INDIA

Third National Report

CONTENTS

A. REPORTING PARTY

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Information on the preparation of the report

Box I.

Please provide information on the preparation of this report, including information on stakeholders involved and material used as a basis for the report.

The Third National Report has been prepared by the Ministry of Environment & Forests (MoEF) through a consultative process involving various stakeholders in the government and non-government sectors. These *inter alia* include:

- concerned Central sectoral Government Ministries/Departments
- experts
- academicians
- NGOs

The relevant portions of the format of the National Report were sent to more than 50 experts/organizations, and also to the members of the Ministry's Consultative Group on biodiversity issues, for providing inputs on the portion of the format relevant to their area of work and expertise. Through this interactive process, a zero draft of the Report was prepared on the basis of inputs received from these stakeholders and relevant information extracted from written and published documents and policy papers.

These *inter alia* include:

(i) Implementation of Article 6 of the Convention on Biological Diversity in India – First National Report. 1998.

(ii) India's Second National Report to the CBD

(iii) National Policy and Macrolevel Action Strategy on Biodiversity, 1999.

(iv) Annual Report of the Ministry of Environment & Forests. 2004-2005

(v) National Forestry Action Programme – India 1999.

(vi) The Biological Diversity Act, 2002

(vii) Biological Diversity Rules, 2004

(viii) Draft National Environment Policy, 2004

(ix) National Wildlife Action Plan, 2004

(x) Final Technical Report of the UNDP/GEF sponsored on National Biodiversity Strategy and Action Plan

(xi) Annual Reports of the concerned Central government Ministries/Departments/agencies e.g. Department of Biotechnology, Department of Science & Technology, Department of Ocean Development/G.B. Pant Institute of Himalayan Environment & Development etc.

Thereafter, the MoEF organized a national workshop in association with Biotech Consortium India Limited, New Delhi on May 20-21, 2005, for preparation of the India's Third National Report to CBD for which the zero draft was circulated to the invitees. In this workshop over 60 participants representing concerned Government Ministries/Departments, research institutions, universities and experts participated. A report of this workshop is at Annex-I. The zero draft was extensively deliberated upon in the workshop. Based on the inputs/comments received from the participants in the workshop, the zero draft was further worked upon and a first draft of the report was thus prepared. The first draft was subjected to another round of consultations with the experts, concerned Ministries/Departments and organizations. Based on further inputs received, and consultation of other relevant documents, a second and final draft of the report was prepared. This draft was deliberated at length in a meeting of the Consultative Group on biodiversity issues and finalized. India's Draft Third National Report is being submitted after obtaining necessary approvals in the Government. It is proposed to bring out the Third National Report as a proper publication, which will be submitted when ready.

B. PRIORITY SETTING, TARGETS AND OBSTACLES

Box II.

Please provide an overview of the status and trends of various components of biological diversity in your country based on the information and data available.

India is one of the 17 megadiverse countries. With only 2.4% of the land area, India already accounts for 7-8% of the recorded species of the world. India is equally rich in associated traditional and indigenous knowledge.

Systematic surveys of flora and fauna of the country covering all the ecosystems started with the establishment of the Botanical Survey of India (BSI) in 1890 and the Zoological Survey of India (ZSI) in 1916. Almost 70% of the country's land area has been surveyed and around 45,000 species plants and 89,000 species of animals have been described till date. It has been estimated that another 400,000 species may still exist in India, which so far remain undescribed.

The list of recorded species, in different taxonomic groups

Taxonomic group	No. of species			% of world flora
	India		World	
Angiosperms	17500	(5725)	250000	7.0
Gymnosperms	48	(10)	650	7.4
Pteridophytes	1200	(193)	10000	12.0
Bryophytes	2850	(938)	14500	19.7
Lichens	2075	(518)	13500	15.0
Fungi	14500	(3500)	70000	20.7
Algae	6500	(1924)	40000	16.30
Virus/Bacteria	850		8050	10.6
Total	45523	(12808)	406700	11.80

Estimated number of described species

Taxonomic group	No. of species		% in India
	World	India	
PROTISTA (Protozoa)	31250	2577	8.24
ANIMALIA			
Mesozoa	71	10	14.08
Porifera	4562	486	10.65
Cnidaria	9916	842	8.49
Ctenophora	100	12	12.00
Platyhelminthes	17500	1622	9.22
Nemertinea	600	-	-
Rotifera	2500	330	13.20
Gastrotricha	3000	100	3.33
Kinorhyncha	100	10	10.00
Nematoda	30000	2850	9.50
Nematomorpha	250	-	-
Acanthocephala	800	229	28.62
Sipuncula	145	35	24.14

Mollusca	66535	5070	7.62
Echiura	127	43	33.86
Annelida	12700	840	6.61
Onychophora	100	1	1.00
Arthropoda	**987949**	**68389**	**6.90**
Crustacea	35534	2934	8.26
Insecta	867391	59353	6.83
Arachnida	73440	5818	7.90
Pycnogonida	600	16	2.67
Pauropoda	360	-	-
Chilopoda	3000	100	3.33
Diplopoda	7500	162	2.16
Symphyla	120	4	3.33
Merostomata	4	2	50.00
Phoronida	11	3	27.27
Bryozoa (Ectoprocta)	4000	200	5.00
Entoprocta	60	10	16.66
Brachiopoda	300	3	1.00
Pogonophora	80	-	-
Priapulida	8	-	-
Pentastomida	70	-	-
Chaetognatha	111	30	27.02
Tardigrada	514	30	5.83
Echinodermata	6223	765	12.29
Hemichordata	120	12	10.00
Chordata	**48451**	**4994**	**10.40**
Protochordata	2106	119	5.65
Pisces	21723	2546	11.72
Amphibia	5150	240	4.66
Reptillia	5817	460	7.91
Aves	9026	1232	13.66
Mammalia	4629	397	8.58
Total (Animalia)	1196903	86905	7.25
Grand Total (Protista + Animalia)	1228153	89492	7.28

India's strategies for conservation and sustainable utilization of biodiversity in the past have comprised providing special status and protection to biodiversity rich area by declaring them as National Parks, Wildlife Sanctuaries, Biosphere Reserves, Ecologically fragile and sensitive areas; off loading pressure; from reserve forests by alternative measures of fuelwood and fodder need satisfaction; by afforestation of degraded areas and wastelands; creation of *ex-situ* conservation facilities such as gene banks etc.

Special efforts are continuously being made for conservation of endangered, endemic and economically important species of plants and animals. The functional base of the two major agencies involved in exploration, inventorization and documentation of biodiversity in general i.e. BSI and ZSI has been

further expanded to include new areas such as inventorization of endemic, rare and threatened species, evolving conservation strategies and studies on fragile ecosystems and protected areas etc.

Efforts have also been initiated towards inventorization of microbial diversity by strengthening the institutional capabilities and setting up of depositories.

An All India Coordinated Project for Capacity Building in Taxonomy (AICOPTAX) that envisages establishment of Centres for Research in identifying priority gap areas (e.g. virus, bacteria, micro lepidoptera etc.) in the field of taxonomy, education and training and strengthening of BSI and ZSI as coordinating units, has been launched since 1999. The project has organized specialized groups drawn from universities, botanical and Zoological Surveys of India to take up taxonomic work on animal viruses, bacteria and archaea, algae, fungi, lichens, bryophytes, pteridophytes, gymnosperms, palms, grasses, bamboos, orchids, helminthes and nematodes, micro lepidoptera and mollusca. The project is operational in 82 units as of now.

Priority Setting

1. Please indicate, by marking an "**X**" in the appropriate column below, the level of priority your country accords to the implementation of various articles, provisions and relevant programmes of the work of the Convention.

Article / Provision / Programme of Work	Level of Priority		
	High	Medium	Low
a) Article 5 – Cooperation	X		
b) Article 6 - General measures for conservation and sustainable use	X		
c) Article 7 - Identification and monitoring	X		
d) Article 8 – *In-situ* conservation	X		
e) Article 8(h) - Alien species	X		
f) Article 8(j) - Traditional knowledge and related provisions	X		
g) Article 9 – *Ex-situ* conservation	X		
h) Article 10 – Sustainable use of components of biological diversity	X		
i) Article 11 - Incentive measures	X		
j) Article 12 - Research and training	X		
k) Article 13 - Public education and awareness	X		
l) Article 14 - Impact assessment and minimizing adverse impacts	X		
m) Article 15 - Access to genetic resources	X		
n) Article 16 - Access to and transfer of technology	X		
o) Article 17 - Exchange of information	X		

p) Article 18 – Scientific and technical cooperation	X		
q) Article 19 - Handling of biotechnology and distribution of its benefits	X		
r) Article 20 - Financial resources	X		
s) Article 21 - Financial mechanism	X		
t) Agricultural biodiversity	X		
u) Forest biodiversity	X		
v) Inland water biodiversity	X		
w) Marine and coastal biodiversity	X		
x) Dryland and subhumid land biodiversity	X		
y) Mountain biodiversity	X		

Challenges and Obstacles to Implementation

2. Please use the scale indicated below to reflect the level of challenges faced by your country in implementing the provisions of the Articles of the Convention (5, 6,7, 8, 8h, 8j, 9, 10, 11,12, 13, 14, 15,16, 17, 18, 19 and 20)

3 = High Challenge	1 = Low Challenge
2 = Medium Challenge	0 = Challenge has been successfully overcome
N/A = Not applicable	

Challenges	Articles																	
	5	6	7	8	8h	8j	9	10	11	12	13	14	15	16	17	18	19	20
a) Lack of political will and support	1	1	1	1	2	1	1	2	1	1	1	1	1	1	1	1	2	1
b) Limited public participation and stakeholder involvement	2	2	1	2	1	1	1	1	2	1	2	1	2	1	1	2	1	1
c) Lack of mainstreaming and integration of biodiversity issues into other sectors	2	3	2	2	1	2	1	2	3	2	3	2	3	3	2	3	2	3
d) Lack of precautionary and proactive measures	1	1	1	2	3	2	2	1	2	2	2	2	1	1	2	2	2	2

e) Inadequate capacity to act, caused by institutional weakness	1	1	2	1	3	2	1	2	2	1	1	2	1	2	1	1	2	2
f) Lack of transfer of technology and expertise	2	2	2	2	2	2	1	2	1	1	1	1	2	2	2	2	3	2
g) Loss of traditional knowledge	3	2	3	2	3	3	1	2	3	2	2	3	2	3	3	2	2	3
h) Lack of adequate scientific research capacities to support all the objectives	1	1	1	1	1	1	1	2	1	1	2	1	1	1	1	1	2	1
i) Lack of accessible knowledge and information	1	2	2	1	2	2	2	2	2	1	1	2	2	2	1	1	2	1
j) Lack of public education and awareness at all levels	N/A	1	1	3	2	2	2	2	1	1	2	1	2	1	1	1	2	1
k) Existing scientific and traditional knowledge not fully utilized	N/A	2	1	2	2	1	2	2	1	1	2	2	2	2	2	2	2	2
l) Loss of biodiversity and the corresponding goods and services it provides not properly understood and documented	3	2	3	2	3	2	2	2	3	2	1	3	1	2	2	1	2	2
m) Lack of financial, human, technical resources	2	2	1	1	2	3	1	1	1	2	1	2	2	1	2	2	1	2
n) Lack of economic incentive measures	2	1	1	2	2	2	1	1	2	2	2	2	2	3	3	2	2	2
o) Lack of benefit-sharing	3	2	2	2	3	3	2	3	3	2	3	3	3	1	2	3	3	3
p) Lack of synergies at national and international levels	2	3	2	2	2	3	1	3	3	2	2	3	2	1	3	3	3	3
q) Lack of horizontal cooperation among stakeholders	2	3	2	2	3	3	3	3	2	2	2	3	3	2	2	2	2	3

r) Lack of effective partnerships	2	3	2	3	2	2	3	3	3	2	2	3	2	3	3	3	3	2
s) Lack of engagement of scientific community	1	2	1	1	2	2	1	1	2	2	2	2	1	1	1	1	1	2
t) Lack of appropriate policies and laws	1	2	1	1	2	2	1	1	2	2	2	2	1	1	1	1	2	2
u) Poverty	-	3	2	2	2	2	N/A	3	2	2	2	2	3	3	3	2	2	2
v) Population pressure	3	2	2	3	1	1	N/A	3	2	1	1	1	1	1	2	2	3	3
w) Unsustainable consumption and production patterns	3	2	2	2	3	2	3	3	2	2	2	3	2	2	3	2	2	2
x) Lack of capacities for local communities	3	2	2	2	2	2	1	2	1	1	2	2	3	3	2	2	3	3
y) Lack of knowledge and practice of ecosystem-based approaches to management	2	3	2	2	1	1	2	2	2	3	2	2	2	3	2	3	2	3
z) Weak law enforcement capacity	3	2	1	2	1	1	1	2	1	1	1	1	2	2	2	2	2	2
aa) Natural disasters and environmental change	2	2	2	2	2	2	1	3	2	2	2	2	2	3	1	1	3	2
bb) Others (please specify)																		

2010 Target

The Conference of the Parties, in decision VII/30, annex II, decided to establish a provisional framework for goals and targets in order to clarify the 2010 global target adopted by decision VI/26, help assess the progress towards the target, and promote coherence among the programmes of work of the Convention. Parties and Governments are invited to develop their own targets with this flexible framework. Please provide relevant information by responding to the questions and requests contained in the following tables.

Box III.

Goal 1	**Promote the conservation of the biological diversity of ecosystems, habitats and biomes.**
Target 1.1	**At least ten percent of each of the world's ecological regions effectively conserved**

I) National target: Has a national target been established corresponding to the global target above?

a)	No	
b)	Yes, the same as the global target	
c)	Yes, one or more specific national targets have been established	X

Please provide details below.

India's strategies for conservation of biological diversity of ecosystems, habitats and biomes comprise of providing special status and protection to biodiversity rich areas. This includes declaring them as national parks, wildlife sanctuaries, biosphere reserve and ecologically fragile and sensitive areas such as wetlands.

The National Forest Policy, 1981 lays down that one third of the geographical area of the country should be under forest/tree cover. The 10th Five Year Plan mandate is to increase the forest and tree cover in the country to 33% of the geographical area by 2012 as against present area of 23% under forest cover.

Approximately 4.74% area of the total geographical area is already under extensive *in situ* conservation of habitats and ecosystems. There are 94 National Parks and 501 Wildlife Sanctuaries in the country covering an area of 15.67 million hectares. This process is being continued for setting up of additional 278 National Parks and Sanctuaries in 26 states.

Biosphere reserves, internationally recognized areas of terrestrial and coastal ecosystems have been given special attention by launching schemes to facilitate conservation of representative landscapes and their immense biological diversity and cultural heritage. Fourteen biosphere reserves have been designated so far in the country, out of which four biosphere reserves namely Sunderbans, Gulf of Mannar, Nilgiri and Nanda Devi have been included so far in the World Network of Biosphere Reserves. Efforts are on for getting remaining biosphere reserves included in the World Network of Biosphere Reserves.

India is home to some of the best mangroves in the world. The mangrove conservation programme was launched in 1987 and so far 35 mangrove areas have been identified for intensive conservation and management in the country. New and additional mangrove conservation areas are being identified continuously in consultation with relevant State governments.

The National Committee on Mangroves and Coral Reefs has recommended intensive conservation and management of corals in four areas namely Andaman and Nicobar Islands, Lakshadweep Island, Gulf of Kachh and Gulf of Mannar.

The National River Conservation Directorate of the MoEF is engaged in implementing the river action plan under the National River Conservation Plan (NRCP). At present, it covers a total of 31 rivers in the country spread over 18 states.

Under the the National Lake Conservation Plan (NLCP), a programme for conservation and

management of lakes and other similar water bodies, so far, 28 lakes have been taken up.

National Wetland Conservation Programme (NWCP) has been initiated for identified wetlands, which are at present 66 covering 21 states.

All the above programmes are ongoing and more area for conservation is continuously being included in the national lists.

II) National targets for specific programmes of work: If such national target(s) ha(s)(ve) been established, please indicate here, and give further details in the box(es).

Programme of work	Yes	No	Details
a) Agricultural	X		A Citrus gene sanctuary has been established to conserve both wild and cultivated species/varieties of *Citrus* and 14 possible gene sanctuaries have been identified for establishment. National Bureau of Plant Genetic Resources (NBPGR), National Bureau of Animal Genetic Resources (NBAGR), National Bureau of Fish Genetic Resources (NBFGR) and National Bureau of Agriculturally Important Microorganisms (NBAIM) have been established and search programmes launched on useful gene pool in various agro ecosystems of the country.
b) Inland water	X		The National River Conservation Directorate of the MoEF is engaged in implementing the river action plan under the National River Conservation Plan (NRCP). At present, it covers a total of 31 rivers in the country spread over 18 states. Under the National Lake Conservation Plan (NLCP), a programme for conservation and management of lakes and other similar water bodies, so far, 28 lakes have been taken up. National Wetland Conservation Programme (NWCP) has been initiated for identified wetlands which are at present 66 covering 21 states. All the above programmes are ongoing and more area is continuously being included in the national lists.
c) Marine and coastal	X		The mangrove conservation programme was launched in 1987 and so far 35 mangrove areas have been identified for intensive conservation and management in the country. New and additional mangrove conservation areas are being identified continuously in consultation with relevant state governments. Microorganisms from these ecosystems are being used in reestablishment of plant diversity in such ecosystems The National Committee on Mangroves and Coral Reefs has recommended intensive conservation and management of corals in four areas namely Andaman and Nicobar Islands, Lakshadweep Island, Gulf of Kachh and Gulf of Mannar. This will help conserve the *in situ* microbial symbionts gene pool as well. India has set up 31 Marine Protected Areas, 18 of which are fully under marine environment, whereas the other 13 are partly in sea and partly on land. A GIS based system has been developed for 11 critical marine habitats (namely Gulf of Kachchh, Gulf of Khambat, Karwar

			islands, Cochin Islands, Sunderbans, Kadmat island, Gulf of Mannar, Pichavaram, Coringa and Gahirmatha) to assess the status of some of the critical coastal habitats such as mangroves, coral reefs, sea grass beds, estuaries, beaches, backwaters etc. Suitable management plans for protection, conservation and restoration have been worked out by the Integrated and Coastal Marine Area Management (ICMAM), Chennai, an attached office of the Department of Ocean Development. A full fledged training facility is also available for integrated marine area management.
d) Dry and subhumid land		X	Afforestation and regeneration of dry and sub humid lands is being undertaken through resource management involving different institutions. The programmes include: National Watershed Development Project for Rainfed Areas, All India Coordinated Research Project for Dryland Agriculture, Integrated Afforestation and Eco development Project Scheme, Integrated Wasteland and Development Programme, Desert Development Programme, Drought Prone Areas Programme etc. The National Action Programme (NAP) of United Nations Convention to combat Desertification (VNCCD) has been prepared and is under implementation.
e) Forest	X		Extensive programmes for aforestation of degraded forest land, waste lands, etc. are in progress for increase of forest and tree over from the present level of 23% of the country's land area to 33% in 2012. These programmes include integrated forest protection schemes, National Aforestation and Eco-development Board, Joint Forest Management, etc.
f) Mountain	X		On account of richness and uniqueness of biodiversity elements and wide ranging indigenous knowledge systems on use of bioreources coupled with increasing scale of degradation of bioresources, at least two mountain areas in the country (the Himalayas and Western Ghats) have emerged as global conservation priority. In response to this recognition, the Government of India, under its Protected Area (PA) programme has made significant contribution. As such the coverage under designated PAs is approximately 9.6% of geographical area in the Himalayas and 10.1% in western Ghats. This is higher than the national average (4.7%) and corresponds well with the acceptable global realistic target of 10% coverage under PAs.

III) Has the global or national target been incorporated into relevant plans, programmes and strategies?

a)	No	
b)	Yes, into national biodiversity strategy and action plan	
c)	Yes, into sectoral strategies, plans and programmes	X

Please provide details below.

Targets for biological conservation of ecosystems have been defined in various ways directly or indirectly in most of the relevant national plans, programmes and strategies. Some of these are listed below:

- Draft National Environment Policy, 2004 (under finalization)
- National Policy and Macrolevel Action Strategy on Biodiversity, 1999
- National Biodiversity Strategy and Action Plan (NBSAP) (Under finalization)
- National Forest Policy amended in 1988
- National Conservation Strategy and Policy Statement for Environment and Sustainable Development

- National Agricultural Policy
- National Land Use Policy
- National Fisheries Policy
- National Wildlife Action Plan
- Environmental Action Plan
- National Forestry Action Programme
- National Seeds Policy
- National Biotechnology Development Strategy (under finalization)
- 10th Five Year Plan

IV) Please provide information on current status and trends in relation to this target.

National Action Plans on various components of biodiversity such as forests, wildlife, agrobiodiversity, agricultural technologies etc. have been framed and programmes initiated.

V) Please provide information on indicators used in relation to this target.

The indicators used in relation to this target have been mostly in terms of the land area and the number of protected areas e.g.:

- Present forest areas
- Area under degraded lands
- Number of biosphere reserves
- Number of protected lands
- Number of wetlands, mangroves and coral reefs
- Number of rivers under conservation programme
- Area under cultivated lands
- Urban Parks, Zoological Gardens
- Area under plantation trees outside forests
- Area recovered from encroachments
- Reclamation of mined areas

VI) Please provide information on challenges in implementation of this target.

- Lack of economic incentive measures
- Lack of financial resources
- Lack of inter-sectoral integration
- Over use of the resources
- Natural disasters
- Inappropriate conservation facilities and taxonomic workforce for microorganisms
- Lack of specific legislation in some areas
- Lack of *in situ* gene banks for specific breeds
- Shortage of trained manpower

VII)Please provide any other relevant information.

In addition to these planned programmes, participatory processes are being developed with local communities for ecosystem conservation and management. Rural communities in India have an ancient tradition of conservation of natural ecosystems and species and many of these practices still survive. This includes sacred sites i.e. providing protection to patches of forests (sacred groves), water bodies (sacred ponds, lakes etc.) and entire landscapes for cultural and religious reasons.

Several diverse areas are also under community protection, commonly referred to as community conserved areas.

Box IV.

Target 1.2	**Areas of particular importance to biodiversity protected**

I) National target: Has a national target been established corresponding to the global target above?

a) No	
b) Yes, the same as the global target	
c) Yes, one or more specific national targets have been established	X

Please provide details below.

Ecologically sensitive zones have been identified under the Environment (Protection) Act, 1986 to impose restriction on the industries, operations, process and other developmental activities in the region that have detrimental effect on the environment, to provide for restoration of denuded areas, management of catchment areas, watershed management etc., for a planned development. So far six such areas have been notified.

India Eco-development Project, a World Bank assisted project is being undertaken to improve the capacity of protected area management to conserve biodiversity and gain support of the local people for conservation by increasing opportunities for local participation in protected area management.

Forest Conservation Act (1980) has implications on diversion of forest areas.

Article 37 of the Biodiversity Act 2002 provides that areas of biodiversity importance be notified as biodiversity heritage sites.

II) National targets for specific programmes of work: If such national target(s) ha(s)(ve) been established, please indicate here, and give further details in the box(es).

Programme of work	Yes	No	Details
a) Agricultural	X		A Citrus gene sanctuary has been established to conserve both wild and cultivated species/varieties of *Citrus* and 14 possible gene sanctuaries have been identified for establishment. National Bureaus of Plant Genetic Resources, Animal Genetic Resources, Fish Genetic Resources and Agriculturally Important Microorganisms have been established and search programmes launched on useful gene pool in various agro ecosystems of the country. Documentation of all varieties of crop plants including traditional/farmers varieties and land uses. Conservation of livestock breeds and programs for characterization/ conservation of all indigenous animal genetic resources by National Bureau for Animal Genetic Resources in networking with State Animal Husbandry Department, State Agricultural/Veterinary Universities, NGOs. etc.
b) Inland water	X		National Wetland Program is in place
c) Marine and coastal	X		The Coastal Regulation Zone includes coastal stretches of seas, bays, estuaries, creeks, rivers and backwaters which are influenced by tidal action (on the landward side), upto 500m from the high tide line including the inter-tidal zone. Restrictions have been imposed on the setting up and expansion of industries and operations or process etc. in the Coastal Regulation Zone (CRZ) through a government notification. A national and 13 state level Coastal Zone Management Authorities have been constituted

			and Coastal Zone Management Plans have been prepared demarcating ecologically sensitive areas. Integrated Coastal Zone Management Plans also been prepared for Andaman and Nicobar and Lakshadeep Islands though scientific institutions.
d) Dry and subhumid land			Afforestation and regeneration of dry and sub humid lands is being undertaken through resource management involving different institutions. The programmes include: National Watershed Development Project for Rainfed Areas, All India Coordinated Research Project for Dryland Agriculture, Integrated Afforestation and Eco development Project Scheme, Integrated Wasteland and Development Programme, Desert Development Programme, Drought Prone Areas Programme etc. The National Action Programme (NAP) of United Nations Convention to combat Desertification (VNCCD) has been prepared and is under implementation.
e) Forest	X		Provisions for declaring important biodiversity areas including forests, etc. as Biodiversity Heritage Sites been made in the Biological Diversity Act 2002. New legal PA categories have been created in the Wildlife Protection (WLP) Act, namely 'Conservation Reserves' and 'Community Reserves', so as to include suitable adjacent habitats and corridors with Protected Areas.
f) Mountain	X		The Indian Himalayan Region (Trans, Northwest, West, Central and east Himalayan provinces) has 15 national Parks and 59 wildlife sanctuaries. In addition 6 biosphere reserves have also been designated (i.e. Nanda Devi in Uttaranchal, Kancgchendzonga in Sikkim, Dehang Debang in Arunachal; Nokrek in Meghalaya, Manas and Dibru Saikhowa in Assam). Of these, the Nandadevi Biosphere Reserve has been included in Global Network of Biosphere Reserves. The oldest PA of the region is Corbett National Park which was established in 1936. The random distribution of PAs covering more than 5.5% area in each biogeographic province of the Indian Himalayan Region [Trans- 7 PAs (9.2% of area); Northwest–29 (5.88%); west -18 (13.06%; Central–8 (7.82%); and East–12(11.44%] supposedly takes care of representative habitats and biota along longitudinal east to west gradient. Considering the size of PAs, compared to the country mean (270.3 Km^2, n=566), the mean size for the Himalayan PAs (512.07 Km^2 , n=74) is larger. The system of PAs in the Western Ghats includes the Nilgiri Biosphere Reserve, the first and largest Biosphere Reserve in India, 13 National Parks and 45 wildlife sanctuaries. The largest national park in Bandipur and the largest wildlife sanctuary in the Anamalai hills. The Bandipur, Periyar and Kalakad-Mundanthurai are Project Tiger Reserves Some other protected areas of the region fall under Project Elephant Reserves.
III) Has the global or national target been incorporated into relevant plans, programmes and strategies?			
a) No			

b)	Yes, into national biodiversity strategy and action plan	
c)	Yes, into sectoral strategies, plans and programmes	X

Please provide details below.

Draft Environment Policy, 2004,Forest Policy 1988, Draft Biotechnology Strategy, 2005 are some of the important policies under which targets for areas of immediate importance are planned and programmes initiated.

IV) Please provide information on current status and trends in relation to this target.

V) Please provide information on indicators used in relation to this target.

- Number of national parks, sanctuaries and biosphere reserves etc.

VI) Please provide information on challenges in implementation of this target.

- Overuse of resources
- Poverty
- Population Growth
- Financial constraints
- Unorganized marketing and pressure of market forces.

VII)Please provide any other relevant information.

Box V.

Goal 2	**Promote the conservation of species diversity**
Target 2.1	**Restore, maintain, or reduce the decline of populations of species of selected taxonomic groups**

I) National target: Has a national target been established corresponding to the global target above?

a)	No	
b)	Yes, the same as the global target	
c)	Yes, one or more specific national targets have been established	X

Please provide details below.

Protected areas consists of both National Parks (habitat oriented) and Wildlife Sanctuaries (species oriented). The species oriented special conservation programmes such as Project Tiger, Project Elephant have been in place in India for the past several decades.

Project Tiger was launched in 1973 with a mandate to conserve tigers in a holistic manner. Initially the project was launched in 9 tiger reserves, covering an area of 16,339 sq. km. which has now increased to 28 tiger reserves, encompassing 37,761 sq. km. of tiger habitats distributed in seven states.

Project Elephant was launched in February 1992 to assist States having free ranging populations of wild elephant to ensure long term survival of identified viable population of elephants in their natural habitats. The project is being implemented in 13 States. Elephant Day is celebrated during the Wildlife Week in all the elephant reserves in the country. A planned breeding programme has been initiated for the Red Panda at Padmaja Naidu Himalaya Geological Park, Darjeeling.

Efforts to identify suitable alternative homes for single isolated populations of species such as Jerdon's Courser, Asiatic Lion, Manipur Deer, Wroughton's Free Tailed Bat and the like, and manage the same as Protected Areas effectively have been ongoing since 2002.Identification of endangered species of wild animals is also undertaken for the purpose of captive breeding and assigning responsibility to ex situ conservation to the 165 recognized zoos.

Botanical Survey of India has come out with following publications on threatened species –

1.Red Data Book of Indian Plants, Vol. I, (1987), Vol. II, (1988); Vol. III, (1989)
2.Conservation Status of Endemic Plants in Peninsular India - An Evaluation (In Press)
3.Threatened and Endemic Orchids of Sikkim and North-Eastern India (1984)
4. Materials for the Category of Threatened Plants of India (1983)

Zoological Survey of India has come out with following publications on threatened species –

1. The Red Data Book on Indian Animals Part-I Vertebrata, ZSI (Mammals, Aves, Reptilia and Amphibia)
2. Status Survey of Endangered Species, ZSI 1994

Sanctuary for rosewood, medicinal plants, schemes for orchids, ferns, epiphytes, bamboo mission, research on propagation of species. Establishment of germplasm banks, preservation plots, and assisted natural regeneration and protection through community participation are some other initiatives.

Mitigation efforts, such as reintroduction of locally extinct species have also been undertaken, such as for rhino in Dudhawa National Park.

II) National targets for specific programmes of work: If such national target(s) ha(s)(ve) been established, please indicate here, and give further details in the box(es).

Programme of work	Yes	No	Details
a) Agricultural	X		Specific conservation programmes have been initiated for wild relatives of crop plants and some domesticated animals
b) Inland water	X		Establishment Of Ramsar Sites
c) Marine and coastal	X		Establishment of new Marine protected areas
d) Dry and subhumid land		X	Programmes for afforestation, regeneration and development of dry and subhumid lands
e) Forest	X		National Parks, Wildlife Sanctuaries and Biosphere Reserves
f) Mountain	X		Hill Area Development Schemes

III) Has the global or national target been incorporated into relevant plans, programmes and strategies?

a) No	
b) Yes, into national biodiversity strategy and action plan	
c) Yes, into sectoral strategies, plans and programmes	X

Please provide details below.

IV) Please provide information on current status and trends in relation to this target.

V) Please provide information on indicators used in relation to this target.

Establishment of reserves, area covered, funds allocation, enabling policies and number of species covered.

VI) Please provide information on challenges in implementation of this target.

Habitat degradation, limited allocation of funds, poor manpower in protected areas and forest area management, poor infrastructure and technical skills, poor legal enforcement for punishments.

VII)Please provide any other relevant information.

Research on lesser known species and species interactions needs to be promoted.

Box VI.

Target 2.2	**Status of threatened species improved**

I) National target: Has a national target been established corresponding to the global target above?

a) No	
b) Yes, the same as the global target	
c) Yes, one or more specific national targets have been established	X

Please provide details below.

Project Tiger was launched in 1973 with a mandate to conserve tigers in a holistic manner. Initially the project was launched in 9 tiger reserves, covering an area of 16,339 sq. km. which has now increased to 28 tiger reserves, encompassing 37,761 sq. km. of tiger habitats distributed in seven states.Though the focus of the project is on the flagship species tiger, it strives to maintain the stability of ecosystem by fostering other profit level in the food chain. The population of tigers in the country has increased significantly to more 3600 from less then 2000 at the time of launching of the project. Through this project, India has successfully conserved almost 60% of the global population of wild tigers in their natural habitats.

Project Elephant was launched in February 1992 to assist States having free ranging populations of wild elephant to ensure long term survival of identified viable population of elephants in their natural habitats. The project is being implemented in 13 States. Elephant Day is celebrated during the Wildlife Week in all the elephant reserves in the country.

A planned breeding programme has been initiated for the Red Panda at Padmaja Naidu Himalaya Geological Park, Darjeeling.

Centre for Cellular and Molecular Biology (CCMB), Department of Biotechnology, Govt. of India, Council for Scientific and Industrial Research and the State Government of Andhra Pradesh are establishing a facility called Laboratory for Conservation of Endangered Species (LaCONES).

Efforts to identify suitable alternative homes for single isolated populations of species such as Jerdon's Courser, Asiatic Lion, Manipur Deer, Wroughton's Free Tailed Bat and the like, and manage the same as Protected Areas effectively have been ongoing since 2002.

Botanical Survey of India has come out with following publications on threatened species –

1.Red Data Book of Indian Plants, Vol. I, (1987), Vol. II, (1988); Vol. III, (1989)
2.Conservation Status of Endemic Plants in Peninsular India - An Evaluation (In Press)
3.Threatened and Endemic Orchids of Sikkim and North-Eastern India (1984)
4. Materials for the Category of Threatened Plants of India (1983)

Zoological Survey of India has come out with following publications on threatened species –

1. The Red Data Book on Indian Animals Part-I Vertebrata, ZSI (Mammals, Aves, Reptilia and Amphibia)
2. Status Survey of Endangered Species, ZSI 1994

II) National targets for specific programmes of work: If such national target(s) ha(s)(ve) been established, please indicate here, and give further details in the box(es).

Programme of work	**Yes**	**No**	**Details**
a) Agricultural	X		Special programmes have been launched by four National Bureaus i.e. NBPGR, NBAGR, NBFGR and NBAIM as well as some other national institutions.
b) Inland water	X		National Wetland Conservation Programme (NWCP) has been initiated as an ongoing process for wetlands

			(at present 66 covering 21 states).
c) Marine and coastal	X		New and additional mangrove conservation areas are being identified continuously to the existing 35 sites in consultation with relevant state governments.
d) Dry and subhumid land		X	Programmes for afforestation, regeneration and development of dry and subhumid lands
e) Forest	X		Project Tiger, Project Elephant and other such programmes
f) Mountain	X		Special attention has been given in the identification and conservation of threatened species in mountain regions. For example, out of a total 583 threatened plants (Red Data Book species) in India 121(20.8%) species are from Himalayan region. Various organizations are implementing programmes for improving the status of these species. Nearly 29 mammalian species listed under Schedule 1 of the Indian Wildlife Protection Act are Himalayan.

III) Has the global or national target been incorporated into relevant plans, programmes and strategies?

a) No	
b) Yes, into national biodiversity strategy and action plan	
c) Yes, into sectoral strategies, plans and programmes	X

Please provide details below.

Conservation programmes on species such as tiger, elephant, and species specific sanctuaries for wild and domesticated biodiversity have been established so as to strengthen the conservation efforts. Creation of Zoological parks, botanical gardens, captive breeding programmes, genetic mapping and gene banking research activities on Ex-Situ/In-Situ Conservation of flora & fauna in different ecosystem within forests (National Genome Project) are other initiatives. Biosphere Reserves have been specifically designated to implement coordinated conservation strategies for wild and domesticated flora and fauna. So far 14 Biosphere Reserves have been established.

IV) Please provide information on current status and trends in relation to this target.

Populations of large number of threatened species such as giant squirrel, rhino, etc. is being restored through various programmes being undertaken.

V) Please provide information on indicators used in relation to this target.

Increase in numbers of species.

VI) Please provide information on challenges in implementation of this target.

Difficulties in coping with the new threats to biodiversity such as poaching of tigers for medicinal use outside India.

Limited financial resources and provisions to compensate people getting affected due to newly faced situations such as expansion of habitat by elephant in human settlements with orchards, etc.

Lack of educational awareness programmes for different target groups.

Biotic pressure, fragmentation of habitats, Environmental/abiotic factors such as Climate Change, lack of manpower & information.

VII)Please provide any other relevant information.

Box VII.

Goal 3	**Promote the conservation of genetic diversity**
Target 3.1	**Genetic diversity of crops, livestock, and of harvested species of trees, fish and wildlife and other valuable species conserved, and associated indigenous and local knowledge maintained**

I) National target: Has a national target been established corresponding to the global target above?

a) No	
b) Yes, the same as the global target	
c) Yes, one or more specific national targets have been established	X

Please provide details below.

National Bureau of Plant Genetic Resources (NBPGR) has been engaged in documenting the large number of varieties of crops plants in the country. There are about 2300 varieties released at central and states levels. These have been documented and digitized. Efforts of local people and NGOs are also contributing to the conservation of local varieties of crops and animals and their associated traditional knowledge.

Similarly National Bureau of Animal Genetic Resources (NBAGR) and National Bureau of Fish Genetic Resources (NBFGR) are engaged in conservation of germ plasm. National Bureau of Fish Genetic Resources has been engaged in preparing a detailed database of fish genetic resources for their conservation. It has developed a National Facility for Gene Banking , Live Gene Banking and Tissue Accession. The work on documenting the species in different regions are underway and the work on traditional knowledge on fish has also been initiated at NBFGR.

Conservation programmes by NBAGR and concerned departments of Central /State governments have been initiated for those livestock breeds showing a decline in population. National Programme on Cattle and Buffalo Breeding (NPCBB) has been started for conservation, improvement and sustainable development of cattle and buffalo genetic resources and a National Gene Bank has been set up at NBAGR, Karnal. Conservation programmes are in progress for breeds such as the Spiti horse, Beetal goats, Nilli-Ravi buffaloes, Sahiwal cattle, Kodi adu goats, Tharparkar cattle, Barbari goat, Double humped camels, Jamnapuri Goats, Bhadawari and Toda buffaloes, Krishna Valley cattle, Pandharpuri buffaloes.

Centre for Cellular and Molecular Biology has established a National Facility for Conservation of Endangered species of animals.

Provision of documenting People's Biodiversity Register has been incorporated in the Biological Diversity Act, 2002 to document the important species at local level and the associated traditional knowledge for developing a national database. Traditional Knowledge Digital Library (TKDL) has been prepared for preserving the ancient Indian Knowledge on medicinal plants.

An internationally recognized culture collection as per Budapest Treaty, the Microbial Type Culture Collection has been established at Institute of Microbial Technology (IMTECH) in Chandigarh. National Bureau of Agriculturally Important Microorganisms (NBAIM) has been established at Mau and several specialized microbial culture collections exist at various academic institutions.

Development of high yielding clones of Eucalyptus, Poplar, Tamarinds Indica, Neem, Teak and Casuriana etc. and planting stock improvement programme of Indian Council for Forestry Research and Education (ICFRE) has enhanced productivity of the plants.

II) National targets for specific programmes of work: If such national target(s) ha(s)(ve) been established, please indicate here, and give further details in the box(es).

Programme of work	Yes	No	Details
a) Agricultural	X		Promotion of crop diversity use by on farm methods, participatory plant breeding and joint evaluation by all crop based institutes of Indian council of Agricultural Research (ICAR) for evaluation and characterization of

			crop germplasm for increased utilization.
b) Inland water	X		Fish stock identification and species specific information for conservation
c) Marine and coastal	X		Fish stock identification and species specific information for conservation Plan for protection of mangrove genetic resources, Establishment of Gene Banks, Crocodile Breeding Centre etc.
d) Dry and subhumid land		X	
e) Forest	X		Inventorisation of valuable species undertaken in many areas.
f) Mountain	X		

III) Has the global or national target been incorporated into relevant plans, programmes and strategies?

a) No	
b) Yes, into national biodiversity strategy and action plan	
c) Yes, into sectoral strategies, plans and programmes	X

Please provide details below.

Section 41 of the Biological Diversity Act, 2002 has provided for documentation of land races, folk varieties and cultivars and chronicling knowledge relating to biological diversity. The process has been initiated at few places in the country. Draft Environment Policy 2004 has put specific emphasis on enhancing *ex-situ* conservation of genetic resources in designated gene banks across the country. Genetic material of threatened species of flora and fauna is to be conserved on priority.

IV) Please provide information on current status and trends in relation to this target.

The number of threatened species is on the rise.

V) Please provide information on indicators used in relation to this target.

Identification of fragile ecosystems

VI) Please provide information on challenges in implementation of this target.

Better coordination and more funds are required for implementing this target.

VII)Please provide any other relevant information.

Box VIII.

Goal 4	**Promote sustainable use and consumption.**
Target 4.1	**Biodiversity-based products derived from sources that are sustainably managed, and production areas managed consistent with the conservation of biodiversity**

I) National target: Has a national target been established corresponding to the global target above?

a) No	
b) Yes, the same as the global target	
c) Yes, one or more specific national targets have been established	X

Please provide details below.

Porgrammes for sustainable utilization of biological diversity by involving local communities all over India have been undertaken under through the National Afforestation and Ecodevelopment Board (NAEB).

Joint Forest Management (JFM) has spread all over India covering more than 17 million hectares of forests where local communities are engaged in sustainable utilization of biological diversity needed for their daily requirements. Local norms of starting dates for the harvesting of Non-timber Forest Produces (NTFPs) have been formulated keeping in view of the sustainability of the species.

An institutional mechanism has been created under Biological Diversity Act 2002 and Rules, 2004 by establishing National Biodiversity Authority, State Biodiversity Boards and Biodiversity Management Committees to take steps for building up database and to create information and documentation system for biological resources and associated traditional knowledge through biodiversity registers and electronics data bases, to ensure effective management, promotion and sustainable uses.

Efforts have been made by National Innovation Foundation in developing products based on the local knowledge of biodiversity.

Technologies leading to sustainable harvest of forest products such as tapping of gum karaya; non-violent honey hunting etc. are being supported through programmes of science and technology departments.

A microbial wealth search programme is underway in the Council of Scientific and Industrial Research (CSIR) for bioprospecting of the gene pool of the country.

II) National targets for specific programmes of work: If such national target(s) ha(s)(ve) been established, please indicate here, and give further details in the box(es).

Programme of work	**Yes**	**No**	**Details**
a) Agricultural	X		Through community initiatives Kitchen Herbal Gardens have been established in several States in India. A mission mode project on Household Food and Nutritional Security was initiated in 2000, and completed in 2005. The project focussed on tribal areas and local communities in 10 States of India. Its aim was sustainable use of biodiversity for local communities. There were six different programmes, one each on life support crops, horticulture and vegetable gardening, animal husbandry, fisheries, value addition and impact assessment. An All India Coordinated Research Project on Under-Utilized and Under Exploited Plants was initiated in 1982, with the primary objective of generating improved technology and developing high yielding varieties in

			selected crops of future economic importance. Efforts under the project led to assemblage of over 10,000 germplasm accessions of different unde-utilized crops. Presently, the project is functioning at 20 centres with new crops such as Jatropha, Adzuki bean and Faba bean. The technical programme encompasses 19 plant species comprising 12 food crops and 7 plant species for feed and fodder, industrial or soil reclamation value. Characterization of different livestock and poultry breeds through systematic surveys in their native tract is being undertaken.
b) Inland water	X		Establishment of Eco-Tourism spots Aquaculture/Mariculture, lobster and Mud crab fattening programme of DOD, ban on fishing during monsoon. Turtle excluder devices in trawl nets to reduce bycatch
c) Marine and coastal	X		Seaweed culture, mussel culture, pearl culture etc.
d) Dry and subhumid land			Sustainable collection of NTFRs in dry and subhumid lands undertaken.
e) Forest	X		Sustainable collection of non timber forest produce has been contributing substantially to the local livelihoods all over India.
f) Mountain	X		a. Considering the life support and economic value of mountain biodiversity elements, especially ecologically and economically important plant groups (e.g. medicinal plants, wild edible plants etc), efforts are being made to assess the sustainable harvest potential for economic enterprises. For example, studies have established that fruits of *Myrica esculenta* (a popular wild edible tree) can contribute to the cash economy of local rural inhabitants of Kumaun in the Himalaya, if harvested properly. At the village level, the income generated through harvest of *Myrica* fruits was significant and at the same time existing intensity of harvest does not affect the natural recruitment process. b. Likewise, for Himalayan medicinal plants need has been felt for conducting assessment of the current requirement of raw material based on the analysis of market trends of herbal drug formulation. For example, in the Himalayan region assessment of medicinal plants requirement was carried out on the basis of use value index. Assessment of the stock (175 species) revealed that users (industry) rely more on exclusive wild forms (64.6%). Also, it was noticed that destructive mode of harvesting prevails. In view of these facts, efforts are being made to popularize the domestication of Himalayan medicinal plants so that pressure on wild populations is minimized.

III) Has the global or national target been incorporated into relevant plans, programmes and strategies?	
a) No	
b) Yes, into national biodiversity strategy and action plan	
c) Yes, into sectoral strategies, plans and programmes	X

Please provide details below.

Joint Forest Management has been a successful exercise incorporated in functioning of various schemes of the State Forest Departments.

Network of Medicinal Plant Conservation Areas (MPCAs) has been established in various parts of the country for *in situ* as well as *ex situ* conservation of medicinal plants.

IV) Please provide information on current status and trends in relation to this target.

So far, more than 80,000 Committees under Joint Forest Management scheme have been established in India covering about 17 million hectare of the area, which is more than the area under the Protected Area network (about 14 million hectare). There has been an increasing trend over the period for the area brought under under JFM initiative.

V) Please provide information on indicators used in relation to this target.

- Area under JFM programme
- Number of MPCAs
- Involvement of local people in the natural resource management

VI) Please provide information on challenges in implementation of this target.

Keeping involvement of local people proactive for conservation is one of the foremost challenges along with limited financial resources for positive incentives.

Most urban and many industrials users of bioresources seem unaware of the unsustainably of their consumption.

Standards for Certification of forests & forest products is imperative in light of global initiative on certification. Any forest product (timber or non timber) that is traded in the international market, needs to have a certification that the product is derived from sustainably managed forests.

VII)Please provide any other relevant information.

Box IX.

Target 4.2	**Unsustainable consumption, of biological resources, or that impacts upon biodiversity, reduced**

I) National target: Has a national target been established corresponding to the global target above?

a) No	
b) Yes, the same as the global target	
c) Yes, one or more specific national targets have been established	X

Please provide details below.

According to the Biological Diversity Act, 2002, no person, who is a citizen of India or a body corporate, association or organization which is registered in India, shall obtain any biological resource for commercial utilization, or bio-survey and bio-utilization for commercial utilization except after giving prior intimation to the State Biodiversity Board concerned. The State Biodiversity Boards have the authority to regulate any such activities which is against the objectives of conservation, sustainable utilization and equitable sharing of benefits.

Six Ecologically Sensitive Areas (ESAs) have been notified under the Environment Protection Act in the country for imposing restrictions on the industries, operations, process and other developmental activities that have detrimental effect on the environment.

Techniques for sustainable harvesting of bioresources such as non violent honey hunting, sustainable tapping of gum Karaya (gum of *Sterculia urens*), etc. have been developed to control unsustainable harvesting of such produce.

Categories of forest management such as Reserved Forests are strictly managed in terms of harvesting of any material, which is allowed only after the permission of Government.

II) National targets for specific programmes of work: If such national target(s) ha(s)(ve) been established, please indicate here, and give further details in the box(es).

Programme of work	**Yes**	**No**	**Details**
a) Agricultural	X		Conservation of agricultural lands Lack of adequate grazing land for domestic livestock making them unsustainable.
b) Inland water	X		Programme for conservation and management of wetlands being implemented wherein unsustainable harvesting from such water bodies is not allowed.
c) Marine and coastal	X		Marine protected areas have been established for the conservation of coral reefs especially on the islands of Andaman and Nicobar.
d) Dry and subhumid land	X		Afforestation and regeneration of dry and subhumid lands is being undertaken
e) Forest	X		Biosphere Reserves provide the opportunity of sustainable utilization of natural resources. Sample/ Preservation plots created by different states can also provide the opportunity of sustainable utilization of natural resources.
f) Mountain	X		Nearly 450 plants of the Himalayan region are endangered mainly because of habitat destruction and over-exploitation. *Panax pseudo-ginseng, Calamus inermis, Phoenix rupicola, Dioscorea deltoidea, Coptis teeta, Picrorhiza kurrooa*, etc, and a large number of orchids are some such examples. Efforts being undertaken to prevent unsustainable harvesting of such species.

III) Has the global or national target been incorporated into relevant plans, programmes and strategies?	
a) No	
b) Yes, into national biodiversity strategy and action plan	
c) Yes, into sectoral strategies, plans and programmes	X

Please provide details below.

Multiple options for sustainable utilization have been carried out which include legislative measures such as through the provisions of Biological Diversity Act, 2002, scientific techniques of harvesting such as non violent honey hunting methods, local level sustainability programmes such as Joint Forest Management etc.

IV) Please provide information on current status and trends in relation to this target.

Awareness level on sustainable use is increasing

V) Please provide information on indicators used in relation to this target.

Increase in the application of various measures for controlling unsustainable use.

VI) Please provide information on challenges in implementation of this target.

Lack of awareness of genetic resources and their value.

Increasing attitude of local people towards short term financial gains from the natural resources such as non timber forest products.

Limited financial resources for assuring incentives for sustainable utilization.

VII)Please provide any other relevant information.

Box X.

Target 4.3	**No species of wild flora or fauna endangered by international trade**

I) National target: Has a national target been established corresponding to the global target above?

a) No	
b) Yes, the same as the global target	
c) Yes, one or more specific national targets have been established	X

Please provide details below.

India is a Party to the Convention on International Trade in Endangered Species (CITES). National targets are planned and considered under CITES, Environment Protection Act, 1986 and Biological Diversity Act, 2002. Endangered species are prohibited for international trade

II) National targets for specific programmes of work: If such national target(s) ha(s)(ve) been established, please indicate here, and give further details in the box(es).

Programme of work	Yes	No	Details
a) Agricultural	X		Exchange of crop species material is regulated by Ministry of Agriculture.
b) Inland water	X		International trade in endangered species is regulated through CITES

c) Marine and coastal	X		Regulation of Shark Fishing (Whale Shark), sea cucumbers, corals, salt water crocodiles, sea turtles (4 spp.) whales and some shells. Trade is not allowed on these living beings.
d) Dry and subhumid land			International trade in endangered species is regulated through CITES
e) Forest	X		International trade in endangered species is regulated through CITES
f) Mountain	X		International trade in endangered species is regulated through CITES

III) Has the global or national target been incorporated into relevant plans, programmes and strategies?

a) No	
b) Yes, into national biodiversity strategy and action plan	
c) Yes, into sectoral strategies, plans and programmes	X

Please provide details below.

- National targets are planned and considered under Draft National Environment Policy, 2004,Biological Diversity Act, 2002 and Biological Diversity Rules, 2004

IV) Please provide information on current status and trends in relation to this target.

Conservation programmes being implemented for endangered species such as Siberian cranes, tigers, sea cow and elephants etc.

V) Please provide information on indicators used in relation to this target.

Increase in the populations of the endangered species.

VI) Please provide information on challenges in implementation of this target.

Limited allocation of funds, lack of awareness etc.

VII)Please provide any other relevant information.

Box XI.

Goal 5	**Pressures from habitat loss, land use change and degradation, and unsustainable water use, reduced.**
Target 5.1	**Rate of loss and degradation of natural habitats decreased**

I) National target: Has a national target been established corresponding to the global target above?

a) No	
b) Yes, the same as the global target	
c) Yes, one or more specific national targets have been established	X

Please provide details below.

Nearly 600 Protected Areas have been established in the country. Apart from the network of Protected Areas, 14 Biosphere Reserves have also been declared.

Reserved Forests are one of the most strictly protected forest areas outside the protected areas. Extensive forested areas in the country are under this Reserved Forest category.

More than 80,000 Joint Forest Management Committees are making a visible positive impact on the restoration of degraded forests and efficient management of forested areas.

India also has areas declared as a part of International Bird Area Network. India has documented more than 14000 sacred groves and it is estimated than the number all over the country might be ten fold. Apart from this, there are extensive local level efforts initiated for conservation through Community Conserved Areas (CCAs).

II) National targets for specific programmes of work: If such national target(s) ha(s)(ve) been established, please indicate here, and give further details in the box(es).

Programme of work	Yes	No	Details
a) Agricultural	X		Various programmes being undertaken e.g. Kitchen Herbal Gardens, Household Food and Nutritional Security.
b) Inland water	X		Programme for conservation and management of identified wetlands in the country is being implemented which has resulted in reducing the rate of loss and degradation of these habitats.
c) Marine and coastal	X		Mangrove conservation programme has been in operation and so far 35 mangrove areas have been identified for intensive conservation and management in the country. The State Governments are continuously persuaded to identify new and additional mangrove conservation areas. Intensive conservation and management of coral reefs has also been initiated. Other critical habitats (such as sand dune beeches sea grass beds) are protected under CRZ. Creation of new PAs under WLP Act in marine sector, being considered.
d) Dry and subhumid land			Sustainable harvesting of NTFPs encouraged and promoted.
e) Forest	X		The National Afforestation and Eco-development Board evolves mechanisms for ecological restoration of degraded forest areas and adjoining lands including ecologically fragile areas through systematic planning and implementation in a cost effective manner.
f) Mountain	X		Sustainable harvesting of NTFPs encouraged and promoted.

III) Has the global or national target been incorporated into relevant plans, programmes and strategies?

a) No	
b) Yes, into national biodiversity strategy and action plan	
c) Yes, into sectoral strategies, plans and programmes	X

Please provide details below.

The Draft National Environment Policy, 2004 provides for formulation of an innovative strategy for increase of forest and tree cover from the present level of 23% of the country's land area to 33% in 2012, though afforestation of degraded forest land, wastelands and tree cover on private and revenue land. The National Forest Policy also aims at maintaining environment and ecological balance. It emphasizes the natural heritage, preserving flora, fuel, fodder, NTFP's and requirements of rural and tribal people and increasing forest productivity at national level though community involvement.

IV) Please provide information on current status and trends in relation to this target.

V) Please provide information on indicators used in relation to this target.

Reduction in areas of degraded habitats.

VI) Please provide information on challenges in implementation of this target.

- Dissemination of information
- Lack of awareness
- Inadequate funds
- Population pressure

VII)Please provide any other relevant information.

Box XII.

Goal 6	**Control threats from invasive alien species.**
Target 6.1	**Pathways for major potential alien invasive species controlled**

I) National target: Has a national target been established corresponding to the global target above?

a) No	
b) Yes, the same as the global target	
c) Yes, one or more specific national targets have been established	X

Please provide details below.

In India, in the context of prevention of invasive alien species introductions, there are six agencies which are responsible for issuance of certificate for export/import of bioresources. These are as follows:

i. Plant Quarantine Division, NBPGR issues phytosanitary certificate for export of material and permits for import of germplasm, under the Plant Quarantine Order (PQO) 2003 of the Destructive Insects and Pests Act, 1914.

ii. The Plant Protection Adviser issues permit for import of live insects and microbial cultures, plants and plant products, and phytosanitary certificates along with the organism for export under the PQO.

iii. Department of Animal Husbandry and Dairying deals with import of livestock issues health certificate for the livestock to be exported, if required by the importing country, under the Livestock Importation Act, 1898.

iv. Directorate General of Foreign Trade issues license before export of any living organism or their product from the country under the Foreign Trade (Development & Regulation) Act 1992.

v. The Ministry of Environment & Forests issues approval alongwith quarantine certificate for export of wild animals and articles under the Wildlife (Protection) Act 1972.

vi. The National Biodiversity Authority, Ministry of Environment & Forests, is empowered to issue approval for export of biological material from the country under the Biological Diversity Act 2002.

At the central level, there are two relevant departments in the Ministry of Agriculture – the Department of Agriculture and Cooperation (DAC) and Department of Agricultural Research and Education (DARE) - which are concerned with plant protection outreach and research, respectively. Through Indian Council of Agricultural Research, about 90 Institutes and more than 100 universities in the country are having programmes on various invasive alien species. Guidelines on Quarantine and Strategic Plan for exotic introduction published. Besides the programme at national and state level under the ICAR on IAS,the threat of invasive pest species gaining entry into India through imported plant/planting material is taken care of under the Plant Quarantine (Regulation of Import into India) Order, 2003. However, the risk analysis for invasiveness of a plant species per se is not taken care of under the PQ order.

In addition, CITES regulations and IMO guidelines for Ballast Water introduction are in place.

II) National targets for specific programmes of work: If such national target(s) ha(s)(ve) been established, please indicate here, and give further details in the box(es).

Programme of work	**Yes**	**No**	**Details**
a) Agricultural	X		

b) Inland water	X		
c) Marine and coastal	X		
d) Dry and subhumid land			
e) Forest			Establishment of Asia-Pacific Forest Invasive Species Network (APFISN) under FAO has finalized the format for submitting country report on stocktaking of national activities by MoEF.
f) Mountain			

III) Has the global or national target been incorporated into relevant plans, programmes and strategies?

a) No	
b) Yes, into national biodiversity strategy and action plan	
c) Yes, into sectoral strategies, plans and programmes	X

Please provide details below.

IV) Please provide information on current status and trends in relation to this target.

V) Please provide information on indicators used in relation to this target.

VI) Please provide information on challenges in implementation of this target.

Limited knowledge as well as human expertise about biological life history of the various invasive alien species.

Limitations due to natural processes in recovery of natural habitats which have undergone the invasion.

No financial resources to recover the habitats from invasive species.

Due to obvious reasons, the species threatening immediate economic activities are paid more attention and hence other species get neglected resulting into increased amount of threat.

VII)Please provide any other relevant information.

Box XIII.

Target 6.2	**Management plans in place for major alien species that threaten ecosystems, habitats or species**

I) National target: Has a national target been established corresponding to the global target above?

a) No	
b) Yes, the same as the global target	
c) Yes, one or more specific national targets have been established	X

Please provide details below.

The taxa causing the most damage in India include insects, mites, molluscs, weeds, and pathogens.

The DAC organises discussions with the ICAR and other related departments at regular intervals to advance strategies and programmes to address serious pest problems, including invasive alien species.
A national committee on exotic fish introduction is also in place.

II) National targets for specific programmes of work: If such national target(s) ha(s)(ve) been established, please indicate here, and give further details in the box(es).

Programme of work	Yes	No	Details
a) Agricultural	X		
b) Inland water	X		
c) Marine and coastal	X		
d) Dry and subhumid land		X	
e) Forest	X		
f) Mountain		X	

III) Has the global or national target been incorporated into relevant plans, programmes and strategies?

a) No	
b) Yes, into national biodiversity strategy and action plan	
c) Yes, into sectoral strategies, plans and programmes	X

Please provide details below.

IV) Please provide information on current status and trends in relation to this target.

V) Please provide information on indicators used in relation to this target.

VI) Please provide information on challenges in implementation of this target.

VII) Please provide any other relevant information.

Box XIV.

Goal 7	**Address challenges to biodiversity from climate change, and pollution.**
Target 7.1	**Maintain and enhance resilience of the components of biodiversity to adapt to climate change**

I) National target: Has a national target been established corresponding to the global target above?

a) No	
b) Yes, the same as the global target	
c) Yes, one or more specific national targets have been established	X

Please provide details below.

II) National targets for specific programmes of work: If such national target(s) ha(s)(ve) been established, please indicate here, and give further details in the box(es).

Programme of work	Yes	No	Details
a) Agricultural	X		
b) Inland water	X		
c) Marine and coastal	X		
d) Dry and subhumid land	-		
e) Forest	X		
f) Mountain	X		In view of the climate sensitive nature of mountain biodiversity, efforts being made to understand the responses of biodiversity elements (species/ecosystems) towards changing climate. For example, in the Himalaya detailed investigation on status of biodiversity (especially plant diversity) in the timberline zone of west Himalaya has been conducted. Such studies in climate sensitive habitats are supposed to form the basis for indicating changes as a consequence of global warming. Indirect evidences from species studies are being generated to predict the changes. Also, this type of species level study would form a basis for formulating conservation plans.

III) Has the global or national target been incorporated into relevant plans, programmes and strategies?

a) No	
b) Yes, into national biodiversity strategy and action plan	
c) Yes, into sectoral strategies, plans and programmes	X

Please provide details below.

Control of vehicular pollution

IV) Please provide information on current status and trends in relation to this target.

V) Please provide information on indicators used in relation to this target.

VI) Please provide information on challenges in implementation of this target.

VII) Please provide any other relevant information.

Box XV.

Target 7.2	**Reduce pollution and its impacts on biodiversity**

I) National target: Has a national target been established corresponding to the global target above?

a) No	
b) Yes, the same as the global target	
c) Yes, one or more specific national targets have been established	X

Please provide details below.

- Environmental Impact Assessment (EIA) Procedure is mandatory legally for 32 categories of development activities in India vide a Notification issued in 1994 under the Environment Protection Act 1986. The objective of the EIA is to minimize environmental impacts of development processes.
- National River Conservation Directorate has been set up to reduce pollution in the rivers under the National River Conservation Plan (NRCP). The Ganga Action Plan and Yamuna Action Plan are being implemented. Several other rivers are under active consideration of the NRCP.
- National Lake Conservation Programme (NLCP) has taken up lakes such as Powai, Ooty and Kodaikanal for conservation.
- Under Environment (Protection) Act 1986, six areas in the country are declared as Ecologically Sensitive Areas namely Doon valley, Murud Janjira, part of Aravallis, Dahanu taluka, Mahabaleshwar – Panchagani, Pachmarhi, Numaligarh (no development zone), Matheran. These areas have been set up in order to save the sensitive ecosystems. Guidelines have been set up to submit proposals to declare Ecologically Sensitive Areas.

II) National targets for specific programmes of work: If such national target(s) ha(s)(ve) been established, please indicate here, and give further details in the box(es).

Programme of work	**Yes**	**No**	**Details**
a) Agricultural	X		Promotion of organic agriculture, promotion of education and awareness decreased use of poly bags, diversity of low input (fertilizers and pesticides.)
b) Inland water	X		National River Action Plan to improve the water qualities of the river through the implementation of pollution abatement schemes.
c) Marine and coastal	X		Environment Protection Act, CRZ Notification, Prevention of Water Pollution Act
d) Dry and subhumid land			
e) Forest			
f) Mountain			

III) Has the global or national target been incorporated into relevant plans, programmes and strategies?

a) No	
b) Yes, into national biodiversity strategy and action plan	
c) Yes, into sectoral strategies, plans and programmes	X

Please provide details below.

IV) Please provide information on current status and trends in relation to this target.

V) Please provide information on indicators used in relation to this target.

VI) Please provide information on challenges in implementation of this target.
VII) Please provide any other relevant information.

Box XVI.

Goal 8	**Maintain capacity of ecosystems to deliver goods and services and support livelihoods.**
Target 8.1	**Capacity of ecosystems to deliver goods and services maintained**

I) National target: Has a national target been established corresponding to the global target above?	
a) No	
b) Yes, the same as the global target	
c) Yes, one or more specific national targets have been established	X

Please provide details below.

Intensive programmes all over India have been undertaken to enhance the capacities of ecosystems to deliver goods and services. The holistic programmes like Joint Forest Management not only give importance to forest areas but also help recharge the groundwater table and help control soil erosion. The programme is operational on more than 17 million hectare land spread all over the country.

At Panchayat (village council) level, there have been Watershed committees all over the country. Through these committees, watershed programmes have been implemented mainly focusing on groundwater recharge and soil erosion.

Ecodevelopment approach in and around Project Tiger areas have been implemented for improving the natural habitats and also reducing the dependence of local people on the forests.

II) National targets for specific programmes of work: If such national target(s) ha(s)(ve) been established, please indicate here, and give further details in the box(es).

Programme of work	Yes	No	Details
a) Agricultural		X	
b) Inland water	X		
c) Marine and coastal	X		Coastal Protection, Regulation of fishing, Eco Development Societies, Fisheries Cooperation are in place.
d) Dry and subhumid land			
e) Forest			
f) Mountain			

III) Has the global or national target been incorporated into relevant plans, programmes and strategies?	
a) No	
b) Yes, into national biodiversity strategy and action plan	
c) Yes, into sectoral strategies, plans and programmes	X

Please provide details below.
IV) Please provide information on current status and trends in relation to this target.
Orient ecotourism activities towards benefiting local populations
V) Please provide information on indicators used in relation to this target.
VI) Please provide information on challenges in implementation of this target.
VII) Please provide any other relevant information.

Box XVII.

Target 8.2	**Biological resources that support sustainable livelihoods, local food security and health care, especially of poor people maintained**

I) National target: Has a national target been established corresponding to the global target above?	
a) No	
b) Yes, the same as the global target	
c) Yes, one or more specific national targets have been established	X

Please provide details below.

Local level governance has been strengthened through Panchayat (village council) systems and building supportive bodies such as Biodiversity Management Committees, Watershed committees along with national and state level legislations. Special attention has been paid to tribal areas by declaring Scheduled Areas and by providing special facilities for livelihoods, local foods security and health care.

Joint Forest Management Committees have created opportunities for sustainable livelihoods based on natural resources.

Measures for conservation adopted for better fish biosecurity and also for health management have been taken.

II) National targets for specific programmes of work: If such national target(s) ha(s)(ve) been established, please indicate here, and give further details in the box(es).

Programme of work	Yes	No	Details
a) Agricultural	X		Agriculture related subjects, household food security, programme for tribal areas, underutilized crops, new markets for diversification etc.
b) Inland water	X		Extensive programmes of pisciculture have been undertaken by providing improved seedlings in states like Andhra Pradesh. In eastern Indian States like Orissa, West Bengal, homestead waterbodies have been part of the traditional systems to provide food security by maintaining fresh water fishes.
c) Marine and coastal	X		Prawn culture has been supported in coastal areas of Karnataka, West Bengal, etc.
d) Dry and subhumid land			
e) Forest			Through Joint Forest Management Programme in most of the participating 28 States in the country, extensive focus has been given towards non-timber forest produces (NTFPs). It includes the NTFPs of commercial

			value as well as for the household use mostly in form of supplementary food. JFM has resulted in increasing the availability of NTFPs in many parts for the poor people.
f) Mountain			As a stocktaking exercise, inventories of Himalayan Bioresources is being developed as follows: a. Family wise inventory of plants (in progress) b. Inventory of Himalayan medicinal plants (completed). Total species – 1748 (1020 herbs, 339 trees, 338 shrubs, 51 pteridophytes). c. Inventory of Wild edible plants of the Himalaya (completed). Total species – 675, representing 84.4% of total wild edible reported from India. d. Status assessment and mapping of these resources is also being attempted.

III) Has the global or national target been incorporated into relevant plans, programmes and strategies?	
a) No	
b) Yes, into national biodiversity strategy and action plan	
c) Yes, into sectoral strategies, plans and programmes	X
Please provide details below.	

IV) Please provide information on current status and trends in relation to this target.

V) Please provide information on indicators used in relation to this target.

VI) Please provide information on challenges in implementation of this target.

VII) Please provide any other relevant information.

Box XVIII.

Goal 9	**Maintain socio-cultural diversity of indigenous and local communities.**
Target 9.1	**Protect traditional knowledge, innovations and practices**

I) National target: Has a national target been established corresponding to the global target above?	
a) No	
b) Yes, the same as the global target	
c) Yes, one or more specific national targets have been established	X
Please provide details below.	

The Biological Diversity Act and Rules provide for preparing People's Biodiversity Registers at Panchayat level in consultation with local people. The Register shall contain comprehensive information on availability and knowledge of local biological resources, their medicinal or any other use, or any other traditional knowledge associated with them.

Traditional Knowledge Digital Library (TKDL) an easily navigable computerized database, has been prepared for documentating traditional knowledge related to use of medicinal plants in India. TKDL will help in preventing misappropriation of traditional knowledge from patenting.

National Innovation Foundation has been established to record the traditional knowledge, innovations and practices at the grassroots level for the purpose of product development and appropriation, so as to ensure benefit sharing to the knowledge holder.

II) National targets for specific programmes of work: If such national target(s) ha(s)(ve) been established, please indicate here, and give further details in the box(es).

Programme of work	Yes	No	Details
a) Agricultural	X		ICAR project on indigenous traditional knowledge (ITK), passport data updation, validation initiated also started about ITK.
b) Inland water	X		
c) Marine and coastal	X		Provisions of Biodiversity Act. Wildlife Protection Act provides hunting rights to tribals of A&N Islands and tribal reserves
d) Dry and subhumid land			
e) Forest	X		
f) Mountain	X		

III) Has the global or national target been incorporated into relevant plans, programmes and strategies?

a) No	
b) Yes, into national biodiversity strategy and action plan	
c) Yes, into sectoral strategies, plans and programmes	X

Please provide details below.

Legislative measures such Biological Diversity Act, 2002 and Plant Variety Protection and Farmers Rights Act provide the basis of incorporating this target in all the relevant plans, programmes and strategies.

IV) Please provide information on current status and trends in relation to this target.

There is an increasing awareness to protect traditional knowledge, innovations and practices and therefore, several programmes are being formulated.

V) Please provide information on indicators used in relation to this target.

Availability of documentation

VI) Please provide information on challenges in implementation of this target.

Acceptance of documentation by local people.

VII)Please provide any other relevant information.

Box XIX.

Target 9.2	**Protect the rights of indigenous and local communities over their traditional knowledge, innovations and practices, including their rights to benefit sharing**

I) National target: Has a national target been established corresponding to the global target above?

a) No	
b) Yes, the same as the global target	
c) Yes, one or more specific national targets have been established	X

Please provide details below.

The mechanism of benefit sharing as envisaged in the Biological Diversity Act 2002 is as follows. Section 3 of the Biological Diversity Act 2002 provides for mandatory prior approval of the National Biodiversity Authority (NBA) for obtaining any biological resources occurring in India or associated knowledge for commercial or any other use. Further, Section 6 of the Act provides that prior approval of NBA is also required before applying for any IPRs in or outside India for any invention based on research or information on a biological resource obtained from India. The NBA grants such approvals subject to terms and conditions so as to secure equitable sharing of benefits arising out of the use of accessed biological resources, and associated knowledge. Similarly, Indian industry is required to provide prior intimation to the concerned State Biodiversity Board (SBB) about the use of biological resource, and the SBB has the power to restrict any such activity which violates the objectives of conservation, sustainable use and equitable sharing of benefits. The NBA as well as the SBBs are required to undertake mandatory consultation of the concerned local level Biodiversity Management Committees (BMCs) for decision making process relating to access and benefit sharing, thereby formalizing the prior informed consent by communities for access and benefit sharing.

II) National targets for specific programmes of work: If such national target(s) ha(s)(ve) been established, please indicate here, and give further details in the box(es).

Programme of work	**Yes**	**No**	**Details**
a) Agricultural	X		Plant Variety Protection and Farmers Rights Act provides for protection of farmers rights.
b) Inland water			
c) Marine and coastal			
d) Dry and subhumid land			
e) Forest			
f) Mountain	X		Considering the diversity of indigenous communities and their traditions in mountain areas of the Himalaya, the G.B. Pant Institute of Himalayan Environment & Development under Ministry of Environment & Forests, Govt. of India, has initiated a core programme 'Indigenous Knowledge Systems'. The programme focuses on documentation of IKS and subsequently provides support in protecting the rights and developing benefit-sharing mechanisms for indigenous communities.

III) Has the global or national target been incorporated into relevant plans, programmes and strategies?

a) No	
b) Yes, into national biodiversity strategy and action plan	
c) Yes, into sectoral strategies, plans and programmes	X

Please provide details below.

Enactment of Biological Diversity Act, 2002 has given a major impetus to the protection of rights of indigenous and local communities over their traditional knowledge.
IV) Please provide information on current status and trends in relation to this target.
V) Please provide information on indicators used in relation to this target.
Development of suitable models
VI) Please provide information on challenges in implementation of this target.
Complexity of socio-cultural aspects
VII)Please provide any other relevant information.

Box XX.

Goal 10	**Ensure the fair and equitable sharing of benefits arising out of the use of genetic resources.**
Target 10.1	**All transfers of genetic resources are in line with the Convention on Biological Diversity, the International Treaty on Plant Genetic Resources for Food and Agriculture and other applicable agreements**

I) National target: Has a national target been established corresponding to the global target above?

a) No	
b) Yes, the same as the global target	
c) Yes, one or more specific national targets have been established	X

Please provide details below.

Legislative framework is in place with enactment of Biological Diversity Act, 2002, Plant Variety Protection and Farmers Rights Act and the Patents Act (Second and Third Amendments) and the targets are being established. It is proposed in the Draft National Environment Policy, 2004 to take measures to formulate and adopt an internationally recognized system of legally enforceable *sui-generis* intellectual property rights for the country's genetic resources, to enable the country, including where relevant the local communities, to derive economic benefits from grant of access to these resources and for ethno-biology knowledge, and to enable local communities to realize significant financial benefits from permitting the use of such knowledge. It is also proposed to set up an on-line database of the inventory of such ethno-biology knowledge, once the legal regime, domestic and multilateral, for their protection is in place.

II) National targets for specific programmes of work: If such national target(s) ha(s)(ve) been established, please indicate here, and give further details in the box(es).

Programme of work	Yes	No	Details
a) Agricultural			
b) Inland water			
c) Marine and coastal			
d) Dry and subhumid land			
e) Forest			
f) Mountain			

III) Has the global or national target been incorporated into relevant plans, programmes and strategies?

a) No	
b) Yes, into national biodiversity strategy and action plan	
c) Yes, into sectoral strategies, plans and programmes	X

Please provide details below.

Same as given at 1 above

IV) Please provide information on current status and trends in relation to this target.

V) Please provide information on indicators used in relation to this target.

VI) Please provide information on challenges in implementation of this target.

VII) Please provide any other relevant information.

Box XXI.

Target 10.2	**Benefits arising from the commercial and other utilization of genetic resources shared with the countries providing such resources**

I) National target: Has a national target been established corresponding to the global target above?

a) No	
b) Yes, the same as the global target	
c) Yes, one or more specific national targets have been established	X

Please provide details below.

India has enacted the Biological Diversity Act 2002 and Biological Diversity Rules 2004, which primarily aim at facilitating access to biological resources and associated knowledge subject to certain terms and conditions which secure equitable sharing of benefits arising out of their use.

India as the President of Like Minded Megadiverse Countries (LMMCs) has been navigating the deliberations on behalf of LMMCs for developing an International Regime on Access and Benefit Sharing. It is expected that such a regime would ensure that the benefits arising from the commercial and other utilization of genetic resources associated knowledge shared are with the countries providing such resources and knowledge, in accordance with the provisions of the Convention on Biological Diversity.

II) National targets for specific programmes of work: If such national target(s) ha(s)(ve) been established, please indicate here, and give further details in the box(es).

Programme of work	**Yes**	**No**	**Details**
a) Agricultural	X		Documentation of biodiversity of land races, folk varieties, cultivars, domesticable stocks and breeds of animals and chronicling of knowledge relating to biodiversity, has been provided for in the Biological Diversity Act and Rules. The Act also provides for ensuring equitable sharing of benefits arising out of the use of biological resources and associated knowledge.
b) Inland water			Same as above
c) Marine and coastal			Same as above
d) Dry and subhumid land			Same as above

e) Forest			Same as above
f) Mountain	X		In addition, the efforts regarding conservation of medicinal plants are ongoing through international organizations like ICIMOD in the mountain areas of India, Nepal, Pakistan, etc. These processes will help to evolve access and benefit sharing related to medicinal plants and the associated knowledge.

III) Has the global or national target been incorporated into relevant plans, programmes and strategies?	
a) No	
b) Yes, into national biodiversity strategy and action plan	
c) Yes, into sectoral strategies, plans and programmes	X

Please provide details below.

The mechanism of benefit sharing as envisaged in the Biological Diversity Act 2002 is as follows. Section 3 of the Biological Diversity Act 2002 provides for mandatory prior approval of the National Biodiversity Authority (NBA) for obtaining any biological resources occurring in India or associated knowledge for commercial or any other use. Further, Section 6 of the Act provides that prior approval of NBA is also required before applying for any IPRs in or outside India for any invention based on research or information on a biological resource obtained from India. The NBA grants such approvals subject to terms and conditions so as to secure equitable sharing of benefits arising out of the use of accessed biological resources, and associated knowledge. Similarly, Indian industry is required to provide prior intimation to the concerned State Biodiversity Board (SBB) about the use of biological resource, and the SBB has the power to restrict any such activity which violates the objectives of conservation, sustainable use and equitable sharing of benefits. The NBA as well as the SBBs are required to undertake mandatory consultation of the concerned local level Biodiversity Management Committees (BMCs) for decision making process relating to access and benefit sharing, thereby formalizing the prior informed consent by communities for access and benefit sharing.

IV) Please provide information on current status and trends in relation to this target.

V) Please provide information on indicators used in relation to this target.

VI) Please provide information on challenges in implementation of this target.

VII) Please provide any other relevant information.

Box XXII.

Goal 11	**Parties have improved financial, human, scientific, technical and technological capacity to implement the Convention.**
Target 11.1	**New and additional financial resources are transferred to developing country Parties, to allow for the effective implementation of their commitments under the Convention, in accordance with Article 20**

I) National target: Has a national target been established corresponding to the global target above?

a) No	
b) Yes, the same as the global target	
c) Yes, one or more specific national targets have been established	X

Please provide details below.

MoEF is the operational nodal point for GEF funded projects in India. Thirteen projects are under implementation, and three have been completed. Eleven projects have been approved in principle for GEF funding and are in the preparatory phase. UNDP GEF/CCF Small Grant Programmes has supported ninety projects in India since 1992 to support activities that demonstrate community based approaches. Financial resources have also been accessed from India Canada Environment Facility (ICEF) for Canada India Institutional Strengthening Project etc.

II) National targets for specific programmes of work: If such national target(s) ha(s)(ve) been established, please indicate here, and give further details in the box(es).

Programme of work	Yes	No	Details
a) Agricultural			
b) Inland water			
c) Marine and coastal			
d) Dry and subhumid land			
e) Forest			
f) Mountain			

III) Has the global or national target been incorporated into relevant plans, programmes and strategies?

a) No	
b) Yes, into national biodiversity strategy and action plan	
c) Yes, into sectoral strategies, plans and programmes	X

Please provide details below.

IV) Please provide information on current status and trends in relation to this target.

V) Please provide information on indicators used in relation to this target.

VI) Please provide information on challenges in implementation of this target.

VII)lease provide any other relevant information.

Box XXIII.

Target 11.2	**Technology is transferred to developing country Parties, to allow for the effective implementation of their commitments under the Convention, in accordance with its Article 20, paragraph 4**

I) National target: Has a national target been established corresponding to the global target above?

a) No	
b) Yes, the same as the global target	
c) Yes, one or more specific national targets have been established	X

Please provide details below.

II) National targets for specific programmes of work: If such national target(s) ha(s)(ve) been established, please indicate here, and give further details in the box(es).

Programme of work	**Yes**	**No**	**Details**
a) Agricultural			
b) Inland water			
c) Marine and coastal			
d) Dry and subhumid land			
e) Forest			
f) Mountain			

III) Has the global or national target been incorporated into relevant plans, programmes and strategies?

a) No	
b) Yes, into national biodiversity strategy and action plan	
c) Yes, into sectoral strategies, plans and programmes	

Please provide details below.

IV) Please provide information on current status and trends in relation to this target.

V) Please provide information on indicators used in relation to this target.

VI) Please provide information on challenges in implementation of this target.

VII) Please provide any other relevant information.

Global Strategy for Plant Conservation (GSPC)

The Conference of the Parties, in decision VI/9, annex, adopted the Global Strategy for Plant Conservation. Parties and Governments are invited to develop their own targets with this flexible framework. The Conference of the Parties considered the Strategy as a pilot approach for the use of outcome oriented targets under the Convention. In decision VII/10, the Conference of the Parties decided to integrate the targets into the reporting framework for the Third National Reports. Please provide relevant information by responding to the questions and requests contained in the following tables.

Box XXIV.

Target 1. A widely accessible working list of known plant species, as a step towards a complete world flora.	
I) Has your country established national target corresponding to the above global target?	
a) Yes	X
b) No	
Please specify	
A working list of such plant groups as Angiosperms, Gymnosperms, Pteridophytes, Bryophytes, Lichens and some groups of Algae and Fungi is in place.	
II) Has your country incorporated the above global or national target into relevant plans, programmes and strategies?	
a) Yes	X
b) No	
Please specify	
The Botanical Survey of India, along with some other national laboratories and academic institutions has an ongoing programme on survey and inventorisation of plant diversity.	
III) Current status (please indicate current status related to this target)	
A working list of such plant groups as Angiosperms, Gymnosperms, Pteridophytes, Bryophytes, Lichens, Algae and Fungi is available, but information on lower groups of plants (Bryophytes, Lichens, Algae and Fungi) is widely scattered.	
IV) Measures taken to achieve target (please indicate activities, legislative measures and other steps taken with a view to achieve the target)	
Capacity building in taxonomy in areas where adequate expertise is not available, e.g. lower groups and some other specialized group of plants.	
V) Progress made towards target (please specify indicators used to monitor progress towards the target)	
Progress has been made as per the targets. Quarterly and annual targets are set and physical progress made against the targets is monitored.	
VI) Constraints to achieving progress towards the target	
Lack of adequate number of taxonomists for different taxonomic groups of plants, especially lower groups, and lack of opportunities for trained taxonomists.	
VII)Any other relevant information	

Box XXV.

Target 2. A preliminary assessment of the conservation status of all known plant species, at national, regional and international levels.	
I) Has your country established national target corresponding to the above global target?	
a) Yes	X
b) No	
Please specify	
A preliminary assessment of the conservation status has been done in case of flowering plants, Pteridophytes and few Bryophytes only.	
II) Has your country incorporated the above global or national target into relevant plans, programmes and strategies?	
a) Yes	X
b) No	
Please specify	
The Botanical Survey of India, along with some other national organizations and some NGOs e.g. FRLHT have ongoing programmes on survey and inventorisation of rare, endangered and threatened species of flora.	
III) Current status (please indicate current status related to this target)	
About 1500 species of Angiosperms, and some Gymnosperm, Pteridophytes and Bryophytes have been preliminary assessed as rare and threatened. Red Data sheets on 1182 species, based on pre 1994 IUCN categories, have been prepared and 708 Red Data sheets have been published in four volumes of Red Data Books brought out by BSI so far. The IUCN Red List has included 1236 plant species from the country under various categories of threat as per its 1997 criteria. Recently a red list of 1255 threatened vascular plant species in India has been compiled. A pictorial identification manual of plant species included in different appendices of CITES as well as those in Negative List of Export has been prepared by the ENVIS center of BSI. Development of digital database on Threatened plant of India has been initiated.	
IV) Measures taken to achieve target (please indicate activities, legislative measures and other steps taken with a view to achieve the target)	
The Botanical Survey of India, along with some other national organizations and some NGOs e.g. FRLHT have ongoing programmes on survey and inventorisation of rare, endangered and threatened species of flora alongwith their conservation status.	
V) Progress made towards target (please specify indicators used to monitor progress towards the target)	
About 1500 species of Angiosperms, and some Gymnosperm, Pteridophytes and Bryophytes have been preliminary assessed as rare and threatened. Red Data sheets on 1182 species, based on pre 1994 IUCN categories, have been prepared and 708 Red Data sheets have been published in four volumes of Red Data Books brought out by BSI so far. The IUCN Red List has included 1236 plant species from the country under various categories of threat as per its 1997 criteria. Recently a red list of 1255 threatened vascular plant species in India has been compiled. A pictorial identification manual of plant species included in different appendices of CITES as well as those in Negative List of Export has been prepared by the ENVIS center of BSI. Development of digital database on Threatened plant of India has been initiated.	
VI) Constraints to achieving progress towards the target	
Lack of adequate number of specialists in different taxonomic groups, especially lower groups of plants, and lack of population data of species.	
VII)Any other relevant information	

Box XXVI.

Target 3. Development of models with protocols for plant conservation and sustainable use, based on research and practical experience.	
I) Has your country established national target corresponding to the above global target?	
a) Yes	X
b) No	
Please specify	
The Botanical Survey of India, through advisory services like identification of species/habitat needing conservation intervention, continuously helps in development of such models. Recently an in-country programme "investing in Nature (IIN)-India" has been initiated by Botanic Garden Conservation International (BGCI), WWF and Earth watch in collaboration with National Botanical Research Institute (NBRI), Lucknow under which a number of botanic gardens have been initiated for the purpose. Ministry of Environment and Forests, New Delhi also initiated a one time grant for creation and augmentation of facilities in a chain of botanic gardens across the country to develop model protocols for conservation under its "Assistance to Botanic Garden Programme".	
II) Has your country incorporated the above global or national target into relevant plans, programmes and strategies?	
a) Yes	X
b) No	
Please specify	
The MoEF has an ongoing programme as mentioned above under (I).	
III) Current status (please indicate current status related to this target)	
Ten botanic gardens under Botanical Survey of India have an ongoing programme. Besides a number of other gardens attached with other national organizations and academic institutions have implemented the ex situ conservation programmes with financial assistance from the MoEF. In some states, like Karnataka, Maharashtra, etc., Medicinal Plant Conservation areas are being developed by the Foundation for Revitalization of Local Health Traditions (FRLHT), Centre of Excellence of MoEF, in collaboration with State Forest departments and the local people.	
IV) Measures taken to achieve target (please indicate activities, legislative measures and other steps taken with a view to achieve the target)	
Awareness programmes, public education and distribution of planting materials, etc. are some of the measures proposed to be undertaken.	
V) Progress made towards target (please specify indicators used to monitor progress towards the target)	
Physical verification of the conservation of targeted species is used as an effective indicator for monitoring.	
VI) Constraints to achieving progress towards the target	
Lack of adequate information on the conservation biology and edaphic requirements of the targeted species are major constraints.	
VII)Any other relevant information	

Box XXVII.

Target 4. At least ten percent of each of the world's ecological regions effectively conserved.	
I) Has your country established national target corresponding to the above global target?	
a) Yes	X
b) No	
Please specify	
India already has an elaborate Protected Area Network, comprising 94 National Parks (NP) and 501 Wildlife Sanctuaries (WLS), covering approximately 4.74% of the total geographical area of the country. To provide more adequate coverage to biological diversity, it is envisaged to increase the number of NPs to 163 and WLSs to 707 covering 5.74 per cent of the total area. Besides, there are 13 Biosphere Reserves, 27 Tiger Reserves, 5 World Heritage (Natural) sites, 19 Ramsar sites, 309 Forest Preservation Plots, a large number of Sacred Groves and a few Gene Sanctuaries.	
II) Has your country incorporated the above global or national target into relevant plans, programmes and strategies?	
a) Yes	X
b) No	
Please specify	
The MoEF has an ongoing programme of identifying newer areas to be brought under the protected area network.	
III) Current status (please indicate current status related to this target)	
India already has an elaborate Protected Area Network, comprising 94 National Parks (NP) and 501 Wildlife Sanctuaries (WLS), covering approximately 4.74% of the total geographical area of the country. To provide more adequate coverage to biological diversity, it is envisaged to increase the number of NPs to 163 and WLSs to 707 covering 5.74 per cent of the total area. Besides, there are 13 Biosphere Reserves, 27 Tiger Reserves, 5 World Heritage (Natural) sites, 19 Ramsar sites, 309 Forest Preservation Plots, a large number of Sacred Groves and a few Gene Sanctuaries.	
IV) Measures taken to achieve target (please indicate activities, legislative measures and other steps taken with a view to achieve the target)	
The MoEF has an ongoing programme of identifying newer areas to be brought under the protected area network.	
V) Progress made towards target (please specify indicators used to monitor progress towards the target)	
As elaborated under (I) above.	
VI) Constraints to achieving progress towards the target	
Curtailment of almost all consumptive uses of resources from the protected areas has at times led to conflicts between conservationists on one hand and various stakeholders on the other hand.	
VII)Any other relevant information	

Box XXVIII.

Target 5. Protection of fifty percent of the most important areas for plant diversity assured.	
I) Has your country established national target corresponding to the above global target?	
a) Yes	X
b) No	
Please specify	
A multi-pronged strategy has been adopted to provide protection to important plant areas through in-situ and ex-situ programmes. There are about 595 Protected Areas where a wide range of biodiversity has been protected across various ecosystems spread all over the country. The processes of strengthening this network are going on through identifying new PAs as well as new categories of PAs by involving local communities. The Biological Diversity Act vide section 37.1 provides for setting up of areas of biodiversity importance, as biodiversity heritage sites, in consultation with the local bodies. Gene banks and botanical gardens have been established for conservation of plants.	
II) Has your country incorporated the above global or national target into relevant plans, programmes and strategies?	
a) Yes	X
b) No	
Please specify	
Enactment of legal provisions of various kinds of protected areas in form of National Parks and Wildlife sanctuaries, Community and Conservation reserves, Heritage sites etc. has been undertaken by the government.	
III) Current status (please indicate current status related to this target)	
National Biodiversity Authority is in process of issuing guidelines for identifying Heritage Sites. Similarly, process is going on for implementing amendments of Wildlife Protection Act for creating two new categories of Protected Areas namely Conservation and Community Reserves.	
IV) Measures taken to achieve target (please indicate activities, legislative measures and other steps taken with a view to achieve the target)	
V) Progress made towards target (please specify indicators used to monitor progress towards the target)	
VI) Constraints to achieving progress towards the target	
VII)Any other relevant information	

Box XXIX.

Target 6. At least thirty percent of production lands managed consistent with the conservation of plant diversity.	
I) Has your country established national target corresponding to the above global target?	
a) Yes	
b) No	
Please specify	
II) Has your country incorporated the above global or national target into relevant plans, programmes and strategies?	
a) Yes	
b) No	
Please specify	
III) Current status (please indicate current status related to this target)	
IV) Measures taken to achieve target (please indicate activities, legislative measures and other steps taken with a view to achieve the target)	
V) Progress made towards target (please specify indicators used to monitor progress towards the target)	
VI) Constraints to achieving progress towards the target	
VII)Any other relevant information	

Box XXX.

Target 7. Sixty percent of the world's threatened species conserved *In-situ*.	
I) Has your country established national target corresponding to the above global target?	
a) Yes	X
b) No	
Please specify	
Many endangered species conserved	
II) Has your country incorporated the above global or national target into relevant plans, programmes and strategies?	
a) Yes	X
b) No	
Please specify	
The Botanical Survey of India has an ongoing programme for assessment of plant diversity in protected areas of the country.	
III) Current status (please indicate current status related to this target)	
So far, plant diversity in nine Biosphere Reserves (Nanda Devi, Great Nicobar, Gulf of Mannar, Nilgiri, Manas, Dibru-Saikhowa, Kanchendzonga, Simlipal and Pachmarhi), 55 National Parks, 27 Tiger Reserves and a few Wildlife Sanctuaries has been documented.	
IV) Measures taken to achieve target (please indicate activities, legislative measures and other steps taken with a view to achieve the target)	
As elaborated under (II) and (III) above. The documentation of the plant diversity in protected areas has been made one of the primary objectives of BSI.	
V) Progress made towards target (please specify indicators used to monitor progress towards the target)	
As elaborated under (III) above.	
VI) Constraints to achieving progress towards the target	
Lack of adequate number of qualified manpower (taxonomists) to expedite the study.	
VII)Any other relevant information	

Box XXXI.

Target 8. Sixty percent of threatened plant species in accessible *Ex-situ* collections, preferably in the country of origin, and 10 percent of them included in recovery and restoration programmes.	
I) Has your country established national target corresponding to the above global target?	
a) Yes	X
b) No	
Please specify	
Collection and preservation of crop genetic resources is being done by the National Bureau of Plant Genetic Resources (NBPGR), New Delhi. The Indian National Gene Bank of the NBPGR presently comprises a Seed Repository, holding nearly 1,45,000 accessions; Tissue Culture Repository having 800 accessions, and has 1000 samples cryopreserved in liquid Nitrogen. The Bureau is assigned the task of collecting the germplasm and maintaining them in seed banks and field gene banks, for short and medium term preservation. The Bureau also supplies these genetic materials to both Indian and foreign agencies, on request, exclusively for research purpose only.	

II) Has your country incorporated the above global or national target into relevant plans, programmes and strategies?	
a) Yes	X
b) No	

Please specify

The Botanical Survey of India, with the Indian Botanic Garden, Howrah, Botanic Garden of Indian Republic, NOIDA and nine experimental botanic gardens attached to its Circle offices across the country, has an ongoing programme of collection, introduction, multiplication, maintenance and scientific study of rare and threatened, medicinal and economically important species of plants. Presently, this facility is serving as living repositories of an estimated 1,50,000 live plants belonging to about 4000 largely indigenous and selected highly valued economic exotic species. This includes over 250 endemic and threatened species and a number of wild progenitors of cultivated crop plants.

III) Current status (please indicate current status related to this target)

Same as under Target (II) above.

IV) Measures taken to achieve target (please indicate activities, legislative measures and other steps taken with a view to achieve the target)

As elaborated under (II) and (III) above. In addition, the Department of Biotechnology has initiated a number of programmes relevant to *ex situ* conservation of biodiversity, such as germplasm facilities, tissue culture pilot plants, biocontrol agents, biofertiliser, clean technologies and bioinformatics. Some of the important National Facilities sponsored by the Department are: National Facility of Microbial Type Collections at Chandigarh; Blue-Green Algae at IARI, New Delhi; for Marine Cyano-bacteria at Tiruchirapalli; Plant Tissue Culture Repository at NBPGR, New Delhi besides the Tissue Culture Pilot Plants of multiplication of Forest Trees at National Chemical Laboratory, Pune and Tata Energy Research Institute, New Delhi. Besides under the G-15 initiative of the Gene Banks of Medicinal and Aromatic Plants (GEBMAP), three National Gene Banks have also been established at CIMAP, Lucknow, NBPGR, New Delhi and TBGRI, Thiruvananthapuram. In addition, plant tissue culture laboratories have also been established by many organizations, like the Botanical Survey of India (BSI), Indian Council of Forestry Research and Education (ICFRE), Dehradun and Bangalore; G.B. Pant Institute of Himalayan Environment and Development, Almora; National Botanical Research Institute (NBRI), Lucknow; Central Institute of Medicinal and Aromatic Plants (CIMAP), Lucknow, Tropical Botanical Garden and Research Institute (TBGRI), Thiruvananthapuram; State Forest Department of Arunachal Pradesh and several University departments, etc., for rapid mass propagation of selected rare, threatened and economically important plants specie.

V) Progress made towards target (please specify indicators used to monitor progress towards the target)

As elaborated under Target 8(III) and (IV) above.

VI) Constraints to achieving progress towards the target

To strength and supplement *in situ* conservation efforts, India has also undertaken measures for *ex situ* conservation of both wild as well as domesticated plants, especially the threatened species. The major facilities of *ex situ* conservation are the botanic gardens, field gene banks, seed banks, cryobanks, tissue culture repositories, etc. At present there are 150 organized botanic gardens or large parks in the country, of which 33 gardens (including the historical Indian Botanic garden of the Botanical Survey of India) are managed by the Central or State Governments; 70 gardens and parks are in public domain and 40 gardens are run by the Universities.

VII)Any other relevant information

Box XXXII.

Target 9. Seventy percent of the genetic diversity of crops and other major socio-economically valuable plant species conserved, and associated indigenous and local knowledge maintained.	
I) Has your country established national target corresponding to the above global target?	
a) Yes	X
b) No	
Please specify	
Collection and preservation of the crop genetic resources is being done by the National Bureau of Plant Genetic Resources (NBPGR), New Delhi. The Indian National Gene Bank of the NBPGR presently comprises a Seed Repository, holding nearly 1,45,000 accessions; Tissue Culture Repository having 800 accessions, and has 1000 samples cryopreserved in liquid Nitrogen. The Bureau is assigned the task of collecting the germplasm and maintaining them in seed banks and field gene banks, for short and medium term preservation. The Bureau also supplies these genetic materials to both Indian and foreign agencies, on request, exclusively for research purpose only.	
II) Has your country incorporated the above global or national target into relevant plans, programmes and strategies?	
a) Yes	X
b) No	
Please specify	
As already elaborated under Target 8 (II)	
III) Current status (please indicate current status related to this target)	
Same as under Target 8 (II)	
IV) Measures taken to achieve target (please indicate activities, legislative measures and other steps taken with a view to achieve the target)	
As elaborated under Target 8 (IV)	
V) Progress made towards target (please specify indicators used to monitor progress towards the target)	
As elaborated under Target 8 (III) and (IV)	
VI) Constraints to achieving progress towards the target	
Financial constraints Better coordination desirable for optimum utilization of limited funds available.	
VII)Any other relevant information	

Box XXXIII.

Target 10. Management plans in place for at least 100 major alien species that threaten plants, plant communities and associated habitats and ecosystems.	
I) Has your country established national target corresponding to the above global target?	
a) Yes	
b) No	X
Please specify	
Even though there are no management plans available for the alien species, efforts are on to improve the understanding about these species through research programmes such as the one on *Mikania* forest weed in the Western Ghats of India by Kerala Forest Research Institute.	
II) Has your country incorporated the above global or national target into relevant plans, programmes and strategies?	
a) Yes	
b) No	X
Please specify	
Lack of sufficient information is a major constraint to develop the national targets on alien species.	
III) Current status (please indicate current status related to this target)	
The Botanical Survey of India, under its ongoing programme on survey and documentation of plant resource of the country also documents the alien species, and reports, from time to time, new such records in Indian flora.	
IV) Measures taken to achieve target (please indicate activities, legislative measures and other steps taken with a view to achieve the target)	
Various measures have been put in place for management of alien species (may see Box XII). However, the problem of alien species is much more dynamic due to natural spread of the alien species through seed dispersal mechanisms, etc.	
V) Progress made towards target (please specify indicators used to monitor progress towards the target)	
VI) Constraints to achieving progress towards the target	
The high levels of dynamism displayed by the biological systems is an important constraint. The measures need to respond according to the changing behaviour of the response and impact of the alien species.	
VII)Any other relevant information	

Box XXXIV.

Target 11. No species of wild flora endangered by international trade.	
I) Has your country established national target corresponding to the above global target?	
a) Yes	X
b) No	
Please specify	
II) Has your country incorporated the above global or national target into relevant plans, programmes and strategies?	
a) Yes	X
b) No	
Please specify	
A list of plant species in international trade is available with the Directorate General of Foreign Trade (DGFT). To regulate the trade of endangered species of plants, a Negative List, comprising 29 species/group of species, is in force since April 01, 1998. India is also a party to the Convention on Endangered Species of Wild Fauna and Flora (CITES), and has Wildlife Protection Act and National Biodiversity Act in place. Some of the measures put in place may be seen in Box XII.	
III) Current status (please indicate current status related to this target)	
Fourteen species (*Saussurea costus, Nepenthes khasiana, Cycas beddomei, Renanthera imschootiana, Vanda coerulea, Paphiopedilum charlesworthii, P. druryi, P. fairreanium, P. hirsutissimum, P. insigne, P. spicerianum. P. venustum, P. villosum and P. wardianium)* are listed in Appendix I of CITES as well as Schedule VI of the Wildlife Protection Act; 13 species/groups (*Podophyllum hexandrum*, *Dioscorea deltoidea*, *Rauvolfia serpentina*, *Aquilaria malaccensis*, *Picrorhiza kurrooa*, *Pterocarpus santalinus*, *Taxus wallichiana*, *Nardostachys grandiflora*, species of *Aloe*, *Cyathea*, and all species of family *Orchidaceae*, *Cycadaceae* (except those included in Appendix I) and *Cactaceae* are listed in Appendix II of CITES, and 29 species/group of species are listed in Negative List of Export.	
IV) Measures taken to achieve target (please indicate activities, legislative measures and other steps taken with a view to achieve the target)	
Botanical Survey of India has an ongoing programme of assessment of endangered plant species and based on threat perceptions, trade data, etc., it proposes, through the MoEF, its inclusion in different Appendices of CITES or the Negative List of Export. Wildlife Protection Act and Biological Diversity Act also help in achieving these targets.	
V) Progress made towards target (please specify indicators used to monitor progress towards the target)	
As elaborated under (II) and (III) above.	
VI) Constraints to achieving progress towards the target	
Illegal collection of threatened plants is still not a cognizable offence, except those listed in Schedule VI of Wildlife Protection Act, or if collected from a protected area. This is a major lacuna. Untrained staff of various enforcement agencies like Forest Department, Customs, Coast Guards, etc., who fail to identify the consignment, does not help the matter either.	
VII)Any other relevant information	

Box XXXV.

Target 12. Thirty percent of plant-based products derived from sources that are sustainably managed.	
I) Has your country established national target corresponding to the above global target?	
a) Yes	X
b) No	
Please specify	
Through integrated programmes on ecosystem such as Joint Forest Management programmes, sustainable extraction of plant based products such as non timber forest produce (NTFPs) have been undertaken. Development of techniques of sustainable extraction are ongoing such as tapping of gum karaya.	
II) Has your country incorporated the above global or national target into relevant plans, programmes and strategies?	
a) Yes	X
b) No	
Please specify	
There are several efforts addressing sustainable management of plant products. The important legislations related to forests and biological diversity are stringent enough to control the unsustainable harvests. In addition to that	
III) Current status (please indicate current status related to this target)	
IV) Measures taken to achieve target (please indicate activities, legislative measures and other steps taken with a view to achieve the target)	
According to Wildlife Protection Act, 1927, section 36C. (1) The State Government may, where the community or an individual has volunteered to conserve wild life and its habitat, declare any private or community land not comprised within a National Park, sanctuary or a conservation reserve, as a community reserve, for protecting fauna, flora and traditional or cultural conservation values and practices and "36A. (1) The State Government may, after having consultations with the local communities, declare any area owned by the Government, particularly the areas adjacent to National Parks and sanctuaries and those areas which link one protected area with another, as a conservation reserve for protecting landscapes, seascapes, flora and fauna and their habitat. The Biological Diversity Act 2002 provides for mandatory consultation of the local level Biodiversity Management Committees by the National Biodiversity Authority and State Biodiversity Boards on all issues relating to conservation and sustainable use of biological resources.	
V) Progress made towards target (please specify indicators used to monitor progress towards the target)	
VI) Constraints to achieving progress towards the target	
To deal with the complexity of socio-cultural situations in the country is an important challenge to establish newer institutions like Biodiversity Management Committee, Community and Conservation Reserves, etc.	
VII)Any other relevant information	

Box XXXVI.

Target 13. The decline of plant resources, and associated indigenous and local knowledge, innovations and practices that support sustainable livelihoods, local food security and health care, halted.	
I) Has your country established national target corresponding to the above global target?	
a) Yes	
b) No	
Please specify	
II) Has your country incorporated the above global or national target into relevant plans, programmes and strategies?	
a) Yes	
b) No	
Please specify	
III) Current status (please indicate current status related to this target)	
IV) Measures taken to achieve target (please indicate activities, legislative measures and other steps taken with a view to achieve the target)	
V) Progress made towards target (please specify indicators used to monitor progress towards the target)	
VI) Constraints to achieving progress towards the target	
VII)Any other relevant information	

Box XXXVII.

Target 14. The importance of plant diversity and the need for its conservation incorporated into communication, educational and public-awareness programmes.	
I) Has your country established national target corresponding to the above global target?	
a) Yes	X
b) No	
Please specify	
II) Has your country incorporated the above global or national target into relevant plans, programmes and strategies?	
a) Yes	X
b) No	
Please specify	

The Ministry of Environment and Forests interacts actively with the University Grants Commission (UGC), National Council for Education, Research & Training (NCERT) and the Ministry of Human Resource Development (MHRD) for introducing and expanding environmental concepts, themes, issues, etc. in the curricula of schools and colleges.

III) Current status (please indicate current status related to this target)

Environmental concepts, themes, issues, etc. have been introduced in the curricula of schools and colleges. The Botanical Survey of India organizes exhibitions, film shows, slide shows and brings out thematic publication for creating public education and awareness. The Indian Council of Forestry Research & Education (ICFRE) organizes forestry extension programmes, including transfer of technology, public awareness, extension of technical support to State Forest Departments, NGOs, etc. These activities are taken through short term courses and seminars, publication of brochures, books and pamphlets, production of films and other audio-visual programmes, adoption of villages for developing social forestry and agro-forestry models and transfer of technology. Forest Research Institute (FRI), Indian Institute of Forest Management (IIFM) and Wildlife Institute of India (WII) impart training on environment, forest and wildlife management. Other organizations/NGOs with activities aimed at creating environmental and conservation awareness among all sections of society are Centre of Environment Education (CEE), C.P.R. Environmental Education Centre (CPREEC), National Museum of Natural History (NMNH), Zoological Survey of India (ZSI), etc.

IV) Measures taken to achieve target (please indicate activities, legislative measures and other steps taken with a view to achieve the target)

As elaborated under (I) and (II) above. Target groups for education, training and awareness include students, public at large, teachers, functionaries of the Government in various sectoral departments and those involved in programmes of conservation, management and utilization of biodiversity.

V) Progress made towards target (please specify indicators used to monitor progress towards the target)

As elaborated under (I) and (II) above.

VI) Constraints to achieving progress towards the target

A nationwide information system with a uniform format for collection, retrieval and dissemination of data on various aspects of biodiversity is needed.

VII)Any other relevant information

Box XXXVIII.

Target 15. The number of trained people working with appropriate facilities in plant conservation increased, according to national needs, to achieve the targets of this Strategy.

I) Has your country established national target corresponding to the above global target?

a) Yes	
b) No	

Please specify

II) Has your country incorporated the above global or national target into relevant plans, programmes and strategies?

a) Yes	
b) No	

Please specify

III) Current status (please indicate current status related to this target)
IV) Measures taken to achieve target (please indicate activities, legislative measures and other steps taken with a view to achieve the target)
V) Progress made towards target (please specify indicators used to monitor progress towards the target)
VI) Constraints to achieving progress towards the target
VII)Any other relevant information

Box XXXIX.

Target 16. Networks for plant conservation activities established or strengthened at national, regional and international levels.	
I) Has your country established national target corresponding to the above global target?	
a) Yes	X
b) No	
Please specify	
The country has a huge network of protected areas, botanic gardens and institutions for conservation activities effectively supported by legislative and policy framework.	
II) Has your country incorporated the above global or national target into relevant plans, programmes and strategies?	
a) Yes	X
b) No	
Please specify	
III) Current status (please indicate current status related to this target)	
IV) Measures taken to achieve target (please indicate activities, legislative measures and other steps taken with a view to achieve the target)	
V) Progress made towards target (please specify indicators used to monitor progress towards the target)	
VI) Constraints to achieving progress towards the target	
VII)Any other relevant information	

Box XL.

Please elaborate below on the implementation of this strategy specifically focusing on: a) outcomes and impacts of actions taken; b) contribution to the achievement of the goals of the Strategic Plan of the Convention; c) contribution to progress towards the 2010 target; d) progress in implementing national biodiversity strategies and action plans; e) contribution to the achievement of the Millennium Development Goals; f) constraints encountered in implementation.

Ecosystem Approach

The ecosystem approach is a strategy for the integrated management of land, water and living resources that promotes conservation and sustainable use in an equitable way. Application of the ecosystem approach will help to reach a balance of the three objectives of the Convention. At its second meeting, the Conference of the Parties has affirmed that the ecosystem approach is the primary framework for action under the Convention (decision II/8). The Conference of the Parties, at its fifth meeting, endorsed the description of the ecosystem approach and operational guidance and recommended the application of the principles and other guidance on the ecosystem approach. The seventh meeting of the Conference of the Parties agreed that the priority at this time should be facilitating implementation of the ecosystem approach. Please provide relevant information by responding to the following questions.

3. ◈ [1] Is your country applying the ecosystem approach, taking into account the principles and guidance contained in the annex to decision V/6? (decision V/6)		
a)	No	
b)	No, but application is under consideration	
c)	Yes, some aspects are being applied	
d)	Yes, substantially implemented	X

4. ◈ Is your country developing practical expressions of the ecosystem approach for national policies and legislation and for implementation activities, with adaptation to local, national, and regional conditions? (decision V/6)	
a) No	
b) No, but development is under consideration	
c) Yes, practical expressions have been developed for applying some principles of the ecosystem approach	X
d) Yes, practical expressions have been developed for applying most principles of the ecosystem approach	

5. Is your country strengthening capacities for the application of the ecosystem approach, and providing technical and financial support for capacity-building to apply the ecosystem approach? (decision V/6)	
a) No	
b) Yes, within the country	X
c) Yes, including providing support to other Parties	

[1] Please note that all the questions marked with ◈ have been previously covered in the second national reports and some thematic reports.

6. ◈ Has your country promoted regional cooperation in applying the ecosystem approach across national borders? (decision V/6)	
a) No	X
b) Yes, informal cooperation (please provide details below)	
c) Yes, formal cooperation (please provide details below)	
Further comments on regional cooperation in applying the ecosystem approach across national borders.	

7. Is your country facilitating the exchange of experiences, capacity building, technology transfer and awareness raising to assist with the implementation of the ecosystem approach? (decisions VI/12 and VII/11)	
a) No	
b) No, some programmes are under development	
c) Yes, some programmes are being implemented (please provide details below)	X
d) Yes, comprehensive programmes are being implemented (please provide details below)	
Further comments on facilitating the exchange of experiences, capacity building, technology transfer and awareness raising to assist with the implementation of the ecosystem approach.	
• No transfer of research findings to field/extension workers • No convergence of research, state government departments, central government projects, extension programmes (e.g. Highways Dept. will build a road through a reserve forest, etc.)	

8. Is your country creating an enabling environment for the implementation of the ecosystem approach, including through development of appropriate institutional frameworks? (decision VII/11)	
a) No	
b) No, but relevant policies and programmes are under development	
c) Yes, some policies and programmes are in place (please provide details below)	X
d) Yes, comprehensive policies and programmes are in place (please provide details below)	
Further comments on the creation of an enabling environment for the implementation of the ecosystem approach.	

C. ARTICLES OF THE CONVENTION

Article 5 – Cooperation

9. ◆ Is your country actively cooperating with other Parties in respect of areas beyond national jurisdiction for the conservation and sustainable use of biological diversity?	
a) No	
b) Yes, bilateral cooperation (please give details below)	X
c) Yes, multilateral cooperation (please give details below)	X
d) Yes, regional and/or subregional cooperation (please give details below)	X
e) Yes, other forms of cooperation (please give details below)	

Further comments on cooperation with other Parties in respect of areas beyond national jurisdiction for the conservation and sustainable use of biodiversity.

The Ministry of Environment and Forests (MoEF) which is the nodal Ministry for the CBD, is also the nodal agency in the country for United Nations Environment Programme (UNEP), South Asia Cooperative Environment Programme (SACEP), International Centre for Integrated Mountain Development (ICIMOD), and International Union for Conservation of Nature and Natural Resources (IUCN). The MoEF also functions as the nodal agency for participation in international agreements on relating to environment, in particular of biodiversity to which India is a Party, such as the Convention on International Trade in Endangered Species (CITES), Convention on Wetlands of International Importance, especially as Waterfowl Habitat (Ramsar), Convention on the Conservation of Migratory Species of Wild Animals (CMS), Convention on Climate Change (FCCC), Convention to Combat Desertification (UNCCD), Commission on Sustainable Development and United Nations Forum on Forests (UNFF). MoEF has constituted Consultative groups for various Conventions to advise the Ministry on country's position for these international agreements. In addition, there is a consultative group on trade and policy issues, which is jointly chaired by Secretary, MOEF and Secretary, Department of Commerce, so as to harmonize policies in trade related Multilateral Environmental Agreements (MEAs).

The Ministry also handles bilateral cooperation matters relating to regional bodies such as UNEP, ESCAP, SAARC, SACEP. In order to complement and supplement work under the various Conventions, and to develop synergies, there is close cooperation among the various units within the MoEF dealing with these Conventions. This cooperation is ensured interalia through reciprocal representation in the consultative groups of various Conventions, exchange of information/documents, seeking inputs on various agenda items before finalising country position, implementation of joint work programmes in a decentralised manner, etc.

10. Is your country working with other Parties to develop regional, subregional or bioregional mechanisms and networks to support implementation of the Convention? (decision VI/27 A)	
a) No	
b) No, but consultations are under way	
c) Yes, some mechanisms and networks have been established (please provide details below)	X
d) Yes, existing mechanisms have been strengthened (please provide details below)	

Further comments on development of regional, subregional or bioregional mechanisms and networks to support implementation of the Convention.

India, alongwith sixteen other mega-diverse countries, which are rich in biological diversity and associated traditional knowledge, have formed a group known as the Like Minded Megadiverse Countries (LMMC). These countries are Bolivia, Brazil, China, Colombia, Costa Rica, Democratic Republic of Congo, Ecuador, India, Indonesia, Kenya, Madagascar, Malaysia, Mexico, Peru, Philippines, South Africa, and Venezuela. The LMMCs hold nearly 70% of all biodiversity. India, as the

present Chair of LMMCs, is coordinating the activities of this group, especially on issues relating to the implementation of the Convention.

In addition, the MOEF also deals with bilateral MoUs/agreements on environment with several countries such as Austria, China, Germany, Iran, Russia, Tajikistan, Turkmenistan, USA and Vietnam. These MoUs/agreements cover a wide array of areas, which pertain to issues of environmental concern. In addition to the formal bilateral agreement, there are cooperative activities with a host of other countries, some of which are as follows:

- European Commission: Meeting of India-EC joint working group on environment facilitated exchange of views on various environmental issues to be raised in multilateral forum (viz. WSSD, CSD), biodiversity and biosafety Protocol, renewable energy, climate change, trade and environment and common challenges faced by both the country.
- Brazil: Brazil and India have worked closely in all international foras for dealing with environmental and economical issues. The Indo-Brazil Common Agenda for Environmental issues was signed by both the governments.
- Canada: The India Canada Environmental Facility is a joint initiative of the Government of India and the Government of Canada created by the signing of a MoU between the two government in 1992 for the purpose of undertaking projects related to environment. The primary focus of the ICEF is to enhance the capacity of Indian institutions and organizations to promote and deliver sustainable development programmes addressing the environment.
- Germany: Under the aegis of Indo-German technical collaboration, several projects are being supported by the Government of Germany in the environmental sector.

11. Is your country taking steps to harmonize national policies and programmes, with a view to optimizing policy coherence, synergies and efficiency in the implementation of various multilateral environment agreements (MEAs) and relevant regional initiatives at the national level? (decision VI/20)

a) No	
b) No, but steps are under consideration	
c) Yes, some steps are being taken (please specify below)	
d) Yes, comprehensive steps are being taken (please specify below)	X

Further comments on the harmonization of policies and programmes at the national level.

Ministry of Environment & Forests is continuously taking steps to harmonise national policies and programmes in the implementation of various multilateral environmental agreements (MEAs). Regular wide ranging consultations are held with sectoral ministries and departments of Government of India, State governments, NGOs, experts, technical institution and other stakeholders to develop country position under MEAs and relevant policies, programmes and legislations.

The approach of identifying and actively involving stakeholders in implementation of various MEAs and relevant regional initiatives is always seen as an effective and essential strategy. MoEF functions with a number of institutions as major partners for developing and implementing national strategies on conservation and sustainable use of biological diversity. These partners include ministries, State government departments, universities and other academic institutions, autonomous institutions, women's organizations and NGOs.

Mechanism have also been developed within the MoEF to ensure close coordination among different units dealing with various MEAs. MoEF has constituted consultative groups for various Conventions to advise the Ministry on issues relating to that Convention with reciprocal representation of various members on these groups.

Box XLI.

Please elaborate below on the implementation of this strategy specifically focusing on: a) outcomes and impacts of actions taken; b) contribution to the achievement of the goals of the Strategic Plan of the Convention; c) contribution to progress towards the 2010 target; d) progress in implementing national biodiversity strategies and action plans; e) contribution to the achievement of the Millennium Development Goals; f) constraints encountered in implementation.
Because of the above mentioned strategies adopted, these has been harmonization of recently enacted legislations, namely, Biodiversity Act, 2002, Plant Varieties Protection and Farmers Rights Act and Patent Amendment Acts Draft National Environment Policy has been formulated which is intended to be a statement of India's commitment to clean environment and to making a positive contribution to international efforts. Draft National Biodiversity Strategy and Action Plan is under development through involvement of all stakeholders viz. government, research institutions, experts and NGOs. Availability of adequate funds is a major constraint in the implementation of various policies and programme in the country.

Article 6 - General measures for conservation and sustainable use

12. Has your country put in place effective national strategies, plans and programmes to provide a national framework for implementing the three objectives of the Convention? (Goal 3.1 of the Strategic Plan)	
a) No	
b) No, but relevant strategies, plans and programmes are under development	
c) Yes, some strategies, plans and programmes are in place (please provide details below)	
d) Yes, comprehensive strategies, plans and programmes are in place (please provide details below)	X

Further comments on the strategies, plans and programmes for implementing the three objectives of the Convention.
India has had a long history of conservation and sustainable use of natural resources, and over a period of time has developed a stable organizational structure for environment protection. Strategies and plans for the conservation and sustainable use of biological resources based on local knowledge systems and practices is ingrained in Indian ethos and way of life. Applications and practices for use of biodiversity in the country have developed over the years in a traditional scientific process. Environment protection is enshrined in the Constitution of India. Article 48-A and Article 51-A(G) of the Directive Principles of State Policy in the Constitution of India state that 'the State shall endeavour to protect and improve the environment and to safeguard the forests and wildlife in the country', and 'to protect and improve the national environment including forests, lakes, rivers and wildlife, and to have compassion for the living creatures'. A focussed articulation of these concerns in programmes and policies began to be seen in the wake of 1972 Stockholm Conference which got further sharpened after 1992 Rio Conference. Between the Stockholm Conference and the Rio Summit, India has been able to develop a stable organisational structure for environment protection in the country. Legislation, policies and programmes were evolved during this period which were geared towards this objective. Numerous and wide ranging policies, programmes and projects were initiated which directly or indirectly serve to protect, conserve and sustainably use the country's biological resources. India's strategies for conservation and sustainable utilisation of biodiversity in the past have comprised providing special status and protection to biodiversity – rich areas by declaring them as

National Parks, Wildlife Sanctuaries, Biosphere Reserves, ecologically fragile and sensitive areas, offloading pressure from reserve forests by alternative measures of fuelwood and fodder need satisfaction, by afforestation of degraded areas and wastelands, creation of ex-situ conservation facilities such as gene banks etc.

These programmes and projects are briefly described below.

1**. Existing legal and policy regime**

Major Central Acts relevant to biodiversity are:
- Indian Forest Act, 1927
- Wildlife (Protection) Act, 1972
- Forest (Conservation) Act, 1980
- Environment (Protection) Act, 1986
- Biological Diversity Act, 2002

These Acts have been amended from time to time and are supported by a number of State laws and statutes concerning forests and other natural resources.

Policies, strategies, and action plans directly relevant to biodiversity include:
- National Forest Policy amended in 1988
- National Conservation Strategy and Policy Statement for Environment and Sustainable Development
- National Agricultural Policy
- National Land Use Policy
- National Fisheries Policy
- National Policy and Macrolevel Action Strategy on Biodiversity
- National Wildlife Action Plan
- Environmental Action Plan
- National Forestry Action Programme

In the year 2004, a draft National Environment Policy has been prepared and is under finalisation, which is a comprehensive policy statement to a common approach to the various sectoral, cross sectoral including fiscal approaches to environment management.

2.Surveys

Survey and inventorisation of the floral and faunal resources are carried out by the Botanical Survey of India (BSI) established in 1890, and the Zoological Survey of India (ZSI) established in 1916. The Forest Survey of India established in 1981 assesses the forest cover, with a view to develop an accurate database for planning and monitoring purposes. The Wildlife Institute of India undertakes studies of endangered species of animals and critical ecosystems.

In addition, there are several other organizations involved in survey and inventorization of floral and faunal resources of the country. These include:

- The Fisheries Survey of India for commercially exploitable coastal and marine fish species
- National Bureau of Plant Genetics Resources (NBPGR) for survey and collection of genetic material for wild races and cultivars.
- National Bureau of Animal Genetic Resources (NBAGR) for survey of all the livestock breeds in their respective breeding tracts.
- National Bureau of Fish Genetic Resources (NBFGR) for survey of fish species.
- National Institute of Oceanography (NIO) and Central Marine Fisheries Research Institute (CMFRI) for monitoring of coastal and marine biodiversity.
- Organizations such as Bombay Natural History Society (BNHS), Salim Ali Centre for Ornithology and Natural History (SACON), Foundation for Revitalization of Local Health Traditions (FRLHT), university and other centers for producing information on biodiversity.

3. *In situ* conservation

Approximately 4.74% of the total geographical area of the country has been earmarked for extensive in situ conservation of habitats and ecosystems. A protected area network of 94 National Parks and 501 Wildlife Sanctuaries has been created. The results of this network have been significant in restoring viable population of large mammals such as tiger, lion, rhinoceros, crocodiles, elephants etc.

To conserve the representative ecosystems, a Biosphere Reserve Programme is being implemented. Fourteen biodiversity rich areas of the country have been designated as Biosphere Reserves applying

the UNESCO/MAB criteria. These reserves aim at conserving the biological diversity and genetic integrity of plants, animals and microorganisms in their totality as part of the natural ecosystems, so as to ensure their self-perpetuation and unhindered evolution of the living resources.

Programmes have also been launched for scientific management and wise use of wetlands, mangroves, and coral reef ecosystems. 60 wetlands, 35 mangrove areas and four coral reef areas have been identified for intensive conservation and management purposes. The various activities under these programmes include protection, catchment area treatment, pollution control, weed control, wildlife conservation, sustainable fisheries development, environmental education and peoples' participation. National and sub-national level committees oversee and guide these programmes to ensure strong policy and strategic support.

To focus attention on urban wetlands threatened by pollution and other anthropogenic activities, State Governments have identified lakes that could be included in the National Lake Conservation Plan (NLCP). The activities of the NLCP include formulation of perspective plans for conservation based on resource survey using remote sensing technology and GIS, studies on biodiversity and related ecological matters, prevention of pollution from point and non-point sources, treatment of catchmen areast, desilting and weed control.

The Project Tiger, launched in 1973 has succeeded in stabilising and increasing the tiger population in the country. Project Elephant, launched in 1991-92 aims at ensuring long-term survival of viable population of elephants by restoring their lost and degraded habitats, mitigating man-elephant conflicts and establishment of a database on the migration and population dynamics of elephants. It integrates the concerns of improving the quality of life of people living around elephant habitats while maintaining viable population of elephants. Eleven elephant reserves have been identified for intensive management. Rhinos have been given special attention in selected sanctuaries and national parks in the North East and North West India. All these programmes, though focussed on a single species, have a wider impact as they conserve habitats and a variety of other species in those habitats.
The Tura Range in Garo Hills of Meghalaya is a gene sanctuary for preserving the rich native diversity of wild Citrus and Musa species. Sanctuaries for rhododendrons and orchids have been established in Sikkim.

The Ministry of Environment and Forests constituted the National Afforestation and Eco-development Board (NAEB) in August 1992. NAEB has evolved specific schemes for promoting afforestation and management strategies, which help the states in developing specific afforestation and management strategies and eco-development packages for augmenting biomass production through a participatory planning process of Joint Forest Management and microplanning.

4. *Ex-situ* conservation

To complement in situ conservation, attention has been paid to ex-situ conservation measures. According to currently available survey, Central Government and State Governments together run and manage 33 Botanical Gardens. Universities have their own botanic gardens. There are 275 zoos, deer parks, safari parks, aquaria etc. A Central Zoo Authority was set up to secure better management of zoos. A scheme entitled Assistance to Botanic Gardens provides one-time assistance to botanic gardens to strengthen and institute measures for ex-situ conservation of threatened and endangered species in their respective regions.

5. National Biodiversity Strategy and Action Plan

India prepared a National Policy and Macrolevel Action Strategy on Biodiversity (1999) through an extensive consultative process. This document is a macro level statement of policies, gaps and further actions needed for conservation and sustainable use of biological diversity. For preparing detailed microlevel action plans at state and regional levels based on this framework document, India had accessed funding from the Global Environment Facility (GEF) for preparing a National Biodiversity Strategy and Action Plan (NBSAP). The NBSAP process has been undertaken in India from 2000-2005 by MoEF in a consultative and decentralized manner. The biodiversity strategy and action plans have been prepared for 33 States and Union Territories, 18 sub-state sites, 10 ecoregions and 13 themes. The final technical report of the NBSAP process prepared through an extensive consultative process has been received and the plan is under preparation and finalization.

6. Programmes on biodiversity conservation of other concerned Ministries

Some activities relevant to biodiversity conservation are also taken up under various programmes of concerned Ministries and Departments of Government of India. For example, the Department of

Biotechnology supports a number of autonomous and non-government institutions in setting up facilities for micropropagation of endangered plants, especially medicinal plants. The Department of Science & Technology and Council of Scientific and Industrial Research have sponsored research and development projects in the area of biodiversity conservation throughout the country. CSIR laboratories in the country have ongoing programmes on biodiversity including those on conservation of medicinal plants and culture of microorganisms which are useful in soil reclamation and marine biodiversity.

13. ◆ Has your country set measurable targets within its national strategies and action plans? (decisions II/7 and III/9)	
a) No	
b) No, measurable targets are still in early stages of development	
c) No, but measurable targets are in advanced stages of development	X
d) Yes, relevant targets are in place (please provide details below)	
e) Yes, reports on implementation of relevant targets available (please provide details below)	

Further comments on targets set within national biodiversity strategies and action plans.

As mentioned in reply to Question 12, India's NBSAP is under finalization.

14. Has your country identified priority actions in its national biodiversity strategy and action plan? (decision VI/27 A)	
a) No	
b) No, but priority actions are being identified	X
c) Yes, priority actions identified (please provide details below)	

Further comments on priority actions identified in the national biodiversity strategy and action plan.

As mentioned in reply to Question 12, India's NBSAP is under finalization.

15. Has your country integrated the conservation and sustainable use of biodiversity as well as benefit sharing into relevant sectoral or cross-sectoral plans, programmes and policies? (decision VI/27 A)	
a) No	
b) Yes, in some sectors (please provide details below)	
c) Yes, in major sectors (please provide details below)	X
d) Yes, in all sectors (please provide details below)	

Further information on integration of the conservation and sustainable use of biodiversity and benefit-sharing into relevant sectoral or cross-sectoral plans, programmes and policies.

The Union Ministry of Environment & Forests is the nodal agency with the responsibility of implementing CBD in the country. MoEF consults all concerned Ministries, Departments, institutions and NGOs as major partners for developing and implementing national strategies on conservation and sustainable use of biodiversity. Therefore, conservation and sustainable use of biodiversity and benefit sharing have been integrated into many of the relevant sectoral and cross sectoral plans, programmes and policies. Some of the major programmes of MoEF and of other Ministries and Departments of Government of India which integrate biodiversity issues are listed below.

Major Programmes of the Ministry of Environment and Forests which integrate biodiversity issues

Survey of natural resources	Floral/faunal surveys by BSI/ ZSI, Forest Survey by FSI
Conservation of natural resources	PAs, BRs, Mangroves, wetlands, Coral Reefs, CZA, Project Tiger, Project Elephant, Botanic Gardens.
EIA	Environmental Clearances under EIA and CRZ Notifications, Notifications for ecologically fragile areas.
Control of pollution	Through CPCBs/SPCBs, monitoring air/ water quality, vehicular pollution control, environmental standards, action plans for polluting industries, eco labeling, clean technologies, bio-monitoring of rivers, CETPs
Hazardous substances management	Chemical safety, hazardous waste management, municipal solid waste management, TSDFs
Conservation of water bodies	National River Conservation Plan, STPs, Action Plans for Ganga, Yamuna, Gomti, and other rivers. National Lake Conservation Plan.
Afforestation and ecodevelopment	NAEB programmes, afforestation schemes, eco-task force, JFM, conservation of non-wood forest product, development of forest / pasture seeds, aerial seeds, integrated wasteland development, fuelwood / fodder development projects, mapping of wastelands, National fund for afforestation.
Research on natural resources	Ecosystem research programmes, Eastern and Western Ghats research, research under MAP, NNRMS, forestry research, research on wood alternative and panel products.
Education and awareness	Formal and non-formal environment education, NEAC, National Green Corps (Eco clubs), NMNH and RMNH, Forestry education, training and extension, IIFM, Nine Centres of Excellence in priority areas on environmental science (CEE, CEREEC, CES, CME, SACON, CEMDE, TBGRI, MSE, FRLHT)

Programmes for biodiversity conservation handled by other Ministries

Ministry / Departments	**Activities**
Agriculture	Watershed Development Programme, Agricultural Research & Education, Rainfed agriculture in National Watershed Development Project, Western Ghats Development Project, Soil Conservation, Bio-fertilizers, Schemes for women participation in agriculture, Integrated Pest Management
Water Resources	Command Area Development Programme, National Watershed Management Project, Flood Control Programmes, People's participation in irrigation, R&D in Water resources planning
Rural Development	Jawahar Rozgar Yojana, DPAP, IREP, Rajiv Gandhi National Drinking Water Mission for rural water supply, Waste land development projects of NWDB
Energy/Coal	R&D for energy plantations and agricultural waste utilization, Training for Environmental Management of Power Projects, R&D for commercialisation of waste disposal
Urban Development	Environment improvement of Urban Slums, Urban basic services, Integrated development of small and medium towns,NCR for Delhi Low cost sanitation & small towns water supply schemes
Science and Technology	Training/HRD in Bio-technology, National facilities for germ plasm collection, Technologies absorption/adoption scheme, Support for Research and Development, Support for Information Services, Support for Infra structure development, Support for Capacity Building

Biodiversity and Climate Change

17. Has your country implemented projects aimed at mitigating and adapting to climate change that incorporate biodiversity conservation and sustainable use? (decision VII/15)	
a) No	
b) No, but some projects or programs are under development	X
c) Yes, some projects have been implemented (please provide details below)	

Further comments on the projects aimed at mitigating and adapting to climate change that incorporate biodiversity conservation and sustainable use.

India's vast population depends on climate sensitive areas like agriculture and forestry for livelihood. Preliminary assessments using BIOME-3 vegetation response model, based on regional climate model projections (HadRM2) for India indicate shifts in forest boundary, changes in species – assemblage or forest types, changes in net primary productivity, possible forest die-back in the transient phase, and potential loss or change in biodiversity.

These impacts on forests may have adverse socio-economic implications for forest-dependent communities and the national economy. The impacts climate change on forest ecosystems are likely to be long-term and irreversible. Thus, there is a need for developing and implementing adaptation strategies to minimize possible adverse impacts. Further, there is a need to study and identify the forest policies, programmes and silviculture practice that contribute to vulnerability of forest ecosystems to climate change. Natural ecosystems such as grassland, mangroves, and coral reefs are also likely to be affected by climate change.

The Government of India attaches high priority to the promotion of R&D in multidisciplinary aspects of environment protection, conservation and development including research in climate change. The Ministry of Environment & Forests is the nodal ministry for the subject of climate change in India. The MoEF, Ministry of Science & Technology (MST), Ministry of Agriculture (MoA), Ministry of Human Resource Development (MoD), Ministry of Health and Family Welfare (MOHFW), and Indian Space Research Organization (ISRO) are the main ministries of the Government of India which promote and undertake climate and climate change- related research in the country.

Preliminary research has been initiated on vulnerability assessment due to climate change on various socio-economic sectors and natural ecosystems in India during the preparation of India's Initial National Communication to the UNFCCC. Many case studies have also been conducted, such as habitat diversity patterns of rarity in the terrestrial vegetation of North-Eastern Uttar Pradesh; species diversity in the Central Himalayas, patterns and relationships with ecosystem characters etc.

The Indian Agricultural Research Institute (IARI) is India's premier national institute for agricultural research, education and extension. The Division of Plant Physiology at IARI offers a course on Global Climate Change in the second trimester of its Masters programme, and has been conducting research on the impacts of climate change on crop productivity. Some of the climate-friendly initiatives in the agriculture sector include the standardization of fuel efficient irrigation pump-set, retrofitting existing pump-sets for higher efficiency, better water and crop management, improved cultivars, more efficient application of synthetic fertilizers, enhanced organic fertilizers use and improved animal feed. Many of these measures would serve to reduce CO_2, CH_4 and N_2O emissions.

India has implemented a large number of progressive policies, programmes and measures to conserve and develop the forests, wildlife, mangroves and coral reefs, such as: the Forest Conservation Act (1980), the National Forest Policy (1988), the Wildlife Act, Joint Forest Management (JFM) programme, Social Forestry, the improved cook-stoe programme, and biogas to conserve fuelwood. Similarly there are conservation programmes for mangroves, coral reefs and lake ecosystems. All these measures have led to some stabilization of the forest area, a reduction in deforestation, afforestation, significantly contributing to conservation of the forest carbon sink. All these preparation will act as a buffer for the forest dependent communities against the challenges posed by climate change.

India has a separate Ministry for promotion of Non- Conventional Energy Sources (MNES) and a separate financial institution for financing Renewable energy projects - Indian Renewable Energy Development Agency. India also has Bureau of Energy Efficiency under Ministry of Power established with support from USAID and GTZ. The aim of these institutions is to promote Renewable energy and Energy Efficiency programmes in the Country.

India has established National CDM Authority (NCDMA) for according host country approval to CDM project as mandated under UNFCCC. MOEF is the Nodal agency for NCDMA. This approval ensures that the project will lead to sustainable development of the country. This approval is given based on

the sustainable development criteria developed by MoEF. One of the criteria used is impact on biodiversity by CDM project.

Chapter 3 of the National Communication report, 2004 submitted to UN Framework Convention on Climate Change (UNFCCC) specifically deals with Vulnerability assessment and adaptation. This report is prepared with inputs from research and academic institutions, NGOs, Experts and policy makers. The report specifically deals with the vulnerability of forests, agriculture natural ecosystem and costal areas due to climate change.

Regional Workshop on Mainstreaming Biodiversity and Climate Change was organized on 6th - 11th April 2003 at Dehradun, India supported by IUCN - Regional Biodiversity Programme, Asia, Ministry of Environment and Forests, Government of India, United Nations Development Programme (UNDP),International Institute of Environment and Development (IIED),Secretariat to Convention on Biological Diversity (CBD), Secretariat to the UN Framework Convention on Climate Change (UNFCCC), UNEP-Regional Office for Asia and Pacific (invited), Wildlife Institute of India. The objective of this workshop were:

- To build region and country-specific knowledge base that is critical for assessing, facilitating and implementing synergistic action on issues of biodiversity and climate change.
- To provide opportunities to negotiators, policy makers, and NGO's from Asia on options for integrating biodiversity concerns into NAPAs and climate change concerns into NBSAPs.
- To build capacity of the key stakeholders on important policy, legal and management issues including on communication, awareness raising components dealing with implementation of synergies at national level.

Training programme for officers from the Indian Forest Service (IFS) on Environmental Priorities and Sustainable Development was conducted by The Centre for Development and Environment Policy (CDEP) during 17-21 February 2003. This training Programme for senior in-service IFS officers was sponsored by the Department of Personnel, Government of India and was aimed at exposing the senior forest officers to the emerging global environment priorities of this millennium. Lectures were organised on important issues like forest & biosphere, water resources, global climate change, land use & land cover change, biodiversity impact assessment, environmental economics, criteria & indicators of sustainable forest management, use of GIS & Remote Sensing in forestry etc.

18. Has your country facilitated coordination to ensure that climate change mitigation and adaptation projects are in line with commitments made under the United Nations Framework Convention on Climate Change and the United Nations Convention to Combat Desertification? (decision VII/15)

a)	No	
b)	No, but relevant mechanisms are under development	X
c)	Yes, relevant mechanisms are in place (please provide details below)	

Further comments on the coordination to ensure that climate change mitigation and adaptation projects are in line with commitments made under the UNFCCC and the UNCCD.

India does not have any commitments for climate change mitigation. However, because of our concern about energy efficiency and use of renewable sources of energy, at the national level India has voluntarily undertaken various measures towards improving energy efficiency and promoting use of renewable sources of energy, *inter alia* through programmes of MNES, Ministry of Petroleum and Natural Gas, Bureau of Energy Efficiency under Ministry of Power, Indian Renewable Energy Development Agency.

Box XLII.

Please elaborate below on the implementation of this article and associated decisions specifically focusing on: a) outcomes and impacts of actions taken; b) contribution to the achievement of the goals of the Strategic Plan of the Convention; c) contribution to progress towards the 2010 target; d) progress in implementing national biodiversity strategies and action plans; e) contribution to the achievement of the Millennium Development Goals; f) constraints encountered in implementation.

Article 7 - Identification and monitoring

19. ◇ On Article 7(a), does your country have an ongoing programme to identify components of biological diversity at the genetic, species, ecosystem level?

a) No	
b) Yes, selected/partial programmes at the genetic, species and/or ecosystem level only (please specify and provide details below)	
c) Yes, complete programmes at ecosystem level and selected/partial inventories at the genetic and/or species level (please specify and provide details below)	X

Further comments on ongoing programmes to identify components of biodiversity at the genetic, species and ecosystem level.

1. Survey and Inventorisation

The Botanical Survey of India (BSI) and the Zoological Survey of India (ZSI) are responsible for the survey and inventorisation of flora and fauna of the country. The Survey organisations have published over the years, documents on flora and fauna at national, state and in some cases district levels and for selected ecosystems. Besides, extensive reports on inventories of resources indicating level of biodiversity in selected areas have also been brought out. The Surveys have also published Red Data Books on endangered species.

BSI established in 1890 has its headquarters in Kolkata and circles and field offices at 10 places in the country. BSI has covered about 70% of the territory of India by field survey. Approximately 23,89,000 specimens collected have been preserved, it has published seven volumes of the flora of India, nine volumes of the state for a and 48 volumes of the district flora. Five volumes of the Red Data Book containing identification details of 820 species of endangered plants had been completed.

ZSI also has its headquarters in Kolkata and 16 field stations in other places. It has covered about 70% of the territory of India's by field survey. 32 volumes of fauna of India and 24 volumes of fauna of various states have been published. A Red Data Book covering identification details of 173 species of mammals and other species of animals under various degrees of threats has been printed.

Forest Survey of India (FSI) is engaged in generating information and database on forest cover and forest resources in the country besides providing services of training, research and extension. The Forest Survey of India prepares a comprehensive State of Forest Report including national forest vegetation map once in every two years and also prepares thematic maps once in ten years using remote sensing data. The forest cover maps and thematic maps are prepared on a scale of 1:50,000.

The Wildlife Institute of India undertakes studies on endangered species of animals and critical ecosystems.

National Bureau of Plant Genetic Resources (NBPGR), National Bureau of Animal Genetic Resources (NBAGR), National Bureau of Fish Genetic Resources (NBFGR) and National Bureau of Agriculturally Important Microorganisms (NBAIM) of Ministry of Agriculture are conducting country wide surveys for the identification, monitoring, characterization and conservation of crop plants, livestock breeds,

fisheries and agriculturally important microorganisms.

The Fisheries Survey of India is engaged in estimating and monitoring commercially important coastal and marine fish species.

In addition, several national research institutions, universities, organizations and other centers also contribute to biodiversity inventorization.

A. Genetic Level: Studies on genetic level are not as yet very widespread and have so far been undertaken only for wild crop relatives and selected domesticated animals through programmes of MOEF, DBT and ICAR. There are several hundred species of wild crop relatives distributed all over the country. A major center for wild rice is the Eastern Peninsular India, the Northeastern hills and the Tamilnadu hills are rich in wild relatives of millets and wild relatives of wheat and barley have been located in the western and north-eastern Himalayas. India's domesticated animals comprise diverse livestock, poultry and other animal breeds. India's eight breeds of buffaloes represent the entire range of the genetic of the genetic diversity of buffaloes in the world. BSI has carried out cytological studies on selected components of Indian flora. It has also carried out molecular studies on selected taxa in collaboration with NCL, Pune, Department of Biotechnology-Department of Space and Delhi and University. ZSI in collaboration with Centre for DNA Fingerprinting and Diagnostics, and Centre for Cellular and Molecular Biology located at Hyderabad is undertaking collaborative training programmes on identifying at genetic level. Training in Biosystematics are also being imparted to the selected trainees on threatened wildlife.

In the context of microbial biodiversity, major monitoring programmes are in place for specific microorganisms by Government of India through Indian Council of Agricultural Research (ICAR) and Indian Council of Medical Research (ICMR) on a long term basis. For example, in a long term all India Coordinated Project on Nitrogen Fixing Organisms under ICAR, rhizobia are monitored for performance at various agro ecological regions of the country through nodule typing.

The Department of Biotechnology had undertaken an initiative on the Inventorization of the existing microbial gene pool in the country which is nearing completion. The Ministry of Environment & Forests under its All India Coordinated Project on Taxonomy (AICOPTAX) has established three centres on the study of Bacteria & Archaea, Fungi and Viruses (animal). These centres, each with five sub centres are involved in strengthening characterization of microbial forms at genetic and species level from various ecosystems.

B. Species Level: BSI has regular ongoing programmes on floral identification and monitoring of various groups of plants from Algae to Angiosperms. The list of recorded species, in different taxonomic groups, from the country is given below:

Taxonomic group	**No. of species**			**% of world flora**
	India		**World**	
Angiosperms	17500	(5725)	286000	7.0
Gymnosperms	48	(10)	650	7.4
Pteridophytes	1200	(193)	13000	12.0
Bryophytes	2825	(938)	14500	39.6
Lichens	2021	(518)	13500	15.0
Fungi	14500	(3500)	70000	20.1
Algae	7175	(1924)	40000	17.93
Virus/Bacteria	850		8050	10.6
Total	**46,119**	(12808)	**4,45,700**	10.34

ZSI also has regular ongoing programmes on faunal identification and monitoring of various groups of animals from Protozoa to mammalia. List of recorded species from the country is given below.

Estimated number of described species

Taxonomic group	No. of species		% in India
	World	**India**	
PROTISTA (Protozoa)	31250	2577	8.24
ANIMALIA			
Mesozoa	71	10	14.08
Porifera	4562	486	10.65
Cnidaria	9916	842	8.49
Ctenophora	100	12	12.00
Platyhelminthes	17500	1622	9.22
Nemertinea	600	-	-
Rotifera	2500	330	13.20
Gastrotricha	3000	100	3.33
Kinorhyncha	100	10	10.00
Nematoda	30000	2850	9.50
Nematomorpha	250	-	-
Acanthocephala	800	229	28.62
Sipuncula	145	35	24.14
Mollusca	66535	5070	7.62
Echiura	127	43	33.86
Annelida	12700	840	6.61
Onychophora	100	1	1.00
Arthropoda	**987949**	**68389**	**6.90**
Crustacea	35534	2934	8.26
Insecta	867391	59353	6.83
Arachnida	73440	5818	7.90
Pycnogonida	600	16	2.67
Pauropoda	360	-	-
Chilopoda	3000	100	3.33
Diplopoda	7500	162	2.16
Symphyla	120	4	3.33
Merostomata	4	2	50.00
Phoronida	11	3	27.27
Bryozoa (Ectoprocta)	4000	200	5.00
Entoprocta	60	10	16.66
Brachiopoda	300	3	1.00
Pogonophora	80	-	-
Priapulida	8	-	-
Pentastomida	70	-	-
Chaetognatha	111	30	27.02
Tardigrada	514	30	5.83
Echinodermata	6223	765	12.29

Hemichordata	120	12	10.00
Chordata	**48451**	**4994**	**10.40**
Protochordata	2106	119	5.65
Pisces	21723	2546	11.72
Amphibia	5150	240	4.66
Reptillia	5817	460	7.91
Aves	9026	1232	13.66
Mammalia	4629	397	8.58
Total (Animalia)	1196903	86905	7.25
Grand Total (Protista + Animalia)	**1228153**	**89492**	**7.28**

National Institute of Oceanography (NIO), Goa has developed several databases on the marine biodiversity at species level including:

1. Crabs of India (http://www.indian-ocean.org): A CDROM on "Marine Prawns of India" was released on January 17, 1998 which was widely appreciated. The second CDROM collates taxonomy, systematics, biogeography, life cycle and morphology related information on 75 crab species that are found in Marine and estuarine waters of this country. This package also lists the specialists on marine crabs in India and their important publication.
2. Prawns of India (http://www.indian-ocean.org): This CD-ROM on Prawns of India gives information related to identification, systematics, life cycle, biogeography, diseases and morphology of prawns in India. Kerala is well known for brackishwater prawn and fish farming known as 'Pokkali' culture
3. Corals of India (http://www.indian-ocean.org)
4. Lignicolous fungi (http://www.indian-ocean.org): About 200 species of marine wood-degrading fungi are known from the world and the present CD furnishes information on 80 species which are collected from mangrove ecosystem.

Sporadic data is also available with respect to fungi, algae, bacteria and viruses in India. The inventory programme of DBT will, when complete shall have a list of microbial species indigenous to the country. Partial lists through DNA sequencing tools are being added through AICOPTAX programme and a majority of this gene pool has been deposited at the Microbial Type Culture Collection (MTCC), Chandigarh. Individual researchers are adding to this list.

In the context of organized microbial inventorization, surveys and systematics, support programmes are relatively new (5-8yr) and database creation is therefore behind that of plants and animals. Also, at least in case of bacteria, the species concept itself is under debate. Further complications arise from the forms that are known only through gene sequences (non-culturables) and have no living representative in global cultures collections. Thus, estimates of bacterial species globally range anywhere from 10^7-10^9 with serious discussions on the validity of data.

C. Ecosystem Level: BSI is undertaking programmes of inventorisation of floral components at ecosystem level in the following areas of the country.

a. Forest Ecosystem
b. Grassland Ecosystem
c. Wetland ecosystem
d. Coastal & Marine ecosystem
e. Mangrove ecosystem
f. Desert (both hot and cold) ecosystem

Details of the same are given below:

Ecosystem	**Area**	**Percentage**	**Floral diversity**
FOREST ECOSYSTEM	6,39,600 sq km	19.46	± 80% of total flora Mountain Flat terrain

GRASSLAND ECOSYSTEM	12 million ha.	4	1300 spp. (370 endemics)
WETLAND ECOSYSTEM	4.1 million ha.	1.22	267 spp.
Natural	1.5 million ha.		(incl. Marshy)
Man made	2.6 million ha.		(excl. Algae)
COASTAL & MANGROVE ECOSYSTEM	0.6 million ha.	0.2	1200 spp.
	7516.6 km coastal line		
MARINE ECOSYSTEM	-----	-----	857 Algal spp. 15 Sea grasses
DESERT ECOSYSTEM			
Hot	2,85,680 sq km	8.69	870 spp.
Cold	98,660 sq km	3	1205 spp.

ZSI is undertaking programmes of Inventorisation of faunal components at ecosystem level in the following areas of the country.

a. Himalayan Ecosystem
b. Freshwater Ecosystem
c. Estuarine Ecosystem
d. Marine Ecosystem
e. Tropical Rainforest Ecosystem
f. Terrestrial Ecosystem
g. Desert Ecosystem
h. Island Ecosystem

Microbiologists have studied various ecosystems often through adhoc research projects, student theses research and by undertaking forays for laboratory. This rather unorganized activity has however touched upon various natural and man-made environments as under.

- Marine coastal area
- Rhizosphere of crop plants
- Eriophid mites
- Fish microorganisms
- Forest plants and litter
- Tree bark
- Aquatic sediments
- Rumen of domesticated animals
- Grasslands
- Food products
- Oligotrophic and eutrophic lakes
- Root nodule bacteria
- Effluents from industries and hospital
- Salt pans and playas
- Thermal springs
- Mangrove plants and sediments
- Anaerobic digesters
- Endophytes

During the last years, a major concerted effort has been made to analyze the microbial diversity in marine environment through a programme supported by the Dept. of Ocean Development. Additional organized support for study of sites such as Sambhar Lake in Rajasthan and Lonar Lake in Maharashtra has been made available, on long-term basis, through the AICOPTAX. To search for agriculturally useful microorganisms for sustainable development, ICAR is in the process of finalizing a major initiative on the subject. CSIR has an in-house multiinstitutional project on microbial wealth of India.

The latest assessment, ninth in the series i.e. SFR-2003 has been completed and the draft report has been submitted to the Ministry for approval. Steady improvements have been made in the forest cover assessment for preparation of each report by employing latest data with higher resolution and scale, with more intensive coverage under ground verification and by using superior techniques of

interpretation.

Special significance in SFR-2003 are: introduction of an additional class of forest cover by splitting dense forest cover (canopy density above 40%) into two classes, namely very dense forest (canopy density more than 70%) and moderately dense forest (canopy density >40-70%) while open forest cover having density 10-40% remains the same. The same criteria has been applied in the case of mangroves also.

Special projects of "Forest Type Mapping of India's Forests" and "Monitoring of Changes in Forest Cover in Tiger Reserve of India" have also been initiated.

FSI has been conducting field inventory for estimating the growing stock (volume) and other parameters of the forests by laying out systematic sample plots. So far about 80% of the country's forest areas have been inventoried including some areas more than once and about 140 reports have been published. During 2002-2007, FSI is also conducting field inventory of forest resources inside and outside forest including vegetation survey and estimation of soil carbon in forest.

A methodology has been developed for a comprehensive assessment of forest resources inside and outside forest areas at national level by stratifying the country into physiographic zones and to take a sample of 10 percent districts for detailed inventory during a cycle of two years. This information, thus generated, will form a part of the biennial State of Forest Report. These estimates will be further improved in the subsequent reports as another set of 10 percent districts are sampled and surveyed, and so on. Together with forest inventory, assessment of herbs & shrubs (vegetation survey) is being carried out. In addition, assessment of regeneration status, biodiversity indices and soil carbon in forest areas are also being carried out.

FSI is conducting National Forest/Tree Inventory along with vegetation survey. As per the revised methodology a National Forest Inventory Database System (NFIDS) based on database software (MS Access) using front end on Visual Basic has been prepared. The data base system has the following modules:

- National Forest Inventory/TOF Data Entry module
- National Forest Inventory/TOF Data Processing module
- National Forest Inventory/TOF Reporting module
- National Forest Inventory/TOF Result database module
- GIS interface with forest cover

Work on the first two modules has already been completed and successfully installed in all the zonal offices. The activities for the remaining modules are being taken up.

Mapping of forest ecosystems and biodiversity is one of the thrust areas of remote sensing applications. State-of-art technology has been developed for mapping of forest ecosystems including their density and vigour. For mapping of biodiversity, methodologies have been developed at the landscape level. The technology has been widely disseminated and transferred to many user agencies. Remote sensing techniques are being used routinely for monitoring of natural resources in the country. In addition, remote sensing and GIS data is also being used for change detection, delineating forest fires, habitat management, mapping of wetlands, mangroves and coral reefs etc.

National Institute of Oceanography (NIO), Goa has developed a database on Mangrove ecosystems of India (http://www.mangroveindia.org).

2. Capacity Building in Taxonomy

India has committed itself to capacity building in taxonomy and taking up exploration and preparation of an inventory of living organisms. Following the recommendations of the workshop, held in Jaipur for this purpose in 1997, the Ministry has launched an All India Coordination Project on Taxonomy (AICOPTAX) in the financial year 1999-2000.

The project envisages establishment of centres for research in identified priority gap areas (e.g., virus, bacteria, microlepidoptera, etc.) in the field of taxonomy, education and training (fellowships, scholarships, chairs, career awards etc.) and strengthening of BSI and ZSI as the coordinating units. The modalities of implementing the All India Project, and prioritising activities under the project have

been decided after detailed consultations with experts. The project has organized specialist groups grown from universities, BSI and ZSI to take up taxonomic work on animal viruses, bacteria & archaea, algae, fungi lichens, bryophytes, pteriodophytes, gymnosperms, palms, grasses and bamboos, orchids, helminthes & nematodes, microlepidoptera and mollusca. Training in plant and animal biosystematics has also been recognized as an important component.
For each centre, an experienced taxonomic expert has been identified as the Coordinator who in turn has identified 4-5 collaborators across the country. The Coordinators of the Centres together with the Collaborators are required to undertake the following activities through training of two Research Scholars each:

- survey, collection, identification and preservation
- maintain collections and taxonomic databanks
- develop identification manuals
- train college teachers and students and local communities in parataxonomy.

Financial assistance is provided to each of these centres for undertaking these activities. Thus each research centre is engaged in training 10 to 12 research scholars. In addition the training centres are imparting training in biosystematics through the use of latest technologies.

A high level Steering Committee headed by taxonomist has been constituted to oversee the implementation of the project.

The project has been continued in 82 units as of now.

20. ◈ On Article 7(b), which components of biological diversity identified in accordance with Annex I of the Convention, have ongoing, systematic monitoring programmes?	
a) at ecosystem level (please provide percentage based on area covered)	X
b) at species level (please provide number of species per taxonomic group and percentage of total known number of species in each group)	X
c) at genetic level (please indicate number and focus of monitoring programmes)	X

Further comments on ongoing monitoring programmes at the genetic, species and ecosystem level.

Various survey organizations such as BSI, ZSI, FSI, Bureaus of genetic resources etc. have regular ongoing programmes of work for the inventorization of biological resources. The details have been explained as part of Question 19.

21. ◈ On Article 7(c), does your country have ongoing, systematic monitoring programmes on any of the following key threats to biodiversity?	
a) No	
b) Yes, invasive alien species (please provide details below)	X
c) Yes, climate change (please provide details below)	X
d) Yes, pollution/eutrophication (please provide details below)	X
e) Yes, land use change/land degradation (please provide details below)	X
f) Yes, overexploitation or unsustainable use (please provide details below)	X

Further comments on monitoring programmes on key threats to biodiversity.

For monitoring key threat to biodiversity, ZSI, BSI, National Afforestation and Ecodevelopment Board, NBPGR, NBAGR and NBAIM etc. have undertaken programmes for assisting various scientific organizations, universities, government departments etc. for monitoring changes in ecosystem and key threats to biodiversity by providing identification and advisory services. BSI and ZSI have such regular ongoing programme of assisting various scientific organizations, Universities, Government departments such as Forest and Wildlife responsible for monitoring the changes in the ecosystem and key threats to biodiversity by providing the identification and advisory services related to faunal

element.

The National Afforestation and Eco-Development Board (NAEB) in the MoEF performs the mandate of promoting afforestation, tree planting, ecological restoration and eco-development activities in the country. Special attention is being given to the regeneration of degraded forest areas and lands adjoining forest areas, national parks, sanctuaries and other protected areas as well as the ecologically fragile areas like the Western Himalayas, Aravallis, Western Ghats etc.

Functions of NAEB also include:

a. Evolve mechanisms for ecological restoration of degraded forest areas and adjoining lands through systematic planning and implementation, in a cost effective manner;
b. Restore through natural regeneration or appropriate intervention the forest cover in the country for ecological security and to meet the fuel wood, fodder and other needs of the rural communities;
c. Restore fuelwood, fodder, timber and other forest produce on the degraded forest and adjoining lands in order to meet the demands for these items;
d. Sponsor research and extension of research findings to disseminate new and proper technologies for the regeneration and development of degraded forest areas and adjoining lands;
e. Create general awareness and help foster a people's movement for promoting Afforestation and eco-development with the assistance of voluntary agencies, non-government organizations, Panchayati Raj Institutions and others and promote participatory and sustainable management of degraded forest areas and adjoining lands;
f. Coordinate and monitor the Action Plans for tree planting, ecological restoration and eco development; and
g. Undertake all other measures necessary for promoting afforestation, tree planting, ecological restoration and eco development activities in the country.

National Afforestation Programme scheme is the flagship scheme of the NAEB to provide support, both in physical and capacity building terms to the Forest Development Agencies (FDAs) which in turn are the main organ to implement Joint Forest Management (JFM). 561 FDAs have been operationalise so far to treat a total area of 7.61 lakh hectares. Bamboo plantation, medicinal plants and jatropha have been given adequate focus under the National Afforestation Programme. Rehabilitation of jhum lands (shifting cultivation) has been given specific focus under this programme and so far 14 jhum projects has been sanctioned in North-Eastern states.

Ecologically Task Forces of Ex-servicemen are employed in remote and difficult area to undertake restoration of degraded ecosystems through afforestation, soil conservation and water resource management techniques.

Joint Forest Management Cell has been established to monitor the JFM programme and generate policies responses. 28 States have adopted JFM with involvement of 8.4 million families. 84,632 JFM Committees are managing around 17.33 million hectares forest land.

Monitoring of specific microorganisms particularly pathogens is being undertaken selectively. Some of the surveillance studies include *Mycobacterium tuberculosis* by Central JALMA Institute for Leprosy (Agra) in collaboration with Centre for DNA Fingerprinting and Diagnostics (CDFD, Hyderabad), enteric pathogens with particular reference to *Vibrio cholerae* O139 by National Institute of Cholera and Enteric Diseases (NICED) at Kolkata, *Yersinia pestis* by National Institute of Communicable Diseases (NICD), Delhi with the help of regional stations of the institute situated across the country, *Leptospira* by Regional Medical Centre (RMC) at Port Blair, Human Immunodeficiency Virus (HIV) by National AIDS Research Institute (NARI), Pune and National AIDS Control Organization (NACO), New Delhi.

A number of investigators, supported by financial assistance from various government agencies, have contributed to the study of prevalence of several other pathogens in our country.

National Bureau of Plant Genetic Resources (NBPGR) and National Bureau of Agriculturally Important Microorganisms (NBAIM) are mandated to check and monitor entry of any invasive species.

Central Pollution Control Board (CPCB), and National Environmental Engineering Research Institute (NEERI) have inbuilt mechanism for monitoring of pollution/eutrophication wherein microbial forms

are also used as indicators.

Indian Council of Agricultural Research monitors land use change / land degradation through coordinated programme in the context of agriculturally useful programmes especially rhizobia, phosphorus solubilisers and other growth promotory forms such as arbuscular mycorrhizal fungi. Indian Council of Agricultural Research has in place guidelines for effective use of microbial inoculants especially biofertilizers and biopesticides to check unsustainable use in agroecosystems so that environmental balance is maintained. Conservation centers in the country have collections of important microorganisms. A few ecosystem based monitoring programmes have been initiated e.g. pathogenic bacteria of river Narmada, endophytes of tree species and crop plants, petroleum hydrocarbon degrading microbes, autotrophs and heterotrophs of Sambhar Lake, thiobacilli from mining sites, heterotrophs and actinomycetes of Lonar lake, root nodulating bacteria of tree legumes of Western Ghats and Nanda Devi biosphere reserve, metagenomic approach to natural ecosystem for non-culturables, marine microbial diversity etc.

22. ◇ On Article 7 (d), does your country have a mechanism to maintain and organize data derived from inventories and monitoring programmes and coordinate information collection and management at the national level?

a) No	
b) No, but some mechanisms or systems are being considered	
c) Yes, some mechanisms or systems are being established	
d) Yes, some mechanisms or systems are in place (please provide details below)	X
e) Yes, a relatively complete system is in place (please provide details below)	

Further information on the coordination of data and information collection and management.

As far as the maintenance of data related to animal resources are concerned, the Zoological Survey of India maintains proper record of all species collected, which forms the National Zoological Collections. The organization coordinates and monitors the information, collection and management at National level. The preparation of Faunal database of nearly 20,00,000 specimens is underway.

As far as the maintenance of data related to plant resources are concerned, the Botanical Survey of India maintains primary data on all species collected in the form of over 30,00,000 herbarium specimens in well planned and maintained herbaria, and the secondary data in the form of label data on the herbarium sheets. The preparation of digital database these specimens is underway.

Several collection centres are maintaining a record of microorganisms wherein both indigenous and global gene pool is maintained. Major facilities include, The Microbial type Culture Collection (MTCC), Chandigarh; National Bureau of Agriculturally Important Microorganisms (NBAIM), Mau Rhizobial Collection Centre, IARI; Marine Cyanobacteria, Bhartidasam University; Private collection centre at Nicholas Peeramal; Anaerobes and Metallogens at Agharkar Research Institute; smaller collections at various universities. Digitisation of the existing major gene pool is nearing completion through a DBT programme.

23. ◇Does your country use indicators for national-level monitoring of biodiversity? (decision III/10)

a) No	
b) No, but identification of potential indicators is under way (please describe)	
c) Yes, some indicators identified and in use (please describe and, if available, provide website address, where data are summarized and presented)	X

d) Yes, a relatively complete set of indicators identified and in use (please describe and, if available, provide website address, where data are summarized and presented	

Further comments on the indicators identified and in use.

Studies are underway for using indicators for national level monitoring of biodiversity. Some species of animals, particularly macro-invertebrates in aquatic ecosystem and soil fauna in forest ecosystem are being studied in order to establish their ability to monitor the degradation of environmental quality. The assessment is based on their distribution and abundance in the affected zone. Similarly, the changes in the population of selected threatened animal species also being monitored. Validation of the threatened species is also being undertaken.

Biodiversity characterization at landscape level is monitored, using satellite remote sensing (RS) and geographical information system (GIS) in biodiversity rich areas, like Western Himalaya, Eastern Himalaya, Western Ghats and the Andaman & Nicobar Islands. These studies use porosity, patchiness, etc. as indicators for national level monitoring of biodiversity at ecosystem and landscape level.

Box XLIII.

Please elaborate below on the implementation of this article and associated decisions specifically focusing on:

a) outcomes and impacts of actions taken;
b) contribution to the achievement of the goals of the Strategic Plan of the Convention;
c) contribution to progress towards the 2010 target;
d) progress in implementing national biodiversity strategies and action plans;
e) contribution to the achievement of the Millennium Development Goals;
f) constraints encountered in implementation.

Decisions on Taxonomy

24. Has your country developed a plan to implement the suggested actions as annexed to decision IV/1? (decision IV/1)

a) No	
b) No, but a plan is under development	X
c) Yes, a plan is in place (please provide details below)	X
d) Yes, reports on implementation available (please provide details below)	

Further information on a plan to implement the suggested actions as annexed to decision IV/1.

India has committed itself to capacity building in taxonomy. MoEF organized a “National Workshop in Capacity Building in Taxonomy” in Jaipur in 1997 which identified gap areas in taxonomy and recommended taking up an All India Coordination Project on Taxonomy (AICOPTAX). The project was launched in 1999-2000.

Under this project, Centres for Research, each with 4-5 coordinating units, have been set up in identified priority gap areas (e.g., virus, bacteria, microlepidoptera, etc.) in the field of taxonomy. As of now, there are 82 such units. In addition, fellowships, scholarships, chairs, career awards etc. have been initiated. Strengthening of BSI and ZSI as the coordinating units has been taken up. Organized specialist groups drawn from universities, BSI and ZSI have been set up to take up taxonomic work on animal viruses, bacteria & archaea, algae, fungi lichens, bryophytes, pteriodophytes, gymnosperms, palms, grasses and bamboos, orchids, helminthes & nematodes, microlepidoptera and mollusca. Training in plant and animal biosystematics has also been recognized as an important component.

For each centre, an experienced taxonomic expert has been identified as the Coordinator who in turn has identified 4-5 collaborators across the country. The Coordinators of the Centres together with the Collaborators are undertaking the following activities through training of two Research Scholars each:

- survey, collection, identification and preservation
- maintain collections and taxonomic databanks
- develop identification manuals
- train college teachers and students and local communities in parataxonomy.

Financial assistance is provided to each of these centres for undertaking these activities. Thus each research centre is engaged in training 10 to 12 research scholars. In addition the training centres are imparting training in biosystematics through the use of latest technologies.

A high level Steering Committee headed by a taxonomist has been constituted to oversee the implementation of the project.

Modalities are presently being explored for developing a cadre of reasonably skilled taxonomists who could help in characterization of biodiversity and associated traditional knowledge, as provided for in the Biological Diversity Act 2002.

25. ◇ Is your country investing on a long-term basis in the development of appropriate infrastructure for your national taxonomic collections? (decision IV/1)

a) No	
b) Yes (please provide details below)	X

Further information on investment on a long-term basis in the development of appropriate infrastructure for your national taxonomic collections.

The two national survey organizations, viz., BSI and ZSI, responsible for the collection, preservation, taxonomic identification and maintenance of National Collections of flora and fauna up to species level are fully funded by the Govt. of India. The BSI and ZSI have well established systems for identification and preservation of specimens collected and are now in the process of building electronic databases. Besides, there are programmes such as All India Coordinated Project on Capacity Building in Taxonomy (AICOPTAX), under which funds are provided by MoEF to various institutes/universities of the country for the development of both, infrastructure and expertise.

Some of the other initiatives include establishment of a Marine Microbial Reference Centre at Kochi, Microbial Type Culture Collection, Chandigarh, National Bureau of Agriculturally Important Microorganisms, Mau and some other smaller collections which are helping to conserve the microbial gene pool.

26. ◇ Does your country provide training programmes in taxonomy and work to increase its capacity of taxonomic research? (decision IV/1)

a) No	
b) Yes (please provide details below)	X

Further information on training programmes in taxonomy and efforts to increase the capacity of taxonomic research.

BSI and ZSI conduct periodically several courses to impart training for the Collection, Preservation and Identification of plant and zoological Specimens. Each year training programmes are being conducted at HQ, Kolkata and selected Regional Stations. These Training Programme are mainly for the Teachers, Research workers in Universities, NGO's and law enforcement officials such as Forest Officials, besides departmental candidates. Besides, the AICOPTAX programme is also aimed towards the development of expertise in taxonomy. Training programme on Wildlife DNA Extraction and Fingerprinting is also being conducted in collaboration with Centre for DNA Fingerprinting and Diagnostics (CDFD), Hyderabad. MTCC and NBAIM carry out short-term training modules especially for young faculty and researchers. Similar training modules on rhizobia and other biofertilizers have been held on a regular basic during the last years under the NATP (ICAR) at IARI and TNAU. The DBT supported Marine Cyanobacterial Centre also holds regular training modules. Training booklets and manuals on several groups have been prepared through the above programmes.

27. ◇ Has your country taken steps to ensure that institutions responsible for biological diversity

inventories and taxonomic activities are financially and administratively stable? (decision IV/1)	
a) No	
b) No, but steps are being considered	
c) Yes, for some institutions	X
d) Yes, for all major institutions	X

The Government of India has taken appropriate measures for the financial and administrative stability of the two major organizations, BSI & ZSI responsible for biological diversity inventorisation and monitoring. MTCC, Chandigarh is jointly supported on a long terms basis by DBT and CSIR whereas NBAIM is a full-fledged Institute of ICAR. Long term support to centre for Marine Cyanobacteria has been provided by DBT. The AICOPTAX initiative of MOEF is likely to receive continued support for some years since this is the only major taxonomy initiative in the country that cuts across all major groups, microorganism, plants and animals. Metagenomic and functional approaches require being established and/ or strengthened to meet the global standards.

28.* [2] Is your country collaborating with the existing regional, subregional and global initiatives, partnerships and institutions in carrying out the programme of work, including assessing regional taxonomic needs and identifying regional-level priorities? (decision VI/8)	
a) No	
b) No, but collaborative programmes are under development	
c) Yes, some collaborative programmes are being implemented (please provide details about collaborative programmes, including results of regional needs assessments)	X
d) Yes, comprehensive collaborative programmes are being implemented (please provide details about collaborative programmes, including results of regional needs assessment and priority identification)	

Further information on the collaboration your country is carrying out to implement the programme of work for the GTI, including regional needs assessment and priority identification.
Collaborative programmes are being implemented at the regional and global levels through South Asia Cooperative Environmental Programme (SACEP); Indo-Australia Training & Capacity Building in Marine Protected Area; Indian Subcontinent Plant Specialist Group (ISPSG); Indian Subcontinent Regional Orchid Specialist Group (ISROSG); Census of Marine Life (CoML) and Ocean Biogeographic Information system (OBIS); and Budapest Treaty for Microorganism, affiliated to World Federation of Culture Collection (WFCC).

29. * Has your country made an assessment of taxonomic needs and capacities at the national level for the implementation of the Convention? (annex to decision VI/8)	
a) No	
b) Yes, basic assessment made (please provide below a list of needs and capacities identified)	X
c) Yes, thorough assessment made (please provide below a list of needs and capacities identified)	

Further comments on national assessment of taxonomic needs and capacities.

[2] The questions marked with * in this section on Taxonomy are similar to some questions contained in the format for a report on the implementation of the programme of work on the Global Taxonomy Initiative. Those countries that have submitted such a report do not need to answer these questions unless they have updated information to provide.

Currently, some lacunae exists in the taxonomic expertise in the country because of death/retirement of old taxonomist on one hand and non interest in taxonomic studies by the students in the universities on the other hand. With the result, there are a large number of animal and plant groups belonging to lower phyla where no taxonomic expertise exists at any level. In order to develop interest in taxonomic studies, encouragement are being given and funds are provided for upcoming students of taxonomy under AICOPTAX. Similarly, capacity building needs have been identified in lower group of plants, animals and microbes, and certain other specialized groups, like orchids, grasses, palms, etc.

In the area of microbial diversity, India had very fine fungal taxonomists at one time and has therefore contributed extensively to new Indian taxa in the past. This work force is now highly depleted and only a handful of experts in various groups are available. Bacterial identification involves not only phenotypic tests of a large variety but molecular tools of various kinds including DNA sequencing. Description of a species furthers requires G+C analysis and DNA: DNA hybridization which requires not only authentic cultures from either experts or culture collection but also tedious procedures. Many Indian researchers have to seek international cooperation to reach this end although IMTECH, Chandigarh and CCMB, Hyderabad are equipped for such lengthy exercise. CCMB in particular has described over 20 new bacterial species from cold environments, particularly Antarctica however for others it has been difficult to get beyond DNA sequencing. Thus, a major thrust is required to develop taxonomic experts for Bacteria & Archaea where expertise is indeed limited. This would mean strengthening some of the established groups and raising others to Centres of Excellence with necessary resources. In addition further thrust is needed in use of housekeeping genes, multilocus enzyme electrophoresis (MLEE) and other tools for characterization of bacteria. Also, considering the large non-culturable diversity of especially bacteria and archaea, it is essential to apply the metagenomics approach to diversity search and biopotentiality. Only limited efforts are currently operative on this front in the country but some younger groups are bracing up to challenge. In the context of environmental dynamics, it would also be prudent to select a few representative chemical environments for assessment of total functional communities utilizing microarrays that are now being used in molecular microbial ecology to understand gene function without the need of cultivation. With the present assessments, it is proposed to draw a roadmap to strengthen the microbial taxonomy, functionality and genetic component through training of appropriate workforce, inter-institutional linkages and bilateral cooperations.

30.* Is your country working on regional or global capacity building to support access to, and generation of, taxonomic information in collaboration with other Parties? (annex to decision VI/8)	
a) No	
b) Yes, relevant programmes are under development	
c) Yes, some activities are being undertaken for this purpose (please provide details below)	X
d) Yes, many activities are being undertaken for this purpose (please provide details below)	

Further comments on regional or global capacity-building to support access to, and generation of, taxonomic information in collaboration with other Parties.

Some activities in SAARC countries under SACEP and Species Survival Commission of IUCN have been initiated. In the area of microbial diversity, while individual groups often have cooperating partners from across the globe, MTCC is part of the world Federation of Culture Collections (WFCC) that is a global body. NBAIM has working linkages with CABI and other similar networks. Both these institutions have held small term training programmes for young researchers but considering the new dimensions that are being added to diversity searches and functionality, greater collaboration with other parties is definitely required.

31.* Has your country developed taxonomic support for the implementation of the programmes of work under the Convention as called upon in decision VI/8? (annex to decision VI/8)	
a) No	
b) Yes, for forest biodiversity (please provide details below)	X
c) Yes, for marine and coastal biodiversity (please provide details	X

	below)	
d)	Yes, for dry and sub-humid lands (please provide details below)	X
e)	Yes, for inland waters biodiversity (please provide details below)	X
f)	Yes, for mountain biodiversity (please provide details below)	X
g)	Yes, for protected areas (please provide details below)	X
h)	Yes, for agricultural biodiversity (please provide details below)	X
i)	Yes, for island biodiversity (please provide details below)	X

Further comments on the development of taxonomic support for the implementation of the programmes of work under the Convention

The basic taxonomic support (Inventorisation of faunal resources) has been build up in ZSI for the implementation of the programme of work related to the following areas:

- Tropical Rainforest
- Coral reefs and Mangroves
- Desert Fauna
- Lakes and rivers
- High Altitude ecosystem
- National Parks, Biosphere Reserves, Tigers Reserves, Wildlife Sanctuaries
- Island ecosystems

The basic taxonomic support in terms of preparing inventories of plant species, their taxonomic characterization, occurrence, etc. in different ecosystems as mentioned above is being provided by the Botanical Survey of India, ICFRE, Wildlife Institute of India, laboratories under CSIR (like NBRI, CIMAP, RRL, IHBT), ICAR (NBPGR) and some academic institutions. As indicated under item 20(a), assessment of microbial diversity in various ecosystems has been undertaken on an adhoc basis.

32. * Has your country developed taxonomic support for the implementation of the cross-cutting issues under the Convention as called upon in decision VI/8?

a)	No	
b)	Yes, for access and benefit-sharing (please provide details below)	X
c)	Yes, for Article 8(j) (please provide details below)	X
d)	Yes, for the ecosystem approach (please provide details below)	X
e)	Yes, for impact assessment, monitoring and indicators (please provide details below)	X
f)	Yes, for invasive alien species (please provide details below)	X
g)	Yes, for others (please provide details below)	

Further comments on the development of taxonomic support for the implementation of the cross-cutting issues under the Convention.

Crosscutting issues such as sustainable development, Resource Management, Bioprospecting, Biopiracy are dealt by Survey organization through identification distribution and monitoring at species level. To provide taxonomic support on the above cross cutting issues, the two national organizations, viz. BSI and ZSI, along with some other national laboratories, academic institutions and NGOs provide information on identity, occurrence and utilization of components of biodiversity, both plants and animals.

Besides the establishment of Centre for Research on Bacteria & Archaea, Fungi and Animal Viruses under AICOPTAX, ICAR has in place strong quarantine measures for agricultural and food products to check entry of any invasive form including GMOs that have to undergo approvals through other bodies. Establishment of Biodiversity Authority of India monitors access and benefit sharing in use of natural biodiversity at national and international fora. Several ecosystems are being studied sporadically through AICOPTAX programme, academic research in Universities and at Institutes. A programme on marine microbial diversity is operating on a long term basis through the Dept. of Ocean Development, Govt. of India.

For purpose of taxonomic support to individual microbiologists, MTCC, Chandigarh provides paid services for identification, conservation and supply of microbial cultures. It also extends facility for maintenance of patented cultures with restricted supply based on the depositors terms and conditions. ICAR is initiating a major programme on the diversity of growth promoting microorganisms keeping sustainable production in mind. DBT similarly supports a biodiversity based bioprospecting initiative now for several years keeping sustainable production, herbals and biopesticides in mind. This runs in concert with the molecular taxonomy initiative of DBT on plant species of importance. Council of Scientific & Industrial Research (CSIR) has begun a network programme entitled, "Exploration and exploitation of microbial wealth of India for novel compounds and biotransformation process" wherein 10 institutes are participating.

Article 8 - *In-situ* conservation [excluding paragraphs (a) to (e), (h) and (j)]

33. ◆ On Article 8(i), has your country endeavored to provide the conditions needed for compatibility between present uses and the conservation of biological diversity and sustainable use of its components?

a) No	
b) No, but potential measures are being identified	
c) Yes, some measures undertaken (please provide details below)	X
d) Yes, comprehensive measures undertaken (please provide details below)	

Further comments on the measures taken to provide the conditions needed for compatibility between present uses and the conservation of biological diversity and sustainable use of its components.

India has endeavored to not only create awareness, but also provide the conditions needed for compatibility between present uses and the conservation of biological diversity and sustainable use of its components by helping foster all stakeholders' involvement at various levels including voluntary agencies, non government organizations, Panchayati Raj institutions and others. Some of the examples are given below:

- **Joint Forest Management Programme:** Joint Forest Management (JFM) programme has emerged as a powerful tool of sustainable forestry in India. 28 states have adopted JFM with involvement of 8.4 million families. 84,632 JFM committees are managing around 17.33 million ha forests land. JFM cell has been established in 1998 to monitor the JFM programme and generate policy responses. A network for consultation with stakeholders has also been developed. Forest development agencies (FDAs) have been set up at the forest division level to undertake holistic development in the forestry sector with people's participation. 561 FDAs have so far been operationalised. This decentralized two tier institutional structure (FDA and JFMC) allows greater participation of the community, both in planning and implementation, to improve forests and livelihood of the people living in and around forest areas. The village is reckoned as a unit of planning and implementation and all activities under the programme conceptualized at the village level. This approach also significantly empowers the local people to participate in the decision making process. To create further awareness, Forest Protection Committees (FPC) and Eco Development Committees (EDC) have been formed at village/Panchayat levels have also been formed in several states.
- **India Eco-Development Project:** Improved Protected Area Management Systems has been evolved to improve the capacity of protected area management to conserve biodiversity and gain support of the local people for conservation by increasing opportunities for local participation in protected area management. Village Eco-Development Programme has been undertaken in order to reduce negative impact of the local people on biodiversity. Education and awareness activities and monitoring and research activities for conservation on identified tiger reserves and national parks have been promoted. The project has been implemented in seven sites in seven different States i.e. Palamau in Jharkhand, Buxa in West Bengal, Nagarhole in Karnataka, Periyar in Kerala, Pench in Madhya Pradesh, Gir in Gujarat and Ranthambore in Rajasthan.
- India is implementing a comprehensive programme since 1987 for conservation and management of wetlands in the country. The activities include preparation and implementation of management action plans for 20 identified wetlands of the country emphasizing participation of people living around these areas. Initiatives have been taken for conservation of biodiversity within wetland areas. For example, in Chilika Lake, a community based approach has been taken

for habitat improvement of Nalabana Sanctuary and in Lokat Lake, a Management Action Plan with specific measures for *in-situ* conservation of Keibul Karjao National Park, which is habitat for endangered ungulate species, cervus eldield.

- The National Mangrove and Coral Reef Committee has the responsibility of promoting management action plan for all mangrove and coral reef regions of the country.
- Special Region Development Programmes have been initiated such as Hill Area Development Programme, Western Ghats Development Programme, Deccan Development Programme.
- In Madhya Pradesh, Jharkhand, West Bengal, Orissa field projects are established to understand the NTFP based species conservation and valued addition by local communities at IIFM under International Centre for Community Forestry.
- Conservation of medicinal plants in Betul district of Madhya Pradesh through local participation under the *in situ* conservation project by Indian Institute of Forest Management (IIFM).
- Project on Criterian and Indicator for sustainable forest management at at IIFM.
- Medicinal Plant Conservation Areas (MPCAs) have been developed by FRLHT in three states – Tamil Nadu, Karnataka and Kerala on *In situ* medicinal plant conservation
- Indian Institute of Science has initiated preparation of People's Biodiversity Registers (PBR) in Western Ghats area though JFM communities to assist in conservation of biological diversity.
- In the Northeastern states, efforts are being made towards biodiversity conservation through people's participation, sacred grove approach, identification of orchids and other local flora by groups working in North Eastern Hill University (NEHU), Shillong.
- Some other relevant programmes include Project Elephant, special conservation projects on Kashmir stag, Brow antlered deer, crocodiles, musk deer, snow leopard, special habitats of conservation importance under the jurisdiction of state governments, marine protected areas, sanctuaries for Rhododendron, Orchid, Citrus, Pitcher plant.

34. ◈ On Article 8(k), has your country developed or maintained the necessary legislation and/or other regulatory provisions for the protection of threatened species and populations?

a) No	
b) No, but legislation is being developed	
c) Yes, legislation or other measures are in place (please provide details below)	X

Further information on the legislation and/or regulations for the protection of threatened species and populations.

1. Wildlife Protection Act (WLPA), 1972 provides for setting up of Sanctuaries, National Parks enclosed areas and the constitution of a Central Zoo Authority. It has provisions related to prohibition, trade or commerce in wild animals, animal articles and trophies. The WLPA prohibits the hunting of the wild animals specified in the Schedules I-IV of the WLPA and also states the special circumstances under which wild animals may be hunted. It also provides for protection of plants specified in Section VI (six species identified at present) in any forestland and any area specified by notification by the central government. In 2002, Wildlife Protection Amendment Act was promulgated with provisions to strengthen conservation and move towards greater participation.

2. India is Party to CITES according to which trade in endangered species is not allowed

3. India has enacted Biological Diversity Act, 2002 which regulates access to biological resources of the country including protection and rehabilitation of threatened species.

4. Programmes are in place for the rehabilitation of threatened species are ongoing in the country through botanical gardens, sanctuaries etc.

5. Specific programmes for species conservation have been initiated for rhino and river dolphins etc

6. Captive breeding programmes are ongoing e.g. for crocodile

7. Red Data Books listing threatened species of plants and animals have been published by BSI and ZSI.

8. Environmental Protection Act, 1986 and Forest Conservation Act, 1980 also address issues related to protection of threatened species and populations.

35. ◈ On Article 8(l), does your country regulate or manage processes and categories of activities identified under Article 7 as having significant adverse effects on biological diversity?

a) No	
b) No, but relevant processes and categories of activities being identified	
c) Yes, to a limited extent (please provide details below)	X
d) Yes, to a significant extent (please provide details below)	

Further comments on the regulation or management of the processes and categories of activities identified by Article 7 as having significant adverse effects on biodiversity.

The legal measures undertaken to regulate processes and categories of activities having significant adverse effects on biological diversity include:

- The CRZ Notification 1991 laid out a detailed set of restrictions on development activities along the coast of the country. To monitor and implement its provision, MoEF constituted 13 State Coastal Zone Management Authorities for each of the coastal states and Union Territories and one National Coastal Zone Authority.
- The Environmental Impact Assessment (EIA) has been made mandatory by giving it a legislative status since 1994 for incorporating environmental concerns in development process. Expert committees under the provision of EIA Notifications have been constituted for appraisal projects received for environment clearance for different sectors such as industry, thermal power, river valley and hydro electric, mining, infrastructure and miscellaneous, nuclear power and new construction projects and industrial estates.

Box XLIV.

Please elaborate below on the implementation of this article and associated decisions specifically focusing on:

a) outcomes and impacts of actions taken;
b) contribution to the achievement of the goals of the Strategic Plan of the Convention;
c) contribution to progress towards the 2010 target;
d) progress in implementing national biodiversity strategies and action plans;
e) contribution to the achievement of the Millennium Development Goals;
f) constraints encountered in implementation

Programme of Work on Protected Areas (Article 8 (a) to (e))

36. Has your country established suitable time bound and measurable national-level protected areas targets and indicators? (decision VII/28)

a) No (please specify reasons)	
b) No, but relevant work is under way	
c) Yes, some targets and indicators established (please provide details below)	X
d) Yes, comprehensive targets and indicators established (please provide details below)	

Further comments on targets and indicators for protected areas.

Suitable and measurable national level protected area targets have been established in India. In 1988, India has 54 national parks and 372 wildlife sanctuaries and in 2005 this network has grown to 94 national parks and 501 wildlife sanctuaries covering 4.74% of the total geographical area of the country. The goal is to establish 163 national parks and 707 wildlife sanctuaries covering 5.74% of the total geographic area of the country. This would ensure appropriate representation of the range of biological values spread across the ten biogeographic zones and twenty-six biogeographic provinces in the country. The monitoring committee of the National Wildlife Action Plan (2002-2016) periodically monitors the status of establishment and management of PAs in the country.

The Draft National Environment Policy 2004 envisages expansion of PA network to represent all biogeographical zones. The Wildlife Action Plan (2002-2006) also calls for expansion of PAs network.

37. Has your country taken action to establish or expand protected areas in any large or relatively unfragmented natural area or areas under high threat, including securing threatened species? (decision VII/28)	
a) No	
b) No, but relevant programmes are under development	
c) Yes, limited actions taken (please provide details below)	
d) Yes, significant actions taken (please provide details below)	X

Further comments on actions taken to establish or expand protected areas.

Detailed recommendations for establishing new PAs and to rationalize the boundaries of existing PAs have been made in the report 'Planning a Protected Area Network in India'. Several unfragmented natural areas and habitats of threatened/ endangered species have been brought within the PA network.

38. Has your country taken any action to address the under representation of marine and inland water ecosystems in the existing national or regional systems of protected areas? (decision VII/28)	
a) No	
b) Not applicable	
c) No, but relevant actions are being considered	
d) Yes, limited actions taken (please provide details below)	
e) Yes, significant actions taken (please provide details below)	X

Further comments on actions taken to address the under representation of marine and inland water ecosystems in the existing national or regional systems of protected areas.

Although several of the marine and inland water ecosystems have been brought under the PA network, more effort is needed to establish and effectively manage the marine protected areas and to adequately protect inland water ecosystems. Presently, there are 31 marine protected areas and over 100 PAs which include both terrestrial and freshwater ecosystems. There is a need to comprehensively review the establishment and management of marine protected areas.

39. Has your country identified and implemented practical steps for improving the integration of protected areas into broader land and seascapes, including policy, planning and other measures? (decision VII/28)	
a) No	
b) No, but some programmes are under development	
c) Yes, some steps identified and implemented (please provide details below)	X
d) Yes, many steps identified and implemented (please provide details below)	

Further comments on practical steps for improving integration of protected areas into broader land and seascapes, including policy, planning and other measures.

Efforts are currently underway to integrate protected areas into broader landscapes by bringing about appropriate changes in policy, planning and management of PAs. The Wildlife Institute of India has identified significant landscapes in the country and the Project Tiger, Government of India is initiating a project 'Biodiversity Conservation and Livelihood Support' in important PAs with linkages with the broader landscapes.

40. Is your country applying environmental impact assessment guidelines to projects or plans for evaluating effects on protected areas? (decision VII/28)

a) No	
b) No, but relevant EIA guidelines are under development	
c) Yes, EIA guidelines are applied to some projects or plans (please provide details below)	X
d) Yes, EIA guidelines are applied to all relevant projects or plans (please provide details below)	

Further comments on application of environmental impact assessment guidelines to projects or plans for evaluating effects on protected areas.

India has sector-specific EIA guidelines and enabling legislation. Any development proposed/ planned in and around the PAs is subjected to EIA process. The incorporation of biodiversity concerns in the EIA process in underway along with the development of guidelines for strategic environment assessment (SEA). These would enable the country to integrate conservation concerns in developmental planning in a meaningful way.

41. Has your country identified legislative and institutional gaps and barriers that impede effective establishment and management of protected areas? (decision VII/28)

a) No	
b) No, but relevant work is under way	
c) Yes, some gaps and barriers identified (please provide details below))	X
d) Yes, many gaps and barriers identified (please provide details below)	

Further comments on identification of legislative and institutional gaps and barriers that impede effective establishment and management of protected areas.

Yes, the country has identified major legislative and institutional barriers that impede effective establishment and management of PAs. The country's key wildlife legislation *viz.*, Wildlife (Protection) Act, 1972 prescribes elaborate provisions for establishment of PAs which include rehabilitation of habitations inside the national park. Unfortunately, the process of rehabilitation has not been fully completed due to a variety of social, economic, political, administrative and financial reasons and thus several PAs have not been legally gazetted to date. Further, the absence of management plans and monitoring processes also effect management effectiveness of PAs. Low investment (manpower & financial) in PAs and inadequate inter-agency coordination also adversely affects the PA management.

42. Has your country undertaken national protected-area capacity needs assessments and established capacity building programmes? (decision VII/28)	
a) No	
b) No, but assessments are under way	X
c) Yes, a basic assessment undertaken and some programmes established (please provide details below)	
d) Yes, a thorough assessment undertaken and comprehensive programmes established (please provide details below)	

Further comments on protected-area capacity needs assessment and establishment of capacity building programmes.

The national protected area management capacity has been assessed. The Wildlife Institute of India is the premier agency of the Ministry of Environment & Forests, Government of India for planning and implementing capacity building programmes in the field of wildlife and protected area management. There is a need to build capacity at the state level especially to train the frontline staff, who are presently inadequately trained and under equipped to meet their job responsibilities.

43. Is your country implementing country-level sustainable financing plans that support national systems of protected areas? (decision VII/28)	
a) No	
b) No, but relevant plan is under development	
c) Yes, relevant plan is in place (please provide details below)	
d) Yes, relevant plan is being implemented (please provide details below)	X

Further comments on implementation of country-level sustainable financing plans that support national systems of protected areas.

At the national level, the central Government provides technical and financial support to strengthen the conservation, protection and other measures that are necessary for natural resources through the Ministry of Environment & Forests. The Ministry plans, promotes and coordinates all forestry and wildlife programmes. Some of the important centrally sponsored schemes include Development of National Parks and Sanctuaries, Eco development in and around Protected Areas, Project Tiger, Project Elephant, Wetland Conservation Programme, Conservation and Management of Coral Reefs, Bio-sphere Reserves etc.

The country presently has no sustainable financing plans that support national systems of PAs. However, the need is being felt to develop these plans and to develop public-private partnerships for effective PA management.

44. Is your country implementing appropriate methods, standards, criteria and indicators for evaluating the effectiveness of protected areas management and governance? (decision VII/28)	
a) No	
b) No, but relevant methods, standards, criteria and indicators are under development	
c) Yes, some national methods, standards, criteria and indicators developed and in use (please provide details below)	X
d) Yes, some national methods, standards, criteria and indicators developed and in use and some international methods, standards, criteria and indicators in use (please provide details below)	

Further comments on methods, standards, criteria and indicators for evaluating the effectiveness of protected areas management and governance.

Globally, the concept of protected area management effectiveness evaluation is of recent origin. The

World Commission on Protected Areas (WCPA) Management Effectiveness Evaluation (MEE) framework has been applied by a few countries. In India, under the UNESCO/ IUCN Project 'Enhancing Our Heritage: Management and Monitoring for Success in World Natural Heritage Sites' operational in two world heritage sites *viz.,* Kaziranga National Park, Assam and Keoladeo National, Rajasthan, evaluation of management effectiveness using WCPA-MEE framework is being done. Recently, the Ministry of Environment & Forests, Government of India and the Office of the Comptroller & Auditor General (C&G), Government of India have initiated the process of conducting independent audit of all national parks and sanctuaries in the country and present the results to the Indian Parliament. Technical assistance and financial resources are needed to establish the MEE process in all 595 PAs and to periodically conduct this exercise.

Box XLV. .

Please elaborate below on the implementation of this article and associated decisions specifically focusing on:

a) outcomes and impacts of actions taken;
b) contribution to the achievement of the goals of the Strategic Plan of the Convention;
c) contribution to progress towards the 2010 target;
d) progress in implementing national biodiversity strategies and action plans;
e) contribution to the achievement of the Millennium Development Goals;
f) constraints encountered in implementation.

Article 8(h) - Alien species

45. Has your country identified alien species introduced into its territory and established a system for tracking the introduction of alien species?

a) No	
b) Yes, some alien species identified but a tracking system not yet established	
c) Yes, some alien species identified and tracking system in place	X
d) Yes, alien species of major concern identified and tracking system in place	

Invasive alien species pose a serious threat to biodiversity, which is considered second only to habitat loss. About 40% of species in Indian flora are alien, of which 25% are invasive. However, not much information is available on invasive fauna and microbes. Some alien species have been identified by various Bureaus but tracking systems are under consideration. For example, National Bureau of Fish Genetic Resources has prepared a list of exotic/alien species under aquaculture/fisheries and aquarium trade and their invasive impact has also been evaluated. A strategic plan and guidelines for quarantine and exotic fish introductions has been prepared and published.

46. ◇ Has your country assessed the risks posed to ecosystems, habitats or species by the introduction of these alien species?

a) No	
b) Yes, but only for some alien species of concern (please provide details below)	X
c) Yes, for most alien species (please provide details below)	

Further information on the assessment of the risks posed to ecosystems, habitats or species by the introduction of these alien species.

Numerous invasive alien species, particularly the natives of tropical South America and Mexico, have severely invaded forest ecosystems, waterways, fisheries, farmlands, fallows and roadsides/pathways. Almost about 40% of the species in Indian flora are alien, of which 25% are

invasive. *Parthenium hysterophorus L.* which is an exotic species from Tropical America has naturalized most of India because of its strong invasive potential. Numerous pests like coffee berry borer, peanut stripe virus, banana bunchy top virus, potato wart, golden nematode have invaded India and are serious pests.

A national workshop sponsored by the Ministry of Environment & Forests was organized in the Department of Botany, Banaras Hindu University during 18-20 August 2004 to discuss various aspects relating to alien invasive species and biodiversity in India. The workshop focused on themes related with the ecology of invasive species, reasons behind invasiveness, their impact and the need for development of a reporting system on alien species.

As of now, assessment of damage has been done mostly at the local level revealing extensive adverse effects on major ecosystems and also showing alarming environmental degradation. Some states, like West Bengal and Tamil Nadu (also Kerala), have adopted legislative and administrative measures for eradicating/preventing further invasion of the most noxious weedy species and exotic fish carnivores (also the Big Head Carp) replacing the native species.

47. ◈ Has your country undertaken measures to prevent the introduction of, control or eradicate, those alien species which threaten ecosystems, habitats or species?

a) No	
b) No, but potential measures are under consideration	
c) Yes, some measures are in place (please provide details below)	X
d) Yes, comprehensive measures are in place (please provide details below)	

Further information on the measures to prevent the introduction of, control or eradicate those alien species that threaten ecosystems, habitats or species.

In India, in the context of prevention of invasive alien species introductions, there are six agencies which are responsible for issuance of certificate for export/import of bioresources. These are as follows:

i. Plant Quarantine Division, NBPGR issues phytosanitary certificate for export of material and permits for import of germplasm, under the Plant Quarantine Order (PQO) 2003 of the Destructive Insects and Pests Act, 1914.
ii. The Plant Protection Adviser issues permit for import of live insects and microbial cultures, plants and plant products, and phytosanitary certificates along with the organism for export under the PQO.
iii. Department of Animal Husbandry and Dairying deals with import of livestock issues health certificate for the livestock to be exported, if required by the importing country, under the Livestock Importation Act, 1898.
iv. Directorate General of Foreign Trade issues license before export of any living organism or their product from the country under the Foreign Trade (Development & Regulation) Act 1992.
v. The Ministry of Environment & Forests issues approval alongwith quarantine certificate for export of wild animals and articles under the Wildlife (Protection) Act 1972.
vi. The National Biodiversity Authority, Ministry of Environment & Forests, is empowered to issue approval for export of biological material from the country under the Biological Diversity Act 2002.

MoEF is implementing Asia-Pacific Forest Invasive Species Network Project of FAO, and is in the process of preparing a country report of invasive alien species.

48. ◆ In dealing with the issue of invasive species, has your country developed, or involved itself in, mechanisms for international cooperation, including the exchange of best practices? (decision V/8)	
a) No	
b) Yes, bilateral cooperation	
c) Yes, regional and/or subregional cooperation	X
d) Yes, multilateral cooperation	

49. ◆ Is your country using the ecosystem approach and precautionary and bio-geographical approaches as appropriate in its work on alien invasive species? (decision V/8)	
a) No	
b) Yes (please provide details below)	X

Further comments on the use of the ecosystem approach and precautionary and bio-geographical approaches in work on alien invasive species.

Based on the past experience where some exotic species (introduced for ornamental purpose) turned out to be highly invasive, precautionary approach has been adopted. Restoration of degraded forest ecosystems has been taken up with priority on regeneration of native and locally adapted species groups. Freshwater ecosystems have been given priority attention for clearing operations. Biogeographical approach has promoted sharing of relevant information among the neighboring states.

50. Has your country identified national needs and priorities for the implementation of the Guiding Principles? (decision VI/23)	
a) No	
b) No, but needs and priorities are being identified	X
c) Yes, national needs and priorities have been identified (please provide below a list of needs and priorities identified)	

Further comments on the identification of national needs and priorities for the implementation of the Guiding Principles.

Identification of national needs and priorities is being undertaken as part of the NBSAP which is under finalization.

51. Has your country created mechanisms to coordinate national programmes for applying the Guiding Principles? (decision VI/23)	
a) No	
b) No, but mechanisms are under development	X
c) Yes, mechanisms are in place (please provide details below)	

Further comments on the mechanisms created to coordinate national programmes for implementing the Guiding Principles.

Preventing accidental entry of invasive alien species is the shared responsibility of the authorized government departments that issue import permits and conduct quarantine check. MoEF supports and coordinates programmes for eradication/control measures/utilization of invasive spp. And also restoration of degraded ecosystems whereas Ministry of Agriculture has the infrastructure and expertise to deal with.

52. Has your country reviewed relevant policies, legislation and institutions in the light of the Guiding Principles, and adjusted or developed policies, legislation and institutions? (decision VI/23)	
a) No	
b) No, but review under way	
c) Yes, review completed and adjustment proposed (please provide details below)	X
d) Yes, adjustment and development ongoing	
e) Yes, some adjustments and development completed (please provide details below)	

Further information on the review, adjustment or development of policies, legislation and institutions in light of the Guiding Principles.
A comprehensive review of the National System has pointed out the need for setting up a 'National Invasive Species Advisory Committee and also a 'Unified Command for Plant and Animal Quarantine' at the national level.

53. Is your country enhancing cooperation between various sectors in order to improve prevention, early detection, eradication and/or control of invasive alien species? (decision VI/23)	
a) No	
b) No, but potential coordination mechanisms are under consideration	X
c) Yes, mechanisms are in place (please provide details below)	

Further comments on cooperation between various sectors.
Active cooperation among the concerned central and state government departments like agriculture, livestock, fisheries, forests, water resources, tourism, commerce, shipping, environment and rural development while involving lead institutions and NGOs are being developed on case-to-case basis.

54. Is your country collaborating with trading partners and neighboring countries to address threats of invasive alien species to biodiversity in ecosystems that cross international boundaries? (decision VI/23)	
a) No	
b) Yes, relevant collaborative programmes are under development	X
c) Yes, relevant programmes are in place (please specify below the measures taken for this purpose)	

Further comments on collaboration with trading partners and neighboring countries.
Consultations/Discussions are underway among neighboring countries.

55. Is your country developing capacity to use risk assessment to address threats of invasive alien species to biodiversity and incorporate such methodologies in environmental impact assessment (EIA) and strategic environmental assessment (SEA)? (decision VI/23)	
a) No	
b) No, but programmes for this purpose are under development	
c) Yes, some activities for developing capacity in this field are being undertaken (please provide details below)	X
d) Yes, comprehensive activities are being undertaken (please provide details below)	

Further information on capacity development to address threats of invasive alien species.
Various research projects have been initiated to develop capacity to address the threats of invasive alien species. Workshops on relevant topics are being regularly organized with active participation of

major stakeholders and key players.

56. Has your country developed financial measures and other policies and tools to promote activities to reduce the threats of invasive species? (decision VI/23)	
a) No	
b) No, but relevant measures and policies are under development	
c) Yes, some measures, policies and tools are in place (please provide details below)	X
d) Yes, comprehensive measures and tools are in place (please provide details below)	

Further comments on the development of financial measures and other policies and tools for the promotion of activities to reduce the threats of invasive species.

Funding and technical support is provided for projects undertaken by various institutions by central Government Ministries and Departments to a limited extent.

Box XLVI.

Please elaborate below on the implementation of this article and associated decisions specifically focusing on:

a) outcomes and impacts of actions taken;
b) contribution to the achievement of the goals of the Strategic Plan of the Convention;
c) contribution to progress towards the 2010 target;
d) progress in implementing national biodiversity strategies and action plans;
e) contribution to the achievement of the Millennium Development Goals;
f) constraints encountered in implementation.

There has been improved coordination, stronger databases and widened networking in the recent years on invasive alien species and recommendations have been developed for actions to be taken at the national, state and grass root levels. However, much more funding and policy support is required to address this important issue.

Article 8(j) - Traditional knowledge and related provisions

GURTS

57. Has your country created and developed capacity-building programmes to involve and enable smallholder farmers, indigenous and local communities, and other relevant stakeholders to effectively participate in decision-making processes related to genetic use restriction technologies?	
a) No	
b) No, but some programmes are under development	X
c) Yes, some programmes are in place (please provide details below)	
d) Yes, comprehensive programmes are in place (please provide details below)	

Further comments on capacity-building programmes to involve and enable smallholder farmers, indigenous and local communities and other relevant stakeholders to effectively participate in decision-making processes related to GURTs.

The use of Gene Use Restriction Technologies (GURTS) or terminator technology is prohibited as per the provisions of the Protection of Plant Varieties and Farmers' Rights Act, which was passed by the Government in 2001. Import of GURTS products has been banned in India and state-of-the-art containment facilities and diagnostic tools have been developed. Regular consultations are held among nodal agencies, major stakeholders and key players on these issues.

Status and Trends

58. Has your country supported indigenous and local communities in undertaking field studies to determine the status, trends and threats related to the knowledge, innovations and practices of indigenous and local communities? (decision VII/16)

a) No	
b) No, but support to relevant studies is being considered	X
c) Yes (please provide information on the studies undertaken)	

Further information on the studies undertaken to determine the status, trends and threats related to the knowledge, innovations and practices of indigenous and local communities, and priority actions identified.

India is rich in traditional knowledge (TK) associated with biological resources. This traditional knowledge is both coded, as in the texts of Indian systems of medicine such as Ayurveda, Unani and Siddha; or is non-coded, which is oral and undocumented.

Constitutional amendment no. 73 of 1993 enshrines democratic decentralization of responsibilities, wherein local bodies consisting of elected representatives, one third of whom are women, are entrusted responsibility of safeguarding local environmental capital stocks.

As envisaged in this amendment, the Biological Diversity Act provides for setting up of Biodiversity Management Committees (BMCs) for conservation, sustainable use, documentation of biodiversity, and chronicling of traditional knowledge.

Mandatory consultation on BMCs of National Biodiversity Authority (NBA) and State Biodiversity Boards (SBBs) ensures involvement of local community in decision making process relating to access and benefit sharing.

Field studies on the status, trends and threats related to the knowledge, innovation and practices (KIP) of indigenous and local communities are undertaken by several institutions and organizations in the country.

Involvement of local communities and support to them for studies on KIP is being encouraged through the preparation of People's Biodiversity Registers under the Biological Diversity Act 2002. In addition, a database on Sacred Groves Information System is under development. Other initiatives include studies on conservation and sustainable use of biodiversity, establishment of medicinal plants park, community conservation of indigenous animal breeds and collection and preservation of indigenous and medicinal plants. Field studies in different parameters of traditional knowledge are being carried out by the National Innovation Foundation, Ahmedabad.

India is not only supporting initiatives for protection of traditional knowledge and access benefit sharing but it has also been engaged since 1950 in the "promotion" and "teaching" of traditional knowledge. For example in health sector, India has established more than 300 graduate and post-graduate colleges of traditional medicine and it has given traditional systems of medicine a legal status in its national health programmes. In the National Health Policy 2002, the Government of India has identified "Revitalization of local (village based) health traditions", as a major thrust area. Community traditional health knowledge registers have been prepared in a participatory way with knowledgeable households and local healers. These registers are kept by "local healer associations" and are used for passing on useful knowledge to future generations as well as protection of traditional knowledge from bioprocessing. Some organizations such as Foundation for Revitalization of Local Health Traditions have developed a software for documentation of local health traditions and the register is also available in digitized form.

Akwé: Kon Guidelines

59. Has your country initiated a legal and institutional review of matters related to cultural, environmental and social impact assessment, with a view to incorporating the Akwé:Kon Guidelines into national legislation, policies, and procedures?	
a) No	
b) No, but review is under way	
c) Yes, a review undertaken (please provide details on the review)	X

Further information on the review.

Biological Diversity Act, 2002 is in place after an extensive consultation process involving various stakeholders and takes into account the sharing of benefits with local people as conservers of biological resources and holders of knowledge and information relating to the use of biological resources.

60. Has your country used the Akwé:Kon Guidelines in any project proposed to take place on sacred sites and/or land and waters traditionally occupied by indigenous and local communities? (decision VII/16)	
a) No	
b) No, but a review of the Akwé: Kon guidelines is under way	
c) Yes, to some extent (please provide details below)	
d) Yes, to a significant extent (please provide details below)	X

Further information on the projects where the Akwé:Kon Guidelines are applied.

MoEF assisted by other organizations are undertaking maintenance of a large number of sacred groves across the country. Comprehensive status reports have been prepared and follow up actions are being taken while providing technical support and funding where required.

Extensive documentation has been done and is available in the form of academic publications on sacred groves. There are about 19,000 sacred groves which are documented from several States in the country. Indira Gandhi Rashtriya Manav Sangrahalaya (IGRMS), Bhopal launched an initiative on sacred groves in 1999, wherein *in-situ* and *ex-situ* conservation of sacred groves in different places in India has been undertaken. Replicas of 8 different kinds of sacred groves from various parts of the country have been established on the campus of IGRMS, Bhopal.

Conservation and sustainable management of dryland biodiversity project aims to promote the conservation of vulnerable, endangered and endemic wild animals, medicinal plants and wild varieties of important crops in two sanctuaries. The project features several innovative approaches to biodiversity conservation, including promoting indigenous knowledge and grassroots solutions for developing alternative livelihoods, and identifying and promoting native conservation ethics (Sacred Groves, Knowledge Forests, etc.) as the foundation for conservation awareness efforts.

The database on Sacred Grove Information System (SGIS) developed by National Chemical Laboratory, Pune, include type and nature of information, information sources, validity and authenticity of information. Information is being collected through published literature and through personal communication. Currently, SGIS holds cursory information on about 3000 sacred groves from the States of Andhra Pradesh, Maharashtra, and Tamil Nadu. Data on sacred groves in other States is being gathered from various sources. Web-based data acquisition and dissemination approach eliminates time gap required for collection and publishing of the data, making it a transparent information based model. Information is also being acquired in multimedia form such as sketches, line drawings, photographs, as well as audio and video clips.

Capacity Building and Participation of Indigenous and Local Communities

61. Has your country undertaken any measures to enhance and strengthen the capacity of indigenous and local communities to be effectively involved in decision-making related to the use of their traditional knowledge, innovations and practices relevant to the conservation and sustainable use of biodiversity? (decision V/16)

a) No	
b) No, but some programmes being developed	
c) Yes, some measures taken (please provide details below)	
d) Yes, comprehensive measures taken (please provide details below)	X

Further information on the measures to enhance and strengthen the capacity of indigenous and local communities.

As mentioned in response to question no. 58, the Biological Diversity Act 2002 provides for mandatory consultation of concerned BMCs by the NBA and SBBs on all issues relating to access to biological resources and associated TK, thereby ensuring involvement of local communities in the decision making process.

Some other measures taken to enhance and strengthen the capacity of indigenous and local communities include the following:

- Establishing medicinal plants parks: an opportunity for biodiversity conservation: This project aims to collect and document the indigenous technical knowledge related to medicinal plants, and to establish a medicinal plants park to serve as a model farm to raise awareness among local people of the need to conserve medicinal plants.
- Save and regenerate the environment: Promoting Sloping Agriculture Land Technology (SALT) and community plantation programmes as an alternative to shifting cultivation in order to protect and preserve the environment.
- Conservation of Hoolock gibbons and rainforest biodiversity through community participation: Educating local people about the importance of the rainforest in maintaining ecological balance. Establishing networks among villagers, forest workers and NGO members to save rainforest habitats and to protect Hoolock gibbons.
- Community conservation of indigenous animal breeds in Tamil Nadu: Provision of support to breeders associations, herders groups and women's groups; documentation of local breeds, raising awareness among target groups.
- Collection and preservation of indigenous and medicinal fruit trees of Assam: To conserve biodiversity of medicinal plants through collection and preservation of germplasm, and to raise awareness among the community through training programmes.
- An environmental awareness generation and ecorestoration programme on the Palni Hills (Western Ghats): The project intends to create awareness about natural processes among villagers, students and decision-makers, and to implement ecorestoration activities in some 75 centers across south India.
- The wild orchids of the Karnataka part of the Western Ghats in Dandeli Wildlife Sanctuary: Project aims at *in situ* and *ex situ* conservation of wild orchids through sustainable collection and harvesting of orchids involving local communities. The project helps to conserve the wild orchids by involving the Karnataka Forest Department.
- Land and water management leading towards biodiversity conservation: The project intends to encourage appropriate local environmental practices through restoration of deteriorated traditional water bodies, revitalization of degraded lands and protection of endangered species of trees.
- Strengthening traditional livelihood system of desert community through agro-forestry and horticulture practices: The project emphasis is on incorporating the components of horticulture and agro-forestry to make agricultural operations more lucrative and more resistant to drought and to popularize the practice of agro-forestry and horticulture among marginalized farmers.
- Confluence of organic farming with self-help group (SHGs) in the Sivaganga and Gunjwani valleys of Pune district: The project aims to connect organizational strength of SHGs with organic farming practices to promote sustainable agriculture, women's empowerment and improved agriculture technology through Integrated Pest Management (IPM).
- Community seed banks for conservation of indigenous genetic resources: empowerment, capacity-building and training: Project will attempt to create and indigenous seed supply system through capacity building, *in situ* conservation and creation of community seed banks.
- Tribal communities of the Jeypore tract of Orissa: In a powerful demonstration of the successes achievable through community-based conservation efforts, tribal groups in the State of Orissa have applied bottom-up efforts to conserve local agro-biodiversity by linking

the livelihood security of villagers with the wider ecological security of the region. In the Jeypore tract, Orissa, introduction of outside crop varieties and forest degradation have led to a decline in the number of native rice varieties. For instance, native rice varieties have fallen in number from 1750 to 150 and are increasingly under threat from commercial varieties. To counter this threat to local biodiversity and to ensure the security of their food supply, tribal communities in the area initiated a programme in 1997 that promotes agro-biodiversity conservation through wide ranging efforts to support community gene management, protect the natural environment, and promote sustainable livelihoods. Supported by the M.S. Swaminathan Research Foundation, the project recognizes the important role played by farmers in the conservation and enhancement of agro-biodiversity and provides encouragement for these activities by providing recognition and monetary rewards for their on-farm conservation efforts. Local farmers are now involved in participatory plant breeding and the compilation of community biodiversity registers, which have been combined with the development of community seed and grain banks. Through these initiatives, remaining varieties of rice are now being conserved and overexploited medicinal plants are being cultivated in community medicinal plant gardens instead of being harvested from the fragile forests of the region. Critically, market linkages have been created based on the promotion of traditional varieties of rice and medicinal plants that allow communities to benefit financially from their conservation activities. By lessening dependence on commercial seeds and purchased food and by developing new production systems and markets for traditional rice varieties, medicinal plants, and other forest products, local people are enjoying new opportunities for economic advancement while ensuring the long term survival of the plant varieties that have supported them for millennia.

- Traditional Knowledge Digital Library (TKDL) is a value added digital database developed by the Government of India for (i) preservation of traditional knowledge; (ii) prevention of misappropriation of traditional knowledge by breaking the language and format barriers of traditional knowledge systems and providing access of these knowledge systems to patent examiner(s) in five international languages i.e. English, German, French, Spanish and Japanese, for establishing the prior art; and (iii) creation of linkages with modern science to initiate active research projects for new drug discovery and development, based on the time tested traditional knowledge systems leading to more affordable health care systems for the poor. For creation of TKDL, Traditional Knowledge Resource Classification (TKRC) has been evolved for approximately 6000 subgroups in Ayurveda, 3500 sub-groups in Unani and 1000 sub-groups in Siddha systems of medicine. The structure of TKRC is similar to that commonly used for classifying modern innovations, which enable an easy linkage with the International Patent Classification (IPC). Transcriptions of several thousands of formulations have already been done. The areas of diversification include traditional foods, traditional architecture and tribal knowledge.
- Components of Biodiversity Digital Library: Council for Scientific and Industrial Research (CSIR) and Botanical Survey of India (BSI) have initiated a collaborative venture to set up a Biodiversity Digital Library with an objective of digitization of plant resources (Kingdom: Plantae) including genetic resources of India, establish source of origin on a scientific basis of this resource and to establish the provider country of this resource and/or knowledge pertaining to the resource. The database will include an inventory of 22,000 species of plant resources and a virtual herbarium of 3.5 million herbarium specimens.
- A comprehensive, computerized database on Indian Medicinal Plants has been developed at Foundation for Revitalization of Local Health Traditions (FRLHT) over the last decade linking scientific name of plant entities with vernacular names. This comprehensive nomenclature database incorporates exhaustive enlistment of plants recorded in medicinal use in India and currently incorporates 7577 botanical names correlated to 146384 vernacular names in 17 languages. This comprehensive database has been prepared through detailed referencing of more than 200 published sources ranging from scholarly commentaries on classical texts relating to codified systems as well as published ethno-medico botanical studies. Each botanical name is correlated to a vernacular and each and every such correlation is linked to a published reference. However, in its present status it represents less than 10% of the vernacular names of medicinal plants in important Indian languages and further work is going on. This database is unique as it provides link between the traditional, cultural knowledge and the precise scientific names of the plant entities.
- A methodology for Documentation and Rapid Assessment of Local Health Traditions (DALHT) has been evolved for supporting the local knowledge about native plant names and their use for promoting primary health care of local communities. This documentation work has involved grass root level NGOs. Data collection has taken place at different sites, covering households and folk healers of different villages in the 4 states of Karnataka, Kerala, Tamil nadu and Maharashtra.
- Building of the country's first bio-geo cultural repository of natural resources has been initiated for use by Indian systems of medicine. The herbarium database incorporates reliable cross-

linkages between local and traditional names used in medical literature and botanical names so that it could be accessed not only by plant taxonomists but also by the non-botanists including physicians of ISM. The herbarium acts as an information source for Indian medicinal plants, particularly on botanical identity, distribution, habit, habitat preferences, ethno-botany, use and method of usage, available variations, threat status, related conservation studies etc. It currently houses 35,000 voucher specimens comprising of 2096 species spread across 150 families. These have been collected from peninsular India, North West, North East and Andaman regions (Karnataka, Kerala, Tamil Nadu, Andhra Pradesh, Maharashtra, Orissa, Himachal Pradesh, Uttaranchal, Jammu & Kashmir in North West Himalayas, Arunachal Pradesh, Meghalaya, Assam, Mizoram & Nagaland in North East India).

62. Has your country developed appropriate mechanisms, guidelines, legislation or other initiatives to foster and promote the effective participation of indigenous and local communities in decision making, policy planning and development and implementation of the conservation and sustainable use of biodiversity at international, regional, subregional, national and local levels? (decision V/16)

a) No	
b) No, but relevant mechanisms, guidelines and legislation are under development	
c) Yes, some mechanisms, guidelines and legislation are in place (please provide details below)	X

Further information on the mechanisms, guidelines and legislation developed.

As mentioned in the response to questions no. 58 and 61, India has enacted the Biological Diversity Act 2002, which provides for effective participation of local communities in decision making, *inter alia* through mandatory consultation of local level BMCs by NBA and SBBs; and preparation of People's Biodiversity Registers etc. In addition, several measures/mechanisms/programmes are in place that promote effective participants of local communities. Some of these are listed in response to question no. 61.

63. Has your country developed mechanisms for promoting the full and effective participation of indigenous and local communities with specific provisions for the full, active and effective participation of women in all elements of the programme of work? (decision V/16, annex)

a) No	
b) No, but relevant mechanisms are being developed	X
c) Yes, mechanisms are in place (please provide details below)	

Further comments on the mechanisms for promoting the full and effective participation of women of indigenous and local communities in all elements of the programme of work.

The mechanisms developed for promoting participation of local communities do have specific provisions for participation of women. For example, the Biological Diversity Rules 2004 provide that not less than one third of the members of the local level Biodiversity Management Committees (BMCs) should be women. Similarly, there are several other such mechanisms/programmes which explicitly and specifically provide for effective participation of women.

Support to implementation

64. Has your country established national, subregional and/or regional indigenous and local community biodiversity advisory committees?	
a) No	
b) No, but relevant work is under way	
c) Yes	X

65. Has your country assisted indigenous and local community organizations to hold regional meetings to discuss the outcomes of the decisions of the Conference of the Parties and to prepare for meetings under the Convention?	
a) No	
b) Yes (please provide details about the outcome of meetings)	X
Further information on the outcome of regional meetings.	
Local community organizations represented through NGOs are involved in preparing for meetings under CBD.	

66. Has your country supported, financially and otherwise, indigenous and local communities in formulating their own community development and biodiversity conservation plans that will enable such communities to adopt a culturally appropriate strategic, integrated and phased approach to their development needs in line with community goals and objectives?	
a) No	
b) Yes, to some extent (please provide details below)	
c) Yes, to a significant extent (please provide details below)	X
Further information on the support provided.	
The Ministry of Environment & Forests has funded and supported the preparation of People's Biodiversity Registers by the Indian Institute of Science. PBRs were prepared for 52 sites in eight States. The PBRs are aimed to build an open and transparent information system on biodiversity resources from village level upwards. The PBRs can be used to promote the sustainable management of natural resources and support claims of communities and individuals to knowledge about biodiversity resources and their use. In addition, local communities have been actively involved in the GEF-funded National Biodiversity Strategy and Action Plan (NBSAP) project, implemented by the MoEF.	

Box XLVII.

Please elaborate below on the implementation of this article and associated decisions specifically focusing on: a) outcomes and impacts of actions taken; b) contribution to the achievement of the goals of the Strategic Plan of the Convention; c) contribution to progress towards the 2010 target; d) progress in implementing national biodiversity strategies and action plans; e) contribution to the achievement of the Millennium Development Goals; f) constraints encountered in implementation.

Article 9 - *Ex-situ* conservation

67. ◈ On Article 9(a) and (b), has your country adopted measures for the *ex-situ* conservation of components of biological diversity native to your country and originating outside your country?

a) No	
b) No, but potential measures are under review	
c) Yes, some measures are in place (please provide details below)	
d) Yes, comprehensive measures are in place (please provide details below)	X

Further information on the measures adopted for the *ex-situ* conservation of components of biodiversity native to your country and originating outside your country.

Ex-situ conservation of biodiversity in India has been institutionalised with the establishment of Botanic Gardens and Zoological Parks with the major objective to conserve components of biological diversity. The tradition of setting up of Botanic Gardens dates back to over 200 years when large spaces within major cities in India were set aside for the purpose. The Indian Botanic Garden at Calcutta was established in 1787. It now spreads over an area of 110 hectares and has around 15,000 plants belonging to 2,500 species. Besides the number of privately owned gardens, there are 33 Government managed and 33 university Botanic Gardens in the country. The Botanical Survey of India is attempting to network these gardens. The Government of India has also initiated establishment of National Botanical Garden in NOIDA in Uttar Pradesh.

The first zoo in India dates back to 1854, being the private zoo of a royalty. The first public zoo in India was established in Chennai by the municipality. Current statistics place the number of zoos, animal parks, aquaria, etc., at 300. Species-oriented captive breeding programmes have been initiated in many of these zoos throughout the country. There are exclusive crocodile and turtle breeding parks established since the 1970s in India.

A Central Zoo Authority (CZA) has been set up under MoEF to provide guidelines to all zoos and monitor their activities. It also oversees the functioning of zoos which can sensitise the visitors about the need for protecting wildlife and habitats and carry out planned breeding of endangered species for augmenting their population in the wild. Captive Breeding Specialist Groups (CBSG) exist for a wide range of organisms in India.

The Government of India has finalised a National Zoo Policy for strengthening scientific and technical capacity for the management of zoos.

Besides the number of zoos and aquaria in India that conserve animals ex situ, NGOs have contributed by maintaining large collections of crocodiles, turtles/tortoises, snakes and lizards. Important NGO maintained reptile parks in India are Chennai Snake Park, Madras Crocodile Bank, Pune Serpentarium and Calcutta Snake Park.

The Indian Council for Agricultural Research (ICAR), has set up a number of gene banks for the ex-situ conservation of plants, fishes and animals under the National Bureau of Plant Genetic Resources (NBPGR), the National Bureau of Animal Genetic Resources (NBAGR), the National Bureau of Fish Genetic Resources (NBFGR) and the National Bureau of Agriculturally Important Microorganisms (NBAIM). Brief details of the these bureaus are given below:

NBPGR: The Indian National Plant Genetic Resources System (IN-PGRS) spearheaded by the National Bureau of Plant Genetic Resources (NBPGR) is among the most dynamic systems in the world which now hold a prominent place. The NBPGR has been entrusted with the national responsibility to plan, conduct, promote, co-ordinate and take lead in activities concerning germplasm collection, introduction, exchange, evaluation, documentation, conservation and sustainable management of diverse germplasm of crop plants and their wild relatives with a view to ensure their availability for use over time to breeders and other researchers. It includes NBPGR network of 10 regional stations/base centres/quarantine centres over different phyto-geographic zones of the country and active collaboration and linkages with over 30 National Active Germplasm Sites (NAGS). NBPGR is conserving genetic resources of crop plants, including their wild relatives. The National Gene Bank (NGB) located at NBPGR has the facility to conserve seed propagated species having 'orthodox seed behavior', i.e. the seeds of such species can be dried to a low moisture content (2-7%), without loosing the viability, and stored at low temperatures (4 to -20^0C). Seeds

can be stored up to 50-100 years under such conditions. The NGB currently holds more than 250,000 accessions for various crop plants and wild species including some duplicate collections. NBPGR has assisted several collaborating institutes/centres in establishing medium-term seed storage; computer and data documentation facilities. In addition it also imparts need based, on the job training to scientist and technicians.

In addition to seed conservation, other *ex situ* conservation methods, such as '*in vitro* storage' and '*cryo* storage', are being employed to conserve species having recalcitrant seeds (seeds which cannot be dried below a critical moisture content and are sensitive to low temperature storage), and vegetatively propagated species. NBPGR has conserved about 1,500 accessions under *in vitro* gene bank and about 5,800 accessions have been conserved in the *cryo* gene bank. For vegetatively propagated species mainly horticultural crop plants, a network of 'field gene banks', are maintaining about 40,000 germplasm accessions.

NBAGR: The establishment of the National Bureau of Animal Genetic Resources (NBAGR) at Karnal in 1984 marked the beginning of India's formal efforts to conserve the livestock genetic resources in the country. The large infrastructure for research and conservation of indigenous germplasm of livestock includes state and central animal husbandry departments, species-specific institutes of the Indian Council of Agricultural Research (ICAR), and state agricultural universities. Many livestock farms maintain indigenous breeds which can form the nuclear herds for in situ conservation. Various bull mother farms and frozen semen banks are interlinked for ex situ conservation of semen of indigenous breeds for posterity.

To increase effectiveness of its conservation programmes, a comprehensive plan for 25 years has been prepared by the NBAGR.

1. The country has a vast network of livestock farms under Central and State Governments as well as NGOs where Indigenous animal genetic resources are managed.
2. *Ex-situ* conservation at Institutional or SAU herds also sizeable number of breeds of Indigenous animals that were imported from other countries in past.
3. *Ex-situ* conservation in the form of frozen semen of indigenous and breeds imported from other countries is done at several places in the country.
4. *Ex-situ* conservation of different breeds

The identification, monitoring and conservation of domestic animal biodiversity programme are going on at National Bureau of Animal Genetic Resources, Karnal. The number of breeds studied/ documented include Cattle (30), Buffalo (10), Sheep (42), Goat (22), Poultry (20), Yak (2), Mithun (2), Horses (8), Camel (6) and Horses (8). NBAGR also prepared a "Country Report" on Status of Domestic Animal Diversity.

NBFGR: India abound in fish genetic resources that inhabit its river systems, wetlands, coastal areas and marine zones. Out of nearly 20,000 documented fish species of the world, 2200 fin fish species have been recorded in India from cold fresh waters of upper stretches of the Indus, the Ganges and the Brahamaputra (73 species), warm waters of its 14 major river systems draining the plains (544 species), brackish waters of estuarine areas (143 species) and marine waters of the three surrounding seas (1440 species). Twenty seven species are considered to be rare/endangered/vulnerable.

The National Bureau of Fish Genetic Resources (NBFGR), located at Lucknow and administered by the Indian Council of Agricultural Research, is devoted to the conservation and sustainable utilisation of fish diversity in India.

NBFGR has developed few ex-situ conservation methodologies for fish genetic resources of the country. It has sperm bank for 23 fish species including endanfered ones. It is also maintaining DNA bank for fish diversity. The Institute has also developed LIVE Gene Banking programme at Lucknow and other regional centers.

1. NBFGR has made a database on the first fish germplasm resource in the country on eco-system wise (cold water, warm water, brackish water and marine)
2. 79 threatened fish species have been recorded as per IUCN
3. 32 species of freshwater is evaluated under Coms. Assessment Manag. Programme (CAMP)
4. Different category of threats to fish genetic resources have been assessed.

5. Information on exotic fish germplasm and their invasion in Aquaculture and Fisheries.

In addition, recognizing the need for sophisticated facilities for research and development and providing services, the following additional germplasm facilities have also been set up:

i) The National Facility for Microbial Type Culture Collection at the Institute of Microbial Technology, Chandigarh, with over 1,600 cultures in its stock.

ii) The National Facility on Blue Green Algal Collection at the Indian Agriculture Research Institute, with over 500 strains and several pure cultures as well as soil-based cultures, which have been supplied to farmers for production of biofertilisers.

iii) The National Facility for Marine Cyanobacteria at the Bharatidasan University, Tiruchirapalli, which is co-ordinating extensive surveys on the southern coast.

iv) The National Facility for Plant Tissue Culture Repository at NBPGR, New Delhi, which has undertaken in vitro conservation of germplasm (seed, pollen in vitro culture) over the medium and long term, particularly for those species for which conventional methods are inadequate. It has 650 accessions of crop species and employs molecular methods of characterisation and classification.

v) The National Facility for Laboratory Animals at the Central Drug Research Institute, Lucknow and the national Institute of Nutrition, Hyderabad have made available quality animals for biomedical research and industry in the country.

vi) The National Facility for Animal Tissue and Cell Cutre, Pune, an autonomous institution under Department of Bitechnology (DBT) has 1127 stock cultures comprising 594 different cell strains. The facility has supplied 401 culture consignments to 84 institutions throughout the country. It also has 50 vectors, plasmids and genomic libraries.

vii) Three National Gene Banks for Medicinal and Aromatic Plants at the Central Institute of Medicinal and Aromatic Plants, Lucknow and the NBPGR, New Delhi, both for the northern region; and the Tropical Botanical Garden and Research Institute, Trivandrum, for peninsular India have been established. These banks will conserve important species of proven medicinal value, which are categorised as endangered, threatened or rare, are used extensively in traditional systems of medicine, are difficult to propagate, have significance for R&D for the future, and are of commercial value. India is the regional co-ordinator for Asia and also the overall co-ordinator for the establishment of Gene Banks of Medicinal and Aromatic Plants among G-15 countries.

viii) The Centre for Cellular and Molecular Biology has been undertaking the development and maintenance of DNA profiles.

Himalayan Forest Research Institute (an ICFRE institution) is also involved in ex-situ conservation of medicinal plants of higher altitude and cold desert areas. UHF, Solan and Ayurveda Centre in Himachal Pradesh are also involved. State Forest Department, J&K is also taking up ex-situ conservation of medicinal plants.

Bombay Natural History Society has initiated e*x-situ* conservation programme for Indian vultures. The captive regime center has been set up at Narayana. The vulture population is declined by about 95%-97%. The decline is due to pain killer diclofenac used in livestock, which are consumed by vultures. India has decided to phase out this drug within next six months.

68. ◆ On Article 9(c), has your country adopted measures for the reintroduction of threatened species into their natural habitats under appropriate conditions?

a) No	
b) No, but potential measures are under review	
c) Yes, some measures are in place (please provide details below)	X
d) Yes, comprehensive measures are in place (please provide details below)	

Further comments on the measures for the reintroduction of threatened species into their natural habitats under appropriate conditions.

Various projects have been initiated for the reintroduction of threatened species into their natural habitats under appropriate conditions and these project-based activities are in progress. For example, threatened species, like the pitcher plant, are being mass-propagated and re-introduced in their natural habitats. Gir Lions are being re-located in Madhya Pradesh. Threatened mangrove

species have been mass propagated and introduced into their natural habitats. Sea reaching for threatened species viz. sea turtles and sea horses has been taken up. National Bureau of Fish Genetic Resources has developed captive breeding programmes for seed production of threatened/endangered fish species for future ranching programmes for conservation.

69. ◈ On Article 9(d), has your country taken measures to regulate and manage the collection of biological resources from natural habitats for *ex-situ* conservation purposes so as not to threaten ecosystems and *in-situ* populations of species?

a) No	
b) No, but potential measures are under review	
c) Yes, some measures are in place (please provide details below)	X
d) Yes, comprehensive measures are in place (please provide details below)	

Further information on the measures to regulate and manage the collection of biological resources from natural habitats for *ex-situ* conservation purposes so as not to threaten ecosystems and *in-situ* populations of species.

Collection of biological materials from their natural habitats is being regulated under provisions of the Wildlife Protection Act and the Biological Diversity Act.

National Bureau of Plant Genetic Resources has also circulated guidelines for collection of crop plant species and wild species that stipulate collection of only a minimal sample in case of rare or endangered plant species. These guidelines are passed on to collectors before all exploration collection missions. (Ref: NBPGR-NATP, Tech Bull No. I, NBPGR 1999). Comprehensive guidelines have been prepared for the use and exchange of germplasm for research by the ICAR including that of animal genetic resources. National Bureau of Fish Genetic Resources is campaigning intensively the mass awareness programs and people's participation for saving degrading natural habitats as well as eroding fish germplasm of different aquatic ecosystems in different parts of the country.

Box XLVIII.

Please elaborate below on the implementation of this article and associated decisions specifically focusing on:

a) outcomes and impacts of actions taken;
b) contribution to the achievement of the goals of the Strategic Plan of the Convention;
c) contribution to progress towards the 2010 target;
d) progress in implementing national biodiversity strategies and action plans;
e) contribution to the achievement of the Millennium Development Goals;
f) constraints encountered in implementation.

Strong national systems of *ex situ* conservation supported by a network of botanical gardens and zoological parks have been developed. There is increasing coherence of policies and programmes on conservation and sustainable use of bio-resources but more fund mobilization and infrastructure development is required.

Article 10 - Sustainable use of components of biological diversity

70. ◈ On Article 10(a), has your country integrated consideration of the conservation and sustainable use of biological resources into national decision-making?	
a) No	
b) No, but steps are being taken	
c) Yes, in some relevant sectors (please provide details below)	X
d) Yes, in most relevant sectors (please provide details below)	

Further information on integrating consideration of conservation and sustainable use of biological resources into national decision-making.

Conservation and sustainable use of biodiversity has been integrated into national decision making through:

i. Policy statements (e.g. National Forest Policy, National Conservation Strategy, National Wildlife Action Plan, Draft National Environment Policy etc.)

ii. Legislative measures (e.g. Environment (Protection) Act, Wildlife (Protection) Act, Biological Diversity Act, Environment Impact Assessment Notification, Coastal Regulation Zone Notification, Notifications on ecologically fragile areas etc.)

iii. Programmes (Joint Forest Management and other programmes of NAEB, Mission mode project on household food and nutritional security)

71. ◈ On Article 10(b), has your country adopted measures relating to the use of biological resources that avoid or minimize adverse impacts on biological diversity?	
a) No	
b) No, but potential measures are under review	
c) Yes, some measures are in place (please provide details below)	X
d) Yes, comprehensive measures are in place (please provide details below)	

Further information on the measures adopted relating to the use of biological resources that avoid or minimize adverse impacts on biological diversity.

Sustainable use of biological diversity is emphasized in policy statements of the Government, notably the National Conservation Strategy and the Policy Statement on Environment and Development, the National Forest Policy, the National Wildlife Action Plan and draft Environment Policy 2004. Several initiatives have been taken to implement various aspects of these policy statements. Sustainable utilisation underscored in these policy statements recognises the interdependence of local communities and people on biological resources, and emphasise the need to draw upon the existing resources keeping long term conservation in view. In accordance with appreciation of the needs and the local situations, pressure from biodiversity rich areas and resources is to be diverted by bringing additional areas under green cover to satisfy local demands, by encouraging environmental friendly substitutes to meet the needs, by promoting energy-efficient devices, by creating awareness and an environment to restrict use and extraction of only desired part of component rather than the entire organism. Remedial actions for restoration of degraded areas have been undertaken through ecorestoration programmes by involving local people. Special attention has been given to coastal zone through Coastal Zone Regulation Rules, 1991 under Environment (Protection) Act.

To adopt economically effective and socially viable incentives for conservation and sustainable use of biological diversity, strategies such as use of items like wood substitutes, alternative energy sources (biogas, wind mills, solar cookers, wave energy, fuel efficient stoves, etc.), establishment of nurseries, tree planting, stall feeding, water harvesting, and pollution abatement measures are being implemented.

In 1994, the Government of India, under the Environment (Protection) Act, issued the Environmental Impact Assessment notification by which Environmental Impact Assessment is mandatory for 32 selected sectors while undertaking developmental projects.

The National Conservation Strategy and Policy Statement on Environment and Sustainable Development, 1992 provides for the basis for the integration and internalisation of environmental

considerations in the policies and programmes of different sectors. It also emphasises sustainable lifestyles and the proper management and conservation of resources.

Beginning in the 1980s as scattered initiatives by some forest officials, and since 1990 transformed into a national programme, Joint Forest Management (JFM) is an ambitious government attempt at regenerating and sustainably using forests. It was launched by MoEF's circular of June 1, 1990 to all states and union territories providing guidelines for *the 'Involvement of Village Communities and Voluntary Agencies in the Regeneration of Degraded Forests'* (GoI, 1990). Almost all the JFM orders in various states allow a 100% share for members of the Forest Protection Committees in the flow of usufructs (NTFP and fuelwood and small timber except reserved items) from the protected forest areas. NTFP flow thus provides a significant incentive to communities for the protection of their respective forest areas. Though the initial thrust of JFM was towards timber production, both communities and forest officials are realising that NTFP use is far more sustainable and beneficial.

Some of the other initiatives include a mission mode project on Household Food and Nutritional Security initiated in 2000 and completed in 2005. The project focused on tribal area and local communities in 10 states of India. Its aim was sustainable use of biodiversity for local communities. There were six different programmes, one each on life support crops, horticulture and vegetable gardening, animal husbandry, fisheries, value addition and impact assessment.

All India Coordinated Research Project on Under-Utilized and Under Exploited Plants was initiated in 1982, with the primary objective of generating improved technology and developing of high yielding varieties in selected crops of future economic importance. Efforts under the project led to assemblage of over 10,000 germplasm accessions of different under-utilized crops. Presently, the project is functioning at 20 centres with new crops such as Jatropha, Adzuki bean, Faba bean etc. The technical programme encompasses 19 plant species comprising 12 food crops and 7 plant species for feed and fodder, industrial or soil reclamation value.

72. ◆ On Article 10(c), has your country put in place measures that protect and encourage customary use of biological resources that is compatible with conservation or sustainable use requirements?

a) No	
b) No, but potential measures are under review	
c) Yes, some measures are in place (please provide details below)	X
d) Yes, comprehensive measures are in place (please provide details below)	

Further information on the measures that protect and encourage customary use of biological resources that is compatible with conservation or sustainable use requirements.

Honey Bee Network is an important example to illustrate some of measures taken to protect and encourage customary use of biological resources in India. It is a knowledge Centre/Network pooling solutions by people from different sectors throughout the country and the world. Honey Bee has collected over 10,000 examples of contemporary innovations and outstanding examples of the use of traditional local knowledge in the sustainable management of natural and other resources. These innovations are shared with local communities and individuals within India and in 75 other countries through the Honey Bee newsletter which is published in eight different languages (English, Spanish, Hindi, Gujarati, Tamil, Kannada, Pahari and Telugu). SRISTI (Society for Research and Initiatives for Sustainable Technologies and Institutions), a NGO based in Ahmedabad, India, set up in 1993 to essentially sustain Honey Bee Newsletter and associated research and action activities. SRISTI supports Honey Bee Network by linking **six "Es" – ethics, equity, excellence, environment, education and efficiency in enterprise.** The Honey Bee Network has created new standards of accountability and ethics in dealing with grassroots innovations by strengthening people to people learning. The formal sector cannot use the traditional knowledge in the Newsletter without acknowledgement, citation and prior informed consent of the knowledge holder. The Honey Bee supported the concept of Prior Informed Consent much before the CBD came into existence. The Honey Bee Network approach promotes that for innovations in one part of the world, investments are made in the other. The Honey Bee database with thousands of innovations is being upgraded to multimedia capabilities. This will ensure that barriers of languages, literacy and localism can be overcome to connect innovators, potential entrepreneurs and investors across regions. The idea is that through using electronic, textual and oral media, a multilevel network can be put in place to

support the documentation, experimentation and reward, both in material and non-material form of individual and collective grassroots innovations.

73. ◇ On Article 10(d), has your country put in place measures that help local populations develop and implement remedial action in degraded areas where biological diversity has been reduced?

a) No	
b) No, but potential measures are under review	
c) Yes, some measures are in place (please provide details below)	X
d) Yes, comprehensive measures are in place (please provide details below)	

Further information on the measures that help local populations develop and implement remedial action in degraded areas where biodiversity has been reduced.

National Afforestation and Eco-Development Board (NAEB) in the Ministry of Environment & Forests gives special attention to regeneration of degraded forest areas and lands adjoining forest areas, national parks, sanctuaries and other protected areas as well as ecologically fragile areas like the Western Himalayas, Aravallis, Eastern Ghats etc. The functions of NAEB involve evolving mechanisms for ecological restoration of degraded forest areas and adjoining lands through systematic planning and implementation in a cost effective manner. It also sponsors extension of research findings to disseminate new and proper technologies for the above. It creates awareness to help foster a people's movement for promoting afforestation and eco development with the assistance of voluntarily agencies, NGOs, panchayati raj institutions and others for promoting participatory and sustainable management of degraded forest areas and adjoining lands.

MoEF has recognized Centre for Environmental Management of Degraded Ecosystems, School of Environmental Studies, University of Delhi as a Centre of Excellence for research in this area.

74. ◇ Has your country identified indicators and incentive measures for sectors relevant to the conservation and sustainable use of biodiversity? (decision V/24)

a) No	
b) No, but assessment of potential indicators and incentive measures is under way	
c) Yes, indicators and incentive measures identified (please describe below)	X

Further comments on the identification of indicators and incentive measures for sectors relevant to the conservation and sustainable use of biodiversity.

Some work has been undertaken on these indicators and incentive measures as described below:

Indicators:

a) Number of protected areas in the country
b) Number of Joint Forest Management (JFM) Committees. There are more than 80,000 JFM committees all over India spread over more than 17 million ha area which is more than the area under Protected Area system in the country.
c) Continued existence of large number of community conserved practices such as sacred groves, lakes, etc. There are more than 19,000 sacred groves documented and it is estimated that the number of sacred groves in the country could be between 100,000 to 150,000.
d) Exhaustive set of criteria and indicators has been developed for the sustainability through Bhopal- India process over the period.
e) Existing system of conservation management has been strengthened by legislative measures such as enactment of National Biological Diversity Act

Incentive Measures:

a) A mechanism of National, State and Local Biodiversity Funds has been initiated through National Biological Diversity Act. This will allow separate budget allocation for biodiversity conservation at the respective level.
b) Provision of National Gene Fund has been made through Protection of Plant Varieties and Farmer's Rights Act.
c) National Biological Diversity Act has made provision of cess on the biological material going out

of the jurisdiction of local bodies (e.g. panchayats) for commercial purposes.

d) Fellowships and Awards have been instituted at national level. These include Indira Gandhi Paryavaran Puraskar, B.P. Pal National Environment Fellowship Award for Biodiversity, Pitambar Pant National Environment Fellowship Award, National Awards for Prevention of Pollution, Rajiv Gandhi Environment Award for Clean Technology, Indira Priyadarshini Vrikshmitra Award, Dr. Salim Ali National Wildlife Fellowship Award and Shri Kailash Sankha National Wildlife Fellowship Award.

e) Eco-development programmes have been undertaken to reduce the anthropic pressure on protected areas.

f) Establishment of JFM committees have created a mechanism of dialogue between the user of biodiversity and managers of the biodiversity. This has resulted in creating the stake of local communities in the management of the biodiversity.

75. ◆ Has your country implemented sustainable use practices, programmes and policies for the sustainable use of biological diversity, especially in pursuit of poverty alleviation? (decision V/24)

a) No	
b) No, but potential practices, programmes and policies are under review	
c) Yes, some policies and programmes are in place (please provide details below)	X
d) Yes, comprehensive policies and programmes are in place (please provide details below)	

Further information on sustainable use programmes and policies.

Various programmes initiated by the Ministry of Environment & Forests including National Afforestation Programme Scheme, setting up of Joint Forest Management Committees, Hill Area Development Programme etc. focus on greater participation of the community with an objective to improve their livelihoods. These programmes thereby also help in the poverty alleviation in the respective areas.

76. ◆ Has your country developed or explored mechanisms to involve the private sector in initiatives on the sustainable use of biodiversity? (decision V/24)

a) No	
b) No, but mechanisms are under development	
c) Yes, mechanisms are in place (please describe below)	X

Further comments on the development of mechanisms to involve the private sector in initiatives on the sustainable use of biodiversity.

The involvement of private sector is encouraged in initiatives on the sustainable use of biodiversity. For example, both public and private sectors – comprising individuals, companies, cooperatives, and industry – are playing key roles in the management of forests. Indian coal companies, like the CIL (Coal India Ltd), undertake plantation in coalfields and reclamation and afforestation of mined-out areas with native species, thereby helping in carbon sequestration. In case forestland is used for a mine, the CIL provides non-forestland of an equivalent area with funds for re-afforestation or regenerates twice as much degraded forestland. The private sector has also demonstrated its ability to enhance the productivity of wastelands and is dominant in the areas of wood harvesting and processing.

77. Has your country initiated a process to apply the Addis Ababa Principles and Guidelines for the Sustainable Use of Biodiversity? (decision VII/12)	
a) No	
b) No, but the principles and guidelines are under review	
c) Yes, a process is being planned	X
d) Yes, a process has been initiated (please provide detailed information)	
Further information on the process to apply the Addis Ababa Principles and Guidelines for the Sustainable Use of Biodiversity.	
May refer to replies in response to questions no. 70-76	

78. Has your country taken any initiative or action to develop and transfer technologies and provide financial resources to assist in the application of the Addis Ababa Principles and Guidelines for the Sustainable Use of Biodiversity? (decision VII/12)	
a) No	
b) No, but relevant programmes are under development	
c) Yes, some technologies developed and transferred and limited financial resources provided (please provide details below)	X
d) Yes, many technologies developed and transferred and significant financial resources provided (please provide details below)	
Further comments on the development and transfer of technologies and provision of financial resources to assist in the application of the Addis Ababa Principles and Guidelines for the Sustainable Use of Biodiversity.	

Biodiversity and Tourism

79. ◈ Has your country established mechanisms to assess, monitor and measure the impact of tourism on biodiversity?	
a) No	
b) No, but mechanisms are under development	X
c) Yes, mechanisms are in place (please specify below)	
d) Yes, existing mechanisms are under review	
Further comments on the establishment of mechanisms to assess, monitor and measure the impact of tourism on biodiversity.	

80. ◈ Has your country provided educational and training programmes to the tourism operators so as to increase their awareness of the impacts of tourism on biodiversity and upgrade the technical capacity at the local level to minimize the impacts? (decision V/25)	
a) No	
b) No, but programmes are under development	X
c) Yes, programmes are in place (please describe below)	
Further comments on educational and training programmes provided to tourism operators.	

81. Does your country provide indigenous and local communities with capacity-building and financial resources to support their participation in tourism policy-making, development planning, product development and management? (decision VII/14)	
a) No	
b) No, but relevant programmes are being considered	
c) Yes, some programmes are in place (please provide details below)	X
d) Yes, comprehensive programmes are in place (please provide details below)	

Further comments in the capacity-building and financial resources provided to indigenous and local communities to support their participation in tourism policy-making, development planning, product development and management.

The Policy & Guidelines for Ecotourism in India 1998 identify four cardinal principles which should be met in the developmental process itself. These are:

1) It should involve local community and lead to the over all economic development of the area.
2) It should identify the likely conflicts between the resource use for tourism and livelihood of local inhabitants and attempt to minimize such conflicts.
3) The type and scale of tourism development should be compatible with the environment and socio-cultural characteristics of the local community.
4) It should be planned as a part of the overall area development strategy, guided by an integrated land-use plan and associated commensurate expansion of public services.

The Ministry of Tourism, Government of India and the United Nations Development Programme (UNDP) have partnered an innovative Endogenous Tourism Project, Incredible India, which focusses on rural tourism experience based on rural art and craft skills, cultural and natural heritage. The Project complements the Ministry's Rural Tourism Scheme that supports rural infrastructure. A key objective of the Incredible India partnership with UNDP is access to target markets within India and abroad together with the travel trade and the media.

This Project is being implemented at 31 rural locations in 20 states with community participation through NGO or Panchayat Partners, District Collectors as Focal Points and specialized stakeholders, all of whom were consulted in the creation of Project work plans. The locations are linked to known tourism
circuits, enabling the visitor to combine the rural tourism experience with nearby attractions in cultural and heritage sites, wildlife, indigenous healing systems or fairs and festivals. The Project's tourism focuses on capacity building and training in visitor handling, including home stays, guiding and cuisine will benefit low-income rural communities, women and unemployed youth. The focus includes traditional Gurukul learning of art and craft to broaden the visitor's experience in Incredible !ndia with sustainable community interaction.

Some of 31 Project locations are as follows:

1. ***Pochampalli*** (Nalgonda District, Andhra Pradesh): Hyderabad 50 km: *renowned for Ikat tie-and-dye weaving of silk saris and fabrics.*

2. ***Raghurajpur*** (Puri District, Orissa): Bhuvaneshwar 35 km and Puri 15 km: *showcasing Orissa's live mural painting tradition using only mineral and earth colours, patachitra, stone carving, woodwork and gotipua dance.*

3. ***Hodka*** (Kachchh District, Gujarat): Bhuj 60 km from; Khavda (last village in Banni region alongside Rann of Kachchh) 31 km: *vibrant fabric embroider; leatherware; mud-work;appliqué.*

4. ***Pranpur*** (Ashok Nagar District, Madhya Pradesh): Chanderi 3 km; Jhansi (road, 3 hours) and Lalitpur (road, 1 hour) both on Delhi-Chennai trunk train route: *reputed for gossamer fine saris and brocades; stone & wood carving; Malwa plateau monuments.*

5. ***Aranmula*** (Pathanamthitta District, Kerala): Kochi (Nedumbassery airport) 140 km and Thiruvananthapuram 125 km: *on banks of Pampa river; unique metal mirror; Vasthu Vidya*

Gurukulam; mural art gallery; ceremonial Onam snake boat procession; Vijnana Kala Vedi; Parthsarathy temple.

6. ***Lachen*** (North District, Sikkim): Gangtok 110 km, all-weather road; altitude 3000 metres, bordering Kanchenjunga National Park, 90 km from Tibet crest, upper Teesta valley: *migrant Bhutia yak-herding community; altitude safaris; treks; wool weaving; Nyingmapa Mahayana Buddhist monastery.*

7. ***Nagarnar*** (Bastar District, Chhattisgarh): Jagdalpur 18 km; Raipur 300 km via NH 43: *diverse tribal craft in terracotta, bell metal, wrought iron.*

8. ***Karaikudi*** (Sivaganga District, Tamil Nadu): Madurai 82 km: *Chettinad architectural tradition (mansions); cuisine; wood carving; saris; palm leaf baskets; gold jewellery.*

9. ***Mana*** (Chamoli District, Uttaranchal): Delhi 525 km (NH 58); Badrinath 3 km; altitude 3420 metres, in Garhwal: *last Indian village on Mana Pass route to Tibet; migrant Bhutia community; wool weaving; woodwork; close to Badrinath shrine; Valley of Flowers & Hemkund Sahib circuit; Himalayan heritage.*

Some of the State Governments too have undertaken specific measures for promoting involvement of local communities in tourism policy making. For example, the Draft Tourism Vision 2025 of Department of Tourism, Kerala is a landmark move in this direction. The Vision Document chalks out the Objectives, Vision, Strategies and Action Plan, the Action Plan includes short term, midterm and long term action points for the development of tourism in Kerala State. The Vision Document emphasizes on three forms of tourism: Backwater, Ayurveda and Ecotourism. Currently this is only in the realm of policies and vision documents, the practicality and implementation is yet to happen by working together with Panchayat Raj Institutions at local level.

82. Has your country integrated the Guidelines on Biodiversity and Tourism Development in the development or review of national strategies and plans for tourism development, national biodiversity strategies and actions plans, and other related sectoral strategies? (decision VII/14)

a) No, but the guidelines are under review	
b) No, but a plan is under consideration to integrate some principles of the guidelines into relevant strategies	
c) Yes, a few principles of the guidelines are integrated into some sectoral plans and NBSAPs (please specify which principle and sector)	
d) Yes, many principles of the guidelines are integrated into some sectoral plans and NBSAPs (please specify which principle and sector)	X

Further information on the sectors where the principles of the Guidelines on Biodiversity and Tourism Development are integrated.

In pursuance of the Government of India's policy to achieve sustainability in tourism development and to ensure regulated growth of ecotourism with its positive impacts of environmental protection and community development, the Government has come out with Policy and Guidelines for Ecotourism in India 1998. In this document, the cardinal principles identified, which should be met in the developmental process are as follows:

1) It should involve local community and lead to the over all economic development of the area.
2) It should identify the likely conflicts between the resource use for tourism and livelihood of local inhabitants and attempt to minimize such conflicts.
3) The type and scale of tourism development should be compatible with the environment and socio-cultural characteristics of the local community.
4) It should be planned as a part of the overall area development strategy, guided by an integrated land-use plan and associated commensurate expansion of public services.

The Policy & Guidelines for Ecotourism in India is in line with the Guidelines on Biodiversity and Tourism Development annexed to decision VII/14.

Box XLIX.

Please elaborate below on the implementation of this article and associated decisions specifically focusing on: a) outcomes and impacts of actions taken; b) contribution to the achievement of the goals of the Strategic Plan of the Convention; c) contribution to progress towards the 2010 target; d) progress in implementing national biodiversity strategies and action plans; e) contribution to the achievement of the Millennium Development Goals; f) constraints encountered in implementation.

Article 11 - Incentive measures

83. ◈ Has your country established programmes to identify and adopt economically and socially sound measures that act as incentives for the conservation and sustainable use of components of biological diversity?

a) No	
b) No, but relevant programmes are under development	
c) Yes, some programmes are in place (please provide details below)	X
d) Yes, comprehensive programmes are in place (please provide details below)	

Further comments on the programmes to identify and adopt incentives for the conservation and sustainable use of biodiversity.

Some of the programmes in place that include incentives for the conservation and sustainable use of components of biological diversity include the following:

- Joint Forest Management Program involves participation of the local people to jointly (with the government) protect and manage the forest resource in return for a share in the yields from it.
- Biological Diversity Act 2002 has provision for securing equitable share in benefits arising out of the use of biological resources.
- Corporate sector initiatives on voluntary basis, under (Corporate Responsibility for Environment Protection especially Green accounting, auditing, ecolabelling and in some cases green lending practices.
- Initiatives by NGOs, Academic Institutions and other Civil Society have been exemplary. Lots of research and action oriented policies have demonstrated the feasibility of payment for biodiversity and ecosystem services
- Preparation of Peoples' Biodiversity Registers.
- To encourage people, institutions, communities, men and women to contribute to rehabilitation and conservation of elements of biological diversity, and reward excellence and achievement in these, several incentives an awards have been instituted by the Government. Some of these are Indira Priyadarshini Vrikshamitra (Friend of Trees) Awards, B.P.Pal National Environment Fellowship Award for Biodiversity, Rajiv Gandhi Wildlife Conservation Award, Dr. Salim Ali Fellowship for Avian Biology and Kailash Shankla Award for Mammal Study and Indira Gandhi Paryavaran Puraskar

84. ◇ Has your country developed the mechanisms or approaches to ensure adequate incorporation of both market and non-market values of biological diversity into relevant plans, policies and programmes and other relevant areas? (decisions III/18 and IV/10)

a) No	
b) No, but relevant mechanisms are under development	X
c) Yes, mechanisms are in place (please provide details below)	
d) Yes, review of impact of mechanisms available (please provide details below)	

Further comments on the mechanism or approaches to incorporate market and non-market values of biodiversity into relevant plans, policies and programmes.

Some mechanisms are under development and discussion for incorporation of market and non-market value of biodiversity into relevant plans, policies and programmes. For example, empowering local communities to receive the market prices and to work out the market prices based on sustainable rates of extraction, land use and water resource availability and the impacts on other critical ecosystem as a consequence to this extraction. Other possible incentives being discussed are listed below:

Positive Incentives	Disincentives	Indirect Incentives	Removal of Perverse Incentives
• agricultural land set-aside schemes • public or grant-aided land purchase • wetland reserves • oven-ants/conservation easements • cost-sharing/management agreements • species enhancement schemes • customary cultivation of biodiversity • international biodiversity transfers • incentive payments for organic farming • taxation and fiscal measures	• user fees • non-compliance fees • fines for damages • environmental liability • performance bonds • habitat mitigation schemes • marine pollution liability	• individual transfer-able fishing quotas • tradable development rights • property-right mechanisms • species commercialization • biodiversity prospecting deals • forestry offsets • air emission trading • effluent discharge trading • tradable water entitlements • wetlands mitigation banking • joint implementation • debt-for-nature swaps • international franchise agreements • eco-labeling	• reduction and restructuring agricultural support harmful t biodiversity • introduction of agricultural conservation compliance measures • reform of public forestry concession pricing, licence fees, reforestation fees, and royalties • full appraisal of forest benefits • discontinuation of below-co timber sales • reform of tax structures • full cost pricing for water services • appraisal of biodiversity impacts in the transport secto • road pricing • costing of biodiversity loss i energy investment appraisal

85. ◇ Has your country developed training and capacity-building programmes to implement incentive measures and promote private-sector initiatives? (decision III/18)

a) No	
b) No, but relevant programmes are under development	
c) Yes, some programmes are in place	X
d) Yes, many programmes are in place	

86. Does your country take into consideration the proposals for the design and implementation of incentive measures as contained in Annex I to decision VI/15 when designing and implementing incentive measures for the conservation and sustainable use of biodiversity? (decision VI/15)	
a) No	X
b) Yes (please provide details below)	
Further information on the proposals considered when designing and implementing the incentive measures for the conservation and sustainable use of biodiversity.	
Some suggestions in this respect made in the past are: (1)Stakeholder participation, with their contribution properly accounted.(2) To start putting values to biodiversity resources such as forests (base not only on timber and NWFPs but its watershed functions, carbon values, ecotourism and recreation values etc.	

87. Has your country made any progress in removing or mitigating policies or practices that generate perverse incentives for the conservation and sustainable use of biological diversity? (decision VII/18)	
a) No	
b) No, but identification of such policies and practices is under way	
c) Yes, relevant policies and practices identified but not entirely removed or mitigated (please provide details below)	X
d) Yes, relevant policies and practices identified and removed or mitigated (please provide details below)	
Further information on perverse incentives identified and/or removed or mitigated.	
National Biodiversity Authority and State Biodiversity Boards have been established as per the provision of the Biological Diversity Act 2002, which would be responsible for developing and overseeing the incentives for the conservation and sustainable use of biological diversity.	

Box L.

Please elaborate below on the implementation of this article and associated decisions specifically focusing on:
a) outcomes and impacts of actions taken;
b) contribution to the achievement of the goals of the Strategic Plan of the Convention;
c) contribution to progress towards the 2010 target;
d) progress in implementing national biodiversity strategies and action plans;
e) contribution to the achievement of the Millennium Development Goals;
f) constraints encountered in implementation.

Article 12 - Research and training

88. On Article 12(a), has your country established programmes for scientific and technical education and training in measures for the identification, conservation and sustainable use of biological diversity and its components?

a) No	
b) No, but programmes are under development	
c) Yes, programmes are in place (please provide details below)	X

Further information on the programmes for scientific and technical education and training in the measures for identification, conservation and sustainable use of biodiversity.

India has established a large number of research and training institutions in the field of biodiversity which have comprehensive programmes and activities relating to conservation of biodiversity. These institutions include the following:

Government organizations:

Zoological Survey of India (ZSI), Botanical Survey of India (BSI), Forest Survey of India (FSI), Indian Institute of Forest Management (IIFM), Forest Research Institute (FRI), Indian Council of Forestry Research and Education (ICFRE), Wildlife Institute of India (WII), G.B. Pant Institute of Himalayan Environment and Development, Centre for Ecological Sciences, Indian Institute of Science, Centre for Environment Education (CEE), Indian Council of Agricultural Research (ICAR), Council for Scientific and Industrial Research (CSIR), National Botanical Research Institute (NBRI), National Institute of Oceanography (NIO), Central Institute of Medicinal and Aromatic Plants (CIMAP), National Environmental Engineering Research Institute (NEERI), Indian Space and Research Organization (ISRO), National Remote Sensing Agency (NRSA), Indian Council for Social Science Research (ICSSR).

Non Government Organizations

Bombay Natural History Society (BNHS), World Wide Fund for Nature (WWF), Wildlife Trust Of India (WTI), Wildlife Protection Society of India (WPSI), Centre for Wildlife Studies, (CWS), Centre for Environment Education (CEE), Ashoka Trust for Research in Ecology and Environment (ATREE), International Society of Naturalists (INSONA), The Energy Research Institute (TERI), Centre for Science and Environment (CSE), M. S. Swaminathan Research Foundation (MSSRF), Environment Protection Training and Research Institute (EPTRI)

In addition, the MoEF has set up nine Centres of Excellences so far with a view to strengthening awareness, research and training in priority areas of environmental science and management. These are: Centre for Environment Education (CEE), Ahmedabad; CPR Environmental Education Centre (CPREEC), Chennai; Centre for Ecological Studies (CES), Bangalore; Centre of Mining Environment (CME); Dhanbad; Salim Ali Centre for Ornithology and Natural History (SACON), Coimbatore; Centre for Environment Management of Degraded Ecosystem (CEMDE), Delhi; the Tropical Botanic Garden and Research Institute (TBGRI), Thiruvananthapuram; Madras School of Economics, Chennai; Foundation for Revitalization of Local Health Traditions (FRLHT), Bangalore.

Some of the national programmes and contributions of institutes towards conservation and sustainable use of biological diversity are as follows: -

I) Establishment of National Biodiversity Authority, State Biodiversity Boards and Biodiversity Management Committees under the Biological Diversity Act, with the elaborative frame work and provisions for research, planning and management for biodiversity conservation in the respective states.

II) People's Biodiversity Registers are being developed for identification, conservation and Sustainable use of Biodiversity.

III) Establishment of National Medicinal Plant Boards is but one attempt that encapsulates the advances in the biodiversity research in the country.

IV) Short-term trainings on biodiversity conservation to develop management development skills of the stakeholders by IIFM.

V) Capacity building including implementation of community based biodiversity conservation

programme.

VI) Community based eco-tourism capacity building for the local authorities.

VII) In order to impart scientific and technical education in the area of biodiversity conservation courses like PG Diploma in Biodiversity Conservation (FRI), Certificate course in Wildlife Management (WII) etc. are the courses that have been started in India.

VIII) EPTRI is currently conducting Bioresources Training Programme for School Children Sponsored by the Department of Biotechnology (DBT). CPREEC:

IX) CPREEC has been researching ecological heritage and has surveyed several hundred sacred groves, trees and tanks in Tamil Nadu, A.P. Karnataka and Kerala. Information available on ENVIS website www.ecoheritage.cpreec.org

X) The FRLHT has developed several training and education modules related to conservation and sustainable use of medicinal plants and related traditional knowledge. More than140 training programmes were organized for forest officials, representatives of community based organizations (JFM societies) and different NGO partners.

XI) CIMAP and IHBT have organized a number of biodiversity awareness programmes to apprise young children about the biodiversity conservation and its sustainable use and popular lectures are arranged for general public from time to time. Regular trainings are also organized on cultivation and processing of medicinal and aromatic plants and conservation of endangered species, agro technology of ornamentals and raising of quality planting materials and raising nurseries of aromatic plants for farmers, entrepreneurs etc. IHBT also imparts trainings to foresters, farmers etc. on micro and macro propagation of bamboos. Trainings are also organized on IPR issues. CIMAP maintains a Herbarium of important MAPs.

XII) CSIR has an inter-laboratory network programme on bioprospecting for bioactive compounds. NMITLI runs programmes for bio-prospecting and developing novel herbals, pharmaceuticals and other economically important value added products from the plant genetic resources of the country.

XIII) The NBFGR is assessing status of threatened fish species as per IUCN guidelines as well as through organizing CAMP workshop. 327 species have already been assessed. Networking programme on conservation has been initiated in Northeast region with NGOs. The concept of People's Aqua Sanctuary Management is being tried.

89. On Article 12(b), does your country promote and encourage research which contributes to the conservation and sustainable use of biological diversity?

a) No	
b) Yes (please provide details below)	X

Further information on the research which contributes to the conservation and sustainable use of biodiversity.

The country has a well defined agenda to promote and encourage research in conservation and management of biodiversity. Some of the important areas are:

- Provision of research in all protected areas pertaining to biodiversity conservation including national parks and sanctuaries, biosphere reserves etc.
- Research on plant and animal biodiversity by Botanical survey of India and Zoological survey of India.
- Survey & research on biodiversity in ocean, agricultural biodiversity, fish diversity etc.
- Conservation and management plan of non timber forest produce.
- Eco-tourism and livelihoods.
- Research specifically in the area of medicinal plants.

Contribution of various institutes to promote and encourage research to the conservation of sustainable use of Biological Diversity are as follows: -

- CSIR laboratories as indicated in item 88 have various in-house as well as sponsored programmes, which contribute to the conservation and sustainable use of biological diversity.
- NBRI has a Conservation Biology division, which undertakes investigations on the scientific

reason for species getting rare and endangered. It has also adopted programme for exsitu conservation, which include invitro gene bank, field gene bank, seed bank and reintroduction of rare, endangered species by tissue culture multiplication. CIMAP, Lucknow; RRL, Jammu; IHBT, Palampur have got similar programmes on medicinal and aromatic plants.

- Institute of Himalayan Bioresource Technology (IHBT) conducts surveys and has prepared database on plant resources of western Himalayas. Documentation of traditional knowledge on sustainable use of bioresources is underway. The laboratory is conducting R&D on chemo and molecular characterization of high altitude medicinal and aromatic plants (MAPs); domestication of economic species by understanding reproductive biology, seed biology and nursery establishment of endangered species for introduction of new crops eg. Podophyllum hexandrum, Aconitum, Piccrorhiza kurroa, Rehum, Valeriana, Viola etc; and developing Micro propagation protocols for large scale production of elite MAPs. It has developed database for tea germplasm with respect to morphological, physiological, molecular and bio chemical characters for 150 clones. New and improved varieties of aromatics and ornamentals are developed, released including two varieties of scented rose 'Jwala and Himroz'; HIMGOLD, a variety of Tagetes minuta; and ten varieties of gladiolus with attractive colour and foliage. Several processes have been developed for sustainable use of bioresources like production of an antiviral compound-beta Aescin from Indian horse chestnut and from other natural sources, production of new favouring molecule, and production of red and yellow dye. IHBT is involved in bioprospection of genes and enzymes from cold desert areas. The research resulted in cloning of SOD, PPO and other stress related genes. To develop value added products from bioresources; IHBT has developed technology at lab scale for converting 90% of tea catechin into theaflavin. It has also developed diversified tea products like ready to drink tea from green and black tea and tea based wines.
- Regional Research Laboratory (RRL), Jammu is involved in the establishment of National genebanks of medicinal & aromatic plants. Four Gene Banks have been set up. The laboratory is also involved in *in vitro* & *ex vitro* multiplication of endangered species.
- Central Institute of Medicinal and Aromatic Plants (CIMAP) is involved in R&D activities on conservation and utilization of genetic resources of medicinal and aromatics plants (MAPs), bioprospection and development of technology for therapeutic, nutraceutical and health products, Bio-village approach for technology passage to end users; the herbarium and crude drug repository of the gene bank help in identification and validation of MAPs and their crude drug formulations used in Indian system of medicines.
- National Institute of Oceanography (NIO) conducts the following marine conservation and sustainable use programmes with the support of different Governmental agencies:
  - Conservation and sustainable use of Lakshadweep coral ecosystem (MoEF);
  - Afforestation programme for protecting the mangrove ecosystem in various coastal states of India; and
  - MR-LR programme for assessing the living resources potential and their sustainable exploitation.
- Centre for Cellular and Molecular Biology (CCMB) is involved in setting up of a National Facility for Conservation of Endangered Species of animals in association with DBT and CZA. As part of this, a 'Laboratory for Conservation of Endangered Species' (LaCONES) is being established.
- Biodiversity/ Ecology Division of the Institutes / Research Centres under ICFRE undertakes research programmes that contribute to the conservation and sustainable use of biodiversity in respect of bamboo, medicinal plants and lac host species, Joint Forest Management, Non destructive harvesting of NTFPs, Assistance in Botanical Garden, Ex-situ and in-situ conservation of biodiversity, GIS, Germplasm Conservation etc.
- Forest Research Institute (FRI) is maintaining a National type culture collection of about 1000 forest pathogens and a project on fosarium, a wilt pathogen of shisam is being run by FRI.
- Integrated insect pest management programme, Ecorestoration of Waste lands being carried out by particular division – Entomology, Ecology & Biodiversity conservation division in respective institutes of ICFRE. Publications are underway on these aspects in national journals.
- Arid Forest Research Institute (AFRI), Jodhpur one of the ICFRE institute has prepared a status Report on "Ecological and Environmental assessment in the onshore area of RJ-ON-90/1 Block, Rajasthan" covering Barmer and Jalore district of Rajasthan for conservation and development work to be implemented in this area.
- In the field of conservation & sustainable use of biodiversity two projects entitled "Dynamics of Insect Population in cotton based Agroforestry systems of Andhra Pradesh" and "Assessment of the impact of forest fire on the regeneration of forests in Andhra Pradesh" are

ongoing at Forest Research Centre, Hyderabad.

90. On Article 12(c), does your country promote and cooperate in the use of scientific advances in biological diversity research in developing methods for conservation and sustainable use of biological resources?

a) No	
b) Yes (please provide details below)	X

Further information on the use of scientific advances in biodiversity research in developing methods for conservation and sustainable use of biodiversity.

The scientific research and survey organizations have elaborate programmes and activities for collaborative research for conservation of biodiversity. Some of these programmes are listed below: -

- CSIR laboratories in association with several R&D institutions, NGO's have various S&T programmes for conservation of biological diversity and developing method for conservation.
- NBRI, Lucknow has organized various training programmes for botanic garden managers, researchers, Botany Departments of various Universities for establishing botanic gardens and undertaking conservation of local biodiversity. NBRI is also operating an international botanic garden based conservation programme for the country under the Investing in Nature, an international programme launched by Botanic Garden Conservation International, which was supported by HSBC. Under this programme NBRI is networking 140 botanic gardens and so far offered training to about 80 persons from 40 botanic gardens in conservation biology, tissue culture propagation, *in vitro* conservation of rare, endangered species and their reintroduction in natural habitat, establishement of seed bank, field gene bank, in vitro gene bank, etc.
- RRL-Jammu is working towards development of '*in situ*' and '*ex situ*' conservation protocols of critically endangered species and bio-prospecting for bioactive molecules.
- CIMAP: Strategic methods of short-to-mid-to long-term conservation including Field, Seed, Tissue and DNA banks are being followed on a need-based mode. Gene bank activities at CIMAP are presently focused on biodiversity available in entire Northern and North-Western parts of the country. About 1700 accessions of MAPs, 200 accessions in tissue banks, 1300 accessions in seed bank and 560 accession in DNA banks are being maintained. In addition, 5000 herbarium accessions and 400 crude drugs are also available in the CIMAP repository.
- CCMB is setting up LaCONES as a first step to save and preserve the endangered species of wild animals form annihilation through establishment of gene banks and monitoring genetic variation by DNA fingerprinting, invitro fertilization, embryo transfer and cloning.
- At ICFRE, species association patterns, impact of climatic change on biodiversity, species dominance in a particular habitat, frequency distribution and species index are some of the techniques used to evaluate biodiversity. These scientific advancement in biodiversity research can help in insect diversity, species dominance in a particular habitat, frequency distribution and species index and ecological restoration of derelict mined lands for conservation of Biodiversity. A status report has been prepared covering area Barmer and Jalore districts of Rajasthan for Conservation and Development. Under the Eastern and Western Ghats Research Programme, the institute has taken up studies relating to biodiversity, land use and impact of developmental activities are taken up. Projects are undertaken on various issues related to biodiversity conservation through people's participation by establishing Gene Pool Conservation Areas (GPCA), species recovery research programmes on Rare, Endangered and Threatened species, reproductive biology of endemic species, impact of mining on environment, impact of anthropogenic activities and industrialization on local ecosystems, sacred groves, rehabilitation of degraded areas, grasslands, studies on the flora of Eastern and Western Ghats and ecosystem analysis of forests.
- Indian Institute of Forest Management have undertook a project on Controlling the premature harvesting of the Aonla (*Emblica officinalis),* as a result of which the Madhya Pradesh Forest Department made a circular that the fruits of Aonla should not be harvested before the month of December this has reduced premature harvesting and a legal bindings has also initiated.
- In the field of medicinal plants conservation and sustainable use, the FRLHT has been collaborating and cooperating with Forest Departments of 5 states, more than 18 NGOs and over five research organizations. It is involved in the development of People's Biodiversity Registers, with major thrust on Medicinal Plants resources and related traditional knowledge among the rural communities in five states. The institute has established a full fledged Pharmacognosy laboratory with financial assistance from MoEF, under its Centre of Excellence program.

Box LI.

Please elaborate below on the implementation of this article specifically focusing on: a) outcomes and impacts of actions taken; b) contribution to the achievement of the goals of the Strategic Plan of the Convention; c) contribution to progress towards the 2010 target; d) progress in implementing national biodiversity strategies and action plans; e) contribution to the achievement of the Millennium Development Goals; f) constraints encountered in implementation.
Given the size and diversity of the country, the outcomes and impacts of research and training activities is mixed. Biodiversity inventorization and characterization in the forested landscape is gradually being done within the constraints of manpower and financial resources.

Article 13 - Public education and awareness

91. Is your country implementing a communication, education and public awareness strategy and promoting public participation in support of the Convention? (Goal 4.1 of the Strategic Plan)

a) No	
b) No, but a CEPA strategy is under development	
c) Yes, a CEPA strategy developed and public participation promoted to a limited extent (please provide details below)	
d) Yes, a CEPA strategy developed and public participation promoted to a significant extent (please provide details below)	X

Further comments on the implementation of a CEPA strategy and the promotion of public participation in support of the Convention.

Conservation and sustainable use of biodiversity is one of the thrust areas of the Government for public education and awareness. Ministry of Environment & Forests interacts actively with the University Grants Commission (UGC), National Council of Educational Research and Training (NCERT) and the Ministry of Human Resources Development (MHRD). All India Council for Technical Education (AICTE), and State Education Departments, for integration of environmental concepts and issues in the curricula of schools and colleges. Environment education has been introduced as a mandatory subject in schools. In the area of formal education, the National Policy on Education, 1986 stresses on creating consciousness about the environment including biological diversity. NCERT has been assigned the responsibility of developing a prototype syllabi and instructional material in ten core curricular areas of which protection of environment is one. MHRD has launched the Environment Orientation to School Education scheme, wherein special cells are created in the state departments of education for environmental education. Support is also extended through this cell to NGOs to facilitate the development of locale-specific programmes and materials. In order to generate awareness regarding the need to conserve and sustainably utilise biological resources, the communication media such as TV, Radio and Press are being utilised extensively.

Some of the initiatives taken by MoEF in promoting Environment Education and Awareness (EE&A) through non-formal media and methods are:

-The National Environmental Awareness Campaign (NEAC).

-Establishment of Centres of Excellence in Environmental Education

-Establishment of National and Regional Museums of Natural History.

-Setting up of eco-clubs in schools.

-Production and dissemination of films, audio-visual and popular publications on environment.

-Supporting organisation of seminars, symposia and conferences on environmental issues.

-Institution of awards and fellowships.

-Establishment of ENVIS Centres.

An update on activities in the recent past are briefly described below:

- Various activities like development and printing of educational materials including text books, training of master trainers, training of teachers, introduction of Green Text Books under pilot project on "Environment Education in School System" in several States identified under the project have been completed.
- Seven thousand five hundred and eighty eight organizations including NGOs and Voluntary Bodies throughout the country were provided financial assistance for organizing environmental awareness creation activities through diverse means among the various target groups under National Environment Awareness Campaign (NEAC) during 2004-05.
- To impart environmental education and to encourage and mobilize participation of school children in several environmental conservation activities in the localities, financial assistance to about 72,000 schools for functioning of Eco-Clubs was provided under National Green Corps (NGC) Programme. It is proposed to establish Eco clubs in at least 150 schools in each district in the country.
- With the objective of spreading environmental awareness though various media, the Ministry sponsored several programmes including telecast of films, organizing environmental quiz programmes, etc., during the year. A half-hour-weekly environmental magazine programme called "BHOOMI" has also been sponsored by the Ministry for telecast on Doordarshan National channel, on Sundays of every month.
- The National Museum of Natural History (NMNH) has opened its third Regional Museum of Natural History (RMNH) at Bhubaneswar, Orissa on 10th August, 2004 with diverse facilities to impart non-formal environmental education and conservation among students, teachers and the general public.
- The NMNH of the Ministry participated in the Vigyan Rail project with the development of a full coach on 'environment' depicting several digital panels, miniature models, diverse forest types with synchronized calls of animals and birds in order to make the people aware about the natural heritage and environment of the country, during the year.
- The Environmental Information System (ENVIS) developed by the Ministry of Environment and Forests serves as a comprehensive network in environmental information collections, collation, storage, retrieved and dissemination to users, which include decision makers, researchers, academicians, policy planners, research scientists etc. ENVIS has been conceived as a distributed information network with subject specific centres to provide relevant and timely information to all concerned. ENVIS network present has 72 such centres.
- In addition to the part of ENVIS, FRLHT operates websites such as Greenhealers.net – (http://www.greenhealers.net) an online store providing access to "information products" relating to Indian Medical Heritage, Encyclopaedia on Indian Medicinal Plants – (http://encyclopaedia.frlht.or.in) designed to provide access to FRLHT's multi-disciplinary database through structure queries and Green healer website (http://cinomp.frlht.org.in) incorporating simple primary health care of commonly available medicinal plant based on traditional knowledge. It has established MAPNET, a network of around 100 organizations dealing in medical and aromatic plants.
- NBRI (a CSIR Laboratory) established an Eco-education Division in 2001, which imparts knowledge on biodiversity, its value, need for conservation to a cross section of the society. It has a number of theme gardens like: Home gardens for house wives for raising rare and important local lesser known vegetables and medicinal plants to ensure their conservation as well as nutritional and primary healthcare security of rural poor. The division also established the first ever garden for physically challenged and visually impaired people in India. The division also has an out reach programme to spread knowledge about biodiversity and its uses, mode of conservation and sustainable use by both rural and urban people. The division is also operating an Eco brigade jointly with NCC cadets in creating environmental cleaning and planting of trees in and around Lucknow city. NBRI also works with various other NGOs engaged in conservation, village greening, sustainable utilization and eradiction of poverty programmes.
- CIMAP (another CSIR Laboratory) organized, under CEPA strategy, various workshops, training programmes and interactive meets for different section of the society. This is being facilitated through inviting school/college students and general public on specially organized Open Days. Scientists of CIMAP are regular speaker and lectures on Radio and Television programme on scientific awareness on conservation issues. Besides, CIMAP is fostering public participation in conservation mission by launching BIO-Village concept in cultivation of those MAPs which enjoy the same status as that of Cash Crops in traditional agriculture. CIMAP also regularly generates and publishes information on MAPs in the form of books, farm bulletins, training manuals and an in house quarterly scientific journal (JMAPS).
- CPREEC conducts awareness programmes to several target groups like teachers, students, women, youth, NGOs and women. Its publications are on the website (www.cpreec.org) and are downloaded by South Asian Countries. Since 1989-2004 at CPREEC, over 30,000 teachers

have been trained in Environmental Studies, over 1,00,000 students are involved in environmental monitoring, projects for biodiversity conservation, over 12,000 women are involved in tree protection through afforestation and promotion of smokeless chulhas and over 8,000 lawyers, law students and judiciary are trained in Environmental (including Biodiversity) Laws.

- DBT is involved in various programmes such as vacation training programme for school children, training of tribal, rural and out-of- school children, training of fisheries scientists. DBT has also made media resource packages for various end users and has established Garden of bioresources and museum for the visually challenged.
- Under DST, the National Science and Technology Management Information System (NSTMIS) has been entrusted with the task of collection, collation, analysis and dissemination of vital S&T information at national level. With a view to build reasonable database on and carry out analyses on S&T investment, S&T manpower availability/deployment/gap and S&T indicators, a number of studies were sponsored during 2003-04.

- The UGC has issued guidelines to take up environment/biodiversity as a part of curriculum at graduate and post graduate level mandatory. Further, M.Sc. (Biodiversity Conservation) courses have been initiated in some universities like Mizoram.
- Initiatives by state governments include setting up of websites, preparation of Status of Environment Reports (SoE), public hearings etc.
- At NBPGR, 72 grass root level trainings on plant genetic resource awareness under NATP programme have been carried out.

The Government has taken many initiatives for the communication, education and public awareness regarding the biodiversity conservation in the country. These initiatives can be summarized as below

i) Centre for Environment Education (CEE), is a national institution of excellence supported by Ministry of Environment and Forestry, which is engaged in developing programs and materials to increase awareness about the environment.

ii) CPREEC is a Centre of Excellence of the Ministry of Environment & Forests and is engaged in imparting biodiversity conservation education among tribals, school teachers and students and organizes field visits to reserve forest, sanctuaries, national parks, to gain hands on experience.

iii) Centre for Media Studies (CMS), is involved in the activities related to environment in general and biodiversity in particular.

iv) Centre for Science and Environment (CSE) and The Energy Research Institute (TERI) are some of the organisations involved in the research and documentation of the biodiversity conservation in India

To summarize, the Indian Government had pursued a proactive role in enhancing public participation in the conservation of biodiversity in India.

92. Is your country undertaking any activities to facilitate the implementation of the programme of work on Communication, Education and Public Awareness as contained in the annex to decision VI/19? (decision VI/19)	
a) No	
b) No, but some programmes are under development	
c) Yes, some activities are being undertaken (please provide details below)	
d) Yes, many activities are being undertaken (please provide details below)	X
Further comments on the activities to facilitate the implementation of the programme of work on CEPA.	
May refer to reply in response to Question no. 91 above	

93. Is your country strongly and effectively promoting biodiversity-related issues through the press, the various media and public relations and communications networks at national level? (decision VI/19)	
a) No	
b) No, but some programmes are under development	
c) Yes, to a limited extent (please provide details below)	X
d) Yes, to a significant extent (please provide details below)	

Further comments on the promotion of biodiversity-related issues through the press, the various media and public relations and communications networks at national level.

Various institutes are involved in promotion of biodiversity related issues using different communication networks including ENVIS. Some of the indicated examples of these are listed below:

- CEE is actively involved in the promotion of biodiversity issues through the press, various media and public relations and communication networks. Some of the activities are as follows: -
  - A fortnightly CEE News and Features Service reached news, articles, features on various environment and development issues, including biodiversity related articles to over 1500 newspapers and magazines are published regularly. Exclusive features are also worked out in consultation with various newspapers.
  - Through a special project under the UNDP GEF SGP, a series of films titled 'Bhoomi' (Earth) are being developed for national telecast on a prime time programme. Several projects chosen for showcasing relate to biodiversity conservation by communities.
  - CEE hosts an Internship on Environmental Journalism and is a member of the India Environment Journalists Forum.
  - CEE is a Video Resource Centre of the Television Trust for the Environment (TVE). Films, including those on biodiversity, from TVE as well as other sources have been collected at various CEE offices and resource centers facilitated by CEE. Local languages versions of a few films on biodiversity have also been developed and disseminated. Traveling film festivals have been organized in biodiversity rich areas using films on biodiversity and linking up with local biodiversity issues.
  - As National Host Institution of the UNDP GEF Small Grants Programme in India, CEE has facilitated over 150 projects related to biodiversity. A variety of CEPA work has been done and appropriate material produced. These include audio visual material, newsletters, newspaper articles etc.

- FRLHT has been publishing an in-house magazine called 'Amruth' to disseminate the issues on medicinal plants diversity and related traditional knowledge. It also publishes feature articles, in local and national newspapers, on issues related to medicinal plants diversity and need for their conservation and sustainable use, from time to time.

- CSIR activities in the area are as under

- NBRI organizes popular lectures, seminars, exhibitions on its own or jointly with many NGOs engaged in popularizing/sensitizing the biodiversity and related issues at national and international level. At the National level, NBRI is recognized as a Lead Institute and its Director as a lead expert of the country on matters related to biodiversity conservation, inventorization, sustainable utilization and traditional knowledge benefit sharing. NBRI is also recognized as an international referral center on bioprospecting and benefit sharing by CBD/WTO-TRIPs etc. and represents the country in various national and international fora.
- RRL-Jammu has put BIONET (Biodiversity Information Network) in place. Such issues are also highlighted in the News Letters of Research & educational Institutes.
- CIMAP has been sensitizing all components of the MAPs value chain from farmers to end users through regular Press releases of its findings and R&D outputs. National Interactive Meets (Popularly known in the country as NIM) have been organized as biannual events. Press and electronic media are specially invited and provided with in-depth information on scientific developments for their subsequent dissemination in the society.

➢ CPREEC is involved in promoting biodiversity related issues through various communication media: ECONEWS – a quarterly newsletter and ENVIS Newsletter eco heritage. CPREEC also brings out the Indian Journal of Environmental Education. CPREEC has published a book on Biodiversity and booklets on Medicinal Plants, Conservation of Wetlands and Biosphere Reserves of India. CPREEC had organized an Environmental Journalism Seminar and Workshop in partnership with the International Center for Journalists, Washington D.C., and the Indian Institute of Journalism and New Media, Bangalore at Chennai in 2002.

➢ BNHS is also involved in various activities in this area such as : organising press meets on biodiversity issues, Regular columns in national & regional newspapers, workshop for journalists, developing short films and providing technical advise for TV programmes. BNHS also comes out with publications: Hornbill, Mistnet, JBNHS, ENVIS bulletin, Green Governance which are sent over network members.

➢ Centre for Media Studies is responsible for dissemination of information on environment and media.

94. Does your country promote the communication, education and public awareness of biodiversity at the local level? (decision VI/19)

a) No	
b) Yes (please provide details below)	X

Further information on the efforts to promote the communication, education and public awareness of biodiversity at the local level.

Ministry of Environment & Forests promotes communication, education and public awareness of biodiversity of local level through its Centers of Excellence and other institutional network. Some of the examples are cited below: -

➢ Biodiversity awareness at the local level is promoted through several activities and projects of CEE, such as:

- Discussions on agro-biodiversity being directly facilitated at 24 villages in Gujarat as part of the Samvardhan project
- Agro-biodiversity discussions in over 100 villages with the Akhil Gujarat Sajeev Kheti Sabha (an organic farmers' network in Gujarat state)
- Developing a simple manual for school students, especially in tribal and rural areas, to understand linking up with the People's Biodiversity Register activity mandated under the Biodiversity Act 2000.
- Interpretation programmes at natural heritage sites such as the Bhoj Wetland in Bhopal city, several protected areas, and at various zoos.
- Capacity building for boatmen and other local stakeholders, as part of a larger CEPA initiative at Chilika Lake, a Ramsar site, which also included interpretation at a vistor center
- School programme and multistakeholder discussion for conservation of Olive Ridley Turtles, in Goa, on the west coast of India.
- Community mobilization and formation of local level committees for documentation and conservation of sacred groves in Kodagu district, within the Nilgiri Biosphere Reserve, as well as a fully functioning waste management programme.
- CEE has developed a teachers manual in Gujarati, titled 'Jeev Sristhi ne tana bana' which aims to facilitate interactive teaching-learning of key ecology concepts, including themes like

alien invasive species, species and habitat loss, etc.

- Mowgli Utsav, a state level event organized by the Govt. of Madhya Pradesh in collaboration with CEE in 2004 to generate awareness in school students about biodiversity. Around 33000 schools, more than 100000 students participated in state wide selection process. 200 selected students participated in a 3 day camp at Pench National Park. . The Chief Minister of Madhya Pradesh visited the camp and announced that this festival will be held annually.
- Over 20 innovative school-based projects supported under the Scheme for Environmental Orientation to School Education, that address different aspects of biodiversity. These include development of a manual for school teachers on agrobiodiversity conservation (taken up by the NGO Anthra), development of a manual for conserving Olive Ridley Turtles (taken up by CEE), development of special learning and identification material for blind students to identify different grains, flowers, leaves, trees etc. (taken by Arushi, Bhopal, MP), working with tribal children whose families have bee relocated outside the Kuno Wildlife Sanctuary, for developing situation specific material for understanding and sustainably using biodiversity and other natural resources (taken up by Samrakshan)
- To facilitate to process of stakeholder participation, 'Samvaad- A Dialogue for Sustainable Rural Development' was organize by CEE in partnership with its sister organizations VIKSAT, CHETNA and Vikram A Sarabhai Community Science Centre (VASCS) in December 2005. As part of Samvaad, a 'Beej Mela' (Seed exhibition) was organized that showcased the enormous biodiversity of seed crops in Gujarat. Samvaad was an event that promoted the communication, education and pubic awareness of biodiversity at the local level.

- FRLHT, while working with the village level institutions such as JFM societies and other women self help groups (WSHGs), emphasis is laid on building awareness among the people about the importance of wild medicinal plants and related traditional knowledge.
- CSIR activities in this area are as under:
  - RRL-Jammu has BIONET (Biodiversity Information Network) in place.
  - CIMAP is involved in participatory conservation and creating general awareness, and a value-added "MANAV PARK" has been established. Small "GYANIKA" parks of common herbal plants have also been established in many Municipal parks of Lucknow and Varanasi and 10 schools of Lucknow.
- CPREEC has organized exhibitions on Biodiversity, Nilgiri Biosphere Reserve, Medicinal Plants, Conservation of Wetlands and Biosphere Reserves of India at several venues in the country. A video cassette on Vanadevathai (Goddess of Forest) highlighting the importance of sacred groves was also produced.
- CPREEC, the under scheme of Environmental Orientation to School Education, coordinates with smaller NGOs in the states of Andhra Pradesh, Karnataka, Kerala, Orissa and Tamilnadu for carrying out environmental education activities for school teachers and students. Several innovative programmes like biodiversity conservation, maintaining herbal garden, indigenous knowledge system, etc. were undertaken.
- CPREEC has also conducted training programmes for teachers and students on Eco-restoration of Coastal Areas.
- CPREEC maintains a gene pool of medicinal plants at Thambatti village in Nilgiris with more than 180 indigenous species. CPREEC has provided training to tribals on bee keeping, bamboo craft to support their livelihood.
- CPREEC has developed an Eco-model village at Nenmeli village, Kancheepuram district involving local people in protecting the 82 indigenous medicinal plants. This site is the training centre model for biodiversity conservation, watershed management, to which teachers, students, government officials, NGOs, visit to understand its importance.
- Programmes are conducted for women self-help groups and village meetings are also conducted. They are involved in biodiversity conservation and tree plantation.
- CPREEC is involved in conducting workshops at grass root level and bringing out publications in various field.
- BNHS is involved in developing support of local communities through Conservation Education, facilitating interactions among various stakeholders through Conservation Education centres, awareness campaigns to save endangered species of wildlife .

95. Is your country supporting national, regional and international activities prioritized by the Global Initiative on Education and Public Awareness? (decision VI/19)	
a) No	
b) No, but some programmes are under development	
c) Yes, some activities supported (please provide details below)	X
d) Yes, many activities supported (please provide details below)	

Further comments on the support of national, regional and international activities prioritized by the Global Initiative on Education and Public Awareness.

Some of the activities carried out by different Centers of Excellence of MoEF and other institutes in this context are given below: -

Activities undertaken by Centre for Environment Education include disseminating information on various websites i.e. www.envirodebate.net and www.greenteacher.org. The SASEANEE website hosted by CEE, links to the IUCN CEC website. Staff from CEE are members of IUCN CEC, that anchors the GIEPA. CEE has published directories of organizations involved in EE, in print and electronic form. There are several forums for interaction on BD and BD education, anchored by CEE. These include school education networks such as the National Environmental Education Programme for Schools, networks of community organizations, NGOs and govt. agencies that are partners under the UNDP GEF Small Grants Programme, local networks such as of CBOs involved in improved Natural Resource Management in 250 villages in Gujarat, Western India Biodiversity Network. Activities under Global Initiative on Education and Public awareness (GIEPA) include the communication, education and public awareness global network for networking, lists of networks and contact addresses, available on the internet and on CD-ROMs and enhanced communication and knowledge exchange nationally and regionally.

CSIR has organized various national and international training programmes and global initiative like networking in the species-inventorying programme. NBRI has organized various national and international training programme in capacity building and awareness correction in enhancing taxonomic expertise, conservation and sustainable utilization of medicinal plants and other wild plant genetic resources. These programmes are sponsored by Government of India agencies like DST, DBT, ISM (CCRAS) and international agency like NAM S&T, UNESCO, UNIDO, World Bank, etc. Apart from imparting training to Indian students and entrepreneurs, CIMAP is also accepting scholars from other gene-rich countries (particularly from third world countries) for training in frontline R&D areas in MAPs.

CPREEC have trained 33,471 teachers, 2,317 students, 5,682 schools, 27,172 NGOs and rural workers, 8,894 Advocates, academicians, lawyers and law students, 4,170 industrial workers in last 15 years. Video Van has reached out to 64,481 people, Special programmes for women have benefited 13,763 women in rural areas.

Punjab State Council of Science & Technology (PSCST) has taken up environment education projects in several countries in Asia (project on 'Integrating EE in Technical & Vocational Education' in India, China, Indonesia, Malaysia & Philippines; and project on 'Greening Science Education' – a workshop to discuss the issues related to India, Bangladesh, Sri Lanka, Nepal & Bhutan). These recommend biodiversity education as one of the important components of environment education.

96. Has your country developed adequate capacity to deliver initiatives on communication, education and public awareness?	
a) No	
b) No, but some programmes are under development	
c) Yes, some programmes are being implemented (please provide details below)	X
d) Yes, comprehensive programmes are being implemented (please provide details below)	

Further comments on the development of adequate capacity to deliver initiatives on communication, education and public awareness.

Some of the activities carried out by different institutes in this area are given below: -

Activities of CEE:

Training and orientation components are already part of the National Green Corps (that aims to reach 150 schools and colleges in every district of India) and the National Environmental Awareness Campaign of the MOEF. Some materials for biodiversity education already exist, through more are required.

- A compulsory undergraduate course on Environmental Studies has been introduced in colleges in India. CEE has developed a textbook for this, as well as organized orientation programmes for faculty.
- CEE regularly conducts a week-long orientation programme for offices of the Indian Forest Service, on education, communication and participation aspects.
- Locale-specific CEPA strategies for communities and other stakeholders have been developed, and these are integrated into natural resource management programmes. However, further work is required to develop effective and wide reaching CEPA strategies and material for urban areas.
- Similarly, through some programmes exist for policy makers and decision makers in business and industry, more effective tools and capacity to address these sectors need to be developed.
- IFS Compulsory Training on EE
- Undergraduate course in Env Studies: developed textbook, organized faculty training
- NGC leads to informal training of teachers & students

CSIR/NBRI is a partner of an international network programme for In country conservation of rare, endangered and threatened plant species through garden based conservation namely 'Investing in Nature' funded by HSBC through Botanic Garden Conservation International (BGCI), an international botanic garden association. NBRI network over 140 botanic garden of India and provide training to the botanic garden person for Ex-situ conservation RET species in the botanic garden through field gene bank, in vitro bank, seed bank, etc.

CPREEC has written text books on Environmental Studies for standards 1 to 10 for CBSE and Matriculation school Boards and for undergraduates of the University of Madras. The same is being translated into regional language (Tamil) for the University.

CPREEC has also organized workshops for animal keepers of various zoos in Andhra Pradesh and Tamilnadu

BNHS is involved in capacity building programmes for educators, teachers and teacher trainers, workshops on bird conservation and project management through IBCN, distance learning programmes for amateurs & professionals, training programmes for forest guards.

97. Does your country promote cooperation and exchange programmes for biodiversity education and awareness at the national, regional and international levels? (decisions IV /10 and VI/19)

a) No	
b) Yes (please provide details below)	X

Further comments on the promotion of cooperation and exchange programmes for biodiversity education and awareness, at the national, regional and international levels.

Some of the activities carried out by different institutes in this area are given below: -

- Various activities of CEE are:
  - CEE has facilitated exchanges between Small Grants Programme partners in different cuntires in South and Southeast Asia, and with the International Bureau of Plant Genetic Resource (IBPGR)
  - Through the South and Southeast Asia Network for Environmental Education (SASEANEE), a 10 week Certificate Course on Environmental Education is organized every year, which has participation from the region as well as Africa. A module on Biodiversity conservation has been a part of the course content, since its launch in the year 1997. (Till date 84 professionals from 18 countries have been trained under this initiative).
  - Through the South Asia Youth Environment Network (SAYEN), discussions have taken place with members, on biodiversity education and action projects, focusing on the role of youth.
  - From time to time, as and when commissioned by different agencies, like SACEP, IGES, Japan, etc., CEE prepared regional documents on Environmental Education and Communication (EE&C) (some strategies, articles, write-ups, etc.) that had appropriate sections, papers, case studies on BD related education and communication. Such documents

include the South Asia Environmental Education and Training Action Plan: 2002-2007, published by SACEP and UNEP.

- A South Asian Situational Analysis of ESD was a study commissioned to CEE by UNESCO during 204-05.
- During 2002-2004, through the SASEANEE Sectt, the Bangladesh Centre for Environment Education conducted a project titled 'School Education to support Asian Elephant Conservation-Phase II' with support from the U.S. Fish and Wildlife Service. This project was based on the premise that attitudes towards conservation and the environment, which govern the kind of decisions that adults take, in their personal and professional capacities, are shaped early in life. About 50 schools and 100 teachers were involved in this programme. A Bangladeshi edition of CEE's NatureScope India title 'Endangered Elephants' has also been published.
- In the International Conference on Education for a Sustainable Future organized by CEE in January 2005, one of the thematic workshops was 'Communication for Biodiversity Conservation'. Experts and practitioners from different countries were participated in the workshop, and especially considered the opportunities afforded by the CBD for CEPA. Recognizing that the UN Decade for Education for Sustainable Development provides a major opportunity, the workshop on Communication for Sustainable Development provides a major opportunity, the workshop on Communication for Biodiversity Conservation (CBC) focused on the role of communication in achieving key development goals. The workshop was organized in partnership with Kalpavriksh and WWF India. An International Advisory Group guided the development of the workshop structure and content and identifying case examples for presenation and analysis. About sixty delegates participated in the workshop.
- A training programme on Training Session at World Conservation Congress, International Agreements on Protected Areas and Community Based Conservation was organized by a CEE staff member, as part of the IUCN Theme on Indigenous and Local Communities, Equity and Protected Areas (TILCEPA).

➢ CSIR/NBRI is a partner of an international network programme for In country conservation of rare, endangered and threatened plant species through garden based conservation namely 'Investing in Nature' funded by HSBC through Botanic Garden Conservation International (BGCI), an international botanic garden association. NBRI networks over 140 botanic garden of India and provides training to the botanic garden persons for *Ex-situ* conservation RET species in the botanic garden through field gene bank, *in vitro* bank, seed bank, etc.

At the national level such exchange programmes for biodiversity education and awareness in undertaken.

98. Is your country undertaking some CEPA activities for implementation of cross-cutting issues and thematic programmes of work adopted under the Convention?	
a) No (please specify reasons below)	
b) Yes, some activities undertaken for some issues and thematic areas (please provide details below)	X
c) Yes, many activities undertaken for most issues and thematic areas (please provide details below)	
d) Yes, comprehensive activities undertaken for all issues and thematic areas (please provide details below)	

Further comments on the CEPA activities for implementation of cross-cutting issues and thematic programmes of work adopted under the Convention.

CEPA activities for implementation of cross-cutting issues and thematic programmes of work adopted under the Convention are :-

- Climate change: A scoping study on the information needs of different stakeholders who can contribute to abating impacts of climate change was carried out for the British High Commission. This included discussions on biological impacts as well as bioresources that can help abate impacts.
- Indigenous knowledge: A web debate n biodiversity documentation by local communities was facilitated on CEE's www.envirodebate.net. Titles on Medicinal Plants and Livestock biodiversity have been published under the Environment and Development book series.
- CSIR/NBRI assist nodal ministries like Ministry of Environment & Forest and Ministry of Commerce in matters related to CBD, WTO particularly areas such as conservation of biodiversity, sustainable utilization of biodiversity, Traditional Knowledge (TK) access and benefit sharing, etc. NBRI is recognized as a lead institute and NBRI's Director as lead expert in matters related to access and benefit sharing by Govt. of India agency to Ministry of Environment and Forest and Ministry of Commerce. At international level BGCI, UNEP, UNESCO has also recognized NBRI in these areas.

99. ■ Does your country support initiatives by major groups, key actors and stakeholders that integrate biological diversity conservation matters in their practice and education programmes as well as into their relevant sectoral and cross-sectoral plans, programmes and policies? (decision IV/10 and Goal 4.4 of the Strategic Plan)	
a) No	
b) Yes (please provide details below)	X

Further comments on the initiatives by major groups, key actors and stakeholders that integrate biodiversity conservation in their practice and education programmes as well as their relevant sectoral and cross-sectoral plans, programmes and policies.

Initiatives taken by major organizations in this area are given below.

- Activities of CEE:

Actions for Parties, suggested under IV/10	**Done by CEE**
1. Urges Parties:	
(a) To place special emphasis on the requirements of Article 13 of the Convention in the development of their national strategies and action plants;	Done in the Education Awareness and Training Strategy and Action Plan (EATSAP)
(b) To promote education on biological diversity through relevant institutions, including non-governmental organizations;	Done through CEE's own environment education and environment action projects and facilitated through SGP
(c) To allocate appropriate resources for the strategic use of education and communication instruments at each	These activities are not carried out through one programme but different prorammes of CEE take care of different aspects of this objective.

phase of policy formulation, planning, implementation and evaluation, including the identification of relevant target groups seeking to provide these relevant, timely, reliable and understandable information;	
(d) To integrate biological diversity concerns into education strategies, recognizing the particular needs of indigenous and local communities; and	These activities are not carried out through one programme but different programmes of CEE take care of different aspects of this objective.
(e) To support initiatives by major groups that foster stakeholder participation in biological diversity conservation and sustainable use and that integrate biological diversity conservation matters into their practices and educational programmes;	CEE's school and college programmes address this. Also SGP facilitated by CEE has major thrust on stakeholder's participation for planning and execution of conservation and sustainable utilization of biological diversity.
2. Also urges Parties to share experiences on initiatives on public education and awareness and public participation relevant to the Convention, particularly on a sectoral and thematic basis, and to make relevant case studies as well as lessons learned in the preparation of national biological diversity policies, strategies and plans available to the Executive Secretary and for the exchange of information among Parties though the clearing-house mechanism and to consider how to organize assistance for Parties who may be keen to develop public awareness and education strategies, but lack the ability to do s;	CEE helps documentation of cases, and experience sharing through the E and D series, News EE, and various websites. However, this material has not been made proactively available to the Executive Secretary or the Clearing House Mechanism
3. Encourage Parties to make use of the media, including print and electronic media, to promote public education and awareness about the importance and appropriate methods for the conservation and sustainable use of biological diversity;	Done through CEE News and Features Service, TVE Video Resource Centre, as an Environmental Information System (ENVIS) center, and through News EE (a biomonthly newsletter for environment educators).
4.Calls upon Parties, where necessary, to illustrate and translate the provisions of the Convention into the respective local languages to promote public education and awareness-raising of relevant sectors, including local communities;	Ongoing. CEE has several publications in local languages on different aspects of biodiversity, for different stakeholders groups. Local level projects incorporate biodiversity related content to some extent, as appropriate.
5. Decides that public education and awareness issues shall be integrated into and become an integral component of all sectoral and thematic items under the programme of work of the Conference of the Parties;	
6. Invites the United Nations Educational, Scientific and Cultural Organization (UNESCO) to consider launching a global initiative on biological diversity education, training and public awareness and requests the Executive Secretary to explore the feasibility of such an initiative and to report to the fifth meeting of the Conference of the Parties on the progress of such an initiative;	
7. Invites the United Nations Environmental Programme (UNEP), in cooperation with other United Nations bodies and other relevant international and regional organizations, agreements, processes and institutions, to continue and make use of existing initiatives and to further develop its information dissemination and public-awareness activities in support of the work of the Convention.	
8. Urges Parties, relevant organizations and	Ongoing. CEE is the National Hose Institution

donor agencies to support local, national, subregional and regional public education and awareness initiatives;	for the UNDP GEF Small Grants Programme. About 150 projects under the focal area of Biodiversity have been taken up in the past 4 years. All of these have components of CEPA, on different aspects of biodiversity, especially for local communities.
9. Urges Parties, when requesting for assistance through the financial mechanism of the Convention, to propose projects which promote measures for implementing the provisions of the Convention on public education and awareness;	
10. Decides to review progress in the implementation of the above activities, at the latest at its sevent meeting.	

GEF Small Grants Programme: CEE is the National Host Institute for GEF/SGP in India. Through this programme more than 150 projects have been implemented with partner organizations across the country. Around 70 projects are directly involved in Biodiversity conservation in range of ecosystem and communities. CEPA is an integral aspect of all these projects as they involve capacity building of various stakeholders among the project components. Around 20 % of budgetary allocations from most of these projects are utilized foe CEPA related activities. These projects have range from capacity building of local communities for conservation of IBA (Important Bird Area) sites to skill development of various SGP partners, from wild biodiversity conservation to agrobiodiversity conservation. Under CCF II of GEF, few Environment Education projects related to schools and teachers were supported. Some of the exclusive CEPA projects are listed below:

1. "An Environmental Awareness Generation and Eco-restoration Programme on the Palni Hills (Western Ghats) South India" – The Rapinat Herbarium, Tamilnadu
2. "Create Awareness to Develop Resources to Conserve the Biodiversity with Local Initiatives" – Magra Mewar Vikas Sansthan (MMVS), Rajasthan
3. Innovation in Media for Empowerment – Darpana Academy of Performing Arts, Gujarat
4. "Human Resource Development and Capacity Building through development of target specific resource material and training for protection, conservation and restoration of wetlands in Punjab" – Punjab State Council for Science and Technology (PSCST), Punjab
5. Skills Enhancement and Capacity Building of GEF thematic areas with partners and local groups – Nehru Foundation for Development, Gujarat
6. Sabar Sena ("Water Brigades" on the banks of river Sabarmati, to protect and preserve biodiversity and river based civilization) – Jeevanarth, Gujarat
7. Strengthening Role of Panchayat in Re-establishing Biodiversity in Southern Aravali Hills – Alert Sansthan, Rajasthan
8. Community, Outreach and Dissemination for Up-scaling of Small-Plot Sustainable Cultivation Models: Enhancing Livelihoods of Resource Poor Sections – Prayas, Maharashtra.
9. "Outreach of Lessons, Experiences and Community participation to a wider audience including policy makers and partners for better dissemination and replication of SGP approaches" – Surabhi, Maharashtra
10. "Training of the Indian Bird Conservation Network members and Local Stakeholders in the Northeast India for enhancement of Bird Conservation" – BNHS, Maharashtra

Goal 4.4 of Strategic Action Plan

4.4 Key actors and stakeholders, including the private sector, are engaged in partnership to implement the Convention and are integrating biodiversity concerns into their relevant sectoral and cross-sectoral plans, programmes and policies.

Under Environment Education in School System (EESS) project, we have taken initiative to green (environmentalise) text books in 16 states. Now, this initiative will cover all the states of the country.

Through CEE's Industries Initiative, information servicing and sensitization of industry decision makers and representatives, dialogues are ongoing for integration of biodiversity concerns into sectoral programmes.

- The FRLHT, through implementation of Danida and UNDP funded programmes in five states has supported integration of efforts of major stakeholders viz state, FDs, NGOs, local people,

research organizations in the field of medicinal plants conservation and sustainable use. The planning process in the states has been influenced to incorporate medicinal pants conservation and sustainable use activities in their plan budget. The State Forest Departments, having realized the importance of wild medicinal plants, have added a separate chapter on medicinal plants conservation and their sustainable use in the working plans (Management Plants) being prepared for forest divisions in the state.

- NBRI, Lucknow has various grassroot level development activities, which involve educating and encouraging the rural people particularly, women in conservation of local plants particularly, useful in primary healthcare and having nutritional value in community gardens and home gardens. NBRI is developing location specific value addition so that the rural people could undertake value addition in a sustainable manner from the locally available bioresources.

- CIMAP has been providing common platform for various key players to interact and devise joint strategies and action plans. In this endeavor, CIMAP has been working in association with National Medicinal Plant Board of India and other funding institutions like SIDBI, DBT, NABARD etc.

- CPREEC has undertaken awareness building measures to integrate biodiversity conservation in sectorial and cross-sectoral plans.

- BNHS is involved in Green Governance programme for corporate groups: Lending liabilities, CSR, Conservation Education at ISRO, Sriharikota, Armed forces have integrated ecological themes in their training programmes, Network of Police, Custom and Forest department initiated. Local unemployed youth are working as nature guides.

100. Is your country communicating the various elements of the 2010 biodiversity target and establishing appropriate linkages to the Decade on Education for Sustainable Development in the implementation of your national CEPA programmes and activities? (decision VII/24)

a) No	
b) No, but some programmes are under development	X
c) Yes, some programmes developed and activities undertaken for this purpose (please provide details below)	
d) Yes, comprehensive programmes developed and many activities undertaken for this purpose (please provide details below)	

Further comments on the communication of the various elements of the 2010 biodiversity target and the establishment of linkages to the Decade on Education for Sustainable Development.

Some of the activities in this area are given below:

- CEE organized 'Samvaad- A Dialogue for Sustainable Rural Development' in partnership with its sister organizations VIKSAT, CHETNA and Vikram A Sarabhai Community Science Centre (VASCSC) in the month of December 2004. Samvaad facilitated dialogue and lateral learning for sustainable rural developments. The event brought together around 1200 people including members of Panchayat (Men and Women), Teachers, and members of Common Interests Groups from around 200 villages of Gujarat. Participating with them were governments representatives, non governmental organizations, experts in various aspects of sustainable development and academics who involved in a dialogue and lateral learning for sustainable rural development. CEE in partnership with 32 partner agencies organized an International Conference on Education for a Sustainable Future (ESF) from 18-20 January 2005. As part of the Conference, Biodiversity conservation has also been addressed as a major issue. Close to 900 participants from over 50 countries participated in ESF. ESF was the first international event of the UN Decade on Education for Sustainable Development. At the thematic workshop on 'Communication for Biodiversity Conservation', experts and practitioners especially considered the opportunities afforded by the CBD for CEPA. Recognizing that the UN Decade for Education for Sustainable Development provides a major opportunity, the workshop on Communication for Biodiversity Conservation (CBC) focused on the role of communication in achieving key development goals.

The workshop was organized in partnership with Kalpavriksh and WWF India. An International Advisory Group guided the development of the workshop structure and content and identifying case examples for presentation and analysis. About sixty delegates participated in the thematic workshop.

Box LII.

Please elaborate below on the implementation of this article and associated decisions specifically focusing on:

a) outcomes and impacts of actions taken;
b) contribution to the achievement of the goals of the Strategic Plan of the Convention;
c) contribution to progress towards the 2010 target;
d) progress in implementing national biodiversity strategies and action plans;
e) contribution to the achievement of the Millennium Development Goals;
f) constraints encountered in implementation.

a) Outcomes and impacts of actions taken
   a. Textbooks greened in 17 states, integrating biodiversity concerns to some extents.
   b. Extracurrilcular material
   c. Publications on biodiversity
   d. Training programmes
   e. International training programmes
b) Contribution to the achievements of the goals of the Strategic Plan of the Convention.
c) Contribution to the progress towards the 2010 target CEE has the following contributions to the specific focal areas under the 2010 target:
d) Climate Change: Through CEE's Industry Initiative projects on improving energy efficiency and pollution abatement have been taken up.
e) 23 projects related to climate change and 5 projects related to Persistant Organic Pollutants have been facilitated through the UNDP GEF SGP
f) About 15 SGP projects relate to species and habitat level conservation.
g) 3 SGP projects are related to combating desertification.
h) Through direct work with rural communities in about 250 villages, CEE is working towards conservation of agrobiodiversity.
i) On Coorg district, CEE has facilitated the setting up of local committees for conservation of sacred groves and associated traditional knowledge.
j) CEE has facilitated policy discussions on the need to protect traditional knowledge.
k) CEE is working with the State Biodiversity Board in MP to work with school children and communities to promote conservation of traditional knowledge.
l) Several publications on different taxa, field guides etc are helping in the promotion of species level and habitat level conservation.
m) Progress in implementing NBSAP

The technical report has been prepared through a wide consultative process and submitted to Government of India for further action. The NBSAP is not yet finalized in India. However, several of the specific actions recommended for CEPA are continuing, since they are in place from before the NBSAP process, such as working with the school system, development of the biodiversity related material for communities, orientation of nature clubs etc. Some states like Madhya Pradesh have accepted suggestions from the State Biodiversity Strategy and Action Plan and CEE is closely working with them to implement actions regarding the CEPA components.

n) Contributions to the achievements of the MDGs

- Through direct community work in about 250 villages in different parts of the country, activities for improving natural resource management and therefore improving livelihood opportunities are underway.
- Biodiversity aspects are integrated into the village and location specific strategies. Through the UNDPGEF Small Grants Programme, over 150 projects related to the focal area biodiversity have been facilitated. Most of these relate to improving livelihood opportunities among the poorest communities, directly dependent on bioresources.

o) Constraints encountered in implementation

Article 14 - Impact assessment and minimizing adverse impacts

101. ◇ On Article 14.1(a), has your country developed legislation requiring an environmental impact assessment of proposed projects likely to have adverse effects on biological diversity?

a) No	
b) No, legislation is still in early stages of development	
c) No, but legislation is in advanced stages of development	
d) Yes, legislation is in place (please provide details below)	X
e) Yes, review of implementation available (please provide details below)	X

Further information on the legislation requiring EIA of proposed projects likely to have adverse effects on biodiversity.

In order to harmonise developmental efforts with conservation of environment and ecology, India has formulated policies and legislations for the protection and conservation of environment. Accordingly, notified developmental activities could be taken up only after prior clearance from the Ministry under environmental regulations such as Environmental Impact Assessment (EIA) Notification, 1994 and Coastal Regulation Zone (CRZ) Notification, 1991.

Environmental clearances based on EIA was introduced as an administrative measure in 1978-79, initially for river valley projects and extending later to industrial projects. EIA has now been made mandatory for 32 categories of developmental projects in the sectors of industry, thermal power, mining, river valley, infrastructure and nuclear power by the EIA Notification issued in 1994 under the Environment (Protection) Act, 1986. The EIA Notification also provides for two-stage clearance for site-specific projects such as mining, pit-head thermal power projects, river valley projects, ports and harbors. This is mainly to help the investors/promoters to avoid ecologically sensitive areas where acceptability of the project from environmental angle is very remote.

The CRZ Notification declares coastal stretches of seas, bays, estuaries, creeks, river and back waters which are influences by tidal action, upto 500 meters form the high tide line (on the landward side) and inter-tidal zone as the coastal regulation zone. The notification lists activities prohibited in the Coastal Regulation Zone and also lists permissible activities that are regulated. The permissible activities also require environmental clearance under the CRZ Notification.

Environmental clearance is accorded based on scientific tools for prediction of environmental implications of a development project, for evolving necessary mitigative measures that are incorporated in the project design. With a view to ensure multi-disciplinary inputs required for environmental appraisal of development projects, Expert Committees have been reconstituted for the following sectors: mining projects; industrial projects; thermal power projects; river valley, multipurpose irrigation and hydroelectric projects; infrastructure development and miscellaneous projects; nuclear power projects and construction projects.

To address the biodiversity related issues in environmental impact assessment, the baseline status of biological environment including distribution pattern, community structure, population dynamics and species composition of flora and fauna is ascertained. Also information relating to faunal species with reference to distribution, abundance, rarity, species diversity and critical habitat requirements, migratory and travel route disruption, habitat resilence is also collected for assessing the likely significant impacts of proposed developmental activities. Base on the assessment mitigative measures are suggested for protection and conservation of flora and fauna.

In the case of river valley projects, a detailed survey of wildlife and fauna including aquatic is required to ascertain existence of any endangered and migratory species with plans for their rehabilitation. The time bound management plans are also sought for approval to be executed one year in advance of the commencement of impoundment. As the area may harbor, a number of medicinal, rare and endangered plants, a four season study of the flora is insisted. A time bound management plan for approval which would then need to be executed well before impoundment commences is sought.

Ecologically sensitive areas / zones are notified under the Environment (Protection) Act, 1986. The main objective of these notifications is to impose restriction on the industries, operations, process and other developmental activities in the region that have detrimental effect on the environment, to provide for restoration of denuded areas, management of catchment areas, watershed management

etc., for a planned development. It is also intended to ensure sustainable livelihood for the local community and stakeholders. A high level monitoring committee is constituted to ensure compliance with the notification and take action against any violations. Five such ecologically sensitive areas have so far been notified.

The MoEF regularly monitors the implementation of environmental safeguard measures stipulated while according environmental clearance to various developmental projects. During the year under report, 577 projects were monitored till December 2004, through the existing network of 6 Regional Offices of the Ministry. The issues on which the compliance is found to be inadequate or unsatisfactory are taken up with the project authorities for ensuring an effective compliance of the stipulated conditions.

The MoEF has undertaken re-engineering of environmental clearance process based on a comprehensive review of the existing environmental clearance process. The main objective of this review was to make the environmental clearance process more effective and time bound as also to bring about greater transparency and improvement in the quality of appraisal. Based on this review and intensive consultations with all concerned stakeholders, a revised draft Environment Impact Assessment Notification has been issued under the Environment (Protection) Act, 1986, for inviting public response vide S.O. 1324(E) dated 15.9.2005.

The salient features of the revised draft Environment Impact Assessment Notification include categorization of developmental activities requiring environmental clearance based on the criteria of scale of impact, severity of impact and nature of location and thus doing away with the existing investment criteria, categorizing developmental activities into Category 'A' (to be appraised at the Central level), Category 'B' (to be appraised at the State level Environment Impact Assessment Authority); and Category 'A'/'B' (to be screened at the Central level); ensuring quality of EIA/EMP Reports through the introduction of scoping of developmental activities by the Expert Appraisal Committees, provision of structured public consultations; and defining time and information limits and outcomes at each stage of processing and decision making.

In the revised draft Environment Impact Assessment Notification, Biodiversity issues relating to impacts on flora and fauna have been incorporated. These relate to threat of the proposed development activity to the biodiversity which includes genetic diversity, species diversity and ecosystem diversity; likely displacement of fauna both terrestrial and aquatic or creation of barriers for their movement; impacts on protected areas, national parks, sanctuaries and ecologically sensitive areas. Based on the critical assessment, mitigative measures are to be specified for protection and conservation of flora and fauna.

102. ◇ On Article 14.1(b), has your country developed mechanisms to ensure that due consideration is given to the environmental consequences of national programmes and policies that are likely to have significant adverse impacts on biological diversity?

a) No	
b) No, mechanisms are still in early stages of development	
c) No, but mechanisms are in advanced stages of development	
d) Yes, mechanisms are in place (please provide details below)	

Further comments on the mechanisms developed to ensure that due consideration is given to the environmental consequences of national programmes and policies that are likely to have significant adverse impacts on biodiversity.

The MoEF has issued a notification designating biologically rich and ecologically fragile areas as eco-sensitive zones. Under this notification, five sites namely Dahanu, Doon Valley, Mahabaleshwar, Murud Janjira and Panchgani have been notified.

The Department of Ocean Development (DOD) designated as the nodal department to oversee the implementation of Chapter 17 of Agenda 21 has committed itself to introduce the concept as part of a larger programme on Environment Capacity Building (ECB). MoEF is the co-ordinating agency. Under the Integrated Marine and Coastal Area Management (IMCAM) component, activities that have been planned for execution over five years include drawing up model IMCAM plans, formulation of Geographical Information System (GIS) for critical habitats such as mangroves and turtle breeding grounds and determination of the level of pollution in the coastal areas.

Tribunal benches, to legally combat environmental damages, have been proposed in major cities such as New Delhi, Mumbai, Kolkata and Chennai under the National Environmental Tribunal Act, 1995. The National Environment Appellate Authority (NEAA) has been established under NEAA Act 1997 to hear appeals in regard to restriction of areas in setting up of industries.

Minimising adverse impacts of intensive agriculture, animal husbandry and aquaculture on biodiversity has been a major concern in the country. Increasing efforts are being taken by both government, state agricultural universities and NGOs to develop programmes of integrated farming all through the country and especially in fragile ecosystems as that in the Himalayas and rainfed agriculture.

103. ◈ On Article 14.1(c), is your country implementing bilateral, regional and/or multilateral agreements on activities likely to significantly affect biological diversity outside your country's jurisdiction?

a) No	
b) No, but assessment of options is in progress	
c) Yes, some completed, others in progress (please provide details below)	X
d) Yes (please provide details below)	

Further information on the bilateral, regional and/or multilateral agreements on activities likely to significantly affect biodiversity outside your country's jurisdiction.

The issues related to environmental management are dealt with under several environmental related bilateral, regional and multilateral conventions, agreements and programs. For example, South Asia Cooperative Environmental Programme (SACEP) setup in 1982 with headquarter in Colombo deals with regional strategy for environment management (Agenda 21 issues). The SACEP holds its governing council meeting, which concentrates on current regional issues as well as global concerns.

South Asia Association for Regional Cooperation (SAARC) has seven countries of the region as members, viz., Nepal, India, Bangladesh, Bhutan, Pakistan, Maldives, Sri Lanka. So far, five Environmental Ministers Conferences have been held under SAARC, which also has a Committee on Environment, Meteorology and Forest, for working out the detailed plan of action in these areas and implementing the same.

104. ◈ On Article 14.1(d), has your country put mechanisms in place to prevent or minimize danger or damage originating in your territory to biological diversity in the territory of other Parties or in areas beyond the limits of national jurisdiction?

a) No	
b) No, mechanisms are still in early stages of development	
c) No, but mechanisms are in advanced stages of development	X
d) Yes, mechanisms are in place based on current scientific knowledge	

105. ◆ On Article 14.1(e), has your country established national mechanisms for emergency response to activities or events which present a grave and imminent danger to biological diversity?

a) No	
b) No, mechanisms are still in early stages of development	
c) No, but mechanisms are in advanced stages of development	
d) Yes, mechanisms are in place (please provide details below)	X

Further information on national mechanisms for emergency response to the activities or events which present a grave and imminent danger to biodiversity.

Planning and overseeing the implementation of policies and programmes on management of chemical emergencies and hazardous substances are carried out by the Hazardous Substances Management Division (HSMD) in the MOEF with a mandate to promote safe handling, management and use of hazardous substances including hazardous chemicals and hazardous wastes, in order to avoid damage to health and environment. The activities of the division can be grouped under three main thrust area, viz., Chemical Safety; Hazardous Wastes Management and Solid Waste Management.

The Pilot study entitled "GIS based Emergency Planning and Response System with respect to chemical accidents in Major Accident Hazard (MAH) installations" in major industrial clusters in four identified industrial States namely – Gujarat, Maharashtra, Tamil Nadu and Andhra Pradesh has been undertaken. For emergency response to activities with grave danger to biodiversity, Crisis Groups have been set up at Central District and local levels. The system has been designed to help response agencies namely Central Crisis Group (CCG), District Crisis Group (DCG) and Local Crisis Group (LCG), for planning and rehersing response to chemical disasters and also during actual emergency situations so as to organize a well planned response and minimize the damages. To ensure proper implementation of the software at the district level, training programmes have been conducted involving personnel of the State and District Crisis Groups of the districts covered under this project. This project has been extended to cover Delhi-NCT, Rajasthan, Uttar Pradesh, Haryana, Karnataka, Kerala, West Bengal, Assam and Madhya Pradesh.

Policies and programmes are in place for management of chemical emergencies, hazardous wastes management and solid waste management.

India is a Party to the Rotterdam PIC Convention on Hazardous Chemicals, Stockholm Convention on PoP and Basal Convention on transboundary movement of hazardous wastes.

106. Is your country applying the Guidelines for Incorporating Biodiversity-related Issues into Environment-Impact-Assessment Legislation or Processes and in Strategic Impact Assessment as contained in the annex to decision VI/7 in the context of the implementation of paragraph 1 of Article 14? (decision VI/7)

a) No	
b) No, but application of the guidelines under consideration	
c)Yes, some aspects being applied (please specify below)	
d) Yes, major aspects being applied (please specify below)	X

Further comments on application of the guidelines.

Ecologically sensitive areas are notified under the Environment Protection Act 1986 and there are restrictions for setting up of industries, operations, process and other developmental activities in the region that may have detrimental effect on the environment. Biodiversity related issues are also included in the environmental impact assessments so as to provide for restoration of denuded areas, management of catchment areas, watershed management etc. It is also intended to ensure sustainable livelihood for the local communities.

107. On Article 14 (2), has your country put in place national legislative, administrative or policy measures regarding liability and redress for damage to biological diversity? (decision VI/11)	
a) No	X
b) Yes (please specify the measures)	
Further comments on national legislative, administrative or policy measures regarding liability and redress for damage to biological diversity.	

108. Has your country put in place any measures to prevent damage to biological diversity?	
a) No	
b) No, but some measures are being developed	
c) Yes, some measures are in place (please provide details below)	X
d) Yes, comprehensive measures are in place (please provide details below)	

Further information on the measures in place to prevent damage to biological diversity.

As mentioned in detailed response to question no. 101, prior environmental clearance is necessary for 32 categories of developmental projects under the EIA Notification 1994. In addition, activities in coastal areas are regulated under the CRZ Notification 1991.

To address the biodiversity related issued in environmental impact assessment, the baseline status of biological environment including distribution pattern, community structure, population dynamics and species composition of flora and fauna is ascertained. Also information relating to faunal species with reference to distribution, abundance, rarity, species diversity and critical habitat requirements, migratory and travel route disruption, habitat resilence is also collected for assessing the likely significant impacts of proposed developmental activities. Base on the assessment mitigative measures are suggested for protection and conservation of flora and fauna.

In the case of river valley projects, a detailed survey of wildlife and fauna including aquatic is required to ascertain existence of any endangered and migratory species with plans for their rehabilitation. The time bound management plans are also sought for approval to be executed one year in advance of the commencement of impoundment. As the area may harbor, a number of medicinal, rare and endangered plants, a four season study of the flora is insisted. A time bound management plan for approval which would then need to be executed well before impoundment commences is sought.

109. Is your country cooperating with other Parties to strengthen capacities at the national level for the prevention of damage to biodiversity, establishment and implementation of national legislative regimes, policy and administrative measures on liability and redress? (decision VI/11)	
a) No	
b) No, but cooperation is under consideration	
c) No, but cooperative programmes are under development	
d) Yes, some cooperative activities being undertaken (please provide details below)	X
e) Yes, comprehensive cooperative activities being undertaken (please provide details below)	

Further comments on cooperation with other Parties to strengthen capacities for the prevention of damage to biodiversity.

Bilateral MOUs/agreements have been entered into with other Parties to cover issues of

environmental concerns. For example, the India-Canada Environmental Facility, joint initiative of the Government of India and Government of Canada has been set up to enhance the capacity of Indian Institutes and Organizations to promote and deliver sustainable development programmes addressing the environment. The Indo-Brazil common agenda has been signed by both the governments for environmental issues. Advisory services in environmental management, a project under the aegis of Indo German technical collaboration, caters to five fields of activity viz. Eco-city, Eco-Industrial Estates, Eco-Industrial Parks for Electroplating Industries of Madurai, waste management, Sustainable Small Industry and Clean Development Mechanism.

Box LIII.

Please elaborate below on the implementation of this article and associated decisions specifically focusing on:

a) outcomes and impacts of actions taken;
b) contribution to the achievement of the goals of the Strategic Plan of the Convention;
c) contribution to progress towards the 2010 target;
d) progress in implementing national biodiversity strategies and action plans;
e) contribution to the achievement of the Millennium Development Goals;
f) constraints encountered in implementation.

Subsequent to EIA Notification, 1994, prior clearance from MOEF is essential based on EIA study for 32 categories of development projects, so as to minimize any adverse potential impacts, and to incorporate mitigative measures in the planning stage itself.

Article 15 - Access to genetic resources

110. ◆ Has your country endeavored to facilitate access to genetic resources for environmentally sound uses by other Parties, on the basis of prior informed consent and mutually agreed terms, in accordance with paragraphs 2, 4 and 5 of Article 15?

a) No	
b) Yes (please provide details below)	X

Further information on the efforts taken by your country to facilitate access to genetic resources for environmentally sound uses by other Parties, on the basis of prior informed consent and mutually agreed terms.

Operationlisation of the access and benefit sharing provisions stipulated in Article 15 of CBD, is of particular interest to India, which is rich in biological resources and associated traditional knowledge (TK).

Towards this, India has taken three significant legislative measures.

1. Biological Diversity Act 2002 and Biological Diversity Rules 2004

India has enacted the Biological Diversity Act 2002, which was developed through an extensive and intensive consultation process initiated in 1994. India is one of the few countries to have enacted such a legislation. This Act primarily aims at regulating access to biological resources and associated TK so as to ensure equitable sharing of benefits arising out of their use, in accordance with the provision of Article 15 of the CBD. Thereafter, the Government has also promulgated the Biological Diversity Rules 2004.

For implementation of the Act, a three-tiered structure has been envisaged. A National Biodiversity Authority (NBA) has been established at Chennai, to deal with all matters relating to requests for access by foreign individuals, institutions or companies, and all matters relating to transfer of results of research to any foreigner, for which prior approval of NBA is required (Sections 3 and 4). NBA's approval is also required before seeking any IPR based on biological material and associated TK obtained from India (Section 6). NBA also has the power to oppose grant of IPRs in any other country on biological resources or associated knowledge obtained or derived from India (Section 18.4). While granting approvals, NBA imposes conditions which secure equitable sharing in benefits arising out of the use of biological resources or associated knowledge occurring in India. These benefits could include monetary gains, grant of joint ownership of IPRs, transfer of technology, association of Indian scientists in R&D, setting up of venture capital funds etc. (Section 21). In case where specific individuals or group of individuals, for providing access to resource or knowledge, are identifiable, the monetary benefits will be paid directly to them. Otherwise, the amount is to be deposited in a National Biodiversity Fund (Section 21.3). Such monetary benefits, fees, royalties as a result of approvals by NBA, which are deposited in the National Biodiversity Fund, are to be used, in consultation with the local self government concerned, for conservation and development of areas from where the resource has been accessed.

The State Biodiversity Boards (SBBs) are to be set up by the State Governments, to deal with matters relating to access by Indians for commercial purposes. The Indian industry is required to provide prior intimation to the concerned SBB about the use of biological resources from that State (Section 7). The SBB has the power to restrict any such activity which violates the objectives of conservation, sustainable use and equitable sharing of benefits (Section 24).

Institutions of self-government are required to set up Biodiversity Management Committees (BMCs) in their respective areas for undertaking conservation, sustainable use, documentation of biodiversity and chronicling of knowledge relating to biodiversity (Section 41.1). The B MCs may also levy collection fee for collecting biological resource from t heir respective areas (Section 41.3). The NBA and SBBs are required to consult the concerned BMCs on matters relating to the use of biological resources and associated TK within their jurisdiction (Section 41.2). This mandatory consultation of BMCs by NBA and SBBs would ensure formalization of prior informed consent (PIC) by the communities through involvement of BMCs in decision making process.

The Biological Diversity Act provides for the following exemptions:

- to local people and communities of the area, including growers and cultivators of biodiversity and vaids and hakims, who have been practicing indigenous medicine (Section 7);
- to value added products, i.e. products containing portions/ extracts of plants and animals in unrecognizable and physically inseparable form (Section 2 c and p);
- through notification by Central Government of normally traded commodities, so as not to adversely affect trade of these items;
- for collaborative research through government sponsored or government approved institutions subject to overall guidelines and approval of the Central Government (Section 5); and
- traditional practices and use in agriculture, horticulture, poultry, dairy, farming, animal husbandry, bee keeping etc. (Section 2f)

The Biological Diversity Act has an enabling provision in Section 36.5 empowering the Central Government for protecting knowledge of local people relating to biodiversity, *inter alia* through registration of such knowledge and developing a *sui generis* system. The Act provides for notifying threatened species and prohibit or regulate their collection, taking appropriate steps to rehabilitate and preserve those species, thereby ensuring their conservation and management (Section 38). Section 37 of the Act provides for notifying by the State Government in consultation with the local bodies, areas of biodiversity importance as biodiversity heritage sites.

2. The Plant Varieties Protection and Farmers' Rights Act (PVPFRA), 2001

The PVPFRA 2001 and the PVPFR Rules 2003, deal primarily with the protection of plant breeder's rights over the new varieties developed by them and the entitlement of farmers to register new varieties and also to save, breed, use, exchange, share or sell the plant varieties, which the latter have developed, improved and maintained over many generations. The Act is a deviation from the 1991 UPOV Model and can be regarded as an alternate *'sui generis'* system that accord protection of the rights of the formal innovations of a plant breeder and the formal knowledge system and traditional plant varieties of the farmers as well. The important provisions contained in this Act relevant to ABS are those on the protection of farmers rights and the mechanisms suggested for compensation or benefit sharing for the contributions of local communities or farmers in the development of a new plant variety (Sections 39,40 & 41) of the Act and Rules 33 and 66). Section 40 of the Act requires that the breeder or any applicant for registration of a new plant variety shall disclose any information regarding the use of genetic material conserved by any tribal or rural families in the breeding or development of such variety. Similarly, the Act also ensures compensation of the contributions of any village or local communities to the development of a variety registered under this Act. Such compensation will be deposited to National Gene Fund. Another important provision in support of the farmers' conservation efforts is the recognition or rewards for a farmer who is engaged in conservation of genetic resources of land races of wild relatives for a farmer who is engaged in conservation of genetic resources of land races of wild relatives of economic plants and their improvement through selection and preservation. The rewards will be made from the National Gene Fund. Thus, the PVPFRA has stipulated mechanisms for benefit sharing for contributions of farmers / local communities in development of new varieties.

3. The Patent Second Amendment Act 2002 and Patent Third Amendment Act 2005-10-06

The Second and the Third amendments to the Patent Act undertaken in the years 2002 and 2005, respectively, provide for:

(i) exclusion of plants and animals from the purview of patentability (Section 4e);
(ii) exclusion of an invention which in effect is traditional knowledge from patentability (Section 4p);
(iii) mandatory disclosure of the source and geographical origin of the biological material in the specification when used in an invention (Section 8D);
(iv) Non-disclosure or wrongful disclosure of the source of biological material and any associated knowledge to result in opposition to grant of patent or revocation of patent (Section 18(j), Section 25(1)(j) and (k), Section 25(2)(j) and (k).

111. ◈ Has your country taken measures to ensure that any scientific research based on genetic resources provided by other Parties is developed and carried out with the full participation of such Parties, in accordance with Article 15(6)?

a) No	
b) No, but potential measures are under review	
c) Yes, some measures are in place (please provide details below)	X
d) Yes, comprehensive measures are in place (please provide details below)	

Further information on the measures to ensure that any scientific research based on genetic resources provided by other Contracting Parties is developed and carried out with the full participation of such Contracting Parties.

As mentioned in response to question no. 119, the NBA grants approvals to proposals on access to genetic resources subject to certain terms and conditions, which *inter alia* include: location of production, research and development units in such areas; association of Indian scientists and local people with research and development.

112. ◈ Has your country taken measures to ensure the fair and equitable sharing of the results of research and development and of the benefits arising from the commercial and other use of genetic resources with any Contracting Party providing such resources, in accordance with Article 15(7)?

a) No	
b) No, but potential measures are under review	
c) Yes, some measures are in place (please provide details below)	
d) Yes, comprehensive legislation is in place (please provide details below)	X
e) Yes, comprehensive statutory policy or subsidiary legislation are in place (please provide details below)	
f) Yes, comprehensive policy and administrative measures are in place (please provide details below)	

Further information on the type of measures taken.

May refer to the detailed response to question no. 110 above.

113. ◈ In developing national measures to address access to genetic resources and benefit-sharing, has your country taken into account the multilateral system of access and benefit-sharing set out in the International Treaty on Plant Genetic Resources for Food and Agriculture?

a) No	
b) Yes (please provide details below)	X

Further information on national measures taken which consider the multilateral system of access and benefit-sharing as set out in the International Treaty on Plant Genetic Resources for Food and Agriculture.

Sharing of benefits accruing to the breeder from a variety developed from indigenously derived plant genetic resource has been provided in the Protection of Plant Varieties and Farmers' Rights Act passed by the Indian Government in 2001. May refer to details in response to question no. 110

114. Is your country using the Bonn Guidelines when developing and drafting legislative, administrative or policy measures on access and benefit-sharing and/or when negotiating contracts and other arrangements under mutually agreed terms for access and benefit-sharing? (decision VII/19A)

a) No	
b) No, but steps being taken to do so (please provide details below)	
c) Yes (please provide details below)	X

Please provide details and specify successes and constraints in the implementation of the Bonn Guidelines.

India had developed and enacted the Biological Diversity Act, 2002 prior to the adoption of Bonn Guidelines.

115. Has your country adopted national policies or measures, including legislation, which address the role of intellectual property rights in access and benefit-sharing arrangements (i.e. the issue of disclosure of origin/source/legal provenance of genetic resources in applications for intellectual property rights where the subject matter of the application concerns, or makes use of, genetic resources in its development)?

a) No	
b) No, but potential policies or measures have been identified (please specify below)	
c) No, but relevant policies or measures are under development (please specify below)	
d) Yes, some policies or measures are in place (please specify below)	X
e) Yes, comprehensive policies or measures adopted (please specify below)	

Further information on policies or measures that address the role of IPR in access and benefit-sharing arrangements.

India has adopted legislative measures that address the role of IPRs in access and benefit sharing arrangements.

The Biological Diversity Act 2002 provides that NBA's approval is required before seeking IPR based on any research or information on a biological resource obtained from India. The NBA while granting approval may impose benefit sharing fee or royalty or both, or impose conditions including sharing of financial benefits arising out of the commercial utilization of such rights (Section 6.1 and 6.2). The NBA is also empowered to oppose grant of IPRs in any other country on biological resource or associated knowledge obtained or derived from India (Section 18.4).

The amended Patent Act provides for mandatory disclosure of the source and geographical origin of the biological material in the specification when used in an invention. Further, non-disclosure or wrongful disclosure of the source of biological material and any associated knowledge will result in opposition to grant of patent or revocation of patents.

116. Has your country been involved in capacity-building activities related to access and benefit-sharing?

a) Yes (please provide details below)	X
b) No	

Please provide further information on capacity-building activities (your involvement as donor or recipient, key actors involved, target audience, time period, goals and objectives of the capacity-building activities, main capacity-building areas covered, nature of activities). Please also specify whether these activities took into account the Action Plan on capacity-building for access and benefit-sharing adopted at COP VII and available in annex to decision VII/19F.

Govt. of India through its various Ministries and agencies like MoEF, DBT, ICAR, ICMR, CSIR, etc. organized / sponsored various trainings / workshop and capacity building programmes related to access and benefit sharing. Some such activities include:

1. NBRI (CSIR) hosted a three-day regional training on ABS in relation to Bioprospecting during 9-11 January 2005 at the behest of the IUCN, Regional Biodiversity Programme, Asia
2.Thematic working group Interactive sessions on ABS under NBSAP project –MoEF.
3. Capacity building on ABS promoted by National Innovation Foundation., Ahmedabad. The Honey Bee Network initiatives on Access and Benefit-sharing on local resources.
4. **Some of the other capacity building exercises have been drawn from the outcome of the studies with respect to Access and Benefit sharing which include:**

(i) 'The role of IPRs in the sharing of benefits arising from the use of biological resources and associated traditional knowledge-Selected case studies.' (Case study: India by Prof. Anil Gupta). A joint submission by WTPO and UNEP.

(ii) 'Sharing with Kanis: A case study from Kerala' by Anuradha, R.V. 1998.

(iii) 'Rewarding traditional knowledge and contemporary grassroots creativity: The role of IPRs' by Prof. Anil Gupta, 2000.

(iv) 'National Policy and Macrolevel Action Strategy or Biodiversity: India.' 1999.

(v) 'Recognising and rewarding common pool knowledge resources.' Prof. Madhav Gadgil, 2000.

Box LIV.

Please elaborate below on the implementation of this article and associated decisions specifically focusing on:

a) outcomes and impacts of actions taken;
b) contribution to the achievement of the goals of the Strategic Plan of the Convention;
c) contribution to progress towards the 2010 target;
d) progress in implementing national biodiversity strategies and action plans;
e) contribution to the achievement of the Millennium Development Goals;
f) constraints encountered in implementation.

a) Outcomes and impacts of actions taken

•Comprehensive legislations involving ABS in place
-Biological Diversity Act, 2002
-The Plant Varieties Protection & Farmers' Rights Act, 2001
-The Patent (Amendment) Act 2005
•Administrative and Policy measures taken on ABS-Implementation of ABS through National Biodiversity Authority, State Biodiversity Boards; Biodiversity Management Committees.
•Inventory of genetic resources and TK; measures and practices relating to ABS (MoEF, NBPGR/ICAR)

b) Contribution to the achievement of the goals of the Strategic Plan of Convention

•Practice of PIC & MATs on ABS in all biodiversity-related programmes at national level.
•Streamlining ABS through adoption of Bonn Guidelines
•Contributions to development of International regime on Access to Genetic Resources & Benefit-Sharing
-LMMC Delhi Declaration 2005
-CBD – Third Meeting of Adhoc-Working Group on ABS- Bangkok-February 2005
•Contributions made to defining the key terms related to ABS(Presented at the Third Meet of Ad-hoc Working Group on ABS, Bangkok, Feb. 2005)

Contribution to Progress towards the 2010 target: on ABS

•Action taken for wide implementation of the Bonn guidelines
•Contributions made to defining the key terms related ABS(Presented at the Third Meet of Ad-hoc Working Group on ABS, Bangkok, Feb. 2005)
•Contributions to the negotiations for developing an international regime in ABS(Third Meet of Ad-hoc Working Group on ABS, Bangkok, Feb. 2005)
•Measures taken for compliance of PIC and MATs on ABS-Legislative and policy measures on ABS-taken by MoEF and other agencies
•Capacity-building measures taken for implementation of ABS and related activities, including inventory of genetic resources and TK; Global Taxonomic Initiative, etc.

Article 16 - Access to and transfer of technology

117. ◆ On Article 16(1), has your country taken measures to provide or facilitate access for and transfer to other Parties of technologies that are relevant to the conservation and sustainable use of biological diversity or make use of genetic resources and do not cause significant damage to the environment?

a) No	X
b) No, but potential measures are under review	
c) Yes, some measures are in place (please provide details below)	
d) Yes, comprehensive measures are in place (please provide details below)	

Further information on the measures to provide or facilitate access for and transfer to other Parties of technologies that are relevant to the conservation and sustainable use of biodiversity or make use of genetic resources and do not cause significant damage to the environment.

The Biological Diversity Act 2002 provides that prior approval of NBA is required for transferring results of research relating to biological resources obtained from India. NBA's approval is also required before applying for IPRs based on bioresource or associated knowledge derived from India. Further, while granting approvals, the NBA may impose terms and conditions which *inter alia* may include transfer of technology.

118. ◆ On Article 16(3), has your country taken measures so that Parties which provide genetic resources are provided access to and transfer of technology which make use of those resources, on

mutually agreed terms?	
a) No	X
b) No, but potential measures are under review	
c) Yes, some measures are in place	
d) Yes, comprehensive legislation is in place	
e) Yes, comprehensive statutory policy or subsidiary legislation are in place	
f) Yes, comprehensive policy and administrative arrangements are in place	
g) Not applicable	

119. ◈ On Article 16(4), has your country taken measures so that the private sector facilitates access to joint development and transfer of relevant technology for the benefit of Government institutions and the private sector of developing countries?	
a) No	X
b) No, but potential measures are under review	
c) Yes, some policies and measures are in place (please provide details below)	
d) Yes, comprehensive policies and measures are in place (please provide details below)	
e) Not applicable	
Further information on the measures taken.	

Box LV.

Please elaborate below on the implementation of this article specifically focusing on: a) outcomes and impacts of actions taken; b) contribution to the achievement of the goals of the Strategic Plan of the Convention; c) contribution to progress towards the 2010 target; d) progress in implementing national biodiversity strategies and action plans; e) contribution to the achievement of the Millennium Development Goals; f) constraints encountered in implementation.

Programme of Work on transfer of technology and technology cooperation

120. Has your country provided financial and technical support and training to assist in the implementation of the programme of work on transfer of technology and technology cooperation? (decision VII/29)	
a) No	
b) No, but relevant programmes are under development	X
c) Yes, some programmes being implemented (please provide details below)	
d) Yes, comprehensive programmes being implemented (please provide details below)	
Further comments on the provision of financial and technical support and training to assist in the implementation of the programme of work on transfer of technology and technology cooperation.	
There are some programmes under consideration on the transfer of technology and technology cooperation by Department of Biotechnology, Department of Science and Technology, Ministry of Environment & Forests etc. A study is underway for identifying the technology transfer mechanisms in the area of selected biotechnology products among the SAARC countries by Biotech Consortium India Limited under the sponsorship of Ministry of External Affairs.	

121. Is your country taking any measures to remove unnecessary impediments to funding of multi-country initiatives for technology transfer and for scientific and technical cooperation? (decision VII/29)	
a) No	X
b) No, but some measures being considered	
c) Yes, some measures are in place (please provide details below)	
d) Yes, comprehensive measures are in place (please provide details below)	
Further comments on the measures to remove unnecessary impediments to funding of multi-country initiatives for technology transfer and for scientific and technical cooperation.	

122. Has your country made any technology assessments addressing technology needs, opportunities and barriers in relevant sectors as well as related needs in capacity building? (annex to decision VII/29)	
a) No	
b) No, but assessments are under way	X
c) Yes, basic assessments undertaken (please provide details below)	
d) Yes, thorough assessments undertaken (please provide details below)	
Further comments on technology assessments addressing technology needs, opportunities and barriers in relevant sectors as well as related needs in capacity building.	

123. Has your country made any assessments and risk analysis of the potential benefits, risks and associated costs with the introduction of new technologies? (annex to decision VII/29)	
a) No	
b) No, but assessments are under way	
c) Yes, some assessments undertaken (please provide details below)	X
d) Yes, comprehensive assessments undertaken (please provide details below)	
Further comments on the assessments and risk analysis of the potential benefits, risks and associated costs with the introduction of new technologies.	
Assessment and risk analysis of the potential benefits, risks and associated costs with the introduction of new technologies is done on a case by case basis. For example the introduction of Bt cotton, a genetically modified crop was done after detailed field trials, scientific risk assessments as well as socio-economic impact studies.	

124. Has your country identified and implemented any measures to develop or strengthen appropriate information systems for technology transfer and cooperation, including assessing capacity building needs? (annex to decision VII/29)	
a) No	
b) No, but some programmes are under development	X
c) Yes, some programmes are in place and being implemented (please provide details below)	
d) Yes, comprehensive programmes are being implemented (please provide details below)	
Further comments on measures to develop or strengthen appropriate information systems for technology transfer and cooperation.	

125. Has your country taken any of the measures specified under Target 3.2 of the programme of work as a preparatory phase to the development and implementation of national institutional, administrative, legislative and policy frameworks to facilitate cooperation as well as access to and adaptation of technologies of relevance to the Convention? (annex to decision VII/29)	
a) No	X
b) No, but a few measures being considered	
c) Yes, some measures taken (please specify below)	
d) Yes, many measures taken (please specify below)	
Further comments on the measures taken as a preparatory phase to the development and implementation of national institutional, administrative, legislative and policy frameworks to facilitate cooperation as well as access to and adaptation of technologies of relevance to the Convention.	

Box LVI.

Please elaborate below on the implementation of this article and associated decisions specifically focusing on:
a) outcomes and impacts of actions taken; b) contribution to the achievement of the goals of the Strategic Plan of the Convention; c) contribution to progress towards the 2010 target; d) progress in implementing national biodiversity strategies and action plans; e) contribution to the achievement of the Millennium Development Goals; f) constraints encountered in implementation.

Article 17 - Exchange of information

126. ◆ On Article 17(1), has your country taken measures to facilitate the exchange of information from publicly available sources with a view to assist with the implementation of the Convention and promote technical and scientific cooperation?

a) No	
b) No, but potential measures are under review	
c) Yes, some measures are in place	X
d) Yes, comprehensive measures are in place	

India has extensive networks among institutions across the country for information exchange. Some of these institutes have developed mechanisms with international organizations for exchange of publically available information towards implementation of the Convention and promote technical and scientific cooperation. For example, National Botanical Research Institute (NBRI), an institute under Council for Scientific and Industrial Research has signed an agreement with Global Biodiversity Information Facility (GBIF) for sharing herbarium specimen data via Internet. National Chemical Laboratory, Pune has undertaken 'Electronic cataloguing of Indian Fauna' sponsored by GBIF. Institute of Himalayan Bioresource Technology (IHBT) is a member of the Global Forest Information Service (GFIS) in Asia, which is a part of the International Union & Forest Organization (IUFRO). The FAO of UN sent the published literature of Indian Ocean Tuna Commission to NIO and the same was used to record in the standard bibliographic database format for input to ASFA (Aquatic Sciences and Fisheries Abstracts). Over 400 such publications are being analyzed.

The information on Traditional Knowledge Digital Library (TKDL) on Ayurveda is being exchanged with any person who is interested in this information. In fact, a demo CD containing a sample of 500 formulations is sent free of cost to those who are desirous of this information. Several delegations have visited National Institute of Science Communications and Information Resources (NISCAIR) for understanding TKDL and for replicating the TKDL model in their own countries for protecting their TK from misappropriation. A high level delegation from South Africa visited NISCAIR during the first week of December 2003 for creating a collaborative framework between India (CSIR) and South Africa on establishing TKDL for South Africa. A delegation from African Regional Industrial Property Organization (ARIPO) visited NISCAIR during 31st May to 4th June 2004 for understanding the TKDL and to use it as a model for creation of a TKDL for sixteen ARIPO Member States. Assistant Director General (legal policy and international affairs) of the International Property Office (IPO), Singapore visited NISCAIR, New Delhi on 5th March 2004 and the potential areas of collaboration viz. (i) patent examination and searches (ii) use of TKDL database by IPO, Singapore under the usual non-disclosure agreement clauses and (iii) training of persons from Singapore in the IPR-related activities, were discussed.

The following question (127) is for DEVELOPED COUNTRIES

127. ◈ On Article 17(1), do these measures take into account the special needs of developing countries and include the categories of information listed in Article 17(2), such as technical, scientific and socio-economic research, training and surveying programmes, specialized knowledge, repatriation of information and so on?	
a) No	
b) Yes, but they do not include the categories of information listed in Article 17(2), such as technical, scientific and socio-economic research, training and surveying programmes, specialized knowledge, repatriation of information and so on	
c) Yes, and they include categories of information listed in Article 17 (2), such as technical, scientific and socio-economic research, training and surveying programmes, specialized knowledge, repatriation of information and so on	

Box LVII.

Please elaborate below on the implementation of this article and associated decisions specifically focusing on:

a) outcomes and impacts of actions taken;
b) contribution to the achievement of the goals of the Strategic Plan of the Convention;
c) contribution to progress towards the 2010 target;
d) progress in implementing national biodiversity strategies and action plans;
e) contribution to the achievement of the Millennium Development Goals;
f) constraints encountered in implementation.

Exchange of results of technical, scientific and Socio-economic research as well information on training and survey programmes, specialized knowledge, indigenous and traditional knowledge have been useful in facilitating implementation of the Convention. However, the international exchange of information is still limited, and needs further strengthening.

Article 18 - Technical and scientific cooperation

128. ◈ On Article 18(1), has your country taken measures to promote international technical and scientific cooperation in the field of conservation and sustainable use of biological diversity?	
a) No	
b) No, but potential measures are under review	
c) Yes, some measures are in place (please provide details below)	X
d) Yes, comprehensive measures are in place (please provide details below)	

Further information on the measures to promote international technical and scientific cooperation.

International technical and scientific cooperation is encouraged for various biodiversity programmes in all the concerned Ministries. The Ministry of Environment & Forests is the nodal agency in the Government of India for various environmental related multilateral agreements and protocols. It also handles bilateral issues and matters pertaining to multilateral bodies. In addition the Ministry of Science and Technology through various departments such as Department of Science and Technology, Department of Biotechnology, Department of Ocean Development etc., is also undertaking several programmes to promote the international technical and scientific cooperation covering various aspects related to conservation and sustainable use of biological diversity.

In the area of sustainable development, several activities have been taken up which include Preparation of State of Environment (SoE) Report, Formulation of Sustainable Development Indicators (SDI), Formation of National Strategies for Sustainable Development, Global Public Goods, and Partnership for Sustainable Development. Some of the other initiatives include implementation of

an in-country programme by Council of Scientific and Industrial Research through National Botanical Research Institute and establishing an Indian botanic garden network, website for meeting the target of conservation of 20000 rare, endangered and threatened species worldwide by 2010 as defined in Global Strategy for Plant Conservation (GSPC). Institute of Himalayan Bioresource Technology is in collaboration with Rothamsted International, UK for understanding the genetic and chemical diversity in *Piccrorhiza kurroa* and some races of *Exobasidium vexans.* As a part of regional activity of Census of Marine Life (CoML), NIO has been identified as the regional node for Indian Ocean Census of Marine Life (IOCoML). IOCoML is to facilitate the collaborative research between Indian Ocean rim countries in biodiversity studies. NCL and NIO have jointly proposed a programme on Indian Ocean Biogeographic Information System (IndOBIS). Under IndOBIS the activity would confine to collection, validation and dissemination of biodiversity information of this region from published sources. International technical and scientific cooperations have so far been more frequent with third world countries particularly South East Asia, SAARC and ASEAN countries as per CSIR norms. Collaborative projects with Swedish International Development Agency (SIDA) are currently in progress at IFGTB, an institute of ICFRE at Coimbatore.

129. ◆ On Article 18(4), has your country encouraged and developed methods of cooperation for the development and use of technologies, including indigenous and traditional technologies, in pursuance of the objectives of this Convention?	
a) No	
b) No, but relevant methods are under development	
c) Yes, methods are in place	X

The methods of cooperation for the development and use of technologies including indigenous and traditional technologies have been encouraged in India through various government as well as non-government agencies. The funding of government is aimed towards improvement of indigenous technologies for research management and biodiversity conservation.

For example, Department of AYUSH, Government of India has identified NBRI to act as India's Nodal Centre for Asia Pacific Traditional Medicine Network (APTMNET) for developing a database and sharing of traditional knowledge. The IFGTB, within the Council at Coimbatore had collaborative projects on Conservation of Medicinal plants in Medicinal Plant Conservation Area in Natural Forests, identified by FRLHT, Bangalore (an NGO) and State Forest Departments, which was part of a Project funded by DANIDA. Collaborative programmes with ICAR Institutes, Agricultural Universities and other sister organization of ICFRE institutes have been established in implementing CBD strategies. Efforts are under way to get National Accession for the germ plasm collected for ex-situ conservation. National Innovation Foundation has been established to record the traditional knowledge, innovations and practices at the grass roots level for the purpose of product development and appropriation. Traditional Knowledge Digital Library has been set up to develop computerized databases of traditional knowledge.

Department of Biotechnology has set up four national gene banks for Medicinal and Aromatic plants to conserve endangered/threatened/rare species of proven medicinal value, those extensively used in traditional systems of medicine, taxa difficult to propagate and with R&D leads and economically important species.

130. ◆ On Article 18(5), has your country promoted the establishment of joint research programmes and joint ventures for the development of technologies relevant to the objectives of the Convention?	
a) No	
b) Yes (please provide some examples below)	X

Examples for the establishment of joint research programmes and joint ventures for the development of technologies relevant to the objectives of the Convention.

Establishment of joint research programmes and joint ventures for the development of technologies relevant to the objectives of the Convention is being promoted at both the national and international level. For example, CIMAP is a participating lab in INDO-ASEAN project and has been exchanging scientists for advanced training under various exchange programmes of the Government of India. Some programmes have been started in collaboration with Forest Department of Rajasthan for natural resource management and its impact on biodiversity and productivity.

A National Facility for Conservation of Endangered Species of Animals has been established at CCMB, Hyderabad (Jointly by DBT, CZA, MOEF and Government of Andhra Pradesh) in Jan. 2000

National Science & Technology Management Information System (NSTMIS) programme of Department of Science & Technology supports activities related to building science and technology information on national level.

131. Has your country established links to non-governmental organizations, private sector and other institutions holding important databases or undertaking significant work on biological diversity through the CHM? (decision V/14)	
a) No	
b) No, but coordination with relevant NGOs, private sector and other institutions under way	
c) Yes, links established with relevant NGOs, private sector and institutions	X

Links have been established by several organizations to NGOs, private sector and other institutions holding important databases for undertaking significant work on biological diversity. For example, National Botanical Research Institute has established linkage with the following global databases: The International Legume Database and Information Service (ILDIS) coordinated by the University of Reading, U.K. as per agreement and holds a World database of over 19000 legumes.

Botanic Garden Conservation International (BGCI) Global network database of over 2200 botanic gardens of the world.

The following question (132) is for DEVELOPED COUNTRIES

132. Has your country further developed the CHM to assist developing countries and countries with economies in transition to gain access to information in the field of scientific and technical cooperation? (decision V/14)	
a) No	
b) Yes, by using funding opportunities	
c) Yes, by means of access to, and transfer of technology	
d) Yes, by using research cooperation facilities	
e) Yes, by using repatriation of information	
f) Yes, by using training opportunities	
g) Yes, by using promotion of contacts with relevant institutions, organizations and the private sector	
h) Yes, by using other means (please specify below)	

Further comments on CHM developments to assist developing countries and countries with economies in transition to gain access to information in the field of scientific and technical cooperation.

133. Has your country used CHM to make information available more useful for researchers and decision-makers? (decision V/14)	
a) No	
b) No, but relevant initiatives under consideration	
c) Yes (please provide details below)	X

Further comments on development of relevant initiatives.

MOEF has set up an Environmental Information System (ENVIS) to collect and disseminate information to researchers and the public through a network of 72 centres in the country. Twelve of these centres can be accessed through e-mail. ENVIS functions as a National Focal Point and a Regional Service Centre for the South Asian Sub Region Countries for INFOTERRA network, a global information network of the UNEP. ENVIS has also been designated as the National Focal Point of Sustainable Development Network Programme of UNDP. ENVIS has been designated as the CHM for CBD in the country. It maintains a close liaison with the other national information systems like National Information System on Science and Technology (NISSAT) and Biotechnology Information System (BTIS).

134. Has your country developed, provided and shared services and tools to enhance and facilitate the implementation of the CHM and further improve synergies among biodiversity-related Conventions? (decision V/14)	
a) No	X
b) Yes (please specify services and tools below)	

Further comments on services and tools to enhance and facilitate the implementation of CHM and further improve synergies among biodiversity-related Conventions.

As mentioned above, MOEF has set up an Environmental Information System (ENVIS) as a plan programme and as a comprehensive network in environmental information collection, collation, storage, retrieval and dissemination to varying users, which include decision-makers, researchers, academicians, policy planners, research scientists, etc. ENVIS has been conceived as a distributed information network with the subject-specific centers to carryout the mandates and to provide the relevant and timely information to all concerned. ENVIS network consists of a chain of 72 subject-specific and State related Centres, called ENVIS Centres and are located in the notable organizations/institutions throughout the country. ENVIS is the designated CHM for CBD in India.

Major achievements of ENVIS are:

- Website of the Ministry (http://envfor.nic.in) developed by ENVIS Focal Point is continuously updated
- ENVIS Focal Point responded to approximately 500 queries and the ENVIS network partners about 14000 queries during the year 2004-2005.
- ENVIS Focal Point implemented the World Bank assisted Environment Management Capacity Building Technical Assistance Project (EMCBTAP) of the ENVIS sub-component which aimed at strengthening the ENVIS scheme of the Ministry by encompassing various subject-oriented thematic nodes and State nodes for association in the ENVIS network.
- A portal of ENVIS at http://www.envis.nic.in, launched earlier under EMCBTAP and connecting all the ENVIS network partners was regularly updated by the ENVIS Focal Point. The portal acts as a catalyst for inter-Centre interaction and for information on several broad categories of subject related to environment under which the Centres have been grouped.
- ENVIS Focal Point publishes 'Paryavaran Abstracts', reporting information on environmental research in India.
- Four issues of ENVIRONEWS, a quarterly newsletter was published with the objective of disseminating information on important policies, programmes and legislations.
- ENVIS also functions as a National Focal Point of the Global Information Network, INFOTERRA of UNEP.

In addition to the above there are other initiatives such as Comprehensive Traditional Knowledge Digital Library initiative, BIONET initiative and RMI through establishment of Gene Banks.

Box LVIII.

Please elaborate below on the implementation of this article and associated decisions specifically focusing on: a) outcomes and impacts of actions taken; b) contribution to the achievement of the goals of the Strategic Plan of the Convention; c) contribution to progress towards the 2010 target; d) progress in implementing national biodiversity strategies and action plans; e) contribution to the achievement of the Millennium Development Goals; f) constraints encountered in implementation.

Article 19 - Handling of biotechnology and distribution of its benefits

135. ◆ On Article 19(1), has your country taken measures to provide for the effective participation in biotechnological research activities by those Contracting Parties which provide the genetic resources for such research?	
a) No	X
b) No, but potential measures are under review	
c) Yes, some measures are in place	
d) Yes, comprehensive legislation are in place	
e) Yes, comprehensive statutory policy and subsidiary legislation are in place	
f) Yes, comprehensive policy and administrative measures are in place	

136. ◆ On Article 19(2), has your country taken all practicable measures to promote and advance priority access by Parties, on a fair and equitable basis, to the results and benefits arising from biotechnologies based upon genetic resources provided by those Parties?	
a) No	
b) No, but potential measures are under review	
c) Yes, some measures are in place	X
d) Yes, comprehensive measures are in place	

Box LIX.

Please elaborate below on the implementation of this article and associated decisions specifically focusing on: a) outcomes and impacts of actions taken; b) contribution to the achievement of the goals of the Strategic Plan of the Convention; c) contribution to progress towards the 2010 target; d) progress in implementing national biodiversity strategies and action plans; e) contribution to the achievement of the Millennium Development Goals; f)constraints encountered in implementation.

Article 20 – Financial resources

Box LX.

Please describe for each of the following items the quantity of financial resources, both internal and external, that have been utilized, received or provided, as applicable, to implement the Convention on Biological Diversity, on an annual basis, since your country became a Party to the Convention.	
a) Budgetary allocations by national and local Governments as well as different sectoral ministries	X National and state budgets have allocations for biodiversity conservation programmes.
b) Extra-budgetary resources (identified by donor agencies)	
c) Bilateral channels (identified by donor agencies)	X SIDA, DFID, Ford Foundation and several others
d) Regional channels (identified by donor agencies)	
e) Multilateral channels (identified by donor agencies)	X GEF through UNDP, UNEP and World Bank
f) Private sources (identified by donor agencies)	
g) Resources generated through financial instruments, such as charges for use of biodiversity	X Some resource generated e.g. through entry fees to National Parks and Wildlife Sanctuaries

Box LXI.

Please describe in detail below any major financing programmes, such as biodiversity trust funds or specific programmes that have been established in your country.

A Macro Picture of Budget Allocations on Biodiversity Conservation

YEAR	*AT THE NATIONAL LEVEL;MOEF*			AT THE ALL STATES LEVEL ($$)	
	Ratio of Total MOEF Annual Budgetary Allocation/ GDP (%)	Ratio of Forestry +Wildlife Budgetary Allocation/ GDP(%) (*)	Ratio of Ecology +Env. Budgetary Allocation /GDP (%) (**)	Ratio of Revenue Expenditure on Env. +Forest+ Ecology/Total Revenue Expenditure (%)(***)	Ratio of Capital Expenditure on Env. +Ecology+ Forestry/Total Capital Expenditure (****)
1986-87	5.1	2.9	2.1	2.99	2.27
1987-88	5.7	3.0	2.6	3.03	2.90
1988-89	5.5$	2.9$	2.5$	2.81	1.95
1989-90	5.3$	2.8$	2.4$	2.66	1.65
1990-91	5.2	2.7	2.4	2.60	1.56
1991-92	5.5	3.4	2.1	2.16	1.70
1992-93	5.2	3.0	2.1	1.93	2.06
1993-94	5.4	2.7	2.7	2.30	1.77
1994-95	4.5	2.3	2.1	2.17	1.81
1995-96	3.7	2.1	1.6	2.20	2.49
1996-97	4.3	1.7	2.5	2.08	2.84
1997-98	3.8	1.6	2.1	2.01	1.93
1998-99	3.5	1.7	1.8	2.20	2.10

Involvement of Donor Agencies in Forest/Biodiversity Conservation/Restoration

A. Projects under implementation

Sl. No.	Name of Project	Funding Agency	Project Cost (in million Rupees)	Duration of the project in years	Physical target (000 ha.)
1.	Maharashtra Forestry Project	World Bank	4315.1	8	369
2.	Andhra Pradesh forestry Project	World Bank	3539.2	6	355
3.	Tamil Nadu Afforestation Project	OECF (Japan)	4992.0	6	405
4.	Capacity Building Project for participatory Management	SIDA (Sweden)	85.0	2	19
5.	Dungarpur Integrated Wastelands Development Project	SIDA (Sweden	282.1	7	47
6.	Rehabilitation of Common Lands in Aravali's	EEC	481.5	10	33
7.	Afforestation & Pasture Development along in Indira Gandhi Canal	OECF (Japan)	1075.0	10	61.5
8.	Afforestation of Aravali Hills	OECF (Japan)	1766.9	7	115
9.	Western Ghat forestry Project	DFID (U.K)	842.0	7	61
10.	Forestry and Eco - development Project in Changer	GTZ (Germany	187.0	5	11
11	Forestry Project Kullu-Mandi	DFID (U.K)	139.2	6	7
12.	Uttar Pradesh Research Project	World Bank	2720.0	4	160
13.	Madhya Pradesh Forestry Project	World Bank	2459.4	5	235

Sl. No.	Name of Project	Funding Agency	Project Cost (in million Rupees)	Duration of the project in years	Physical target (000 ha.)
14.	Rajasthan Forestry Project	OECF (Japan)	1391.8	5	55
15.	Integrated Gujarat Forestry Development Project	OECF (Japan)	6085	6	230
16.	Eastern Karnataka Afforestation Project	OECF (Japan)	5655.4	6	171
17.	Punjab Afforestation Project	OECF (Japan)	4420*	8	59
18.	Kerala Forestry Project	World Bank	1830	4	54
19.	Capacity Building Project for Rehabilitation of Degraded forests through Land Scape Participatory Programme	AUSAID (Australia)	11.7	3	
	Grand Total		42,278.3		2447

Note: Invariably these are the projects funded in the 90's
*Loan amount has been provided for four years only in the first phase.

137. ◆ On Article 20(1), has your country provided financial support and incentives to those national activities that are intended to achieve the objectives of the Convention?	
a) No	
b) Yes, incentives only (please provide a list of such incentives below)	
c) Yes, financial support only	
d) Yes, financial support and incentives (please provide details below)	X
Further comments on financial support and incentives provided.	

The next question (138) is for DEVELOPED COUNTRIES

138. ◆ On Article 20(2), has your country provided new and additional financial resources to enable developing country Parties to meet the agreed incremental costs to them of implementing measures which fulfill the obligations of the Convention?	
a) No	
b) Yes (please indicate the amount, on an annual basis, of new and additional financial resources your country has provided)	
Further comments on new and additional financial resources provided.	

The next question (139) is for DEVELOPING COUNTRIES OR COUNTRIES WITH ECONOMIES IN TRANSITION

139. ◆ On Article 20(2), has your country received new and additional financial resources to enable it to meet the agreed full incremental costs of implementing measures which fulfill the obligations of the Convention?	
a) No	
b) Yes	

140. ◆ Has your country established a process to monitor financial support to biodiversity, including support provided by the private sector? (decision V/11)	
a) No	
b) No, but procedures being established	X
c) Yes (please provide details below)	
Further comments on processes to monitor financial support to biodiversity, including support provided by the private sector.	

141. ◆ Has your country considered any measures like tax exemptions in national taxation systems to encourage financial support to biodiversity? (decision V/11)	
a) No	
b) No, but exemptions are under development (please provide details below)	X
c) Yes, exemptions are in place (please provide details below)	
Further comments on tax exemptions for biodiversity-related donations.	
Some of the relevant provisions include several exemptions from Excise duties (e.g., on use of flyash, photo-gypsum, electrical vehicles, use of LNG, customs duty exemptions on components of membrane cell technology, exemption from Capital Gain taxes on shifting away from urban sites, soft loan on pollution control devices etc.	

142. Has your country reviewed national budgets and monetary policies, including the effectiveness of official development assistance allocated to biodiversity, with particular attention paid to positive incentives and their performance as well as perverse incentives and ways and means for their removal or mitigation? (decision VI/16)	
a) No	
b) No, but review is under way	X
c) Yes (please provide results of review below)	
Further comments on review of national budgets and monetary policies, including the effectiveness of official development assistance.	

143. Is your country taking concrete actions to review and further integrate biodiversity considerations in the development and implementation of major international development initiatives, as well as in national sustainable development plans and relevant sectoral policies and plans? (decisions VI/16 and VII/21)	
a) No	
b) No, but review is under way	X
c) Yes, in some initiatives and plans (please provide details below)	
d) Yes, in major initiatives and plans (please provide details below)	
Further comments on review and integration of biodiversity considerations in relevant initiatives, policies and plans.	

144. Is your country enhancing the integration of biological diversity into the sectoral development and assistance programmes? (decision VII/21)	
a) No	
b) No, but relevant programmes are under development	
c) Yes, into some sectoral development and assistance programmes (please provide details below)	X
d) Yes, into major sectoral development and assistance programmes (please provide details below)	
Further comments on the integration of biodiversity into sectoral development and assistance programmes	

Joint Forest Management program under forestry is enhancing the integration of biodiversity conservation.

For more such sectoral links see the table below.

Production Sectors Relevant for Biodiversity Conservation

Pharmaceutical	• Equitable sharing of benefits from the use of bio-resources and related knowledge • Access to biological resources for collection, use, and transfer • Technology transfer
Agriculture	• Use of genetic resources for agriculture • Minimizing the use of agrochemicals affecting biodiversity • Use of living modified organisms from biotechnology determined to be safe
Forestry	• Use a diversity of native species, rather than monocultures and exotics, in afforestation • Avoidance of chemicals • Linking industries with farmers, for provision of raw materials in ways that are sustainable and do not displace small farmers or food-producing lands • R&D for non-wood alternatives to reduce demand on forests
Fishery	• Sustainable use of marine resources and 'mariculture' practices. • Priority to small-scale fisherfolk over large-scale commercial ventures.
Petroleum	• Access to land, marine and coastal areas • Detailed environmental impact assessments (EIAs)
Manufacture/Retail	• Public interest in biodiversity-friendly products. • Appropriate technology transfer • Pollution control measures in manufacturing process • Boost to small-scale biodiversity enterprises

The next question (145) is for DEVELOPED COUNTRIES

145. Please indicate with an "**X**" in the table below in which area your country has provided financial support to developing countries and/or countries with economies in transition. Please elaborate in the space below if necessary.

A r e a s	**Support provided**
a) Undertaking national or regional assessments within the framework of MEA (decision VI/8)	
b) *In-situ* conservation (decision V/16)	
c) Enhance national capacity to establish and maintain the mechanisms to protect traditional knowledge (decision VI/10)	
d) *Ex-situ* conservation (decision V/26)	
e) Implementation of the Global Strategy for Plant Conservation (decision VI/9)	
f) Implementation of the Bonn Guidelines (decision VI/24)	
g) Implementation of programme of work on agricultural biodiversity (decision V/5)	
h) Preparation of first report on the State of World's Animal Genetic Resources (decision VI/17)	
i) Support to work of existing regional coordination mechanisms and development of regional and sub regional networks or processes (decision VI/27)	
j) Development of partnerships and other means to provide the necessary support for the implementation of the programme of work on dry and subhumid lands biological diversity (decision VII/2)	
k) Financial support for the operations of the Coordination Mechanism of the Global Taxonomy Initiative (decision VII/9)	
l) Support to the implementation of the Action Plan on Capacity Building as contained in the annex to decision VII/19 (decision VII/19)	
m) Support to the implementation of the programme of work on mountain biological diversity (decision VII/27)	
n) Support to the implementation of the programme of work on protected areas (decision VII/28)	
o) Support to the development of national indicators (decision VII/30)	
p) Others (please specify)	

Further information on financial support provided to developing countries and countries with economies in transition.

The next question (146) is for DEVELOPING COUNTRIES OR COUNTRIES WITH ECONOMIES IN TRANSITION

146. Please indicate with an "**X**" in the table below in which areas your country has applied for funds from the Global Environment Facility (GEF), from developed countries and/or from other sources. The same area may have more than one source of financial support. Please elaborate in the space below if necessary.

Areas	**Applied for funds from**		
	GEF	**Bilateral**	**Other**
a) Preparation of national biodiversity strategies or action plans	***X***		
b) National capacity self-assessment for implementation of Convention (decision VI/27)	***X***		
c) Priority actions to implement the Global Taxonomy Initiative (decision V/9)			
d) *In-situ* conservation (decision V/16)	***X***		
e) Development of national strategies or action plans to deal with alien species (decision VI/23)			
f) *Ex-situ* conservation, establishment and maintenance of *Ex-situ* conservation facilities (decision V/26)			
g) Projects that promote measures for implementing Article 13 (Education and Public Awareness) (decision VI/19)	***X***		
h) Preparation of national reports (decisions III/9, V/19 and VI/25)	***X***		
i) Projects for conservation and sustainable use of inland water biological diversity (decision IV/4)			
j) Activities for conservation and sustainable use of agricultural biological diversity (decision V/5)	***X***		
k) Implementation of the Cartagena Protocol on Biosafety (decision VI/26)	***X***		
l) Implementation of the Global Taxonomy Initiative			
m) Implementation of the Addis Ababa Principles and Guidelines for the Sustainable Use of Biodiversity			
n) Others (please specify)			

Further information on application for financial support.

Box LXII.

Please elaborate below on the implementation of this article and associated decisions specifically focusing on:

a) outcomes and impacts of actions taken;

b) contribution to the achievement of the goals of the Strategic Plan of the Convention;

c) contribution to progress towards the 2010 target;

d) progress in implementing national biodiversity strategies and action plans;

e) contribution to the achievement of the Millennium Development Goals;

f) constraints encountered in implementation.

D. THEMATIC AREAS

147. Please use the scale indicated below to reflect the level of challenges faced by your country in implementing the thematic programmes of work of the Convention (marine and coastal biodiversity, agricultural biodiversity, forest biodiversity, inland waters biodiversity, dry and sub-humid lands and mountain biodiversity).

3 = High Challenge	1 = Low Challenge
2 = Medium Challenge	0 = Challenge has been successfully overcome
N/A = Not applicable	

Challenges	Programme of Work					
	Agricultural	Forest	Marine and coastal	Inland water ecosystem	Dry and subhumid lands	Mountain
(a) Lack of political will and support	1	1	1	1	1	1
(b) Limited public participation and stakeholder involvement	1	2	2	2	3	2
(c) Lack of main-streaming and integration of biodiversity issues into other sectors	1	2	2	2	2	2
(d) Lack of precautionary and proactive measures	2	2	2	2	2	2
(e) Inadequate capacity to act, caused by institutional weakness	1	2	2	1	2	2
(f) Lack of transfer of technology and expertise	1	2	2	1	2	2
(g) Loss of traditional knowledge	1	1	2	2	2	2
(h) Lack of adequate scientific research capacities to support all the objectives	1	2	2	1	2	1

(i) Lack of accessible knowledge and information	1	1	2	1	2	2
(j) Lack of public education and awareness at all levels	1	2	2	2	2	2
(k) Existing scientific and traditional knowledge not fully utilized	1	1	2	2	2	2
(l) Loss of biodiversity and the corresponding goods and services it provides not properly understood and documented	1	2	3	2	3	2
(m) Lack of financial, human, technical resources	1	3	3	2	3	2
(n) Lack of economic incentive measures	2	2	1	2	2	2
(o) Lack of benefit-sharing	1	2	1	2	2	2
(p) Lack of synergies at national and international levels	1	1	2	1	1	2
(q) Lack of horizontal cooperation among stakeholders	1	2	2	1	2	2
(r) Lack of effective partnerships	1	2	2	2	2	2
(s) Lack of engagement of scientific community	1	1	2	2	2	2
(t) Lack of appropriate policies and laws	1	1	1	1	1	1
(u) Poverty	3	3	2	2	3	2
(v) Population pressure	3	3	2	2	3	2
(w) Unsustainable consumption and production patterns	1	2	2	2	2	3
(x) Lack of capacities for local communities	1	2	2	2	2	2
(y) Lack of knowledge and practice of ecosystem-based approaches to management	2	2	2	2	3	3
(z) Weak law enforcement capacity	1	2	2	2	2	2
(aa) Natural disasters and environmental change	2	2	3	2	2	2

(bb) Others (please specify)						

Inland water ecosystems

148. Has your country incorporated the objectives and relevant activities of the programme of work into the following and implemented them? (decision VII/4)

Strategies, policies, plans and activities	No	Yes, partially, integrated but not implemented	Yes, fully integrated and implemented	N/A
a) Your biodiversity strategies and action plans		X		
b) Wetland policies and strategies		X		
c) Integrated water resources management and water efficiency plans being developed in line with paragraph 25 of the Plan of Implementation of the World Summit on Sustainable Development		X		
d) Enhanced coordination and cooperation between national actors responsible for inland water ecosystems and biological diversity		X		

Further comments on incorporation of the objectives and activities of the programme of work

Several wide ranging policies, strategies and action plans have been formulated by Government of India, which directly or indirectly support wetland conservation in India. The National Conservation Strategy and Policy Statements on Environment and Development (1992) highlights conservation and sustainable development of wetlands, including coastal areas, riverine and island ecosystems. The National Forest Policy and the National Wildlife Action Plan emphasize conservation of wildlife on scientific principles of evolution and genetics, as well as social and cultural ethos of the county. Specific provisions have been made under the National Water Policy (2002) for considering ecological requirements in prioritizing water use.

fective linkages have been developed with the government agencies concerned with water resources management, fisheries, agriculture and rural development for conservation and sustainable livelihoods of the communities living in and around the wetlands. Multi-stakeholder approach involving concerned government agencies, NGOs, and community organizations has been elaborately adopted by wetland authorities involved in the management of various lakes. Planning Commission the apex planning authority in India have played important role in supporting multi-sectoral initiatives for mainstreaming of wetlands into developmental planning.

Some of the specific programmes are listed below.

- For conservation and management of wetlands of the country, India is implementing a comprehensive programme since 1987. The basic objective of the programme is assessment of wetland resources, identification of wetlands of national importance, promotion of R&D activities and formulation and implementation of management action plans of the identified wetlands. At present, 66 wetlands have been identified covering 21 states in the country. Activities under these management action plans include survey and demarcation, catchment area treatment, de-siltation, weed control, fisheries development, biodiversity conservation, community participation, water management, public awareness, pollution abetment etc. The main focus for wetland conservation is now on biological methods of conservation than engineering options under the catchment area treatment component. Further the main thrust is on water shed management and activities aimed at involving close participation of stake holders in order to involve them in decision making processes of wetland conservation in a sustainable manner.

  Another important component of management action plans is conservation of endangered and

threatened species. Several programmes have been initiated by the Ministry of Environment and Forests for the conservation of wildlife under in-situ conditions and supplemented through ex-situ conservation measures in identified cases. Some of the endangered species particularly Rhinoceros and Sangai - the brow antlered deer have been reintroduced in the wetlands. Certain portions of Chilika, Kabar and Loktak wetlands have been declared as sanctuaries especially for the protection and conservation of wildlife. Construction of mounds and ponds has also been undertaken in some wetlands for developing them as suitable waterfowl habitats.

- Guidelines for sustainable development and management of brackish water aquaculture have been drawn up. Some State Governments have also developed their own aquaculture guidelines and regulatory measures in the coastal zone areas.
- A National Lakes Conservation Plan for the restoration and conservation of polluted and degraded land and other similar bodies has been initiated. So far works on 28 lakes have been taken up under this project.
- The National River Conservation Directorate of the MoEF is engaged in implementing the National River Action Plan to improve the water quality of the rivers, which are the major fresh water sources in the country. So far a total of 31 rivers have been covered under the programme.
- Awareness building is one of the important components of the management action plans. Several activities have been undertaken by the State Governments of Punjab, Orissa, Jammu & Kashmir, Madhya Pradesh, Himachal Pradesh, Manipur and Kerala to build awareness among various target groups including school children, youth and major stakeholder groups through audiovisuals, posters, nature camps, films etc.
- India has designated 10 Ramsar Sites viz. Keoladeo National Park, Chilika Lake, Loktak Lake, Wular Lake, Sambhar Lake and Harike Lake. Action has been initiated to designate 25 more wetlands as Ramsar sites.
- Ministry of Environment and Forests has prepared a directory on Wetlands of India in 1990 based on questionnaire survey, which includes information on location, geographical coordinates, area and ecological category of wetlands over 100 ha in different states and union territories. As per the Directory of Wetlands in India, there are 2,167 natural wetlands and 65,253 manmade wetlands occupying an area of 4.1 million hectares. According to the latest survey carried out in 1995 the total mangrove area in the country is 4,533 sq km. About 80% of mangrove forests occur in Sundarbans and Andaman and Nicobar Islands. The rest being distributed in the coastal States of Orissa, Andhra Pradesh, Tamil Nadu, Karnataka, Maharashtra, Gujarat and Goa. A preliminary analysis of the project report on Wetlands of India indicates the total area of wetlands in the country as 7.6 million ha, out of which 3.6 million ha are inland and the rest coastal. Several projects have been sanctioned by the Ministry for inventorisation of wetland resources at the state and district levels.
- India is also implementing a GEF project on conservation and sustainable use of globally significant threatened wetlands of India.
- Celebration of World Wetland Day is being taken up as an important event for spreading awareness on wetlands e.g. Chilika & Loktak. These initiatives have been supported by the MoEF through wetland authorities, like Loktak Development Authority, Chilika Development Authority. Beyond World Wetland Day, several local initiatives have come up as a response to these initiatives. For example, celebration of Loktak Day by the local communities.

149. Has your country identified priorities for each activity in the programme of work, including timescales, in relation to outcome oriented targets? (decision VII/4)	
a) No	
b) Outcome oriented targets developed but priority activities not developed	
c) Priority activities developed but not outcome oriented targets	
d) Yes, comprehensive outcome oriented targets and priority activities developed	X

Further comments on the adoption of outcome oriented targets and priorities for activities, including providing a list of targets (if developed).

As mentioned in response to question 148, 66 wetlands have been identified for intensive conservation and management purposes under the National Wetland Programme of the Govt of India. Successful models have been developed for conservation and sustainable development of Loktak and Chilika. Strategies developed and experiences gained would be applied in the remaining wetlands in a phased manner taking representative of diverse wetland ecosystems. In addition consultative workshops organized in different regions of country have identified key issues of wetlands which would be addressed through integrated conservation and development plans.

150. Is your country promoting synergies between this programme of work and related activities under the Ramsar Convention as well as the implementation of the Joint Work Plan (CBD-Ramsar) at the national level? (decision VII/4)	
a) Not applicable (not Party to Ramsar Convention)	
b) No	
c) No, but potential measures were identified for synergy and joint implementation	
d) Yes, some measures taken for joint implementation (please specify below)	X
e) Yes, comprehensive measures taken for joint implementation (please specify below)	

Further comments on the promotion of synergies between the programme of work and related activities under the Ramsar Convention as well as the implementation of the Joint Work Plan (CBD-Ramsar) at the national level.

There is a close coordination between implementing unit of Ramsar with that of CBD at national level. India took a lead role in formulation of Ramsar guidelines on integration of wetlands into river basin management. As a follow up of this, CBD-Ramsar River Basin Initiative was undertaken and a joint programme was developed for integrated management of wetlands, biological diversity and river basin which operates through cross-sectoral partnership and local, country at national level. The synergy between CBD and Ramsar conventions in India has helped to integrate various developmental sectors into planning process at River Basin level for management of wetlands.

The models developed for Loktak and Chilika have been extensively used at the regional level to demonstrate successful stakeholder led wetland conservation and management. The management of these wetlands involved extensive consultations at various levels; particularly through elaborate social processes to identify the problems and implement restoration measures. This helped to generate awareness at various levels in the sustainable development of the wetland which was used as a practical example for Communication Education and Public Awareness initiative undertaken by the Ramsar Convention.

Restoration of Chilika lake through effective water management, community participation and providing sustain economic benefits to the community dependent upon these resources for their sustenance was carried out by the Government of Orissa, through the support of MoEF, Wetlands International, NGOs and local communities. Restoration of Chilika lake was an example of application of successful model for rehabilitation of biodiversity and livelihood support to a large community dependent upon the lake. Ramsar award was conferred to Chilika Development Authority

for this exemplary wetland restoration model.

151. Has your country taken steps to improve national data on: (decision VII/4)

Issues	Yes	No	No, but development is under way
a) Goods and services provided by inland water ecosystems?	X		
b) The uses and related socioeconomic variables of such goods and services?	X		
c) Basic hydrological aspects of water supply as they relate to maintaining ecosystem function?	X		
d) Species and all taxonomic levels?	X		
e) On threats to which inland water ecosystems are subjected?	X		

Further comments on the development of data sets, in particular a list of data sets developed in case you have replied "**YES**" above.

Development of datasets on the subjects listed above is again undertaken as part of conservation activities by the concerned organizations. Some of these activities are as follows:

a) Economic evaluation of ecosystem processes and functions of inland water systems and impacts of developmental activities on the ecosystem services for Harike , Loktak , River Yamuna Floodplains, Bhoj Wetlands and Chika was carried out for development of policy and resource allocation plans. The studies carried out have highlighted the significance of environmental flows for maintaining biodiversity and ecosystem integrity to ensure long term benefits.

b) Scenario approach was adopted in case of Loktak Lake for balancing socio-economic benefits with goods and services provided by the wetland. Based on the detailed analysis, a barrage operation policy was developed to optimize power generation while maintaining the ecosystem processes and functions to deliver goods and services provided by the wetland. The negotiations are still going on with the hydro-power agency to resolve the water allocation policy.

c) Environmental flow assessment study was carried out by CDA in collaboration with Wetlands International and international experts to assess the impacts of Naraj Barrage and determine optimum fresh water flows required for maintaining salinity regimes in Chilika and agriculture productivity to the flood plain by allowing lateral flow of sediments.

d) The Government of India along with the UNDP in its country cooperation framework (CCF-1), executed a project "Inland Wetlands of India" through the Salim Ali Centre for Ornithology and Natural History (SACON) to identify and generate baseline information on inland wetlands and broad-basing wetland conservation by evolving a 'National Network of Inland Wetland Conservation Areas'. Overall 730 species of angiosperm, 803 species of fish, 23 species of fresh water turtle, 325 species of birds have been recorded from freshwater systems covering an area of 58.4 m ha. Out of the species recorded 114 plants have been found endemic to the region. The survey indicated that 102 species of fishes, 16 species of turtles and 26 species of birds are threatened.

e) Asian Waterfowl bird census periodically monitors changes in species and population of birds. These efforts are being further strengthened through the IBA programme coordinated by BNHS. BNHS has identified 65 Important Bird Areas (IBAs) and have carried out bird migration studies for Chilika, Harike, Keoladeo National Park and Point Calimare.ZSI & WII have carried out extensive inventorization of different of waterbird and other wildlife. Asian Waterbird Census is carried out periodically by Wetlands international in collaboration with BNHS in India. Efforts undertaken for conservation of migratory bird species through network of sites under Central Asian Flyways (CAF)

152. Has your country promoted the application of the guidelines on the rapid assessment of the biological diversity of inland water ecosystems? (decision VII/4)

a) No, the guidelines have not been reviewed	
b) No, the guidelines have been reviewed and found inappropriate	
c) Yes, the guidelines have been reviewed and application/promotion is pending	
d) Yes, the guidelines promoted and applied	

Further comments on the promotion and application of the guidelines on the rapid assessment of the biological diversity of inland water ecosystems.

Box LXIII.

Please elaborate below on the implementation of this programme of work and associated decisions specifically focusing on: a) outcomes and impacts of actions taken; b) contribution to the achievement of the goals of the Strategic Plan of the Convention; c) contribution to progress towards the 2010 target; d) progress in implementing national biodiversity strategies and action plans; e) contribution to the achievement of the Millennium Development Goals; f) constraints encountered in implementation.
Awareness at all levels on conservation and wise use of wetland resources has improved considerable by the actions taken so far in the country. Successful initiatives, as restoration of Chilika Lake, Orissa have led to development of model case studies on conservation of wetland resources, which are being replicated in other representative wetlands. Measures undertaken at the national level for conservation and wise use of wetlands have significantly contributed to achievements of the goals of the strategic plan of the CBD. Basin level wetland conservation plans and strategies have helped to promote cross sectoral planning for conservation and sustainable use of these ecosystems, particularly in the Mahanadi and Brahmaputra river basin, which are being further expanded to other priority regions of India. Inventorization of wetlands carried out through involvement of various agencies is improving information on status and trends of wetland ecosystems, which is a providing key inputs into wetland policy formulation. Effective use of GIS technologies is leading to improved database for several key wetland sites. An effective example is the Loktak Atlas published by Wetlands International and Loktak Development Authority, which contains detailed information on hydrological, ecological and socio economic aspects of the wetland and its catchments. Management Action Plans prepared for biodiversity rich habitats, particularly for rare and endemic species, e.g. Keibul Lamjao National Park, Manipur; Nalabana Bird Sanctuary shall lead to improved conservation status of these habitats. Conservation and management plans presently under implementation shall lead to reduction in the rate of biodiversity loss in the wetlands and their associated catchments, thereby significantly contributing to 2010 target. Wide ranging consultation processes have been initiated for formulation of national wetland policy, national biodiversity strategy and national environmental policy. Wetland conservation and wise use has strong linkages with improving livelihoods of the wetland dependant communities. Significant models are also emerging on enhancement of socioeconomic status of communities dependant on wetland communities through augmentation of resource base, demonstrated effectively in Chilika Lake where hydrological intervention for lake restoration has led to livelihood improvement of communities living in and around Chilika through increased incomes and reduced migration. Application of tools of wetland economic evaluation is also being carried out for integrating the values and functions of wetland ecosystems into planning for livelihood security and poverty reduction. These measures contribute significantly to achievement of MDGs. Experiences gained on problems and issues of wetland ecosystems need to be integrated into formulation of river basin level action plans for priority wetland ecosystems. Case studies from representative ecoregions need to be taken up , and efforts made to mainstream wetlands into national and state level developmental planning.

Marine and coastal biological diversity

General

153. Do your country's strategies and action plans include the following? Please use an "**X**" to indicate your response. (decisions II/10 and IV/15)	
a) Developing new marine and coastal protected areas	X
b) Improving the management of existing marine and coastal protected areas	X
c) Building capacity within the country for management of marine and coastal resources, including through educational programmes and targeted research initiatives (if yes, please elaborate on types of initiatives in the box below)	X
d) Instituting improved integrated marine and coastal area management (including catchments management) in order to reduce sediment and nutrient loads into the marine environment	X
e) Protection of areas important for reproduction, such as spawning and nursery areas	X
f) Improving sewage and other waste treatment	X
g) Controlling excessive fishing and destructive fishing practices	X
h) Developing a comprehensive oceans policy (if yes, please indicate current stage of development in the box below)	X
i) Incorporation of local and traditional knowledge into management of marine and coastal resources (if yes, please elaborate on types of management arrangements in the box below)	X
j) Others (please specify below)	
k) Not applicable	

Please elaborate on the above activities and list any other priority actions relating to conservation and sustainable use of marine and coastal biodiversity.

India is taking adequate measures to conserve the coastal and marine biodiversity. It is conducting meetings, conferences and workshops to identify the current issues and take measures to solve problems. The Coastal Regulation Zone Notification prohibits the developmental activities in coastal areas, and disposal of wastes in the mangrove and coral reef areas and thereby protecting them and their associated biodiversity.

The priority actions are elaborated as follows:

a) The area under protected areas in Islands and Coastal bio-geographic zones is proposed to be increased from 18.5% to 36.14% and from 6.16% to 7.12% of the geographical area, respectively.
b) Effective management of protected areas including marine & coastal protected areas is one of the key strategies under the National Wildlife Action Pan (NWAP), 2002.
c) Government of India through its various Ministries and Departments is taking adequate capacity building activities throughout the country for the effective management of bioresources in general and marine and coastal resources in particular. Ministry of Environment and Forests, Government of India is operating a specific programme called "All India coordinated project on coastal and marine biodiversity" which is promoting research in three major areas viz. survey and inventorization, capacity building and database development. It also extends support to conduct periodical training programmes for the school and college teachers, forest officials and research scholars on estimation of bioresources in the critical habitats like mangroves and coral reefs. Training courses are organized regularly at Wildlife Institute of India, Dehradun for protected areas managers. Besides this, the Bioresources Board of the Department of Biotechnology is also supporting to conduct summer vacation training programmes for

school children at various places on different themes including coastal and marine biodiversity. Department of Ocean Development and Indian Council of Agricultural Research are also supporting short-term training programmes, targeting different stakeholders. Further the United Nations University and UNESCO help hold annual mangrove biodiversity assessment training programmes in which participants from Southeast Asian countries take part. Several national institute such as WII, SACON, ZSI & BSI under MOEF, NIOT, NCAOR, CMLRE & ICMAM-PD under DOD, NIO & CSMCRI under CSIR, CMFRI under ICAR and Universities CSIR are involved in capacity building and conducting targeted research on marine and coastal resources. Specific Ocean Science and Technology Cells (OSTCs) of the DOD have been established in various universities to conduct research and for man power development in various fields of marine science, such as coastal ecology, mariculture, marine biology, marine microbiology, marine benthos etc.

d) Implementation of integrated marine and coastal area management in order to reduce sediment and nutrient loads into the marine environment is already in practice in certain coastal & marine ecosystems. Chilika the largest brackish water lagoon of India is a pioneer in this regard where Chilika Development Authority (CDA) is managing the area in an integrated way. The area which was included in the Montreaux list (Ramsar Sites in danger) was removed from it in 2001 because of concerted efforts of CDA. The Draft National Environment Policy, (NEP), 2004 also calls for sustainable management of mangroves and other marine/coastal habitats. State wise Coastal Management Plans have also been prepared under Coastal Regulation Zone Notification.

e) The coastal zone & marine protected areas are serving as areas for reproduction of aquatic fauna particularly fishes. In Sunderbans the largest expanse of mangroves after declaring the inner areas as National Park for affording high degree of protection the fish catch has increased in the surrounding areas because of undisturbed spawning & nursery areas in the National Park.

f) Improving sewage and other waste treatment is the priority area and Coastal Zone Regulations are in place to check sewage & other waste treatment. The NEP, 2004 also calls for strengthening mechanisms to control such pollution.

g) The National Wild Life Action Plan, 2002 calls for revision of fishing laws & their effective implementation. In Chilika because of concerted efforts of CDA fish landing actually increased due to control of excessive & destructive fishing practices.

h) The Government of India came out with an Ocean Policy Statement in 1982, which has been the guiding principle in several initiatives to develop ocean science and technology, increase knowledge about our marine resources and their proper use. To further coordinate the work of multiform agencies in the ocean sector and activities undertaken in this sector, efforts are on to establish an Ocean Resource Commission.

i) The draft National Biodiversity Strategy and Action Plan, 2002 and the National Wild Life Action Plan, 2002 call for the utilization of traditional knowledge in Management Plans. Almost 60% of the coastal fish catch is carried out by fishermen using local crafts, gears and techniques. In the day-to-day management of coastal resources of marine Protected Areas and in the tourism activities, local and traditional knowledge is used.

Implementation of Integrated Marine and Coastal Area Management

154. Has your country established and/or strengthened institutional, administrative and legislative arrangements for the development of integrated management of marine and coastal ecosystems?	
a) No	
b) Early stages of development	
c) Advanced stages of development	
d) Arrangements in place (please provide details below)	X
e) Not applicable	

Further comments on the current status of implementation of integrated marine and coastal area management.

The Ministry of Environment and Forests has set up an administrative arrangement for the development of integrated management of marine and coastal ecosystem and has identified suitable institutions for undertaking scientific research in this area. The legislative measures include Wildlife Protection Act, Coastal Regulation Zone Notification, Notified Marine Protected Areas & Marine

Biosphere Reserve etc. Chilika example clearly demonstrate the effectiveness of the measures taken so far in the country. Setting up of Chilika Development Authority (CDA) in 1992 was the major step in integrated management of this important coastal/marine ecosystem. CDA adopted scientific approach and brought all the stakeholders on one platform. Because of the integrated management approach Chilika was removed from Montreux record in 2001 and in 2002, it was given Ramsar Wetland Conservation award. Like Chilika Development Authority. Gulf of Mannar Biosphere Reserve, Sunderban Biosphere Reserve and Great Nicobar Biosphere Reserve are also now realities.

155. Has your country implemented ecosystem-based management of marine and coastal resources, for example through integration of coastal management and watershed management, or through integrated multidisciplinary coastal and ocean management?

a)	No	
b)	Early stages of development	
c)	Advanced stages of development	
d)	Arrangements in place (please provide details below)	X
e)	Not applicable	

Further comments on the current status of application of the ecosystem to management of marine and coastal resources.

India is implementing the integrated coastal area management through the Coastal Regulation Zone Notification 1991 which has provisions to protect the critical marine and coastal ecosystems, including mangroves and coral reefs. This Notification controls the discharge of aquaculture drainage water and other industrial wastes into the mangrove and coral reef areas, prevents coral mining and regulates setting up of aquaculture ponds in the coastal areas and other developmental activities which can cause adverse impacts on the marine and coastal ecosystems. To protect the marine and coastal habitat and endangered marine species, legal provisions are in place to create Marine Protected Areas. Many species have been listed as protected in the Wildlife Protection Act.

Marine and Coastal Living Resources

156. Has your country identified components of your marine and coastal ecosystems, which are critical for their functioning, as well as key threats to those ecosystems?

a)	No	
b)	Plans for a comprehensive assessment of marine and coastal ecosystems are in place (please provide details below)	
c)	A comprehensive assessment is currently in progress	
d)	Critical ecosystem components have been identified, and management plans for them are being developed (please provide details below)	
e)	Management plans for important components of marine and coastal ecosystems are in place (please provide details below)	X
f)	Not applicable	

Further comments on the current status of assessment, monitoring and research relating to marine and coastal ecosystems, as well as key threats to them

India has identified various components of the critical marine and coastal ecosystems. These components vary with varying locations. Department of Ocean Development has already completed the assessment of critical habitats of the country and developed databases to manage these critical habitats. Periodical surveys have been conducted at several key locations to identify various biological components of the critical habitats. The Ministry of Environment and Forests has developed specific national mangrove and coral reef plans to manage and coordinate various activities, through the National Committee for Mangroves and Coral reefs. Effective mesh size regulations and fishing holidays have been introduced to reduce the fishing pressure during the breeding seasons. Government has also made elaborate arrangements with its Navy and Coast Guard to reduce poaching in the coastal and marine areas.

157. Is your country undertaking the following activities to implement the Convention's work plan on coral reefs? Please use an "**X**" to indicate your response.

Activities	Not implemented nor a priority	Not implemented but a priority	Currently implemented	Not applicable
a) Ecological assessment and monitoring of reefs			X	
b) Socio-economic assessment and monitoring of communities and stakeholders			X	
c) Management, particularly through application of integrated coastal management and marine and coastal protected areas in coral reef environments			X	
d) Identification and implementation of additional and alternative measures for securing livelihoods of people who directly depend on coral reef services		X		
e) Stakeholder partnerships, community participation programmes and public education campaigns			X	
f) Provision of training and career opportunities for marine taxonomists and ecologists			X	
g) Development of early warning systems of coral bleaching		X		
h) Development of a rapid response capability to document coral bleaching and mortality		X		
i) Restoration and rehabilitation of degraded coral reef habitats			X	
j) Others (please specify below)			X	

Please elaborate on ongoing activities.

India is a partner to the Global Coral Reef Monitoring Network. Considering the importance of coral species in the coastal system, their conservation has been given a high priority in recent years. The Union Government, State Government, Non Government Organisations, Community Organizations and Universities are involved in various activities such as coral reef research, awareness creation and conservation. Development of artificial reefs along the coast is in practice especially in the Kerala coast and Gulf of Mannar Biosphere Reserve and it is proved to be one of the important means of fish stock regeneration and enhancement of socio-economic condition of fisher-folk. Fisher-folk have been educated and empowered for sustainable management of the coral resources and maintaining their livelihoods in some coastal villages of the Gulf of Mannar and Gulf of Kutch. In some adjacent villages of the Gulf of Mannar Biosphere Reserve, people who were directly dependent on coral reefs for their livelihood have been trained for generating alternate income by setting up of cottage industries viz. pickle preparation, vermiculture and vermicompostin, production of food grade agar from seaweeds, handicrafts etc. under the popularly known "Techno-socio-economic" programme. In some fishing villages (coral reef areas) of Gujarat State, Community Learning and Earning Centers have been

started and they are now serving as focal points for co-management. Signboards and posters in strategic public areas with key messages have been kept in almost all the coral reef areas of the country including the Andaman and Nicobar region. Collection, collation and dissemination of information pertaining to estuaries, mangroves and coral reefs of the country are being effectively carried out by the ENVIS Centres, established by the Government of India.

Besides, several central and state government agencies are providing financial assistance for coral reef research. The Ministry of Environment and Forests, Government of India, is implementing a specific programme on mangroves and coral reefs which supports research and conservation activities in the country. CORDIO programme has been supporting activities such as reef monitoring, community based reef restoration, socio-economic monitoring, providing with alternate livelihood, public awareness creation etc. in the Gulf of Mannar region. GCRMN in collaboration with ICRMN is conducting training courses for socio-economic monitoring in the coral reef areas of the Andaman and Nicobar and Agatti Island of the Lakshadweep.

All coral reefs areas outside the PA network are protected under the Category-I of CRZ Notification. All hard corals species are declared as Schedule I animals under the Wildlife Protection Act, giving them maximum legal protection against any exploitation. Along with them, certain other marine/reef associates such as sea cucumbers, mollusks etc. are also protected.

Marine and Coastal Protected Areas

158. Which of the following statements can best describe the current status of marine and coastal protected areas in your country? Please use an "**X**" to indicate your response.	
a) Marine and coastal protected areas have been declared and gazetted (please indicate below how many)	X
b) Management plans for these marine and coastal protected areas have been developed with involvement of all stakeholders	X
c) Effective management with enforcement and monitoring has been put in place	X
d) A national system or network of marine and coastal protected areas is under development	X
e) A national system or network of marine and coastal protected areas has been put in place	X
f) The national system of marine and coastal protected areas includes areas managed for purpose of sustainable use, which may allow extractive activities	X
g) The national system of marine and coastal protected areas includes areas which exclude extractive uses	X
h) The national system of marine and coastal protected areas is surrounded by sustainable management practices over the wider marine and coastal environment.	X
i) Other (please describe below)	
j) Not applicable	

Further comments on the current status of marine and coastal protected areas.

There are 31 Marine Protected Areas in the country, located all along the entire Indian coastline including Andaman and Nicobar and Lakshadweep Island. Besides, another 100 Protected Areas have terrestrial or fresh water ecosystems which constitute boundaries with seawater or partly contain marine environment and they provide with protection to the coastal and marine biodiversity. Three Marine Biosphere Reserves have also been established in the country, which includes the Gulf of Mannar Biosphere Reserve, the first of its kind in the whole of southeast Asia, Government of India has asked the State and Union Territory government to identify and propose new areas for the establishment of Marine Protected Areas. Management plans for some of these marine and coastal

protected areas have been developed with involvement of all stakeholders.

Mariculture

159. Is your country applying the following techniques aimed at minimizing adverse impacts of mariculture on marine and coastal biodiversity? Please check all that apply.	
a) Application of environmental impact assessments for mariculture developments	X
b) Development and application of effective site selection methods in the framework of integrated marine and coastal area management	X
c) Development of effective methods for effluent and waste control	X
d) Development of appropriate genetic resource management plans at the hatchery level	X
e) Development of controlled hatchery and genetically sound reproduction methods in order to avoid seed collection from nature.	X
f) If seed collection from nature cannot be avoided, development of environmentally sound practices for spat collecting operations, including use of selective fishing gear to avoid by-catch	X
g) Use of native species and subspecies in mariculture	X
h) Implementation of effective measures to prevent the inadvertent release of mariculture species and fertile polypoids.	
i) Use of proper methods of breeding and proper places of releasing in order to protect genetic diversity	X
j) Minimizing the use of antibiotics through better husbandry techniques	X
k) Use of selective methods in commercial fishing to avoid or minimize by-catch	X
l) Considering traditional knowledge, where applicable, as a source to develop sustainable mariculture techniques	X
m) Not applicable	

Further comments on techniques that aim at minimizing adverse impacts of mariculture on marine and coastal biodiversity.

India is regulating the mariculture activities through the Aquaculture Authority of India which is promoting sustainable aquaculture. It monitors the establishment of aquaculture ponds in accordance with the coastal zone regulation, establishment of discharge water treatment systems, maintenance of buffer zones and establishment of salt tolerant plants in the buffer zone, banning and monitoring of the usage of certain chemicals (e.g. Chloromphinical) and other related activities. Besides this, the Indian Council of Agricultural Research, Department of Biotechnology and other Government agencies are supporting the development of culture systems for native species, improvement of cultivable species, culture techniques etc. Commercial scale mariculture is being practiced with the native species. State governments also regulate the aquaculture activities through different methods including the introduction of licensing procedure. Seaweeds like *Enteromorpha* and *Chaetomorpha* are used for treating the discharge water. Bivalves have also been used for reducing the turbidity of the discharge water and to reuse the same for culture; however, this has drawback because of the rapid reproductive activity of the bivalves. Most of the farms in operation go for sedimentation and aeration before discharging the pond water into the source.

Coastal mariculture is regulated under Coastal Regulation Zone Notification. There is ban on coastal fishing during monsoon/breeding period. Certain fish species such as Whale shark, some other shark species, sea horses, sea cucumbers, some molluscs etc. are protected under WPA. Fishing using traditional crafts/gears- subsistence level is very high.

Alien Species and Genotypes

160. Has your country put in place mechanisms to control pathways of introduction of alien species in the marine and coastal environment? Please check all that apply and elaborate on types of measures in the space below.	
a) No	
b) Mechanisms to control potential invasions from ballast water have been put in place (please provide details below)	X
c) Mechanisms to control potential invasions from hull fouling have been put in place (please provide details below)	
d) Mechanisms to control potential invasions from aquaculture have been put in place (please provide details below)	X
e) Mechanisms to control potential invasions from accidental releases, such as aquarium releases, have been put in place (please provide details below)	
f) Not applicable	

Further comments on the current status of activities relating to prevention of introductions of alien species in the marine and coastal environment, as well as any eradication activities.

The Port Authorities undertake activities to regulate introduction of alien species through Ballast waters of the ship.

Box LXIV.

Please elaborate below on the implementation of this programme of work and associated decisions specifically focusing on:

a) outcomes and impacts of actions taken;
b) contribution to the achievement of the goals of the Strategic Plan of the Convention;
c) contribution to progress towards the 2010 target;
d) progress in implementing national biodiversity strategies and action plans;
e) contribution to the achievement of the Millennium Development Goals;
f) constraints encountered in implementation.

Agricultural biological diversity

161. ◈ Has your country developed national strategies, programmes and plans that ensure the development and successful implementation of policies and actions that lead to the conservation and sustainable use of agrobiodiversity components? (decisions III/11 and IV/6)	
a) No	
b) No, but strategies, programmes and plans are under development	
c) Yes, some strategies, programmes and plans are in place (please provide details below)	
d) Yes, comprehensive strategies, programmes and plans are in place (please provide details below)	X

Further comments on agrobiodiversity components in national strategies, programmes and plans.

India is bestowed with immense agro-biodiversity and a rich diversity in landraces/traditional

cultivars/farmers' varieties in several agri-horticultural crops. A huge number of crop plants (384) are reported to be cultivated in India. This includes 168 species earlier reported under the Hindustani centre, one of the eight Vavilovian centres of origin and diversity. Further, an enormous richness (326 species) is reported in wild relatives of crop plants as well. A total of 49 indigenous major and minor crops have been reported in the 'History of Agriculture in India', which included 5 cereals and minor millets, 4 pulses, 1 oilseed crop, 9 vegetables, 5 tuber crops, 11 fruits, 5 spices, 1 sugar yielding plant and 7 fibre crops.

Much of the country's agrobiodiversity is in the custody of farming communities/tribals who followed age-old farming systems, including shifting cultivation, made conscious/unconscious selections and inherited and perpetuated their seed/propagules over generations. Concentration of genetic diversity comprising native species and landraces occurs more in Western Ghats, northeastern Himalayas, southern plateau, central India and northwestern Himalayas.

The crops in which rich diversity occurs in India include rice, wheat, barley, pigeonpea, chickpea, minor-millets, mungbean, uradbean, horsegram, mothbean, ricebean, clusterbean, sesame, forage grasses, okra, eggplant, cucumber, melons, citrus, banana and plantains, jackfruit, mango, tamarind, jamun , jute, cotton, ginger, turmeric, pepper, cinnamon and cardamom. Among tuberous crops, rich variability exists in sweet potato, taros and yams. Native resources are also available in *Coleus* species, sword bean, velvet bean and several plantation crops including arecanut and coconut. Diversity also occurs in several minor fruits, such as berries and nuts; and several species of *Rubus, Ribes, Juglans, Pyrus* and *Prunus*. In medicinal plants, India's vast genetic resource base is well known the world over.

Richness in biodiversity among various livestock and poultry species is quite astounding. There are 27 breeds of cattle, 8 breeds of buffalo, over 42 breeds of sheep, 20 breeds of goats, 7 breeds of camel, 8 breeds of horses, and few types of pigs. Considerable biodiversity is also known to exist in yak, mithun and other avian species. India harbours a large population of animal genetic resources with 197.7 million cattle, 77.0 million buffalo, 45.7 million sheep, 110.2 million goat, 2.0 million equines, 1.0 million camel, 10.6 million pig, 0.13 million mithun (Taurus) and 0.04 million yak.

Of about 20,000 species comprising the fish genetic resources of the world, nearly 11 per cent (or 2118 fish species) have been reported in India, including the finfishes from the biodiversity rich Western and Eastern Ghats.

Keeping the above in view, conservation and sustainable use of agricultural biodiversity has received major attention. The Indian Council of Agricultural Research (ICAR) and the Department of Agricultural Research and Education (DARE), cater to the needs of all genetic resources related activities in India as the umbrella organisation and the respective activities on plant, animal, fish, agriculturally important microbes, mushroom and insect genetic resources are covered by the respective National Bureaux/National Research Centres/institutions under the ICAR. The activities covered on plant genetic resources include, planning, conducting, promoting, coordinating collection, introduction, exchange, evaluation, documentation, conservation and sustainable management of diverse germplasm of crop plants and their wild relatives and also ensuring their continous availability for use by breeders and other researchers in India and abroad. More recently, some NGOs have also been actively engaged in the development of Community Gene Bank, including by the establishment of medium term storage facility to support this activity in selected pockets.

The Indian agricultural research system, comprising national institutes, agricultural universities, research organisations and others, is already pursuing the ecosystem approach for crop improvement and genetic resources conservation in the 21 identified agro-climatic zones across the country. India welcomes the on-going work towards refining the guidelines and developing operational systems for this purpose. The Indian Council for Agricultural Research (ICAR) established in 1929 is the second largest agricultural R&D organisation in the world. Over the years, the ICAR has contributed significantly to many vital technological breakthroughs for achieving food and nutritional security for the growing human population, also focussing on marginal farmers, and at the same time maintaining ecological balance and conservation of natural resources. In tune with our emerging heeds, India is re-orienting its efforts to meet the future challenges of increased food production, while ensuring conservation and sustainable utilisation. These efforts are need based and demand driven and there has been a paradigm shift from commodity and product based approach to systems and programme based approach following the eco-regional planning.

With Ministry of Agriculture as the nodal agency, the Inter-Ministerial Consultation Group overviews

the developments and responds to emerging issues. A National Action Plan of Agro-biodiversity in India has been developed and published jointly by National Academy of Agricultural Sciences, Indian Council of Agricultural Research and Indian Society of Plant Genetic Resources in 1999, including the status of Agro-biodiversity in India, (plants, livestocks, poultry, fishes, insects and agriculturally import microbes), agro-biodiversity management and thrust areas, priorities and a National Action Plan.The new legislation on 'Protection of Plant Varieties and Farmers Rights Act' of India, 2001, also has provisions for declaration of non- use of terminator gene technology in development of a plant new varieties for registration.

162. ◆ Has your country identified ways and means to address the potential impacts of genetic use restriction technologies on the *In-situ* and *Ex-situ* conservation and sustainable use, including food security, of agricultural biological diversity? (decision V/5)	
a) No	
b) No, but potential measures are under review	
c) Yes, some measures identified (please provide details below)	
d) Yes, comprehensive measures identified (please provide details below)	X

Further information on ways and means to address the potential impacts of genetic use restriction technologies on the *In-situ* and *Ex-situ* conservation and sustainable use of agricultural biodiversity.

As per the policy of the Govt. of India (Ministry of Environment and Forests), import of GURT technologies is banned in India, and the conditions of import of plant genetic resources into India, include a declaration about use of 'GURT' in the imported sample. (Notification no. GSR 1037 (E) dated 5.12.1989)

The new legislation on 'Protection of Plant Varieties and Farmers Rights Act' of India, 2001, also has provisions for declaration of non-use of terminator gene technology in development of a new plant varieties for registration.

Annex to decision V/5 - Programme of work on agricultural biodiversity

Programme element 1 – Assessment	
163. Has your country undertaken specific assessments of components of agricultural biodiversity such as on plant genetic resources, animal genetic resources, pollinators, pest management and nutrient cycling?	
a) No	
b) Yes, assessments are in progress (please specify components below)	X
c) Yes, assessments completed (please specify components and results of assessments below)	

Further comments on specific assessments of components of agricultural biodiversity.

National Bureaus of Plant, Animal, Fish and Microbial Genetic Resources are operating effectively under the Indian Council of Agricultural Research. In addition, there is the National Bureau of Soil Survey and Land Use Planning. These bureaus have played the vital role in their mandated specific areas while working in partnership with national research institutes/centers, All India Coordinated Crop Improvement Projects, state agricultural universities, lead institutions and NGOs.

For example, an assessment of collected and conserved crop genetic resources have been undertaken by the NBPGR since its inception. About 180,000 collections were available at NBPGR in 1999. A mission mode programme on Sustainable Management of Plant Biodiversity under National Agricultural Technology Project (NATP) was launched on July 1999, after a gap analysis in the existing collections, involving 127 cooperating centers representing 90 organizations.

Under this project since 1999 to March 2005, about 90,0000 accessions comprising landraces, local cultivars, trait specific germplasm of crop plants their wild relatives through 1,718 explorations. Focused attention has been laid on collection of landraces/primitive cultivars of crops, endangered crop species, lesser-known crops, backyard cultigens and wild relatives of crop plants. Equal

emphasis was also laid on collection of vegetables, horticultural species, fibre crops, medicinal plants and under-utilized plant species.Several unexplored areas have been explored for the first time in the programme such as Muthikulam forest area (Tamil Nadu), Indira Gandhi Wild Life Sanctuary (Tamil Nadu); Papikondalu Wild Life Sanctuary (Andhra Pradesh); Kudremukh region (Kerala), Suriyur area (Kerala); Kavaratti (Lakshdweep); Valley of Flowers (Uttaranchal); Tehri Dam submergence areas (Uttaranchal); Western Ghats (Kerala and Tamil Nadu); Andaman and Nicobar Islands; Mizo hills (Mizoram); Jaintia and Khasi hills (Meghalaya); Naga hills (Nagaland); Brahamputura Islands (Assam), etc.Special missions were primarily planned in areas suspected to loose the diversity due to natural or man-caused disturbances. These special missions have been undertaken in Tehri Dam submergence areas (Uttaranchal) and Sardar Sarovar Dam (Narmada Valley). The areas having significantly rich diversity (particularly potential species) like Valley of Flowers (Uttaranchal), Andaman and Nicobar Islands (A&N), Sunderban areas (West Bengal), Brahamputra River Island (Arunanchal Pradesh), etc. were explored on priority. Besides need based missions were also launched in Cyclone hit areas of Orissa and Earthquake hit areas of Gujarat in total, sixteen special exploration missions have been undertaken in different inaccessible and diversity rich areas and 8,000 accessions were augmented during the missions.Several new records have been identified – *Musa acuminata x M. balbisiana* (Bhat Manohar, a *Musa* species-first known natural tetraploid of banana), *Corchorus pseudoolitorius* (new species), *Citrus madurensis, Solanum gigantium, Actinida callos* and *Citrus macroptera* (new records) were collected for valuable trait specific germplasm from diverse habitats. Besides several rare types/endemic/endangered species have been collected.

164. Is your country undertaking assessments of the interactions between agricultural practices and the conservation and sustainable use of the components of biodiversity referred to in Annex I of the Convention (e.g. ecosystems and habitats; species and communities; genomes and genes of social, scientific or economic importance)?

a) No	
b) Yes, assessments are under way	X
c) Yes, some assessments completed (please provide details below)	
d) Yes, comprehensive assessments completed (please provide details below)	

Further comments on assessment of biodiversity components (e.g. ecosystems and habitats; species and communities; genomes and genes of social, scientific or economic importance).

The status of components of agro-biodiversity is being monitored regularly and overall degradation is observed because of adoption of high yielding varieties in place of locally adopted varieties, changing nature of cropping systems and infra-structural developments.

165. Has your country carried out an assessment of the knowledge, innovations and practices of farmers and indigenous and local communities in sustaining agricultural biodiversity and agro-ecosystem services for food production and food security?

a) No	
b) Yes, assessment is under way	X
c) Yes, assessment completed (please specify where information can be retrieved below)	

Further comments on assessment of the knowledge, innovations and practices of farmers and indigenous and local communities.

A mission mode project on collection, documentation and validation of Indigenous Technical Knowledge (ITK) was initiated in 2000. The objectives of the project are to collect, classify and document ITK with respect to agricultural production and farming systems in different agro-climatic regions of the country including agro-biodiversity.

About 2000 ITKs have been documented till 2003, in diverse agro-biodiversity related thematic areas such as water management, storage of farm produce (seeds), cropping systems, soil fertility management, tillage practices, fisheries, veterinary and animal husbandry, ethnic foods, housing materials, thermal efficiency and fuel management etc.

166. Has your country been monitoring an overall degradation, status quo or restoration/rehabilitation of agricultural biodiversity since 1993 when the Convention entered into force?	
a) No	
b) Yes, no change found (status quo)	
c) Yes, overall degradation found (please provide details below)	X
d) Yes, overall restoration or rehabilitation observed (please provide details below)	

Further comments on observations.

The status of components of agro-biodiversity is being monitored regularly and overall degradation is observed because of adoption of high yielding varieties in place of locally adopted varieties, changing nature of cropping systems and infrastructural developments. On Farm conservation of genetic resources and diversified farming practices are being promoted. Databases and monitoring systems are being developed.

Programme element 2 – Adaptive management

167. Has your country identified management practices, technologies and policies that promote the positive, and mitigate the negative, impacts of agriculture on biodiversity, and enhance productivity and the capacity to sustain livelihoods?	
a) No	
b) No, but potential practices, technologies and policies being identified	
c) Yes, some practices, technologies and policies identified (please provide details below)	X
d) Yes, comprehensive practices, technologies and policies identified (please provide details below)	

Further comments on identified management practices, technologies and policies.

The negative impacts of agriculture on biodiversity, productivity and sustaining livelihoods, are now getting attention and thus management practices, technologies and policies are being identified to mitigate the same.For example promotion of integrated crop and livestock farming,revival of Traditional watershed management practices and discouraging the indiscriminate use of chemical fertilizers and pesticides.

Programme element 3 - Capacity-building

168. Has your country increased the capacities of farmers, indigenous and local communities, and their organizations and other stakeholders, to manage sustainable agricultural biodiversity and to develop strategies and methodologies for *In-situ* conservation, sustainable use and management of agricultural biological diversity?	
a) No	
b) Yes (please specify area/component and target groups with increased capacity)	X

Further comments on increased capacities of farmers, indigenous and local communities, and their organizations and other stakeholders.

The Biological Diversity Act and the Protection of Plant Varieties and Farmers Rights Act have been enacted and the provisions of increasing capacity of farmers, local communities and other stakeholders are being implemented.Projects on On-Farm conservation are in progress to develop workable models. Sustainable cropping patterns, with emphasis on legumes, are being promoted.

Landraces, Farmers' traditional varieties and livestock breeds are being documented and conserved.

169. Has your country put in place operational mechanisms for participation by a wide range of stakeholder groups to develop genuine partnerships contributing to the implementation of the programme of work on agricultural biodiversity?	
a) No	
b) No, but potential mechanisms being identified	X
c) No, but mechanisms are under development	
d) Yes, mechanisms are in place	

170. Has your country improved the policy environment, including benefit-sharing arrangements and incentive measures, to support local-level management of agricultural biodiversity?	
a) No	
b) No, but some measures and arrangements being identified	
c) No, but measures and arrangements are under development	
d) Yes, measures and arrangements are being implemented (please specify below)	X
Further comments on the measures taken to improve the policy environment.	
Supportive national legislation has been enacted (PPVFR 2001; Biological Diversity Act 2002). Rules for their implementation have been framed based on wide consultations.	

Programme element 4 – Mainstreaming	
171. Is your country mainstreaming or integrating national plans or strategies for the conservation and sustainable use of agricultural biodiversity in sectoral and cross-sectoral plans and programmes?	
a) No	
b) No, but review is under way	
c) No, but potential frameworks and mechanisms are being identified	
d) Yes, some national plans or strategies mainstreamed and integrated into some sectoral plans and programmes (please provide details below)	X
e) Yes, some national plans or strategies mainstreamed into major sectoral plans and programmes (please provide details below)	
Further comments on mainstreaming and integrating national plans or strategies for the conservation and sustainable use of agricultural biodiversity in sectoral and cross-sectoral plans and programmes.	

172. Is your country supporting the institutional framework and policy and planning mechanisms for the mainstreaming of agricultural biodiversity in agricultural strategies and action plans, and its integration into wider strategies and action plans for biodiversity?	
a) No	
b) Yes, by supporting institutions in undertaking relevant assessments	X
c) Yes, by developing policy and planning guidelines	X
d) Yes, by developing training material	
e) Yes, by supporting capacity-building at policy, technical and local levels	
f) Yes, by promoting synergy in the implementation of agreed plans of action and between ongoing assessment and intergovernmental processes.	

Further comments on support for institutional framework and policy and planning mechanisms.

National Planning Commission approves policy, broad programmes of work and allocation of funds based on proposals developed by nodal union ministries and state governments through a wide consultation-cum-discussion process, involving periodic assessments.

173. In the case of centers of origin in your country, is your country promoting activities for the conservation, on farm, *In-situ*, and *Ex-situ*, of the variability of genetic resources for food and agriculture, including their wild relatives?	
a) No	
b) Yes (please provide details below)	X

Further comments on of the conservation of the variability of genetic resources for food and agriculture in their center of origin.

India has developed infrastructure and expertise in *ex situ* conservation of crop plant species germplasm and a strong National Genetic Resources Conservation in operation. On farm conservation methodologies are being assessed for adoption. Few case studies on on-farm conservation are being evaluated under the National Agricultural Technology Project on Plant Biodiversity. For example i*n situ* conservation of wild species of *Citrus*, was established in 1976 and a Citrus gene sanctuary was identified in North Eastern Hill region.

Box LXV.

Please provide information concerning the actions taken by your country to implement the Plan of Action for the International Initiative for the Conservation and Sustainable Use of Pollinators.

Integrated pest management practices are being promoted with a view to reducing excessive use of pesticides and diversified farming systems are getting more emphasis.

Box LXVI.

Please elaborate below on the implementation of this programme of work and associated decisions specifically focusing on:

a) outcomes and impacts of actions taken;
b) contribution to the achievement of the goals of the Strategic Plan of the Convention;
c) contribution to progress towards the 2010 target;
d) progress in implementing national biodiversity strategies and action plans;
e) contribution to the achievement of the Millennium Development Goals;
f) constraints encountered in implementation.

Sustainable agricultural practices are now receiving greater attention with a renewed focus on integrated crop farming and livestock production systems and also on generating additional income to farm families. On-Farm *in situ* conservation approach with *ex situ* conservation providing safety back up, is being explored under different ecosystems with a view to developing workable models. Value-addition to agri-products (like minor millet's fortification in biscuit-making and horti-products is getting more popular. Support is being provided for conservation and improvement of landraces, traditionally grown farmers' varieties, native livestock breeds, best practices (and associated traditional knowledge).Agricultural biodiversity has received major attention in draft NBSAP. Small sized farm holdings, resource-poor marginal farmers, low level of investment in agri-sector and limited technological advances are the major challenges.

Forest Biological Diversity

General

174. Has your country incorporated relevant parts of the work programme into your national biodiversity strategies and action plans and national forest programmes?

a) No	
b) Yes, please describe the process used	X
c) Yes, please describe constraints/obstacles encountered in the process	
d) Yes, please describe lessons learned	
e) Yes, please describe targets for priority actions in the programme of work	

Further comments on the incorporation of relevant parts of the work programme into your NBSAP and forest programmes

The Ministry of Environment & Forests have formulated National Forestry Action Programme (NFAP), a comprehensive strategic long term plan for the next twenty years to address the issues underlying the major problems of the forestry sectors in line with the National Forest Policy, 1988. The objective of the NFAP is to bring one third of the area of the country under tree/forest cover and to arrest de-forestation for achieving sustainable development of forests. The main components of the programme are:

- Protect existing forest resources
- Improve forest productivity
- Reduce total demand
- Strengthen policy and institutional framework
- Expand forest area

The different provinces of the country have their State Biodiversity Strategy and Action Plans and their programme of work fits with the National work programme. The State Forest and wildlife departments and The National Wildlife Board of India are the agencies that incorporate the actions for implementation at the field level.

The National Afforestation and Eco-development Board (NAEB) was constituted in the Ministry of Environment & Forests in August 1992. The mandate of the NAEB is promoting afforestation, tree planting, ecological restoration and eco-development activities in the country with special attention to degraded forest areas and lands adjoining forest areas, national parks, sanctuaries and other protected areas, as well as the ecologically fragile areas like the Western Himalayas, Aravallis, Western Ghats, etc.

NAEB has evolved specific schemes to promote afforestation and management strategies, which help the States in developing specific afforestation and eco-development packages for augmenting biomass production through a participatory planning process of Joint Forest Management.

In order to develop interconnectivity between rural development, forest conservation and employment generation in the forest fringed villages an umbrella scheme is being implemented on a pilot basis through a decentralised set up. This programme is being implemented by Forest Development Agencies (FDAs) consisting of village forest committees, forest officials and other officials of agriculture, animal husbandry, soil conservation, tribal welfare, public health, education etc. The FDAs will institutionalise monitoring activities and have greater flexibility in project formulation, identification of funding sources, thereby meeting local requirements effectively.

The SFR-2003 provides much more comprehensive status of Forest and Tree cover in the country. Special significance in SFR-2003 are: introduction of an additional class of forest cover by splitting dense forest cover (canopy density above 40%) into two classes, namely very dense forest (canopy density more than 70%) and moderately dense forest (canopy density >40-70%) while open forest cover having density 10-40% remains the same. The same criteria has been applied in the case of mangroves also.

Special projects of "Forest Type Mapping of India's Forests" and "Monitoring of Changes in Forest Cover in Tiger Reserve of India" have also been initiated.

FSI has been conducting field inventory for estimating the growing stock (volume) and other parameters of the forests by laying out systematic sample plots. So far about 80% of the country's forest areas have been inventoried including some areas more than once and about 140 reports have been published. During 2002-2007, FSI is also conducting field inventory of forest resources inside and outside forest including vegetation survey and estimation of soil carbon in forest.

A methodology has been developed for a comprehensive assessment of forest resources inside and outside forest areas at national level by stratifying the country into physiographic zones and to take a sample of 10 percent districts for detailed inventory during a cycle of two years. This information, thus generated, will form a part of the biennial State of Forest Report. These estimates will be further improved in the subsequent reports as another set of 10 percent districts are sampled and surveyed, and so on. Together with forest inventory, assessment of herbs & shrubs (vegetation survey) is being carried out. In addition, assessment of regeneration status, biodiversity indices and soil carbon in forest areas are also being carried out.

Documentation, conservation and evaluation of biodiversity under the mandate of forestry research organizations is a mission policy. Different project activities with the organizations such as Indian Council of Forestry Research and Education are aimed at the strategic development of planning and management of forest biological diversity. Some projects initiated in this respect are as below:

1. Environmental conservation strategies for land use in lower western Himalayas : Butterflies as indicators in monitoring environmental changes in urban gradients
2. Plant growth strategy characterization and derelict mined ecosystem in western Himalayas.
3. Upgradation and computerization of National Insect Reference Collection (NIRC)
4. Inventorisation and monitoring of Biodiversity sites of Doon Valley and surroundings, Uttaranchal
5. Assessment of conservation status of Hill bamboos Collection of germplasm from various Eco-Climatic Zones and establishment of green plasm bank.
6. Studies on Floristic composition and associated mycorrhiza of dominant species in Baspa Valley of District Kinnaur, Himachal Pradesh (H.P.)
7. Studies on plant diversity of Renuka & Simbalwara Wild-life Sanctuaries of H.P.
8. Development of Ecologically Viable and socio-economically acceptable Integrated Model for checking Willow (salix spp.) mortality in Lahaul Valley of H/P.
9. Development of database in tree improvement of mandatory species on Tamilnadu and Kerala
10. Estimation of gene diversity and enhancing seed production in seed orchards of

Eucalyptus, Casuarina, Acacia and Teak.

11. Assessment of biological diversity of various ecosystems and to establish methods for conservation in the Kaziranga National Park of Assam

Box LXVII.

Please indicate what recently applied tools (policy, planning, management, assessment and measurement) and measures, if any, your country is using to implement and assess the programme of work. Please indicate what tools and measures would assist the implementation.
Draft National Environmental Policy 2004 has been prepared by the Ministry in consultation with experts to harmonized the demands of development and environment. The National Biological Diversity Act and Wildlife Protection Act 1972 are other legal provisions made by the Government of India for assisting implementation of work programme.

Box LXVIII.

Please indicate to what extent and how your country has involved indigenous and local communities, and respected their rights and interests, in implementing the programme of work.
Local self-help groups are formed and locally available knowledge is documented with due acknowledgement. Newer technologies are developed using the idea received from local people. Sufficient measures are taken to respect the rights and interests of local communities during various processes such as participatory afforestation and natural resource management. The government of India has undertaken initiatives for promulgation of livelihoods of communities through local arts and skills. The government of India has recognized the importance of indigenous knowledge with the communities and made provisions for protection of intellectual property rights and granting royalty and monetary benefits emanating through use of traditional knowledge. The knowledge about medicinal plants of local communities is also being documented to provide due recognition of the TDk Several projects targeting the importance of traditional knowledge are ongoing with organizations of government of India. 1.Indigenous knowledge of Angami tribe in sustainable management of biodiversity. 2. Collection of ethnobotanical data from various tribes of Central India are some important internally and externally aided projects activities which are being carried out by regional Institutes of ICFRE. The State Forest departments and NGO's maintain documentation of traditional knowledge in Biological diversity registers. India has sought changes in the existing TRIPs (trade related intellectual property rights) agreement to include provisions for the protection of traditional knowledge and preventing bio-piracy. The National Institute of Science Communication (NISCOM) is attempting to convert the entire corpus of traditional knowledge available in Ayurveda, Unani and Siddha into a digitised format. The Biological Diversity Act 2002 makes adequate provisions to ensure that traditional knowledge is not exploited or eroded and communities rights over use of TDK are protected.

Box LXIX.

Please indicate what efforts your country has made towards capacity building in human and capital resources for the implementation of the programme of work.
Extensive efforts have been made across the country towards capacity building in human and capital resources through various projects and programmes funded by national and international agencies. Regular trainings are held on importance of biological diversity for various stakeholders. Awareness camps are held for farmers to apprise them on techniques for propagation of medicinal plants. Development of community based market information services for medicinal plants of Uttaranchal through a website http:marketinfoherbs.icfre.org has been launched by Forest Research Institute of ICFRE.

Box LXX.

Please indicate how your country has collaborated and cooperated (e.g., south-south, north-south, south-north, north-north) with other governments, regional or international organizations in implementing the programme of work. Please also indicate what are the constraints and/or needs identified.
Regional institutes of the council have collaborated with regional research centres of ICAR and *other organization under* Govt. of India and Universities to assess , *sustainable utilization* and document biodiversity. A strategic tie up was established with state governments of Bihar, Jharkhand, West Bengal , Sikkim *Uttaranchal, Punjab, Haryana* etc. to evaluate and document biodiversity in those states. Skilled manpower in the form of local talent are constraints in achieving the desired goal. The World Wildlife Fund also monitors the wildlife trade through the TRAFFIC-division. It has assisted the enforcement agencies in the work of field investigations, raids and seizures, enforcement training, and field studies. Several projects including the one by World Bank (FREEP in ICFRE), UNDP, USDA and UNEP have been completed in the last few projects. The EU project in ICFRE ti

Expanded programme of work on forest biological diversity

Programme element 1 – Conservation, sustainable use and benefit-sharing	
175. Is your country applying the ecosystem approach to the management of all types of forests?	
a) No (please provide reasons below)	
b) No, but potential measures being identified (please provide details below)	
c) Yes (please provide details below)	X

Comments on application of the ecosystem approach to management of forests (including effectiveness of actions taken, lessons learned, impact on forest management, constraints, needs, tools, and targets).
Ecosystem approach to evaluate and conserve biodiversity in various regions has helped in documenting the species association patterns and their dominance. Hence, it helped in preparing an overall action for this particular region. Efforts are being made to adopt the ecological restoration of wastelands based on ecosystem approach where all the components of the ecosystem are restored including floral and faunal biodiversity. Given the high dependence of people on biological resources the ecological management is the best option. Various state and centrally sponsored schemes have been initiated in the mountainous regions to fulfill the policy instrument of linking local people with management and sustainable use of biodiversity. Some of the important schemes are Sanjhi Van Yojana, Ecodevelopment in and around protected areas, development of Minor forest produce etc. Environmental values are being assigned to the forests and the intangible benefits such as carbon sequestration, water conservation, aesthetic

importance are being valued as the ecological services of the forests. A recent successful proposal of ecoservices of Himalayan ecosystems of Uttaranchal State was submitted to the Planning commission of India by the State Government highlighting the fact that compensation needs to be given to the state in lieu of protection of forests.

Different Institutes of ICFRE are actively engaged in Ecological studies on Dipterocarps forest of Gibbon Wild life Sanctuary and monitoring of biodiversity of Kaziranga National Park, Nauradehi WLs, MP, Debrigarh WLS, Orissa. Gradually the management of National Parks and Sanctuaries is also being oriented towards the concept of ecosystem management approach for a holistic conservation of species and maintenance of natural ecological cycles. At the regional level the projects are per the specific bioclimatically defined ecosystems. The Non wood forest products production is also being included in the ecological management concept and in the review of the success of various programmes such as joint forest management, community management ecological management criteria is being used as an indicator.

Research on the landscape scale impact of non-timber-forest-product extraction, burning and grazing, on biodiversity and socio-economic issues began in 1998 in the Western Ghats, India. This research is aimed at understanding the interaction between ecological and socioeconomic processes, and determines the spatio-temporal consequences. In this research effort, interviews with local tribal and non-tribal people are used to obtain an understanding of the interactions between human activities and biodiversity, as viewed by the local people. This simulation model developed in the project for understanding various interactions will then be tested other sites in the Western Ghats and used to inform and guide land use decisions at key intervention points e.g. local / provincial governments. A number of flagship species of the ecosystem (both floral and faunal) have been targeted through ecological projects such as Project Tiger, Project Elephant, Crocodile, Rhino , Santalum album, Tectona grandis, Melina arborea etc. for conservation and improvement. Biosphere reserves and National Parks established in the country are based on the ecological management concept.

176. Has your country undertaken measures to reduce the threats to, and mitigate its impacts on forest biodiversity?

Options	X	Details
a) Yes	X	Please specify below the major threats identified in relation to each objective of goal 2 and the measures undertaken to address priority actions The major threats are changing land use and land management, habitat fragmentation, pressure on national resources, over exploitation of forest and soil resources, forest fires, Broken Corridor etc. Afforestation, ecological restoration and eco-development activities are the measures undertaken with special attention being given to the regeneration of degraded forest areas and lands adjoining forest areas, national parks, sanctuaries and other protective areas as well as the ecological fragile areas. Major programmes for ex-situ and in-situ conservation have been initiated to conserve endangered, rare and threatened species.
b) No		Please provide reasons below

Further comments on measures to reduce threats to, and mitigate the impacts of threatening processes on forest biodiversity (including effectiveness of actions taken, lessons learned, impacts on forest biodiversity, constraints, needs, tools and targets).

Efforts are afoot to conserve the biodiversity at National level and lots of activities were undertaken in this direction. Starting with the legislation supporting management response, research imputs, educational efforts and community awareness, biodiversity conservations seems to have attained global focus. Many measures have been taken to tackle the problem of land degradation and biodiversity loss. Some them are i) participatory planning and management of natural resources; ii) protection and conservation of forest and community areas; iii) Implementation of Maru Gaucher Yojana to rehabilitate Gauchar land in arid districts of Rajasthan iv) Concern with the outcome of any EIAs carried out by the organization on specific sites of

biodiversity significance. The government of India implemented projects for protection of Manipuri deer, Rhino, crocodile, Magar, Musk deer in certain states with a positive effect on populations of these species. As a result of targeted efforts the orchid population. status of medicinal plants, Nilgiri Thar, Civet cat, turtles, chital, and sambhar has increased. Some other examples of broader initiatives to reduce threat to biodiversity loss are as below:

- Environmental Impact Assessment has been made mandatory by Govt. of India for all developmental projects. Biological diversity status and impacts due to the developmental activity undertaken in the project are major criteria for granting permission for the projects.
- Forest Conservation Act 1980, Wildlife Act 1972, Forest Policy 1988, National Wildlife Action programme are legislative measures to enforce conservation.
- Government initiatives to protect biodiversity hotspot areas in the country and promote research in such sensitive areas with regards to impacts of climate change on biodiversity. Workshops sponsored by Ministry of Environment and Forests on Protection of mangroves, promotion of sacred grooves and consolidating information on lesser known tree species are some such examples of recognition and commitment by the Government for India for reducing loss of biodiversity.
- In the state of Himachal Pradesh, a complete ban on hunting and green felling has been imposed which will certainly help in mitigating the impacts of processes that are a threat to forest biodiversity loss.
- A massive tree improvement programme in World Bank sponsored FREEP project was ***based on genetic variability in the natural and production forests*** been undertaken to supply improved and tested planting material for large scale afforestation and thus reduce in the preserve on natural resources.
- A special Project Tiger Task force has been established by the Government of India to save the tiger. The Provisions in the Biological Diversity Act are being enabled at the ground level for reducing the loss of biodiversity.
- Proposal for a National Bureau for Forest Genetic Resources has been initiated by ICFRE for approval by the Government of India. The primary objective is to conserve the germplasm of significant tree species.

India is a member of the Asia Pacific Forest Invasive Species Network (APFISN) under the FAO. The status of national activities being implemented on forest invasive species is being documented. This stocktaking shall be used to reduce the impacts of existing FIS including economic and other impacts in forestry sector, and to develop techniques to prevent the introduction of FIS and monitor and control their impacts.

177. Is your country undertaking any measures to protect, recover and restore forest biological diversity?

Options	X	Details
a) Yes	X	Please identify priority actions in relation to each objective of goal 3 and describe measures undertaken to address these priorities Extensive in-situ & ex-situ conservation programmes are in place. Certain area of the forest is declared as reserve forest to recover the depleting biodiversity.
b) No		Please provide reasons below

Further comments on measures to protect, recover and restore forest biological diversity (including effectiveness of actions taken, lessons learned, impacts on forest biodiversity, constraints, needs, tools and targets).

Protection measures involving local community for resource management like rain water harvesting, soil working to reduce the impacts on forest biodiversity, biomass productivity. The

organization has contributed towards the interpretation and integration of indigenous / local traditional knowledge. Globally two of the hotspots, namely Indo-Burma and Srilanka- Western Ghats cover a major portion of forest biodiversity of Indian sub-continent. Northeastern India cover eastern Himalayas (Sikkim, North Bengal Himalayas) and Andaman- Nicobar islands are under the jurisdiction of the institutes of ICFRE. The institutes through their different projected activities have contributed towards the conservation of forest biodiversity and genetic resources.

Creation of medicinal plant conservation areas (MPCAs), recent establishment of Great Himalayan National Parks, Strengthening of wildlife sanctuaries are some of measures taken by the states to protect, recover and restore the forest floral and faunal biodiversity. The Wildlife wing of different states such as Himachal Pradesh have undertaken Integrated Eco development projects in selected Wildlife sanctuaries and National Parks with active involvement of local communities. Restoration of degraded habitats of animals through large scale plantation of different species of trees under various schemes is also the mandate of the states. The Governments are trying to enhance protection to threatened species to reduce poaching/hunting. For example, under Project Elephant and Project Tiger strengthening of skilled and trained manpower and settlement of tribals has been initiated in buffer areas. The Census methodology of threatened species is also being improved to keep count and track movement of selected species.

Also refer to Box. 180

178. Is your country undertaking any measures to promote the sustainable use of forest biological diversity?

Options	X	Details
a) Yes	X	Please specify priority actions in relation to each objective of goal 4 and describe measures undertaken to address these priorities

The objectives under Goal 4 envisage that products be derived from sustainable managed resources, reduce unsustainable consumption of biological resources, ensure that no species of wild flora and fauna are endangered by International Trade.

The Government of India is committed to the above objectives. In relation to the first objective, the Forest Certification is being recognized by the MoEF as an issue and steps shall be taken to put in place a Forest Certification Policy for products manufactured with the use of Forest Biological Diversity. The Criteria and Indicators for Forests are being finalized by the Indian Institute of Forest Management, Bhopal. The need for incorporating the C&I in the Forest Working Plan and modalities for Incorporation of C&I in the Working Plans is being worked out. The process of incorporating the C&I in the Working plans requires a long-term association and interaction through the regular meetings between the Forest Department and IIFM. The pilot testing of C&I in the Working Plan where the preparation of Working Plan is under way, preferably in the selected FMUs under IIFM-ITTO research project shall be undertaken. The finalisation of Minimum Acceptable Standards (MAS), the political and social implications of such actions need to be taken into cognizance. Under the Operational Strategy for Sustainable Forestry Development with Community Participation in India, on the following criterias at the local level targets biodiversity in FMUs.

Criteria:

Maintenance, conservation and enhancement of bio-diversity

Indicators:

- Variety of plant species
- Variety of animal and bird species
- Pure patches of certain species (specific habitats)
- Waterbodies/waterhole

Criteria:

Maintenance and enhancement of forest resources productivity

- Indicators:
- Production of fuelwood
- Production of timber and poles
- Basal area,
- Stem density
- No. of NWFP yielding trees per hectare
- No. of other species per hectare,
- Total NWFP production, Use of quality seeds in plantation.

Efforts initiated by Chattisgarh Forest Department for certification of non wood forest products (NWFP). Some issues on which further actions shall be taken are as below:

- Draft local and regional level certification standards with the help of all stake holders in the production to consumption chain in each species, area and region. Such stake holders include the local collector, the Primary forest produce cooperative societies, JFMCs, local knowledgeable persons such as the Kochias, vaidhyas etc., professional foresters, agricultural and horticultural scientists, ecologists, social scientists and traders. Such standards should be widely circulated to national and international experts and certification agencies for comments and then adopted.

b) No		Please provide reasons below

Further comments on the promotion of the sustainable use of forest biological diversity (including effectiveness of actions taken, lessons learned, impacts on forest biodiversity, constraints, needs, tools and targets).

Chattisgarh Forest department initiatives on forest certification include the following recommendation on issues that at present are a constraint

- The need to have a single issue labeling of forest products derived from NWFP. This is defined as "a process which results in a claim which may be used on-product referring to the quality of forest or forest management at the origin of the raw material of which the product is made. Labeling is based on certification of forest management and verification of chain of custody as per ITTO guidelines. Labeling on this basis is described as 'single issue' because it only covers forest management and takes no account of other environmental impacts. This is internationally accepted and will help entrepreneurs to market certified herbal products. The certification process in other states needs to be similarly streamlined.
- Need for an independent and autonomous institution needed to be established to undertake certification in the state/country.
- Quality assurance through lab testing facilities for NWFP. Forest Research institute, Dehradun provides at present seed certification for forest tree species. The seed quality certification should incorporate the seed source origin as well.
- For international movement of products of plant and animal origin the provisions of the Biological Diversity Act apply.

179. Is your country undertaking any measures to promote access and benefit-sharing of forest genetic resources?

Options	X	Details
a) Yes	X	Please specify priority actions in relation to each objective of goal 5 and describe measures undertaken The production forestry in India has to keep par for protection of forest genetic resources in situ and reduce pressures from habitat loss, land use change and degradation (the objective of Goal 5). At present the access and sharuing is through the forestry research institutes under ICFRE and State Forest Departments. General public access to genetic material is limited and needs further strengthening. In order to provide quality genetic material of seeds and clonal varieties, large number of Seedling Seed Orchards, , Clonal Seed Orchards, Seed Production Areas are identified, selected and are being managed by ICFRE Institutes for productive species such as Poplar, Eucalyptus, Teak, Casuarina, etc. all over the country to decipher the benefit of tree improvement. Institute of Forest Productivity, Ranchi also has CSO, SSO & SPA. A massive network project has been undertaken with three ICFRE sister institutes to develop a newer technologies in tree improvement The National Bureau of Forest Genetic resources and germplasm banks for forest species to be created within ICFRE, will help to preserve the genetic resources and provide regulated access. The National Biological Diversity Act also shall regulate the access of resources from forests, once it is implemented on full scale. Degradation of habitat loss is monitored and inventorized by the Forest Survey of India and National Remote Sensing Agency. There are schemes from the Govt. of India for monitoring of forest fires. The advances in this technology to detect fires instantaneously and take remedial measures will also help reduce the forest degradation.

b) No		Please provide reasons below

Further comments on the promotion of access and benefit-sharing of forest genetic resources. (including effectiveness of actions taken, lessons learned, impacts on forest biodiversity, constraints, needs, tools and targets)

A good number of projects are underway to develop packages for cultivation of medicinal plants and provide good seeds to the farmers ***with emphasis on sustainable development of resources namely***

Development of appropriate Silvicultural system for selected medicinal plants of Chotanagar and Sarnath Parganas

2 Creation of germplasm resource bank of threatened medicinal plants of Darjeeling Himalayas

3. Medicinal Plants under Tropical Climate of M.P.

Marketing mechanisms and appropriate certification of forest biological resources are major initiatives still required to streamline sustainable access and benefit sharing.

Programme element 2 – Institutional and socio-economic enabling environment

180. Is your country undertaking any measures to enhance the institutional enabling environment for the conservation and sustainable use of forest biological diversity, including access and benefit-sharing?

Options	X	Details
a) Yes	X	Please identify priority actions in relation to each objective of Goal 1 and describe measures undertaken to address these priorities At present access to forest genetic resources is only through specific projects for specific species. For example *Eucalyptus* material imported from Australia for research trials. Access from international boundaries will be subject to legal provisions of BA Act in the country. Community Participation projects and Joint Forest management programmes are examples of local institutions strengthened for conservation of biodiversity. Funds are allotted from the government to enhance the institutional capacity for sustainable use and conservation of forest biological diversity.
b) No		Please provide reasons below

Further comments on the enhancement of the institutional enabling environment for the conservation and sustainable use of forest biological diversity, including access and benefit-sharing (including effectiveness of actions taken, lessons learned, impacts on forest biodiversity, constraints, needs, tools and targets).

There is a dire need to have a holistic approach for institutional strengthening for conservation & sustainable use of forest biological diversity. Some efforts have already been initiated by Government of India to enhance technological expertise through research.

Bioprospecting area, a network programme on "Bioprospecting of biological wealth using biotechnological tools" was initiated during the 9th plan involving 13 institutions. The objectives of the first phase were i) Characterization of biodiversity in different agro ecological regions through remote sensing and GIS based studies. ii) Bioresources mapping, inventorisation and monitoring of biological diversity. iii) Characterization and conservation of Himalayan endangered species including medicinal and aromatic plants. iv) Bioprospecting of molecules and genes for product development. The first phase has been completed and leads obtained

have been taken up further during the 2nd phase for product development. The Department of Biotechnology and Department of Space jointly supported a project for Biodiversity characterization at Landscape level using Satellite Remote Sensing and GIS, Western Ghats, North Eastern region and western Himalayas and Andaman & Nicobar Islands were taken up for mapping. The main objectives of the study included preparation of ecological zone maps using satellite remote sensing data incorporating topographical and bio-climatic information, landscape characterization to establish disturbance gradient using geographical information system and detailed assessment of biodiversity at community level and their distribution pattern in few important biodiversity rich sites of both the islands. (source: dbtindia.nic.in)

Institutes such as ICFRE, WII are already active in the research and policy respect of Forest Biological diversity. The capacity of state forest , wildlife, and environment departments needs further strengthening in this regard.

181. Is your country undertaking any measures to address socio-economic failures and distortions that lead to decisions that result in loss of forest biological diversity?

Options	X	Details
a) Yes	X	Please identify priority actions in relation to each objective of Goal 2 and describe measures undertaken to address these priorities Low income communities and their dependence on forest resources is a major socio economic constraint. Besides illegal trade of forest products-(plant and animal origin) and the high prices they fetch in international market are a hindrance to the protection of forest diversity. Funding mechanisms for research on regular basis need to be improvised to understand the socio economic lapses leading to loss of forest biological diversity.
b) No		Please provide reasons below

Further comments on review of socio-economic failures and distortions that lead to decisions that result in loss of forest biological diversity (including effectiveness of actions taken, lessons learned, impacts on forest biodiversity, constraints, needs, tools and targets).

182. Is your country undertaking any measures to increase public education, participation and awareness in relation to forest biological diversity?

Options	X	Details
a) Yes	X	Please identify priority actions in relation to each objective of goal 3 and describe measures undertaken to address these priorities

		Forest officials are trained in modern nursery practices and forest management. Training for bamboo genetic resource conservation in eastern India is imparted to SFDs, NGOs and Farmers. Several trainings in biodiversity conservation, NWFP, ecorestoration of wastelands, management of Forest Herbaria and Arboreta, establishment and maintenance of field germplasm bank, cultivation of medicinal plants under agroforestry tree species are some examples pf trainings organized by ICFRE. The Indira Gandhi National Forest Academy, Dehradun also runs refresher courses that target aspects of forest biodiversity conservation for mid to senior level for forest officers. Sponsored training and workshops and publications on biodiversity are undertaken by forestry organizations and forest departments at different levels. Recently organized workshops include those on sacred groves, lesser known tree species, mangrove ecosystems, water conservation, vultures. Eco-tourism centers are being developed in several states such as Uttaranchal, UP, Tamilnadu, Karnataka and Rajasthan to generate awareness. University departments are active in several states and run campaigns for educating the masses.
b) No		Please provide reasons below

Further comments on measures to increase public education, participation and awareness in relation to forest biological diversity (including effectiveness of actions taken, lessons learned, impacts on forest biodiversity, constraints, needs, tools and targets).

Public awareness of the importance of the forest biological diversity needs to be strengthened further and made into a campaign for students and school children. Even the implementing agencies such as the Forest departments need to be made aware of the goals of the CBD, the linkages with national forest and biological diversity acts to a much greater extent than at present.

The Council has one of largest collection of floral and faunal species, and herbarium, xylarium of forest species , Botanic garden, nationally which are used as an awareness and education tool. The Ministry of Environment and Forest needs to strengthen this aspect further along with mass awareness programmes with the State forest departments.

Programme element 3 – Knowledge, assessment and monitoring

183. Is your country undertaking any measures to characterize forest ecosystems at various scales in order to improve the assessment of the status and trends of forest biological diversity?

Options	X	Details
a) Yes	X	Please identify priority actions in relation to each objective of Goal 1 and describe measures undertaken to address these priorities Major emphasis is given to assess Himalayan ecosystem and lateritic soil ecosystem
b) No		Please provide reasons below

Further comments on characterization of forest ecosystems at various scales (including effectiveness of actions taken, lessons learned, impacts on forest biodiversity, constraints, needs, tools and targets).

At the Ranchi Institute of the ICFRE two projects one for Himalayan biodiversity study and the other for lateritic soil ecosystem for biodiversity assessments.

The department of biotechnology has sponsored projects for monitoring of biodiversity.

In a study of developing a Biomonitoring system a detailed and supervised classification of satellite imagery showing important landscape features and vegetation type has been prepared for all the study sites. For example, the response of stream insect communities to human disturbance highlights their potential as a valuable biomonitoring tool. Biomonitoring has also been carried out using birds as bioindicators. A group of 18 rural high schools of Karnataka, with committed and competent teachers and students has been identified for the biomonitoring studies. This network completed a study on the freshwater fishes, medicinal plants and other biodiversity resources. First version of the CD ROM for the identification of 250 medicinal plants and 70 freshwater fishes has been developed (Source http://dbtindia.nic.in).

Monitoring is also carried out in preservation plots established by ICFRE for representative forest types. The number of such plots has to be increased to include all forest formations and monitor changes in respect of biological diversity and biological indicators therein on a regular basis. Besides regular census is carried out in National Parks and Sanctuaries for threatened animal species.

Some organizations such as Bombay Natural History Society actively partake in census of avifauna in different regions of the country.

184. Is your country undertaking any measures to improve knowledge on, and methods for, the assessment of the status and trends of forest biological diversity?

Options	X	Details
a) Yes	X	Please identify priority actions in relation to each objective of goal 2 and describe measures undertaken to address these priorities

		The status of threatened species is assessed by different organizations such as ICFRE, Universities and other state and Non governmental agencies such as ATREE. Projects for monitoring forest canopy species diversity are being formulated with UNDP/GEF aid by ATREE in collaboration with other organizations. Also refer to Box 180 for a major project on Bioprospecting by DBT targeting the above subject. Establishment of Preservation Plots for monitoring of biodiversity is being proposed for all state forest departments by ICFRE. Some examples are as below: a. Inventorisation and monitoring of biodiversity sites of Doon valley and surroundings, Uttaranchal. b. Assessment of conservation status of hill bamboos. Collection of germplasm from various eco-climatic zones and establishment of germplasm bank. c. Assessment of biological diversity of various ecosystems and to establish methods for conservation in the Kaziranga National Park of Assam d. Ecorestoration of degraded mangroves habitat along Goa Coast e. Conservation and management of Coondapur mangroves, Karnataka. f. Inventory of coastal plant communities of North Andhra Region A study on avian diversity, threats faced and measures to protect & conserve in the area comprising the adjoining campuses of IWST, IIS, CPRI, Karnataka State Forest Department, Air Force Area, Central School, Hebbal along with Hebbal Lake
b) No		Please provide reasons below

Further comments on improvement of knowledge on and methods for the assessment of the status and trends (including effectiveness of actions taken, lessons learned, impacts on forest biodiversity, constraints, needs, tools and targets).
Acquiring knowledge on forest biological diversity is a continuous process. More lessons are learnt while executing various projects. Accordingly improvement is being made on methods for assessing the forest biological diversity, while executing these projects a lot of constraints in communicating with local communities are faced and efforts were made to convince them for sustainable harvest of forest resources.

185. Is your country undertaking any measures to improve the understanding of the role of forest biodiversity and ecosystem functioning?

Options	X	Details
a) Yes	X	Please identify priority actions in relation to each objective of goal 3 and describe measures undertaken to address these priorities

		Biodiversity monitoring and impact on ecosystem functioning are the priority actions as far as biodiversity assessment is concerned Development of high yielding clones of Eucalyptus, Poplar, Tamarinds indica, Neem, Teak etc promote the conservation of genetic diversity Casuarina planting stock Improvement Programmed of ICFRE has enhanced productivity.
b) No		Please provide reasons below
Further comments on the improvement of the understanding of the role of forest biodiversity and ecosystem functioning (including effectiveness of actions taken, lessons learned, impacts on forest biodiversity, constraints, needs, tools and targets).		

186. Is your country undertaking any measures at national level to improve the infrastructure for data and information management for accurate assessment and monitoring of global forest biodiversity?

Options	X	Details
a) Yes	X	Please identify priority actions in relation to each objective of goal 4 and describe measures undertaken to address these priorities The Council has one of largest collection of floral and faunal species, and herbaria and xylarium of Forest species, Botanic garden, nationally which are used as an awareness and education tool.
b) No		Please provide reasons below
Further comments on the improvement of the infrastructure for data and information management (including effectiveness of actions taken, lessons learned, impacts on forest biodiversity, constraints, needs, tools and targets).		
Efforts have been going on towards the data collection on repositories, digitization of specimens and infrastructure development of live reference, collection in the conservation, arboretum and botanical garden concerned to them. The Indian Council of Forest Research and Education has initiated efforts to be a node of the Global Biodiversity Information Facility of the Government of India. The purpose is to make the World's primary data on biodiversity freely and universally available via the Internet. India is a member to network as per Memorandum of Understanding between MoEF, CSIR & GBIF.		

Box LXXI.

Please elaborate below on the implementation of this programme of work and associated decisions specifically focusing on: a) outcomes and impacts of actions taken; b) contribution to the achievement of the goals of the Strategic Plan of the Convention; c) contribution to progress towards the 2010 target; d) progress in implementing national biodiversity strategies and action plans; e) contribution to the achievement of the Millennium Development Goals; f) constraints encountered in implementation.

Biological diversity of dry and sub-humid lands

187. Is your country supporting scientifically, technically and financially, at the national and regional levels, the activities identified in the programme of work? (decisions V/23 and VII/2)

a) No	
b) Yes (please provide details below)	X

Further comments on scientific, technical and financial support, at the national and regional levels, to the activities identified in the programme of work.

About 228 mha (69%) geographical area of India falls within the dryland (arid, semi-arid and dry sub-humid) as per Thornthwaite classification. The activities related to such vast dry and sub-humid lands have been undertaken by various central ministries such as Ministry of Environment & Forests, Ministry of Rural Development, Ministry of Agriculture, Ministry of Water Resources, and Ministry of Human Resource Development.

The implementation of various programmes, schemes, measures and activities for conservation of natural resources and for addressing land degradation have also been through the establishment of National and State level Landuse Boards which have been set up under the Ministries of Agriculture, Rural Development and Environment & Forests. These are the National Landuse and Wasteland Development Council (NLWC), the National Wasteland Development Board (NWDB), and the National Afforestation and Ecodevelopment Board (NAEB) respectively. Apart from these the National River Conservation Directorate (NRCD) has been set up for cleaning of the most polluted river stretches in the majority rivers in the country.

The activities related to the dry and sub-humid lands are implemented with respect to the legislations such as Forest (Conservation) act, 1980; Environment (Protection) Act, 1986; Water (Prevention and Control of Pollution) Act, 1974, as amended in 1988; Wildlife (Protection) Act, 1972; 73rd and 74th Constitutional Amendments and Biological Diversity Act 2002.

The policy framework for these activities is provided by several policies prepared by respective ministries such as National Water Policy, 1987; National Landuse Policy Outline, 1988; National Forest Policy, 1988; National Policy on Education, 1986, as amended in 1992; Policy on Abatement of Pollution, 1992; National Livestock Policy Perspective, 1996; National Agricultural Policy, 2000; National Population Policy, 2000; National Land Reforms Policy, Draft Grazing and Livestock Management Policy and Draft National Policy for CPR Lands; Policy on Drought.

Several institution and organizations (Central Govt. and State Govt.) are focussing their activities on issues related to arid and semi-arid regions as listed below:

- CAZRI, AFRI (Jodhpur); ZSI, BSI, Jodhpur
- National Research Centre on Camel, Bikaner
- Indian Grassland & Fodder Research Institute, Jhansi
- National Research Centre for Agroforestry, Jhansi
- Central Soil Salinity Research Institute (CSSRI), Karnal and Anand
- ICRISAT, Hyderabad
- Central Research Institute for Dryland Agriculture, Hyderabad
- Gujarat Ecology Commission (GEC), GEER Foundation

Large number of social sector and community development programmes are undertaken in order to combat desertification such as under Social sector programme schemes for women and child development are undertaken along with programmes on health and literacy. Local community development programmes include Jawahar Gram Samridhi Yojana, Rural drinking water supply and sanitation. Many schemes of income generation for poverty eradication are implemented. Credit assistance for rural agro-based activities and schemes include Micro-Credits for Rural Development, National Bank for Agriculture & Rural Development (NABARD), Apex Finance and Development Corporation, Micro-Credit Assistance to Women through NORAD.

Along with these activities efforts are also put in for the capacity building and strengthening the role of various stakeholders in the dry land regions of the country through the following programmes such

as Capacity Building under Watershed Programmes for Wastelands, Integrated Child Development Services (ICDS) Training Programme, Support to Training and Employment Programme for Women (STEP), Employment and Income Generating Training-cum-Employment-cum-Production Units for Women.

Steps have also been taken to augment renewable energy sources by initiating programmes for tapping solar energy, by harnessing wind power, by undertaking plantation programmes with people's participation and by encouraging farmers to plant trees on their fields. The National Programme of Improved chullhas is also being implemented along with National Project on Biogas Development.

Several programmes for Conservation of Land Resources are been undertaken such as National Watershed Development Project on Rainfed Areas (NWDPRA), Soil Conservation in the Catchment of Rivery Valley Projects (RVP/FPRs), All India Coordinated Research Project for Dryland Agriculture (AICRPDA).

Porgrammes on Eco-restoration of degraded lands are been undertaken such as Integrated Afforestation and Ecodevelopment Project Scheme (IAEPS), Integrated Wasteland Development Programme (IWDP), Eco-task Forces, Scheme for Reclamation of Alkali Soils.

The specific programmes addressing the desert and draught prone regions such as Desert Development Programme (DDP), Drought Prone Areas Programme (DPAP), Indira Gandhi Nagar Project (IGNP).

Large number of technologies have been used in the country for combating the desertification. These technologies include such as:

Technologies for Conservation of Soil, Water and Vegetation – Integrated Soil Fertility Management, Integrated Nutrient Management, Soil Quality Monitoring, Use of Modelling for Assessment of Resources Status, Permanent Vegetative Cover through Alternate Landuse Systems, Alternate Landuse Systems for Different Agro-ecological Regions, Soil and Rainwater Conservation, Inter-Terrace Land Treatment, Water Harvesting and Recycling, Tillage, Mulching, Increase in Water Storages.

Technologies specifically to control land degradation in different bio-climatic regions : Control of Wind Erosion, Stablisation of Sand Dunes, Shelterbelt / Wind break Plantations, Management of Pasture and Rangeland.

Technologies for management of degradation of degraded land : Management of Soil and Water Erosion, Rehabilitation of Mine Spoils, Management and Utilisation of Industrial Effluents, Management of Salt Affected Soils and Water logged areas, Reclamation of Water logged Saline soils, Alternate Landuses for Salt affected Soils, Agro-forestry for Moderately Alkaline Soils / Reclaimed Soils.

Traditional / indigenous technologies for combating desertification : Agriculture, water harvesting, conservation of forged resources, combined production system, protection of vegetative cover – sacred groves, water utilisation practices, energy, storage of grains / tubers.

Technologies for drought mitigation : Measures to combat land degradation caused due to drought, Use of early warning systems, agriculture based technologies such as crop weather modelling, contingent crop planning, mid-season correction.

Apart from all these activities there is a good network of protected areas for in-situ conservation. For example arid and semi-arid regions of Gujarat has the largest land area under 25 protected areas (c 17000sq km), Rajasthan has 28 protected areas covering about 9500 sq km.

Some other initiatives include participatory land regeneration and water conservation programmes such as Border Area Development Program (BADP) and Desert Development Program (DPP) and Drought Proof Area Program (DPAP) in Gujarat and Rajasthan, afforestation and rehabilitation of Aravalli Region, setting up of Aravalli biodiversity park with the help of IUCN to support around 40

plant communities, consisting of 3,000–4,000 species typical of the Aravallis mountains – the oldest mountains on the sub-continent including grassland typical of local arid and semi-arid regions etc.

188. Has your country integrated actions under the programme of work of dry and sub-humid lands into its national biodiversity strategies and action plans or the National Action Programme (NAP) of the UNCCD? (decisions V/23, VI/4 and VII/2)	
a) No	
b) Yes (please provide details below)	X

Further comments on actions under the programme of work of dry and sub-humid lands integrated into national biodiversity strategies and action plans or the National Action Programme (NAP) of the UNCCD.

National Action Programme to combat desertification in the context of UNCCD has been prepared in 2001. Many collaborative approaches are in the process of implementation to club different activities under various programmes to improve environmental condition through conservation and improvement in biodiversity in the dry regions. Programmes such as National Watershed development Project for Rainfed Areas (NWDPRA), Soil conservation I the Catchment of River Valley Projects (RVP/FPRS), All India Co-ordinated Research Project for Dryland Agriculture (AICRPDA), Integrated Afforestation and Eco-development Project Scheme (IAEPS), Integrated Wasteland Development Programme (IWDP), Desert Development Programme (DAP), Drought Prone Areas Programme (DPAP), Indira Gandhi Nagar Project (IGNP) are already in place.

189. Has your country undertaken measures to ensure synergistic/collaborative implementation of the programme of work between the national UNCCD process and other processes under related environmental conventions? (decisions V/23, VI/4 and VII/2)	
a) No	
b) Yes, some linkages established (please provide details below)	X
c) Yes, extensive linkages established (please provide details below)	

Further comments on the measures to ensure the synergistic/collaborative implementation of the programme of work between the national UNCCD processes and other processes under related environmental conventions.

The ICFRE has ‘observer status’ with the UNFCCC and is involved with the climate change policy issues in Landuse, Landuse change and Forestry Sector. Arid Forest Research Institute (AFRI), Jodhpur has been associated with the activities under programs of UNCCD conducted by MoEF and has worked on various aspects for combating desertification viz; Sand dune stabilization. Water conservation and management studies, agro forestry in dry areas & salt land reclamation. The various programmes related to watershed and waterbodies are forging linkage with the Ramsar Convention on wetlands. The forest areas in the dry land in Guajrat and Rajasthan are also part of the national protected area network for in situ conservation of biodiversity in those areas.

Programme Part A: Assessment	
190. Has your country assessed and analyzed information on the state of dryland biological diversity and the pressures on it, disseminated existing knowledge and best practices, and filled knowledge gaps in order to determine adequate activities? (Decision V/23, Part A: Assessment, Operational objective, activities 1 to 6)	
a) No	
b) No, but assessment is ongoing	
c) Yes, some assessments undertaken (please provide details below)	X
d) Yes, comprehensive assessment undertaken (please provide details below)	

Further comments on the relevant information on assessments of the status and trends and

dissemination of existing knowledge and best practices.

In comprehensive terms, state, sub-state and eco-regional levels of biodiversity assessment were made while preparing the Biodiversity Strategy and Action Plans (BSAPs) at various state, sub-state and eco-region levels. Several site-specific assessment of state of biodiversity had also been undertaken by various national and state level institutions and university departments. Some of the examples are:

- CAZRI recently made elaborated faunal assessment of Thar region of Rajasthan
- GEC made extensive status survey of rare and threatened biodiversity of Gujarat
- GEER Foundation has made extensive biodiversity assessment of almost all the protected areas of Gujarat and also status of Medicinal Plants of Gujarat.
- AFRI, Jodhpur is engaged in assessment and enhancement of bio productivity, increase the vegetative cover and conserve the biodiversity in hot arid and semi-arid regions of Rajasthan, Gujarat and Dadra & Nagar Havelli using agro forestry research model for sustainable production, development of silvipasture model for Maru Gaucher project suitable for arid and semi-arid region of Rajasthan, raising of arboretum cum botanical garden for native flora of Rajasthan, survey and silvicultural management practices for commercially exploited medicinal plants and assessment on the pest problems in forest nurseries and their management in arid and semi arid regions etc.

The dissemination of knowledge and best practices is done through ENVIS Centres.

Programme Part B: Targeted Actions

191. Has your country taken measures to promote the conservation and sustainable use of the biological diversity of dry and sub-humid lands and the fair and equitable sharing of the benefits arising out of the utilization of its genetic resources, and to combat the loss of biological diversity in dry and sub-humid lands and its socio-economic consequences? (part B of annex I of decision V/23, activities 7 to 9)

a)	No	
b)	Yes, some measures taken (please provide details below)	X
c)	Yes, many measures taken (please provide details below)	

Further comments on the measures taken to promote the conservation and sustainable use of the biological diversity of dry and sub-humid lands and the fair and equitable sharing of the benefits arising out of the utilization of its genetic resources, and to combat the loss of biological diversity in dry and sub-humid lands and its socio-economic consequences.

As mentioned in the answer to the question 187, large number of programmes and technologies have been implemented all over the country. TO mention a few specific examples, many measures are taken to improve the productivity of dry land through afforestation, assisted regeneration and resource management and conservation of diversity for sustainable utilization under programmes such as Joint Forest Management, Watershed Development programs and India Eco-development program. In addition site specific projects have also been undertaken such as drought Proofing Projects in Kachchh and in comprehensive community drought preparedness programme to improve quality of life of women and children in Jodhpur district by AFRI identification of key indicators and suitable strategies for sustainable Joint Forest management in Gujarat and Rajasthan, standardization of nursery practices in respect of selected species suitable for arid and semi –arid region and development of suitable models for urban aesthetic forestry etc.

India has Biological Diversity Act, 2002 where the National Biodiversity Authority (NBA) has to develop a sui generic system for access and benefit sharing of the biological diversity and the associated knowledge for the entire country which also includes the dray lands. The NBA has been established and it has initiated the implementation of the Act.

192. Has your country taken measures to strengthen national capacities, including local capacities, to enhance the implementation of the programme of work?

a)	No	
b)	Yes, some measures taken (please provide details below)	X

c)	Yes, comprehensive measures taken (please provide details below)	
d)	Yes, all identified capacity needs met (please provide details below)	

Further comments on measures taken to strengthen national capacities, including local capacities, to enhance the implementation of the programme of work.

Details of the capacity building programmes have been mention in the answer to the question 187.

Measures have been taken to afforest the degraded land, conserve existing flora and fauna and improve the productivity in the dry regions through iinstitutional manpower and scientist trained in biodiversity management and conservation and capacity building of the local people.

Box LXXII.

Please elaborate below on the implementation of this programme of work and associated decisions specifically focusing on:

a) outcomes and impacts of actions taken;
b) contribution to the achievement of the goals of the Strategic Plan of the Convention;
c) contribution to progress towards the 2010 target;
d) progress in implementing national biodiversity strategies and action plans;
e) contribution to the achievement of the Millennium Development Goals;
f) constraints encountered in implementation.

Mountain Biodiversity

Programme Element 1. Direct actions for conservation, sustainable use ad benefit sharing

193. Has your country taken any measures to prevent and mitigate the negative impacts of key threats to mountain biodiversity?

a)	No	
b)	No, but relevant measures are being considered	
c)	Yes, some measures taken (please provide details below)	X
d)	Yes, many measures taken (please provide details below)	

Further comments on the measures taken to prevent and mitigate the negative impacts of key threats to mountain biodiversity

Mountain biodiversity has been given special importance in various policies, plans and programmes of Government of India. For example, Draft National Environment Policy, 2004 calls for best practices/norms for infrastructure construction, encouraging cultivation of traditional varieties of crops by promotion of organic farming, promoting sustainable tourism in mountain region. National Wildlife Action Plan,2002 calls for development of stringent standards of waste disposal energy & water consumption, construction plans & material and measures to prevent damage to forest & mountain vegetation

A strong network of Protected Areas (covering 9.6% of total geographical area in Indian Himalayas, and 10.1% in Western Ghats) has been established in Indian mountains towards preventing the inappropriate land use practices and changes in different ecosystems and to ensure maintenance of biodiversity, in particular ecosystem integrity. This coverage is considerably higher than the national average of 4.7%. Further, a target of 33% forest cover has been established in the country to be achieved by 2020. The Himalayan region represents nearly 34% forest. Intensive studies on structure and function of forest vegetation along disturbance intensities are regularly conducted in the mountain region for developing appropriate strategies and assess the impact of anthropogenic disturbances. There is a ban on green tree cutting above 1000 m. altitude. Measures are being undertaken to mitigate the impact of shifting cultivation. Stringent view is taken for providing environmental clearance to developmental projects in mountain areas.

Several institutions have been setup with specific focus on research on mountain biodiversity such as

Bioresource Development Unit at Indian Himalayan Bioresource Technology, Palampur, GB Pant Institute of Himalayan Environment and Development, Almora, Mountain Bioresource Complex at Dehradun etc.

194. Has your country taken any measures to protect, recover and restore mountain biodiversity?		
a)	No	
b)	No, but some measures are being considered	
c)	Yes, some measures taken (please provide details below)	X
d)	Yes, many measures taken (please provide details below)	

Further comments on the measures taken to protect, recover and restore mountain biodiversity

To enhance the capacity of mountain ecosystems, to resist and adapt to climate change and other natural calamities and to ensure minimum viable population sizes to enable genetic adaptation to changing environmental conditions the size of protected areas in the mountains has usually been kept large. For example Nanda Devi National Park, a world heritage site today, got degraded due to excessive influence of mountaineers. In 1982 the mountaineering activity was banned completely leading to out recovery of this threatened and fragile ecosystem. Valley of flowers too was declared as National Park in 1982 and camping was banned leading to the recovery of this famous alpine meadow.

The Indian Himalayan Region (Trans, Northwest, West, Central and east Himalayan provinces) has 15 national Parks and 59 wildlife sanctuaries. In addition 6 biosphere reserves have also been designated (i.e. Nanda Devi in Uttaranchal, Kancgchendzonga in Sikkim, Dehang Debang in Arunachal; Nokrek in Meghalaya, Manas and Dibru Saikhowa in Assam). Of these the Nandadevi Biosphere Reserve has been included in Global Network of Biosphere Reserves. The oldest PA of the region is Corbett National Park, which was established in 1936. The random distribution of PAs covering more than 5.5% area in each biogeographic province [Trans- 7 PAs (9.2% of area); Northwest – 29 (5.88%); west 18 (13.06%); Central –8 (7.82%); and East –12(11.44%)] takes care of representative habitats and biota along longitudinal –east to west gradient. The system of PAs in the Western Ghats includes the Nilgiri Biosphere Reserve, the first and largest Biosphere Reserve in India, 13 National Parks and 45 wildlife sanctuaries. The largest national park is in Bandipur and the largest wildlife sanctuary in the Anamalai hills. The Bandipur, Periyar and Kalakad-Mundanthurai are Project Tiger Reserves. Some other protected areas of the region fall under Project Elephant Reserves.

More recently to follow an ecosystems approach of conservation in two entirely diverse parts of the Himalayan Mountains two Biosphere Reserves have been proposed: (i) Cold Desert Biosphere Reserve in Trans Himalayan areas; (ii) World Peace Park BR in Arunachal Pradesh. Further, to enhance ecosystem sustainability, with particular emphasis on degraded slopes restoration through intervention of native plants is being attempted. In this context, application of SWEET (Sloping Watershed Environmental Engineering Technology) across the Himalayan region, and SALT (Sloping Agriculture Land Technology) in North East States is being promoted. Towards examining the representativity and sustainability of existing PAs and to identify gaps and weaknesses, the PA system in the Indian Himalayan Region has been reviewed.

Initiatives have been made recently in different mountain areas of India to initiate specific activities to facilitate maintenance, protection and conservation of existing level of endemic species, An atlas of endemics of Western Ghats has been prepared. G.B. Pant Institute of Himalayan Environment has initiated a programme to document and map the Himalayan endemics. Under this initiative the conservation implications of plant endemism in high altitude Himalayas was reviewed and an action plan was developed. FRI is actively engaged in the studies of Himalayan Pines and its genetic variability, medicinal plants of Uttaranchal through nursery and planting technology. Similarly efforts are being carried out in Environmental conservation strategies for land use in the lower western Himalayas with butterflies as indicator in monitoring environmental changes along an urban gradient

Himalayan Forest Research Institute (HFRI), Shimla is actively engaged in assessment of conservation status of Hill Bamboos, collection of germplasm from various eco-climatic zones in Sutlej catchment area and establishment of germplasm bank and standardization of nursery techniques for mass propagation of selected medicinal plants of temperate Himalayas in different nurseries of Shimla.

To develop *ex situ* mechanisms, establishment of gene banks in the form of Arboreta, Herbal garden, and School campus conservation models are being promoted across the Indian Himalayas. Also, to ensure *ex situ* maintenance of highly sensitive plant species (e.g. endemic medicinal plants, native multipurpose trees) efficient propagation protocols (conventional and biotechnological) have been developed and further initiatives are underway..

195. Has your country taken any measures to promote the sustainable use of mountain biological resources and to maintain genetic diversity in mountain ecosystems?	
a) No	
b) No, but some measures are being considered	
c) Yes, some measures taken (please provide details below)	X
d) Yes, many measures taken (please provide details below)	

Further comments on the measures to promote the sustainable use of mountain biological resources and to maintain genetic diversity in mountain ecosystems

Vast areas of mountains in India have been declared reserved forests from where forest produce is being harvested in a sustainable manner primarily for local use. The areas are also utilized for eco-tourism. A large representative network of protected areas has been established in the mountains of India. Himalayas & Western Ghats have 9.72% & 10.1% area under protected areas. Institution of participatory management have been developed e.g. Joint Forest Managements Village forest council etc. Domestication of wild plant resources is being encouraged for their sustainable use. demonstrations and trainings on Natural resource Management (NRM) practices are being imparted with a particular emphasis on people and resource dynamics in mountain watersheds to promote sustainable land-use practices in relation to human livelihood needs.

196. Has your country taken any measures for sharing the benefits arising from the utilization of mountain genetic resources, including preservation and maintenance of traditional knowledge?	
a) No	
b) No, but some measures are being considered	
c) Yes, some measures taken (please provide details below)	X
d) Yes, many measures taken (please provide details below)	

Further comments on the measures for sharing the benefits arising from the utilization of mountain genetic resources

The Biological Diversity Act, 2002 has provisions to ensure that fair & equitable sharing of benefits arising out of utilization of biodiversity (which include mountain genetic resources) & related traditional knowledge. Several programmes are underway for documenting traditional knowledge by institutions in the country. For example a project to document traditional ecological knowledge is in progress at Indian Council of Forestry Education and Research, Dehradun and this knowledge will be utilized to develop valuable and effective technology which can be further strengthened through our institutional expertise. Use of ethnobotanical knowledge is being analyzed in context of modern knowledge understanding the factors which lead to formation of sacred groves being analyzed.

Programme Element 2. Means of implementation for conservation, sustainable use and benefit sharing	
197. Has your country developed any legal, policy and institutional framework for conservation and sustainable use of mountain biodiversity and for implementing this programme of work?	
a) No	X
b) No, but relevant frameworks are being developed	

c) Yes, some frameworks are in place (please provide details below)	X
d) Yes, comprehensive frameworks are in place (please provide details below)	X

Further comments on the legal, policy and institutional frameworks for conservation and sustainable use of mountain biodiversity and for implementing the programme of work on mountain biodiversity.

The umbrella coverage to legal, policy and institutional framework for conservation and sustainable use and implementation of the programmes on mountain biodiversity is provided under the Biological Diversity Act, 2002 and Biological Diversity Rules 2004. The Indian Forest Act, 1947 and Wildlife Protection Act, 1972 also provide for conservation of forests and protection of mountain biodiversity.

National Bioresource Development Board has been set up by the Department of Biotechnology to decide broad policy framework for sustainable utilization of bioresources.

Other specific programmes, policies and legal frameworks focusing on biodiversity protection in the country have covered mountain biodiversity as well. Some of the examples are given below:

i. Of the total 583 threatened plants (Red Data Book species) in India, 121(20.8%) species are from Himalayan region. Various organizations are implementing programmes for improving the status of these species. Nearly 29 mammalian species listed under Schedule 1 of the Indian Wildlife Protection Act are Himalayan.

ii. Both the areas, the Himalayas and Western Ghats are considered among hotspots of endemic diversity. The Himalayan region is known to represent over 3471 endemic species of flowering plants. Likewise, in Western Ghats, of the total 4000 flowering plant species 1500 are endemic which include 49 monotypic endemic genera. With regard to fauna, of the total 120 mammalian species 14 are endemic in Western Ghats.

ii. A number of mountain species have been included in different appendices of the CITES for banning their international trade so as to protect their status. For example from the Himalayan region species like *Saussurea costus, Rananthera imschootiana, Vanda coerula* and *Paphiopedilum fairieanum, P. insigne, P. venustum* are included in Appendix –I, which require total ban on international commercial trade except for scientific research and conservation purpose for which both export as well as import permit is required. Similarly, species like *Rauvolfia serpentina, Podophyllum hexandrum, Cyathea andersonii, C. brunoniana, C. chinensis, C. contanians, C. gigantean, C. henryi, C. spinulosa, Cycus pectinata, Dioscorea deltoidea, Aquilaria malacaccensis, Taxus wallichiana, Aloe vera, Orchidaceae, Ceropegia hookeri, C. kachinensis, C. longifolia, C. lucida, C. macarantha, C. pubescens, C. wallichiana, euphorbias*, are included in Appendix – II which require, strict control on trade of these taxa, including the 'look alike' species, requiring export permit by the country of origin. Species like *Gnetum montanum, Tauluma hodgsonii, Podocarpus neriifolius*, etc. are included in Appendix –III which require regulation of trade through mutual cooperation from other member countries.

198. Has your country been involved in regional and/or transboundary cooperative agreements on mountain ecosystems for conservation and sustainable use of mountain biodiversity?

a) No	
b) No, but some cooperation frameworks are being considered	X
c) Yes (please provide details below)	

Further information on the regional and/or transboundary cooperative agreements on mountain ecosystems for conservation and sustainable use of mountain biodiversity

India is involved in development of Transboundary Cooperative Agreement on Kanchendzonga Landscape Area, which involves Nepal, Bhutan and India. The initiative specially focuses on finding possibilities to establish biological corridors between Protected Areas within Kanchendzonga Landscape in East Himalayas. A corridor for elephants between India and Nepal is also being discussed for Dudhwa National Park.

To promote appreciation and conservation of mountain biological diversity as means of reducing human conflicts, more proposals to establish Biosphere reserves are being considered. Proposal for establishment of World Peace Park (as Biosphere Reserve) in Arunachal Pradesh is of special significance.

Programme Element 3. Supporting actions for conservation, sustainable use and benefit sharing	
199. Has your country taken any measures for identification, monitoring and assessment of mountain biological diversity?	
a) No	
b) No, but relevant programmes are under development	
c) Yes, some measures are in place (please provide details below)	X
d) Yes, comprehensive measures are in place (please provide details below)	

Further comments on the measures for identification, monitoring and assessment of mountain biodiversity

Various institutions are involved in the identification/monitoring and assessment of mountain diversity such as Botanical Survey of India, Zoological Survey of India, G.B. Pant Institute of Himalayan Environment and Development, State Departments of Agriculture, Horticulture, Fisheries and Forests, university departments and research institutions. Biodiversity registers are being created in some of the areas which include listing of the species and their traditional uses by local communities as well. Village communities are preparing biodiversity registers in a Indo-Canadian Environment Facility (ICEF) sponsored project in Garhwal.

200. Has your country taken any measures for improving research, technical and scientific cooperation and capacity building for conservation and sustainable use of mountain biodiversity?	
a) No	
b) No, but relevant programmes are under development	
c) Yes, some measures are in place (please provide details below)	X
d) Yes, comprehensive measures are in place (please provide details below)	

Further comments on the measures for improving research, technical and scientific cooperation and capacity building for conservation and sustainable use of mountain biodiversity

Mountain areas are provided relatively higher funds under the research schemes and programmes in the country. Some examples of the research initiatives are given below.

- At several institutions, initiatives are under way to conduct long-term research on species adaptability to changes in the Himalayas; and role and importance of biodiversity and ecosystem functioning .
- Towards developing collaborative research programmes of mutual interest various programmes with different countries are being initiated. For example, in the Himalayas G.B. Pant Institute of Himalayan Environment & Development is involved in development of a global project on Pollinators and Sustainable Agriculture. Also, the Institute is one among international partners for Peoples and Resource Dynamics Project on watershed.
- Several interdisciplinary, key research programmes on mountain biodiversity and its relationship to ecosystem structure and functioning is being implemented by the different government, non-government organizations. The Botanical Survey of India -BSI (North Circle Dehradun, Sikkim Himalayan Circle – Gangtok, East Himalayan Field Station – Itanagar) and Zoological Survey of India - ZSI (Northern regional Circle – Dehradun, Arunachal Pradesh Regional station – Itanagar) are implementing programmes on inventorization and prioritization of biodiversity elements at species level; characterization of their habitat relations and assigning ethnobiological values.
- The G.B. Pant Institute of Himalayan Environment & Development is conducting researches on status assessment of priority species and their habitat relationships. Also, different projects being implemented by the Institute on *ex-situ* conservation of plants, especially the high value medicinal plants, rhododendrons and other important species.

Western Ghats:

i. Southern (Coimbatore) and Western (Pune) circles of BSI and ZSI Regional Station Pune undertake the activities on inventorization of species in western Ghat region.

ii. The Western Ghats biodiversity network (launched 1994) through participation of school and college students / teachers and NGOs collects information on status, distribution and ecology of species. The efforts of network have resulted in developing of people's biodiversity registers.

iii. The Tropical Botanical Garden and Research Institute (TBGRI), Thiruvananthapuram (Kerala) is conducting programmes for ex- situ conservation of species.

iv. Several notable NGOs like Foundation for Revitalization of Local Health Traditions (FRLHT), M.S. Swaminathan Foundation, Bombay natural History Society, Ashoka Trust for Research in Ecology and Environment, Kalpavriksha, Zoo Outreach Organization, etc. are also implementing programmes/projects pertaining to species conservation.

201. Has your country taken any measures to develop, promote, validate and transfer appropriate technologies for the conservation of mountain ecosystems?	
a) No	
b) No, but relevant programmes are under development	
c) Yes, some measures are in place (please provide details below)	X
d) Yes, comprehensive measures are in place (please provide details below)	

Further comments on the measures to develop, promote, validate and transfer appropriate technologies for the conservation of mountain ecosystems

Technology development, promotion and transfer for the conservation of mountain ecosystems is being undertaken in terms of various projects by research institutions. For example G.B. Pant Institute of Himalayan Environment and Development has established a rural biotechnological complex for giving training programmes for rural inhabitants, women groups etc.

The XII Finance Commission has earmarked a separate funds for the Himalayan states considering their rich forests and special problems.
A meeting of Mountain States was held at Dehradun in 2004 for regional cooperation and a demand for Hill Council at Centre level was put forward, which is gathering momentum and support.

An IDRC sponsored Indo-Nepal pilot project is underway to estimate the value of ecosystem services generated in the Central Himalayas.

Box LXXIII.

Please elaborate below on the implementation of this programme of work and associated decisions specifically focusing on:

a) outcomes and impacts of actions taken;
b) contribution to the achievement of the goals of the Strategic Plan of the Convention;
c) contribution to progress towards the 2010 target;
d) progress in implementing national biodiversity strategies and action plans;
e) contribution to the achievement of the Millennium Development Goals;
f) constraints encountered in implementation.

E. OPERATIONS OF THE CONVENTION

202. Has your country actively participated in subregional and regional activities in order to prepare for Convention meetings and enhance implementation of the Convention? (decision V/20)	
a) No	
b) Yes (please provide details below)	X

Further comments on the regional and subregional activities in which your country has been

involved.
India has participated actively in Asian Regional meetings for preparing for CBD meetings, whenever these are held. India has participated in LMMC meetings in Mexico, Peru, Malaysia. Now as Chair of LMMC, India has organized LMMC meeting in January 2005.

203. Is your country strengthening regional and subregional cooperation, enhancing integration and promoting synergies with relevant regional and subregional processes? (decision VI/27 B)	
a) No	
b) Yes (please provide details below)	X
Further comments on regional and subregional cooperation and processes.	
South Asian Association for Regional Cooperation (SAARC) has seven countries of the region as members, viz, Nepal, India, Bangladesh, Bhutan, Pakistan, Maldives, Sri Lanka. So far, five Environment Ministers Conferences have been held under SAARC, which also has a Committee on Environment, Meteorology and Forest, for working out the detailed plan of action in these areas and implementing the same.	

The following question (204) is for DEVELOPED COUNTRIES

204. Is your country supporting the work of existing regional coordination mechanisms and the development of regional and subregional networks or processes? (decision VI/27 B)	
a) No	
b) No, but programmes are under development	
c) Yes, included in existing cooperation frameworks (please provide details below)	
d) Yes, some cooperative activities ongoing (please provide details below)	
Further comments on support for the work of existing regional coordination mechanisms and the development of regional and subregional networks or processes.	

205. Is your country working with other Parties to strengthen the existing regional and subregional mechanisms and initiatives for capacity-building? (decision VI/27 B)	
a) No	
b) Yes	X

206. Has your country contributed to the assessment of the regional and subregional mechanisms for implementation of the Convention? (decision VI/27 B)	
a) No	
b) Yes (please provide details below)	
Further comments on contribution to the assessment of the regional and subregional mechanisms.	
South Asian Association for Regional Cooperation (SAARC) has seven countries of the region as members, viz, Nepal, India, Bangladesh, Bhutan, Pakistan, Maldives, Sri Lanka. So far, five Environment Ministers Conferences have been held under SAARC, which also has a Committee on Environment, Meteorology and Forest, for working out the detailed plan of action in these areas and implementing the same. India in its capacity as the Chair of the Like Minded Megadiverse Countries (LMMC) had organized an Expert and Ministerial level Meeting of the LMMCs in New Delhi from 17-21 January, 2005, under the	

patronage of the Hon'able Minister of Environment & Forests as President of LMMC.

This meeting has adopted the New Delhi Ministerial Declaration of Like Minded Megadiverse Countries on Access and Benefit Sharing, which is being seen as the beginning of new era in the negotiations on International Regime on Access and Benefit Sharing as a Legally Binding Instrument (LBI).

Box LXXIV.

Please elaborate below on the implementation of the above decisions specifically focusing on:

a) outcomes and impacts of actions taken;
b) contribution to the achievement of the goals of the Strategic Plan of the Convention;
c) contribution to progress towards the 2010 target;
d) progress in implementing national biodiversity strategies and action plans;
e) contribution to the achievement of the Millennium Development Goals;
f) constraints encountered in implementation.

F. COMMENTS ON THE FORMAT

Box LXXV.

Please provide below recommendations on how to improve this reporting format.