

In celebration of India's diversity of ecosystems, plants,  
animals, microbes, and human cultures

# List of Tables, Boxes, and Figures

## List of Tables

- Table 3.1 Geological Time Scale
- Table 3.2 Indigenous Forest Management in India that Conserves Biodiversity in a Continuum of Land Uses
- Table 3.3 Distribution of Main Workers among the Primary, Secondary and Tertiary Sectors
- Table 3.4 Area under Culturable Lands
- Table 4.1 Biogeographic Zone of India and their Spatial Extent
- Table 4.2 Forest Types as Classified by Champion and Seth (1968)
- Table 4.3 Area of each Vegetation Type and its Floristic Diversity, under each Biogeographic Region
- Table 4.4 Forest Cover Estimates from 1987 to 1999
- Table 4.5 Forest Cover as per 2001 Estimate
- Table 4.6 Area (percentage of potential) under Plesioclimax and under other Degraded Physiognomies of Vegetation
- Table 4.7 Extents of some Coastal Marine Ecosystems in India
- Table 4.8 Estimates as of 1998 of Pollutants Annually Entering the Coastal Seas of India
- Table 4.9 Categories of Natural Freshwater Wetlands
- Table 4.10 Categories of Human-Made Freshwater Wetlands
- Table 4.11 Distribution of Wetlands in the States and Union Territories of India
- Table 4.12 Floristic Diversity in Different Groups
- Table 4.13 Comparison of Estimated Number of Plant Species in the World and India
- Table 4.14 Distribution of the Species in Dominant Angiospermic Families in India
- Table 4.15 Distribution of Ancient Genera in Different Families
- Table 4.16 Distribution of Wild Relatives in Different Crop Groups
- Table 4.17 Threatened Floral Species in India by Threat Category (2002 Red List)
- Table 4.18 Status of Threatened Gymnosperms
- Table 4.19 Distribution of Pteridophytes in Different Peridophytic Zones
- Table 4.20 Distribution of Mosses in Different Bryological Zones
- Table 4.21 Distribution of Liverworts in Different Bryogeographical Territories
- Table 4.22 Distribution of Lichens in Different Lichenographical Regions
- Table 4.23 Distribution of Fungi in Various Groups
- Table 4.24 Distribution of Orchids in Various Regions of India
- Table 4.25 Estimated Number of Aquatic/Wetland Species of Plants in India
- Table 4.26 Estimated Number of Aquatic Vascular Plant Species in Different States of India
- Table 4.27 Comparison Between the Number of Faunal Species in India and the World
- Table 4.28 Estimated Number of Endemic Species in India
- Table 4.29 Distribution of Endemic Vertebrates in the Western Ghats
- Table 4.30 Threatened Faunal Species in India by Threat Category (2002 Red List)
- Table 4.31 Number of Threatened Species
- Table 4.32 Comparison of Numbers of Insects in India and the World
- Table 4.33 Diversity of Mammals in India
- Table 4.34 Diversity of Marine and Freshwater Faunal Species in India
- Table 4.35 Microbial Diversity (Known and Estimated Species)
- Table 4.36 Estimates of the Proportion of 'Unculturable' Micro-organisms in Various Terrestrial and Aquatic Biotopes (Worldwide)

Table 4.37	Possible Taxonomic Components of a Set of 2500 species
Table 4.38	Domestic Animal Diversity
Table 4.39	List of Threatened Livestock Breeds
Table 4.40	Microbial Cultures held at Different Centers in India
Table 4.41	Comparison of the Ecosystem Services of Three Himalayan Forests
Table 4.42	Livelihood Linkages with Common Property Resources
Table 4.43	Medicinal Plants Species Diversity used by local communities in Different Biogeographic Zones of India
Table 4.44	Nutritive Values per 100 g of Food Grains
Table 4.45	Exports of Medicinal Plants in 2000-01
Table 4.46	Economic Value of Ecosystem Services: Selected Indian Studies
Table 4.47	Production and Export of Marine Products of India
Table 4.48	Revenues obtained from Non-Wood Forest Produce (in Rs.'000)
Table 4.49	Traits of Farms in the Deccan Region, Andhra Pradesh
Table 4.50	Chemical Properties of Different Farms
Table 4.51	Comparison of Crop Yields and Returns Between Ecological, Conventional and Chemical Farming in Dryland Agriculture
Table 4.52	Balance Sheet Between Ecological, Conventional and Chemical Agriculture
Table 4.53	Comparative values of a land race and a commercial variety
Table 5.1	Comparison of the Different Types of Vegetation in the Nilgiri Biosphere Reserve between 1849 and 1992
Table 5.2	Commercial Threats facing Protected Areas in India
Table 5.3	Summary of Human-Wildlife conflict across India
Table 5.4	Area (in million ha) under High Yielding Varieties of Select Crops
Table 5.5	Decline in 'Minor' Crops after the Green Revolution
Table 5.6	Coverage of Different Categories of Rice Cultivation in Tripura
Table 5.7	Area and Production of Some Crops in Punjab
Table 5.8	Rice Distributed and Current Fallows (in 1990)
Table 5.9	Loans offered by Manjeera Grameena Bank in Medak District of Andhra Pradesh
Table 6.1	State-wise Distribution of PAs
Table 6.2	Biogeographic Region-wise Distribution
Table 6.3	Present Status of Preservation Plots in India
Table 6.4	State-wise List of Crocodile Rearing and Releasing Sites in India
Table 6.5	Status of JFM (as on March 1, 2002)
Table 6.6	List of ENVIS Centres
Table 6.7	Comparison of Time Given (in minutes) to Various Issues on Primetime Newscasts
Table 6.8	Agro-technologies by CIMAP
Table 6.9	Programmes of the Ministry of Non-Conventional Energy Sources
Table 6.10	NBAGR Study Areas
Table 7.1	Actions to Ensure Sustainable Plantation Activities
Table 7.2	Gaps and Strategies Relating to Forest Policies and Laws
Table 7.3	Estimated and Installed Capacity of Renewable Energy in India

## List of Boxes

Box 1.1	Use of BSAPs and Sub-thematic Reviews in the NAP
Box 3.1	First Domestication of Indian Animals
Box 3.2	Rulers and Wildlife in India: A Brief History
Box 3.3	Sacred spaces
Box 3.4	Traditional Water Harvesting Systems used in Different Ecological Zones in India
Box 3.5	The Raika Pastoralists of Rajasthan
Box 3.6	Microbial Biodiversity in Traditional Fermented Foods and Beverages of the North-East Region

- Box 3.7 The Dying Dokpas Of North Sikkim
- Box 3.8 Contradictions in Himachal Pradesh's Land Use Data
- Box 4.1 Rock Outcrops
- Box 4.2 Vertebrate Fauna of the Salt Desert
- Box 4.3 Flora of the Cold Desert
- Box 4.4 Hotspecks
- Box 4.5 Wetlands in India: Some Prominent Examples
- Box 4.6 Rattans (Canes) of India
- Box 4.7 Monotypic Genera of Pteridophytes
- Box 4.8 Bamboos of India
- Box 4.9 Profiles of Aquatic Plant Species
- Box 4.10 North-East India
- Box 4.11 Extinct Species
- Box 4.12 Freshwater and Marine Species Diversity
- Box 4.13 Estimates of Undiscovered Species in India
- Box 4.14 Genetic Variety in Traditional Agro-ecosystems
- Box 4.15 The Advanced Agriculture of the 19th Century India
- Box 4.16 Home Gardens
- Box 4.17 Diversity in Rainfed Agriculture
- Box 4.18 Loss of Crop Diversity in West Bengal
- Box 4.19 Yak Breeds and Distribution in India
- Box 4.20 Indigenous Breeds of Indian Dogs
- Box 4.21 Mountain Forest Ecosystem and Water
- Box 4.22 Economic Values of Arid Grasslands in Kachchh
- Box 4.23 The Value of Weeds
- Box 4.24 Uncultivated Greens
- Box 4.25 Economic Values of Wild Medicinal Plants
- Box 4.26 Medicinal Value of Marine Bioresources
- Box 4.27 Values of Microorganisms in Medicines
- Box 4.28 Valuing Eco-tourism at a Sacred Lake of the Sikkim Himalaya, India
- Box 4.29 Diverse Values of Agro-biodiversity
- Box 4.30 Festivals: Celebrations of Diversity
- Box 5.1 Indices of Human Impacts
- Box 5.2 Mining and Biodiversity
- Box 5.3 Impacts of Toxics on Biodiversity
- Box 5.4 Dams and Biodiversity
- Box 5.5 Human-Wildlife Conflicts
- Box 5.6 Musk Deer Hunting
- Box 5.7 Mesquit (*Prosopis juliflora*)
- Box 5.8 Wildlife Disease and Faulty Reintroductions
- Box 5.9 Impact of Climate Change on Biodiversity
- Box 5.10 The Genetic Poverty of Modern Agriculture
- Box 5.11 Diversity, Drylands and the Public Distribution System
- Box 5.12 The Planning Commission on Development vs. Environment
- Box 5.13 Is Industrialisation Sustainable?
- Box 5.14 Relaxation in Environmental Amendments and Procedures
- Box 5.15 Development-related Perverse Incentives in Agriculture
- Box 5.16 Losing out?
- Box 5.17 Conversion of Community Forests into State Owned 'Forests' - Village Women's Experience
- Box 5.18 Unresolved issues in Tribal Empowerment
- Box 5.19 Impact of Inappropriate Institutional Changes on Community Management in Goa
- Box 5.20 From *Chipko* to *Ped Kato*

- Box 5.21 The Threat from Forest Encroachments
- Box 5.22 The Marginalisation of Small-scale and Artisanal Fishworkers
- Box 5.23 The Ama Sangathan's struggles in Orissa
- Box 5.24 The Odds Against the Forest Department
- Box 5.25 Adivasi Workshop Statement on Biodiversity
- Box 5.26 Legal Lacunae: The Case of Andhra Pradesh
- Box 5.27 Impacts on Fish Production in Gujarat
- Box 6.1 Environment Impact Assessment (EIA)
- Box 6.2 Traditional Knowledge Digital Library
- Box 6.3 Biodiversity Information System
- Box 6.4 Urban Forestry Plans
- Box 6.5 Biodiversity Conservation Prioritisation Project
- Box 6.6 The Important Bird Areas Programme (IBA)
- Box 6.7 Research activities by NGOs at a State/Union Territory Level
- Box 6.8 NCL's Center for Biodiversity Informatics
- Box 6.9 Herbaria, Museum, Insect Collections and other Databases
- Box 6.10 Existing Information Resources
- Box 6.11 Community- Based Monitoring at Biligiri Rangaswamy Temple (BRT) Wildlife Sanctuary
- Box 6.12 Participatory Mapping as part of BCPP
- Box 6.13 Research within the NBSAP
- Box 6.14 India's Protected Areas: Some Interesting Titbits
- Box 6.15 India Ecodevelopment Project
- Box 6.16 Ecodevelopment in the Kalakad-Mundanthurai and Periyar Tiger Reserves
- Box 6.17 Regeneration and Restoration of Ecosystems and Reintroduction of Species
- Box 6.18 Ecologically Sensitive Areas under Environment (Protection) Act, 1986
- Box 6.19 Supreme Court Judgement on Aquaculture, 1996
- Box 6.20 Special Conservation Measures for Endangered Plant Species
- Box 6.21 *In Situ* conservation in Urban Areas
- Box 6.22 Initiatives addressing Human Wildlife Conflicts
- Box 6.23 Some Initiatives at State/Union Territory level
- Box 6.24 Community Forest Management in Orissa
- Box 6.25 Some People's Movements Leading to Conservation
- Box 6.26 Ecological Parks in Indian Oil Refineries
- Box 6.27 *In Situ* Conservation Efforts as part of the NBSAP Process
- Box 6.28 Red Panda Rehabilitation
- Box 6.29 Germplasm Facilities
- Box 6.30 Indian Crocodile Action Plans
- Box 6.31 Positive Impacts of JFM
- Box 6.32 Tassar Silk and Honey in Garhwal Himalaya
- Box 6.33 The Nanda Devi Biodiversity Conservation and Ecotourism Declaration
- Box 6.34 Tawa Reservoir and the Tawa Matsya Sangh
- Box 6.35 Sustainable Tourism in Kumarakom
- Box 6.36 Participatory Planning by Panchayats in Kerala
- Box 6.37 NTFP Transfer in Orissa
- Box 6.38 Implementation of Minor Forest Produce (MFP) Ownership Transfer in some other States
- Box 6.39 How Equitable are JFM Committees: The case of VFC Bagadari, District Narsinghpur, MP
- Box 6.40 Task Force on Conservation, Cultivation, Sustainable Use and Legal Protection for Medicinal Plants
- Box 6.41 Public Hearings under Environment Impact Assessment Notification, 1994
- Box 6.42 Diversity of CFM in Uttaranchal
- Box 6.43 Taking JFM Forward: the Karnataka People's Model
- Box 6.44 Saigata Village Initiative

- Box 6.45 Community-based Systems in Fisheries
- Box 6.46 Benefit Sharing from the *Mahuda* Tree in Dhandasan
- Box 6.47 Supreme Court Judgement on Settlement of Rights
- Box 6.48 The Kani-TBGRI Model
- Box 6.49 NBSAP Initiatives towards Equity
- Box 6.50 Integrating Biodiversity Education in 10 Shiksha Mission Schools
- Box 6.51 Yatras/Boat Rallies as part of the NBSAP Process
- Box 6.52 Environment Education and People with Disabilities
- Box 6.53 Kids for Tigers
- Box 6.54 Learning from Experience in Nahin Kalan Village, Uttaranchal
- Box 6.55 Initiatives towards Awareness as part of NBSAP
- Box 6.56 A Media Campaign Saves a Sanctuary
- Box 6.57 Chilika Development Authority
- Box 6.58 Coastal Zone Management Authorities
- Box 6.59 Special Region Development Programmes
- Box 6.60 Role of the State with respect to Public Lands/Waters: From Eminent Domain to Public Trust
- Box 6.61 The Biological Diversity Act 2002
- Box 6.62 Legislative Framework for Marine Fisheries and Conservation in India
- Box 6.63 Some Legal and Policy Measures related to the Mining Sector
- Box 6.64 Bhaonta Kolyala Village, Rajasthan: Community Conservation of Biodiversity
- Box 6.65 Amendments to the CRZ Notification, 1991
- Box 6.66 Conflicting Policy, Legal and Institutional Frameworks for Participatory Forest Management (PFM) in Himachal Pradesh
- Box 6.67 Innovative Funding
- Box 6.68 The Srinivasan Services Trust (SST)
- Box 6.69 Innovative Fishing Practices
- Box 6.70 Community or People's Biodiversity Registers
- Box 6.71 Gender and Seed Jatra
- Box 6.72 NBSAP Related Activities on Agro-biodiversity
- Box 6.73 Nagaland Empowerment of People through Economic Development (NEPED)
- Box 6.74 Some Organic Farming Initiatives
- Box 6.75 Land Reforms in West Bengal
- Box 6.76 *Prajateerpu* – The Citizens' jury
- Box 6.77 Celebratory Biodiversity Festivals...and the Role of the NBSAP
- Box 7.0.1 Role of the State Towards Public Lands/Waters: From Eminent Domain to Public Trust
- Box 7.0.2 Ecoregional Authorities (Recommendations of Ecoregional BSAPs)
- Box 7.0.3 The Ecosystem Approach in the Gangetic Plains and Western Himalaya (Recommendations of the relevant BSAPs)
- Box 7.0.4 Regional Planning for Conservation and Development: Recommendations from a National Workshop
- Box 7.0.5 The Ecosystem Approach in the Convention on Biological Diversity
- Box 7.0.6 Revitalise and Nurture Community Spirit and Innovation
- Box 7.0.7 Rights and Responsibilities Regarding Decision-making: Moving towards Participatory Democracy
- Box 7.0.8 Urban and Rural Natural Resource Governance: The Role of the 74th Amendment
- Box 7.0.9 Autonomous District Councils (Recommendations from various BSAPs)
- Box 7.1.1.1 Research and Monitoring in India's Protected Areas
- Box 7.1.1.2 Monitoring and Evaluation (Recommendations in various BSAPs)
- Box 7.1.2.1 Conserving Neglected Ecosystems: Grasslands, Wetlands, and Coastal/Marine Areas
- Box 7.1.2.2 Community Conserved Areas(Recommendations from various BSAPs)
- Box 7.1.2.3 Protecting the Coast
- Box 7.1.2.4 Protecting Rock Outcrops
- Box 7.1.2.5 Using the Armed Forces for Conservation (Extracts from various BSAPs)

- Box 7.1.2.6 Indian Crocodiles Action Plan
- Box 7.1.2.7 Candidate Species for Reintroduction, Enhancement, or Translocation
- Box 7.1.2.8 Actions to Counter Climate Change in the Western Himalaya Ecoregion (WHE)
- Box 7.1.2.9 Priority Trans-boundary Sites for Conservation Action in the Eastern Himalaya
- Box 7.1.2.10 Priority Trans-boundary Sites for Marine Conservation
- Box 7.1.3.1 Threatened and Endemic Plants of India needing *Ex Situ* Conservation Initiatives
- Box 7.1.4.1 National Forestry Action Plan
- Box 7.1.4.2 Conservation and Sustainable Utilization of Medicinal Plants, and Promotion of Biodiversity-Based Health Traditions
- Box 7.1.4.3 Health and Biodiversity: Perceptions of Nattu Vaidyas
- Box 7.1.4.4 Reviving Natural Dyes
- Box 7.1.4.5 Encouraging Community Enterprise in Medicinal Plants: An Initiative in Kerala
- Box 7.1.4.6 Critical Questions in Biodiversity-Based Enterprises
- Box 7.1.5.1 The Right of Free, Prior and Informed Consent of Adivasi/Indigenous Tribal Peoples
- Box 7.1.6.1 Advocating Inclusion for the 'Disabled'
- Box 7.1.7.1 Inter-sectoral Integration at the State Level (Recommendations from various BSAPs)
- Box 7.1.7.2 River Valley Projects and Biodiversity (Strategies in various BSAPs)
- Box 7.1.7.3 Making Thermal Power Biodiversity-friendly
- Box 7.1.7.4 Involving Local People in deciding about Development Projects
- Box 7.1.8.1 The Ocean Policy Statement, 1982: Gaps and Strategies
- Box 7.1.8.2 Forest Sector Reforms as Part of Forest Policy and Laws
- Box 7.1.8.3 Science and Technology Policy 2003
- Box 7.1.8.4 Policy for Marine Fisherfolk in Kerala
- Box 7.1.8.5 Wild Life Act's Provisions on Threatened Species
- Box 7.1.8.6 Marine Biodiversity Conservation and Livelihood Security in Relevant Laws and the Constitution
- Box 7.1.8.7 Integrating Inter-generational Equity into Law
- Box 7.1.8.8 Using PESA 1996 for Biodiversity and Livelihoods
- Box 7.1.8.9 Rights of the Adivasi/Indigenous Tribal Peoples
- Box 7.1.8.10 Using the Supreme Court Judgement on Wetlands
- Box 7.1.9.1 Policy Support for Natural Resources Accounting/Budgeting
- Box 7.1.9.2 Innovative Financial Mechanisms at State Level (Recommendations in Some State BSAPs)
- Box 7.1.10.1 Making Paper Production Biodiversity-Friendly
- Box 7.2.2.1 Cultivating Landscapes: The International Focus
- Box 7.2.2.2 Uncultivated Plants for Food Security and Livelihoods
- Box 7.2.2.3 Conserving Threatened Livestock Breeds (Recommendations from some BSAPs)
- Box 7.2.2.4 Agricultural Diversification = Increasing Crop Diversity?
- Box 7.2.2.5 Bringing Back Agro-biodiversity to Green Revolution Areas (Recommendations of some state BSAPs)
- Box 7.2.4.1 Restructuring the PDS: The Way to Sustainable Agriculture and Livelihoods
- Box 7.2.4.2 Items Suggested to be included in PDS in Jashpur District, Chhatisgarh
- Box 7.2.4.3 A Local PDS Scenario: Medak District of Andhra Pradesh
- Box 7.2.4.4 Linking Nutrition and Biodiversity
- Box 7.2.4.5 *Jhum*: Towards Sustainable Strategies (Recommendations On Shifting Cultivation In North-East state BSAPs)
- Box 7.2.4.6 Manure is Gold
- Box 7.2.5.1 Equity Aspects in the Agriculture Policy
- Box 7.2.5.2 Gender Aspects in Agricultural Policy
- Box 7.2.7.1 Integrating Fruit, Medicinal and other Plants into the Agro-ecosystem (Excerpts from Nahin Kalan Substate BSAP)
- Box 7.2.9.1 Financial Schemes in Agriculture: Need to Simplify

Box 7.2.10.1 GMOs and Biosafety (Recommendations in some BSAPs)

Box 8.1 NBSAP and the Biological Diversity Act: Supporting each other in Implementation

## List of Figures

Figure 1.1 NBSAP Institutional Structure

Figure 4.1 Marine Fish Production in India

Figure 7.1 Decision Tree: Non-Human Primate Reintroductions

Figure 8.1 Implementation Mechanism of NBSAP

## List of Maps

Map 3.1 Physiographic Regions of India

Map 3.2 Geological Divisions of India

Map 3.3 Population of India

Map 3.4 Population Density of India

Map 3.5 Tribal Population of India

Map 4.1 Bioclimatic Regions of India

Map 4.2 Biogeographic Classification of India: Zones

Map 4.3 Biogeographic Classification of India: Provinces

Map 4.4 Forest Cover and Land Use of India

Map 4.5 Forest Types of India

Map 4.6 Agro-ecological Regions India

Map 4.7 Soil Types India

Map 5.1 Habitat Suitability Map of Chinkara (Present)

Map 5.2 Habitat Suitability Map of Chinkara (After Commencement of State-II of IGNP)