement between government and it aims to ensure the international trade in species of wild animals and plants dose not threat the survival.

As the trade in wild species cross borders between countries, the effort to regulate it requires international co-operation and CITES was formed for such co-operation. CITES was formed as a result of resolution adopted in 1963 at a meeting of members of IUCN (International Union for the Conservation of the Nature). On 1 July 1975 CITES entered in force and it has become one of the largest conservation agreements with membership of 175 countries. CITES is essentially an international agreement to which countries adhere voluntarily. States have agreed to be bound by the convention are known as parties for implementing the convention and it does not take the place of national laws. It provides a frame work to be respected by each party which has to adopt its own domestic legislation to ensure that CITES is implemented at the National level.

How CITES works

CITES works by controlling the international trade in specimens of selected species to certain controls. All export, import, re-export and introduction through a system of licensing. Each party of the convention must designate Management Authorities for licensing system and Scientific Authorities to advise them on the effects of trade on status of the species. The species covered by CITES are listed in three Appendices according to the degree of protection they need. About 35000 species were listed under the three appendices of CITES (Table 1).

Appendix I: Includes the species threatened with extinction. Trade in specimens of these species is permitted only in exceptional circumstances.
Appendix II: Includes species not necessarily threatened with extinction, but in which trade must be controlled in order to avoid utilization in compatible with their survival.
Appendix III: This Appendix contains species that are protected in at least one country, which has asked other, CITES parties for assistance in controlling trade.
The Conference of Parties (CoP) which is the supreme decision-making body of the convention and comprises all the member countries. They have agreed in resolution on a set of biological and trade criteria to help determine whether a species should be included in the Appendices I or II or III. Parties submit proposals based on those criteria to amend these two appendices. Those amendment proposals are dismissed and then submitted to vote. A specimen of CITE –listed species may be imported or exploited (re-exploited) from a country party to the convention only if the appropriate export/import permit has been obtained and presented for clearance at the part of entry or exit. There are some variations of requirements from one country to another and it is always necessary to check as the national laws that may be strict, but basic condition that apply for appendices I, II and III.

The CITES Species

About 5000 species of animals and 29000 species of plants are protected by CITES against overexploitation through international trade. The species are grouped in the appendices according to how threatened they are in international trade. They include some whole groups, such as primates, cetaceans (whales, dolphins and porpoises), sea turtles, parrots, corals, fishes (Table 2) and orchids. But in some cases only subspecies or geographically separate population of species is listed. Any type of wild plants or animal may be included in the list of species protected by CITES and the range of wildlife species included in the Appendices extends from leeches to lion and from pine trees to pitcher plants. Organism like bears and whales are the better known examples of CITE species and most numerous groups include many less popular plants, mussels, frogs, corals and sea cucumbers (Table 3).

Non-Detriment Findings

CITES scientific Authorities of exporting countries and sometimes also from importing countries are continually challenged to determine whether a particular export will be detrimental to the survival of a species and define which information and parameters are relevant to determine this. Hence it is important to provide some basic criteria and guidelines, and well documented methodologies to facilitate the formulation of Non-Detrimental Findings (NDF) to make more complete and scientifically sound information are required to implement the convention.

NDF for the European Eel

The European eel (Anguilla anguilla) showed decline from the late 19th century due to overfishing, migration obstacles, turbine mortalities, persistent pollutants, fluctuations in ocean currents and general decrease in accessible growing areas. The eel has now become red listed as CR (critically endangered) internationally since 2008. It was listed in Appendix II species by CITES from March 2009.

Back ground information on the taxa needed for NDF are

1. Biological data
2. Species management within the country for which case study is being presented
3. Utilisation and trade for range state for which case study is being presented.

It includes all aspects of distribution, biological characteristics, population and conservation status. Data on life history characteristics of the species, habitat types, role of species in its ecosystem, global population size, global and national conservation status and main threats within the states are essential for NDF. Species management aspects like history of management, purpose of management, restoration measures and harvest details also needed for better NDF (Table 4).

After concluding an initial NDF during 2008 it was decided that trade within EU will not influenced directly by CITES listing but to be allowed to export to third countries i.e. outside E U, or between non-EU countries on NDF has to be found – a scientifically based permit stating that the specimens was legally obtained and that export will not be detrimental to the survival of the species. Detailed data on the population of *Anguilla anguilla* are scarce today and European Union regulation demands much more data to be collected not only on biology and trends but also concerning fishing efforts and trade.

Biological characteristics: Basics of life history characteristics indicate the likely sensitivity of a species to harvest. For example the K-selected species with a high intrinsic rate of increase are likely to be less risk from harvest than R- selected species which mature slowly and have low reproductive rates.

Ecological adaptability: Ecological adaptability indicates the likely sensitivity to harvest and encompasses factors such as the species breadth of habitat use, dietary breadth and environmental tolerance. These factors are divided into the broad categories of generalists and specialist. Generalist can switch prey or habitat types relatively easily and are likely to be less affected by disturbances in their range than specialists occupy a narrow ecological niche. A specialist with a low level of ecological adaptability is somewhat more likely to be negatively impacted by harvest for the trade than generalist. For example, a given predator population at the top of food chain is likely to be more sensitive to harvest than a given herbivorous population lower in the food chain.

Dispersal efficiency: Species which have mechanism that ensure a wide dispersal of individuals during some part of their life history may be less susceptible to effects of harvest than similar species. Large number of marine organisms depends on the dispersal of large number of widely distributed planktonic larvae and so many are able to re-colonise habitats from which the more sedentary adults have been overfished.

Interaction with humans: The tolerance of a species to human activity may indicate its likely sensitivity to effects of harvest. Species mostly tolerant of human intervention are also likely to be least affected by the harvest. Pests, which people have difficulty in eradicating and commercial species that benefit from the spread of human

induced environments such as agricultural are likely to be least sensitive to harvest. For example modified habitats in oil palm plantations in Indonesia support much higher populations of rodent prey and consequently of blood pythons than an equivalent natural habitat.

National status: The pattern of distribution of a species provides some indication of a species sensitivity to harvest. Wide spread species with a continuous distributions at the national level are likely to be less sensitive to harvest. Population fragmentations may leads to sub-populations, adapted to a specialized habitat are not viable for effective harvest. Species occur in a few locations at the national level could be particularly at risk from unmanaged harvest.

Harvest management: The total harvest of the population at the national level must be estimated assessing both unmanaged and illegal off-trade. Illegal harvest some assessment has to make to get an idea about illegal trade-off.

CITES in India

International trade in all wild fauna and flora in general, and the species covered under CITES is controlled jointly through the Wild life (Protection) Act 1972, Amendment Act, 2002, the Foreign Trade (Development regulation) Act 1992, the Foreign Trade Policy of Government of India and Customs Act, 1962. The Director of Wildlife Preservation, Government of India is the Management Authority for CITES in India. Import of animals and their parts and products for zoological parks and circuses or for research may be permitted subject to the provisions CITES and on the recommendations of the Chief Wildlife Warden of the States and Union Territories under license from Director General of Foreign Trade (DGFT). Import of wild animals as pests in the personal baggage of a passenger is also subject to the provisions of CITES in accordance with the Ministry of Commerce's rules. All imports and exports of wild animals including marine species and plants are permitted only through the Customs points at Mumbai, Kolkata, New Delhi, Chennai, Cochin, Amristar and Tuticorin according to the rules (Table 5). Two essential conditions governing the import and export of Wildlife and the derivatives are (i) compliance with the provisions of CITES (ii) inspection of the consignments by the Regional Deputy Directors of Wildlife Preservation at the Customs points. In case of items covered under CITES, an endorsement is made on the relevant CITES export permit. All marine species that have been included in the Schedules of the Wild Life (Protection) Act, 1972 are not permitted for export. All Holothurians are included in the Schedule 1 of Wild Life (Protection) Act, 1972.

Authorities of CITES

India is a signatory to CITES since 1976. The Additional Director General (Wildlife) cum Director, Wildlife Preservation, MOEF, Government of India is the Managing Authority, CITES India. Scientific authorities deal with the CITES related matter in the Country are Directors of zoological, botanical, marine and wildlife Institutes of India. Considering the seriousness of organized wildlife crime having an inter-state and international ramification and illegal trade of the Wildlife and products, the Wildlife Crime Control Bureau was created in 2007 under the provisions of the Wildlife Protection Act 1972. The Wildlife Crime Control Bureau, Head quarters at New Delhi and regional offices at New Delhi, Kolkata, Mumbai, and Chennai. The enforcement of CITES provisions is presently being carried out by the Customs officials and Regional Deputy Directors, Wildlife Crime Control Bureau through the Customs Act, 1962 at the point of import/export and by the State Wildlife Departments headed by Chief Wildlife Wardens under Wildlife (Protection) Act, 1972.

Table 31. 1 Number of species and subspecies included in the appendices of CITES

Organisms/appendices	Appendix I	Appendix II	Appendix III
Mammals	297 species 23 sub species	492 species 5 subspecies	44 species 10 sub species
Birds	156 species 11 subspecies	1275 species 2 subspecies	24 species
Reptiles	76 species 5 sub species	582 species	56 species
Amphibians	17 species	113 species	1 species
Fish	15 species	81 species	-
Invertebrates	64 species 5 subspecies	2142 species 1 subspecies	22 species 3 subspecies
Plants	301 species 4 subspecies	29105 species	119 species 1 subspecies
Total	926 species 48 subspecies	33790 species 8 sub species	266 species 14 subspecies

Table 31. 2 List of fish species in the CITES appendices

Appendix I	Appendix II	Appendix II
	Cetorhinus maximus (Basking shark)	
	Carcharodon carcharias (Great white shark)	
	Rhincodon typus (Whale shark)	
Prsitida spp. (Saw fishes)		
	Pristis microdon (Saw fish)	
	Acipenseriformes spp. (Paddle fishes and sturgeons)	
Acipensor brevirostrum (Sturgeons)		
Acipenser sturio (Sturgeons)		
	Anguilla anguilla (Eel)	
Chasmistes cujus (Cui-cui)		
Probarus jullieni (Blind carp)	*Caecobarbus geertsi*	
Scleropages formosus	*Arapaima gigas*	
	Cheilinus undulates (Napoelon fish)	
Totoaba macdonaldi		
Pangasianodon gigas (Pangasid catfish)		
	Hippocampus spp.	
	Neoceratodus forsteri	
Latimeria spp.		

Table 31.3 List of Sea cucumbers and corals in the CITES appendices

Appendix I	Appendix II	Appendix II
Sea cucumbers		
		I*sostichopus fuscus*
Corals		
	Antipatheria spp. (Black corals)	
		Corallium elatus
		Corallium japonicum
		Corallium konjoi
		Corallium secundum
	Helioporidae spp. (Blue corals)	
	Scleractinia spp. (Stony corals)	
	Tubiporidae spp. (Organ-pipe coral)	
	Milleporidae spp. (Fire corals)	
	Stylasteridae spp. (Lace corals)	

Table 31. 4 Format for evaluation to assess the Non-Detriment Findings

Question Number	Question Category	Question	Responses 1 to 5
2.1	Biology	BIOLOGY-Life history	
2.2		BIOLOGY-Niche breadth	
2.3		BIOLOGY-Dispersal	
2.4		BIOLOGY-Human tolerance	
2.5	Status	STATUS- National distribution	
2.6		STATUS-National abundance	
2.7		STATUS- National population trend	
2.8		STATUS-Information quality	
2.9		STATUS-Major threat	
2.10	Management	MANAGEMENT- Illegal off-take	
2.11		MANAGEMENT- Management history	
2.12		MANAGEMENT- Management plan	

2.13		MANAGEMENT- Aim of harvest	
2.14		MANAGEMENT- Quotas	
2.15	Control	CONTROL- Harvest in PA	
2.16		CONTROL-Harvest in strong tenure	
2.17		CONTROL-Open access harvest	
2.18		CONTROL-Confidence in harvest mgt	
2.19	Monitoring	MONITORING-Monitoring method	
2.20		MONITORING-Confidence in monitoring	
2.21	Incentives	INCENTIVES-Effect of harvest	
2.22		INCENTIVES-Species conservation incentives	
2.23		INCENTIVES-Habitat conservation incentives	
2.24	Protection	PROTECTION-Proportion protected from harvest	
2.25		PROTECTION-Effectiveness of protection	
2.26		PROTECTION-Regulation of harvest	

Table 31. 5 List of marine species and their export status in India

Item	HS CODE	Export policy	Nature of restriction
Marine species and products except the following	0300 00 00	Free	Subject to pre-shipment quality inspection as many be specified by the Government through notification
(a) those species (and their parts products and derivatives) mentioned in the Schedules of the Wildlife (Protection) Act, 1972	0300 00 00	Prohibited	Not permitted to be exported
Fresh or Chilled or Frozen silver pomfrets of weight less than 300 gm	0302 69 30 0303 79 50	Restricted	Export permitted under license
Beche-de-mer	0303 79 99	Prohibited	Not permitted to be exported irrespective of its size
Lobsters except undersized rock lobster and sand lobster			
Panulirus polyphagus 300 gm as whole chilled live or frozen, 250 gm as whole cooked; 90 gm as tail	0306 11 00 0306 21 00	Prohibited	Not permitted to be exported
Panulirus homarus 200gm as whole live, chilled or frozen, 170 gm as	0306 11 00 0306 21 00	Prohibited	Not permitted to be exported

whole cooked, 50 gm as tail			
Panulirus ornatus 500gm as whole live/chilled or frozen; 425 gm as whole cooked; 150gm as tail	0306 11 00 0306 21 00	Prohibited	Not permitted to be exported
Thenus orientalis 150 gm as whole; 45 gm as tail	0306 12 10 0306 12 90 0306 22 00	Prohibited	Not permitted to be exported

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