Achieving the 2010 Biodiversity Target

NBA-SL 2010

CBD

Chapter 1

National Biodiversity Assessment Towards the 2010 Biodiversity Target

Sujith S Ratnayake

4NR Biodiversity Project Coordinator
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BDS

National Biodiversity Assessment
Fourth Country Report from Sri Lanka
to the United Nations Convention on Biological Diversity

Approaches Employed

- National Biodiversity Assessment (NBASL)
- 4NR Synthesis

National Biodiversity Assessment
Fourth Country Report from Sri Lanka
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Approaches
Outcomes-Key Findings
Challenges Encountered
Areas of Improvement
Case Studies-Lessons Learned

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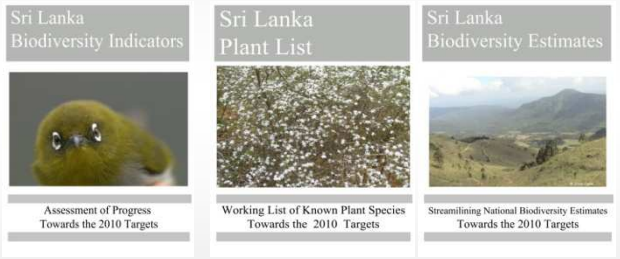
NBA–SL Timeline

Formalization — **Assessments** — **4NR Synthesis**



Review

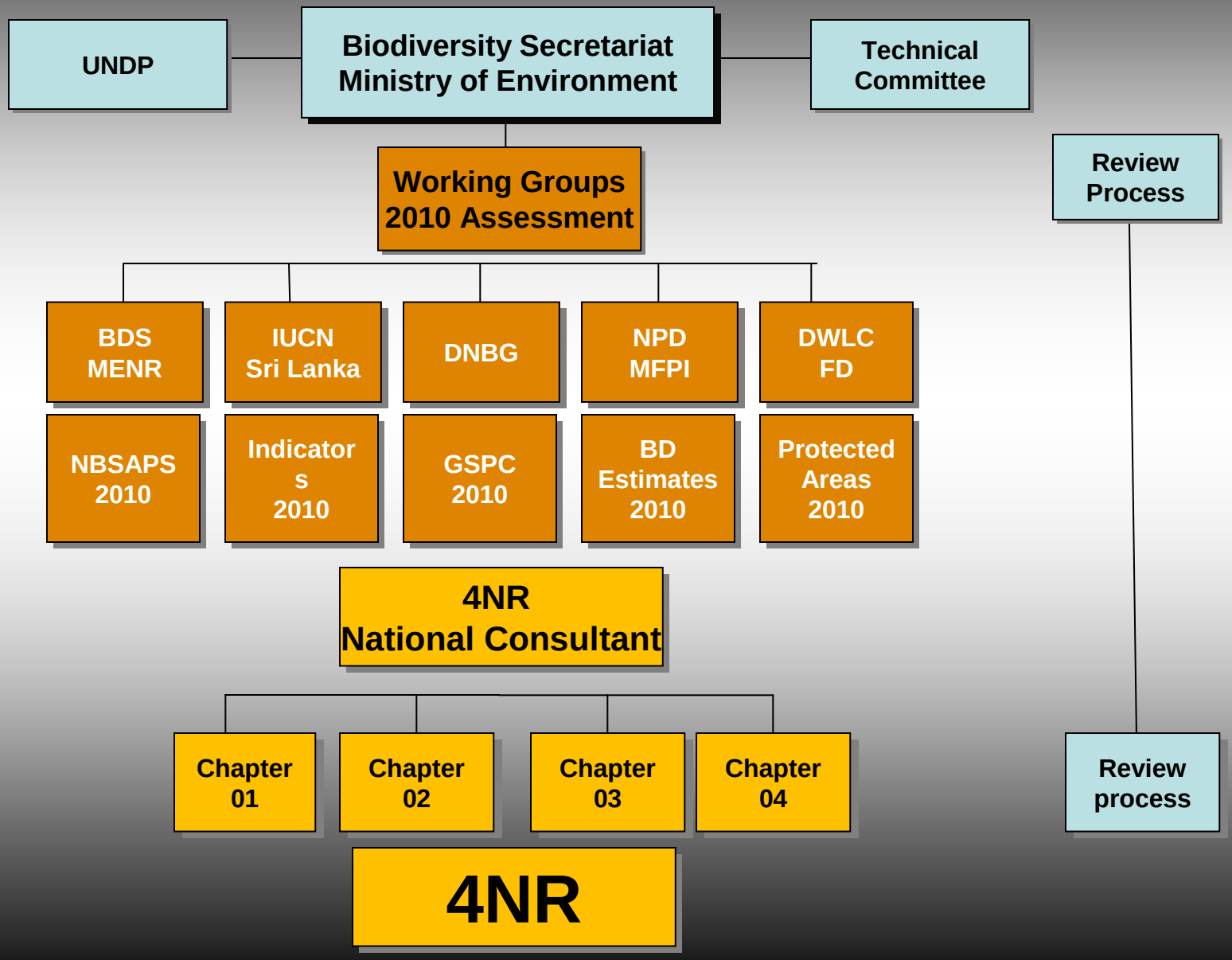
2007 — **2008** — **2009**

Launch

Assessment Reports

Release of 4NR

NBA-SL Approach



National Biodiversity Assessment
Fourth Country Report from Sri Lanka
to the United Nations Convention on Biological Diversity

Key Outcomes/Findings

Sri Lanka
NBSAPs

Assessing Progress Implementation of the Convention on Bilogical Diversity
Towards the 2010 Targets

Sri Lanka
Biodiversity Indicators

Assessment of Progress
Towards the 2010 Targets

Sri Lanka
Plant List

Working List of Known Plant Species
Towards the 2010 Targets

Sri Lanka
Biodiversity Estimates

Streamilining National Biodiversity Estimates
Towards the 2010 Targets

Sri Lanka
Protected Areas

Peotected Area Gap Analysis
Towards the 2010 Targets

Achieving the 2010 Biodiversity Target

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National Biodiversity Assessment
Assessing Progress Towards the Implementation of the United Nations Convention on Biological Diversity

Article No	Article	Satisfactory	Moderate	Need improvement
Article 5	Cooperation	Yes		
Article 6	General measures	Yes		
Article 7	Identification and monitoring		Yes	
Article 8	In situ conservation & PAs	Yes		
Article 8 (h)	Alien species			Yes
Article 8 (j)	Traditional Knowledge		Yes	
Article 9	Ex situ conservation		Yes	
Article 10	Sustainable Use		Yes	
Article 11	Incentive measures		Yes	
Article 12	Research & Training			Yes
Article 13	Education& Awareness	Yes		
Article 14	Impact assessment	Yes		
Article 15	Access to Genetic Resources			Yes
Article 16	Access to transfer of Technology		Yes	
Article 17	Exchange of Information		Yes	
Article 18	Technical& Scientific Cooperation		Yes	
Article 19	Handling of Biotechnology & Benefits			Yes

National Biodiversity Assessment
Assessing Progress Towards the Implementation of the United Nations Convention on Biological Diversity
Sri Lanka NBSAPs

THEMATIC PoWs	STATUS	RECOMMENDATION
Agricultural Biodiversity	CWR & PGRFA National Information systems are in Place. lot of work has been done for other areas	A holistic approach & an effective coordination body wanted
Inland, Marine & Coastal (IMC) Ecosystems	IMC systems protection measures are in place but enforcement are weak; research work moderate	Ecosystem rapid assessment guidelines required
Forest Biological diversity	Satisfactory; policy reforms, studies done; protection mechanisms in place	Ecosystem approach needed; joint forest management approaches strengthened
Bio Diversity in Dry & Humid Lands	Initial work has been done (NCR, PAMWCP);	Comprehensive assessment needed
Mountain Biodiversity	NCR covered dry & wet zone mountain & rock hill forests;	More research needed to identify floral & faunal diversity, pioneer species and successional stages

CBD Focal Area	Indicators (CBD/Additional)	Trend to 2010
Status and trends of the components of biological diversity	Trends in extent of selected biomes, ecosystems, and habitats	
	Trends in abundance and distribution of selected species	
	Coverage of protected areas	
	Change in status of threatened species	
	Trends in genetic diversity of domesticated animals, cultivated plants, and fish species of major socioeconomic importance	
Sustainable use	Area of forest, agricultural and aquaculture ecosystems under sustainable management	
	Trends in extend of home gardens (Kandyan home gardens) (additional)	
	Trends to regulate unsustainable/over/illegal exploitation of wild fauna and flora through legislations (additional)	
	Trends in regulation of plant and animal exports through international trade	
	Sustainable Human Development Index (SHDI) (additional)	
	Ecological footprint and related concepts	Data Deficient
Threats to biodiversity	Trend in degradation of habitats/ Pressure from human population density (additional)	
	No and Cost of invasive alien species	
	Implications on Climate change on Biodiversity	
	Trends in human-wildlife conflicts (additional)	

CBD Focal Area	Indicators (CBD/Additional)	Trend to 2010
Ecosystem integrity and goods and services	Connectivity / fragmentation of ecosystems	
	vulnerability to natural disasters (additional)	
	Ecosystem quality/integrity in fresh water wetland ecosystems	
	Marine Trophic Index	Data Deficient
Status of traditional knowledge, innovations and Practices	Status and trends of national policies and regulations that govern protection of TK, innovation and practices (additional)	
	Status and trends of community who depend on traditional medicines (Aurvedic) and traditional food verities (additional)	
	Trends in regulation provided with equal rights and privileges for indigenous people of Sri Lanka ('veddhas')by the constitution. (additional)	
Status of access and benefit-sharing	Trend in follow the Code of ethics for research on biological diversity involving access to genetic resources (additional)	
	Status and trends of national policies /regulations tand mechanisms that govern ABS (additional)	
	Percentage of reduction illegal patenting for inventions based on genetic resources and/or traditional knowledge inherited to Sri Lanka (additional)	
Status of resource transfers	Trend in annual budgetary allocation for BD conservation (additional)	
	Trend in official external resources assistance (monetary /technical)	
Status of BD Information public awareness (additional)	Trends in information generation and integration to education systems	

National Biodiversity Assessment
Working List of Known Plant Species

Sri Lanka Plant List

Digitizing the information available in floras, published manuscripts and other literature on Angiosperms, Gymnosperms, Pteridophytes, Bryophytes and Lichens

Preparing a database on important information on these species such as taxonomy, ecology, distribution, and conservation status

Compilation of a book with list of known plants with useful information

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National Biodiversity Assessment
Streamlining National Biodiversity Estimates
Toward the 2010 Target

Sri Lanka Biodiversity Estimates

Estimation of Economic Value of Ecosystem services (Market/Non market)

Provisioning, Regulating ,Cultural

Estimation of Economic & Health costs of Degradation of Ecosystem services

Estimation of Economic Benefits of Appling CDM

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National Biodiversity Assessment
Streamlining National Biodiversity Estimates
Toward the 2010 Target
Sri Lanka Biodiversity Estimates

Mainstreaming into National Income Accounting

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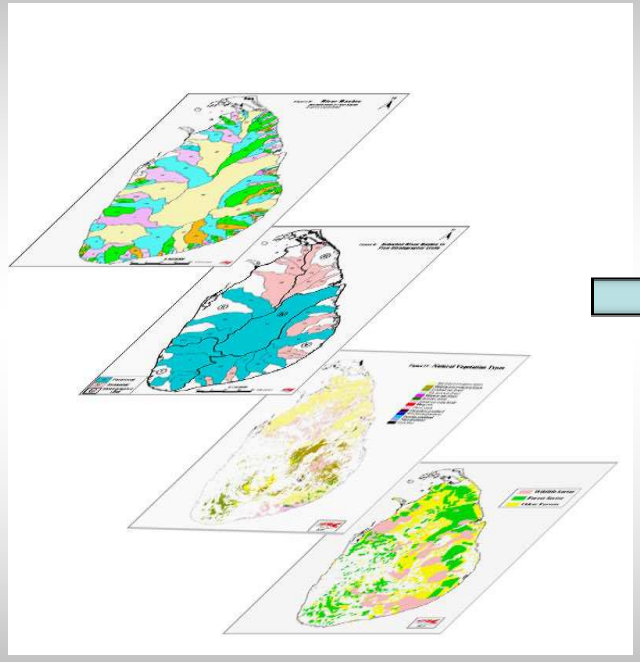
National Biodiversity Assessment

PROTECTED AREA GAP ALALYSIS

Toward the 2010 Target



National Physical Planning Process

Sectoral Planning Process

Cross Sectoral Planning Process

NBSAPs National/Provincial

NECSD

10 Year Plan

National Budget

Identification of High Conservation Value Areas to Conserve Sri Lanka's Biological Diversity and these areas assemble as strategic portfolio of conservation sites that better represent biodiversity and ecological systems. Its include Ecological system targets (Climate Soil, PAs, Watersheds etc.) Community targets (Vegetation, hotspots etc) and Species targets/Taxonomic overly targets

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4th National Report

Fourth Country Report from Sri Lanka
to the United Nations Convention on Biological Diversity

Chapter 1

Overview of biodiversity status, trends and threats

Dr Jinie Dela
National Consultant
4th National Report

Introduction

- Provide a general overview of Sri Lanka's rich biological diversity,
  - its status, trends and threats
- Inform decision-makers and other stakeholders
- *Aim is not to* provide an exhaustive documentation of the status of the country's biological wealth.
- Structured to follow the thematic areas **adopted by the Convention on Biological Diversity**: which are forest, inland wetland, coastal and marine and agricultural biodiversity.
- This is also consonant with the approach adopted by the Biodiversity Conservation Action Plan of 1999 and Its addendum 2007.

Approach- for analysis /synthesis

- **Overview** – in terms of ecosystems, species, genetic diversity and the importance of BD components for human wellbeing
- **Status and trends** in important BD components – using indicators that exist
- **Main threats** (underlying drivers and causes)
- **Implications of observed changes** – in terms of biodiversity components – in terms of ecology, livelihood, social and economic development
- **SPATIAL & TEMPORAL CHANGES OF PROBABLE AREAS**

Problems/challenges

- A great deal of information up to 2002
- Lack of reliable and current information since then apart form the Red List.
- Data on the factors/ features differ– even from the same institution
- Lack of a proper format for reporting
- Lack of proper referencing and authenticity
- Need for an accurate, reliable, set of data on biodiversity
- Time limitation – expected to prepare report from 2006

Gaps and recommendations for improvement

- Need to get direct comments on relevant sections of chapter from FD, DWLC, CCD, MPPA, DOA, PGRC, HORDI , NBG and NZG – for data accuracy
- Prepare chapter 1 as a stand alone document for BD information and awareness creation

Strategy adopted

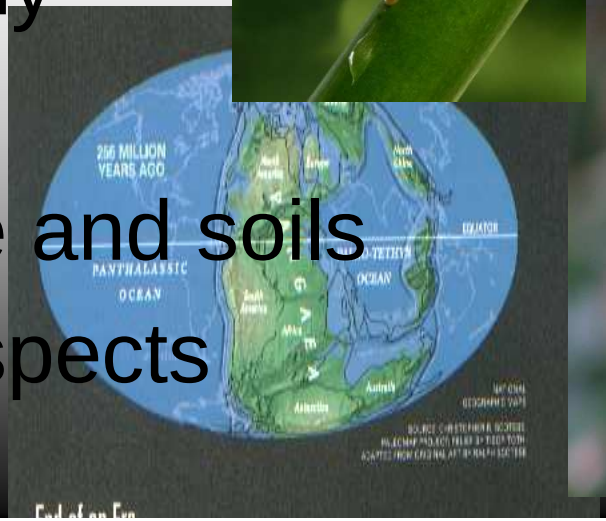
- Use of available data and documents derived though wide stakeholder participation
- Prepare draft chapter and send to relevant selected institutions for data updating
- Consultant to visit /telephones to get the updated data

Contents

1.2 An overview of Sri Lanka's biodiversity

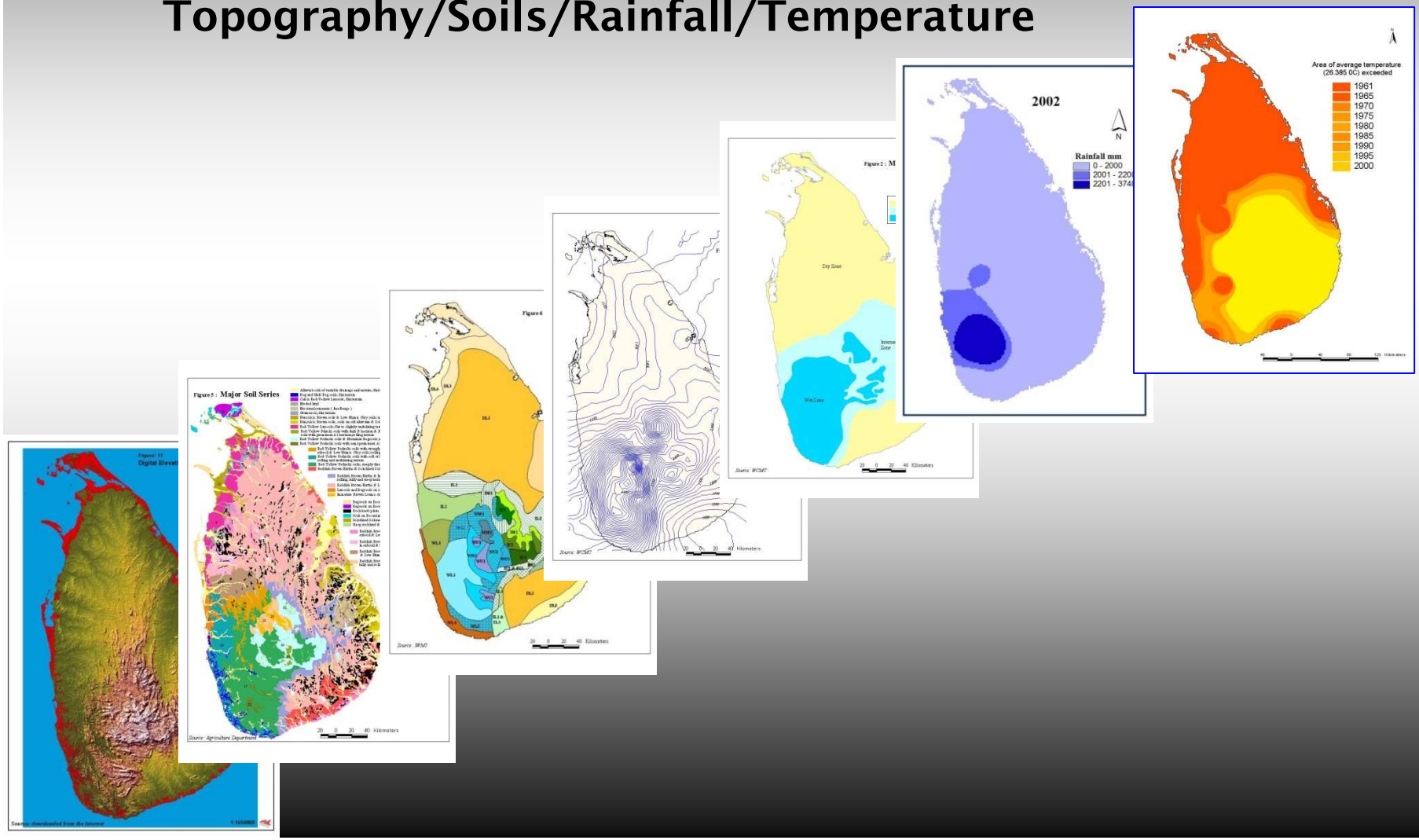
1.2.1 Factors influencing Sri Lanka's unique biodiversity

- Geo-evolutionary
- Topography
- Climate
- Agriculture and soils
- Cultural aspects



An Overview continued

Topography/Soils/Rainfall/Temperature



An overview
continued

1.2.2. Overall ecosystem diversity

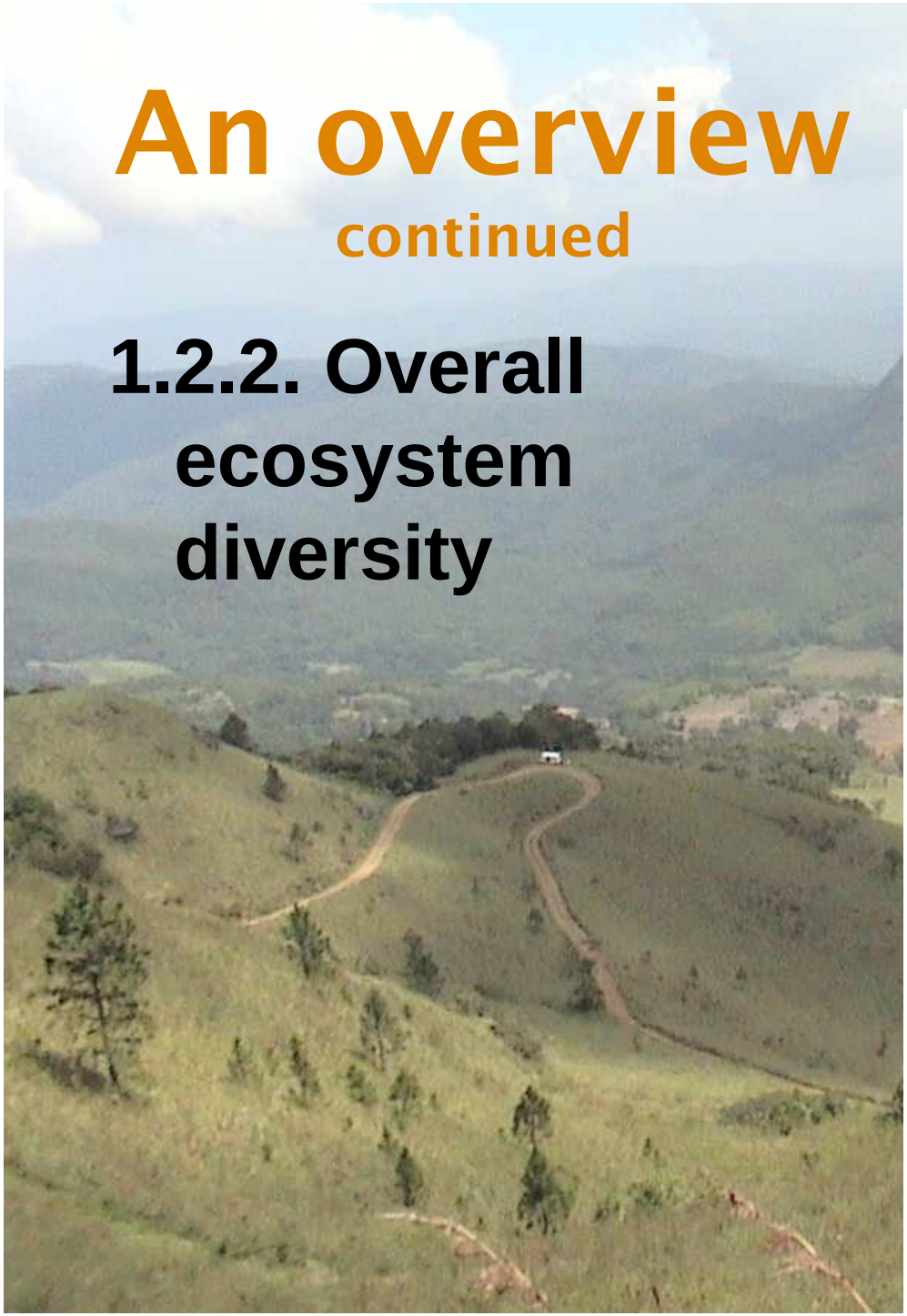


TABLE 1: **Ecosystem Diversity of Sri Lanka**

Ecosystems	Provisional extent (ha)
Forest and related ecosystems	
• tropical wet lowland evergreen forest (lowland rain forest)*	141,506
• tropical moist evergreen forest*	
• Tropical dry mixed evergreen (monsoon) forest*	243,886
• tropical thorn forest (arid zone)	1,090,981
• riverine forest*	na
• tropical sub montane forest*	22,435
• tropical montane forest*	68,616
• grasslands (wet *pathana*, dry pathana, savannah)	3,108
	Na
Inland wetland ecosystems	
• flood plains	na
• swamps	na
• streams and rivers	5,913,800
• reservoirs and ponds	179,790
• wet villu grasslands	na
• wet montane grasslands wet patanas	na
Coastal and marine ecosystems	
• mangrove habitats*	12,500
• salt marshes*	23,819
• sand dunes and beaches*	19,394
• mud flats	9.754
• seagrass beds	na
• lagoons and basin estuaries	158,017
• coral reefs	na
• coastal seas	na
Agricultural ecosystems	
• paddy lands	491,129
• fruit cultivations+	97,000
• small crop holdings or other field crops (pulses, sesame etc)	128,000
• vegetables (including, root and tuber crops)**	110,000 ha
• crop plantations	772,000
• home gardens (cultivated)+	367,800
chena lands (slash and burn cultivation)	na

Source: Statistical Compendium on Natural Resource Management for Sustainable Development (2001); and MOFE (1999)[19] denoted by' amd MoENR, 2002 denoted by ++'

An overview
continued

1.2.2. Overall ecosystem diversity

TABLE 2 : Land Balance Sheet for Sri Lanka

Type of land	Hectares (ha)
Reserved land (reservoirs, streams, roads etc.)	585,300
Forests and catchment areas	2,000,000
Steep lands	380,000
Lands above 5000 ft. contour	76,400
Barren lands	77,000
Marshes and mangroves	70,000
Presently used land	2,635,000
Sparsely used land (chena, patana, etc..)	728,800
Total land area	**6,552,500**

Source: adapted from Somasekeran (1996) cited in Madduma Bandara (2001)

An overview continued

1.2.3. Overall species diversity – in brief

An overview continued

1.2.4. Genetic diversity in brief

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An overview continued

1.2.5 Overview of threats to Sri Lanka's biodiversity

- **Habitat loss and fragmentation**
- **Habitat degradation**
- **Over exploitation of biological resources**
- **Loss of traditional crop and livestock varieties and breeds**
- **Pollution**
- **Human - wildlife conflicts**
- **Spread of alien invasive species**
- **Increasing human population density**

Based on Assessments & case Studies

An overview continued

1.3. Species diversity

(in natural systems)

(ex situ collections)

1.3.1 Status/Threats

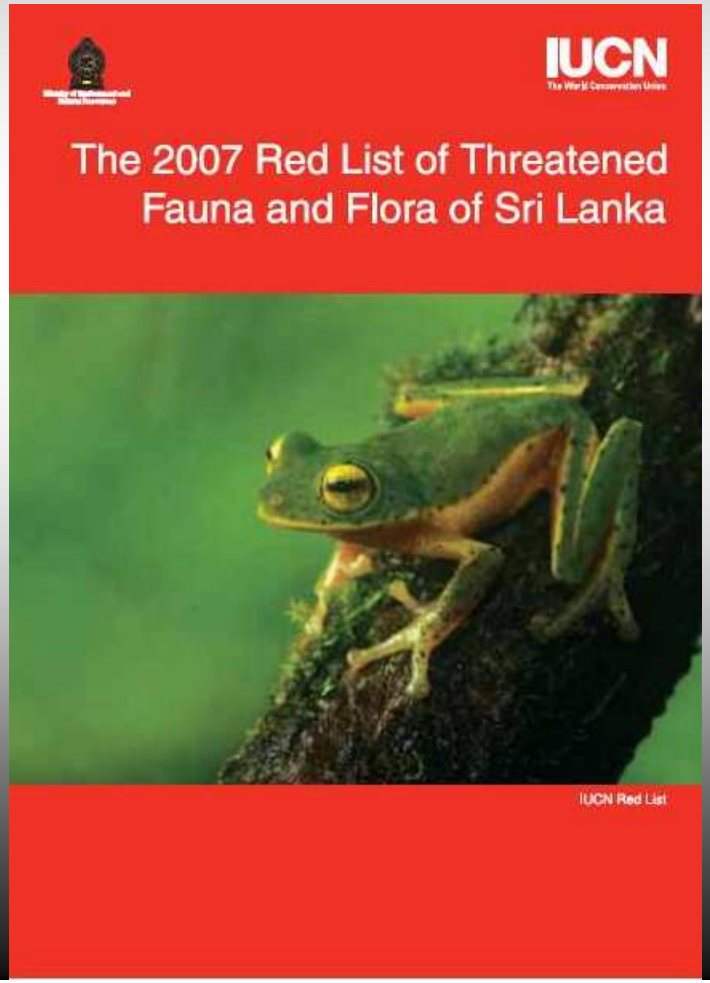
Highlighting

- endemics
- geographic relicts
- ecosystem services (pollinators)

Species diversity continued

1.3.2. Issues and threats

Red listing initiatives

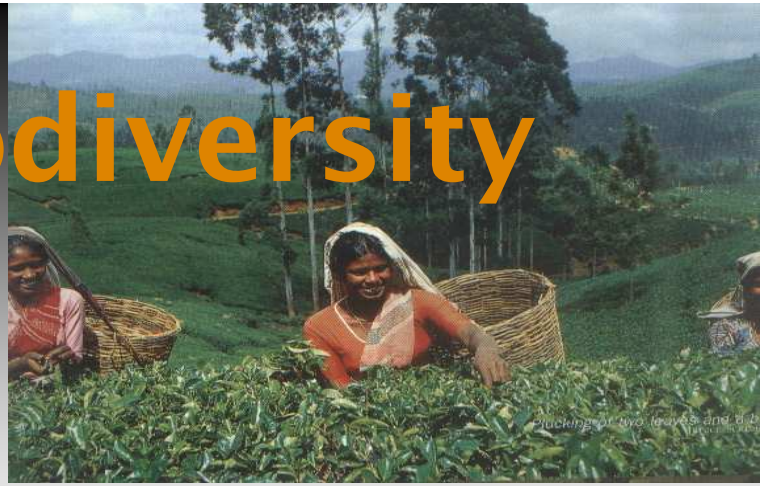


Forests and grassland
continued

Grasslands

- Savannas
- Dry *pathana*
- Wet *pathana*
- *Damana* grasslands
- *Talawa* grasslands
- *Villu* grasslands

Agricultural biodiversity
continued



1.7.2 Issues and threats

- Adoption of high yielding varieties and breeds that are from uniform genetic stock and reliance on agrochemicals to maintain high yields.
- Inevitable loss of valuable knowledge about traditional varieties and their cultivation requirements and associated cultural practices over time.
- Mono-cropping on a large scale - clearing of forests
- Neglect of soil conservation – reliance on pesticides
- Chemical fertilisers and pesticides – loss of soil micro organisms
- Decline of Pollinators
- Impact of agro-pollution on other aspects of biodiversity

Implications of biodiversity loss
continued

1.8.4 Impact of changes in agricultural systems

- Agricultural productivity is heavily dependant on the availability of fertile soils

- Arable land and freshwater

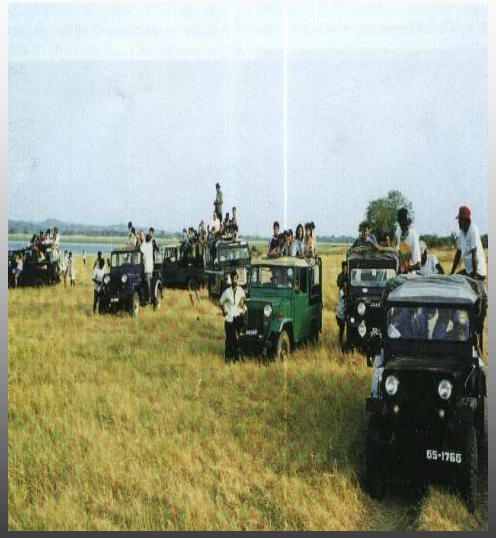
Lessons Learned

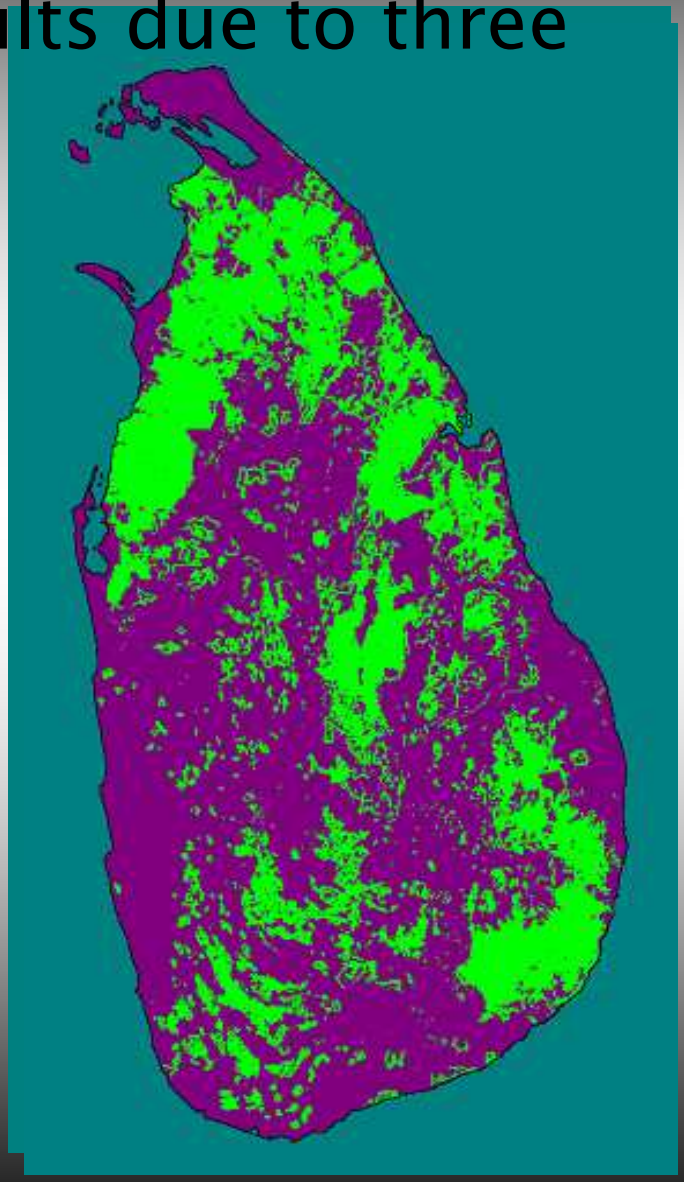
- The loss of biodiversity results due to three main reasons

Habitat Loss & Fragmentation

Habitat /Degradation

Over Exploitation

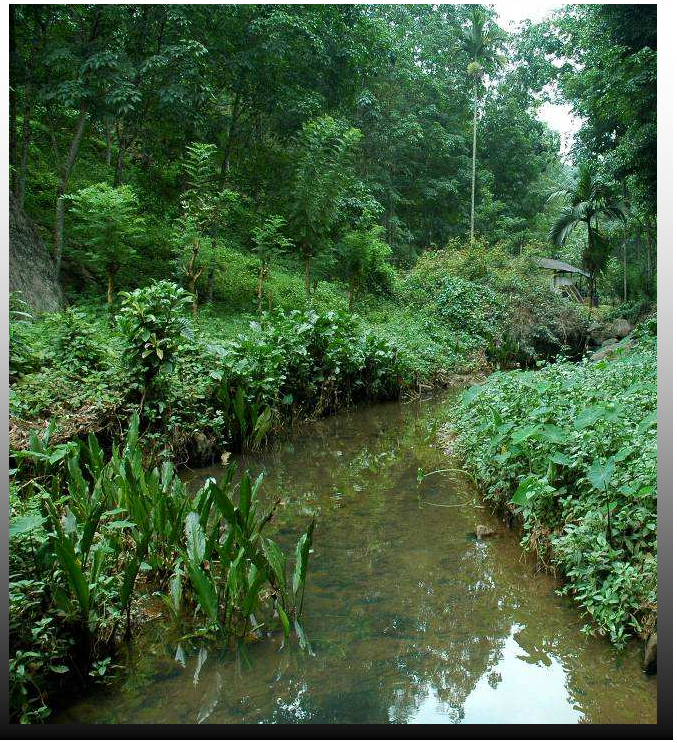




Case Study Species: *Puntius bandula*

- Described by R. Pethiyagoda in 1991
- Point endemic restricted to a small unnamed stream in the Kegalle District

- Current population size is less than 100 adult fish
- Listed as a restricted sp. in FFPO
- Listed as a critically endangered species in IUCN redlist of Globally Threatened species

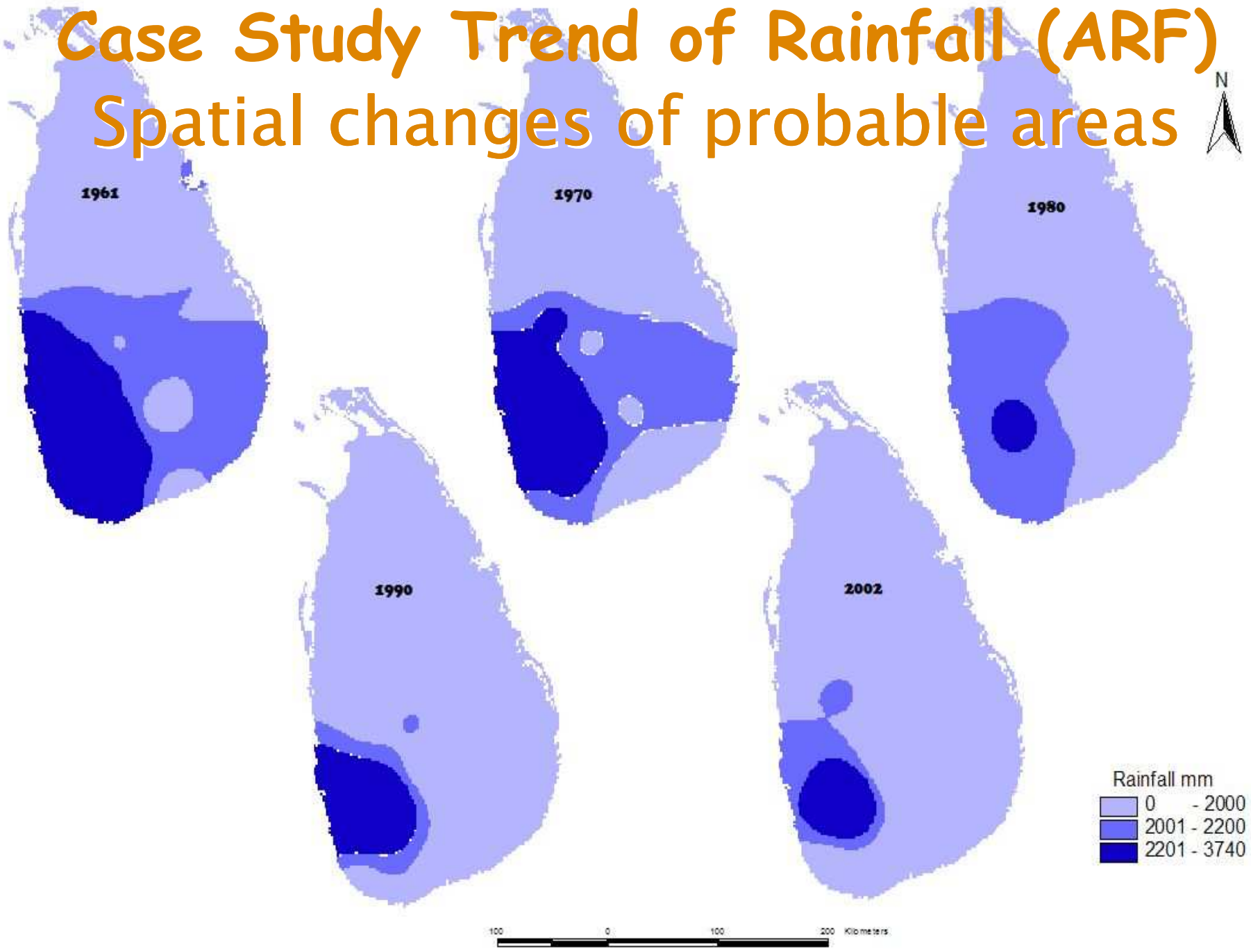


Lessons Learned

- The loss of biodiversity results due to three main reasons
- Lack of information on many of our species
- Lack of Data & information on Ecological Values of our Biodiversity
- Inadequacy of our protected area network to provide adequate protection to Sri Lanka's Biodiversity

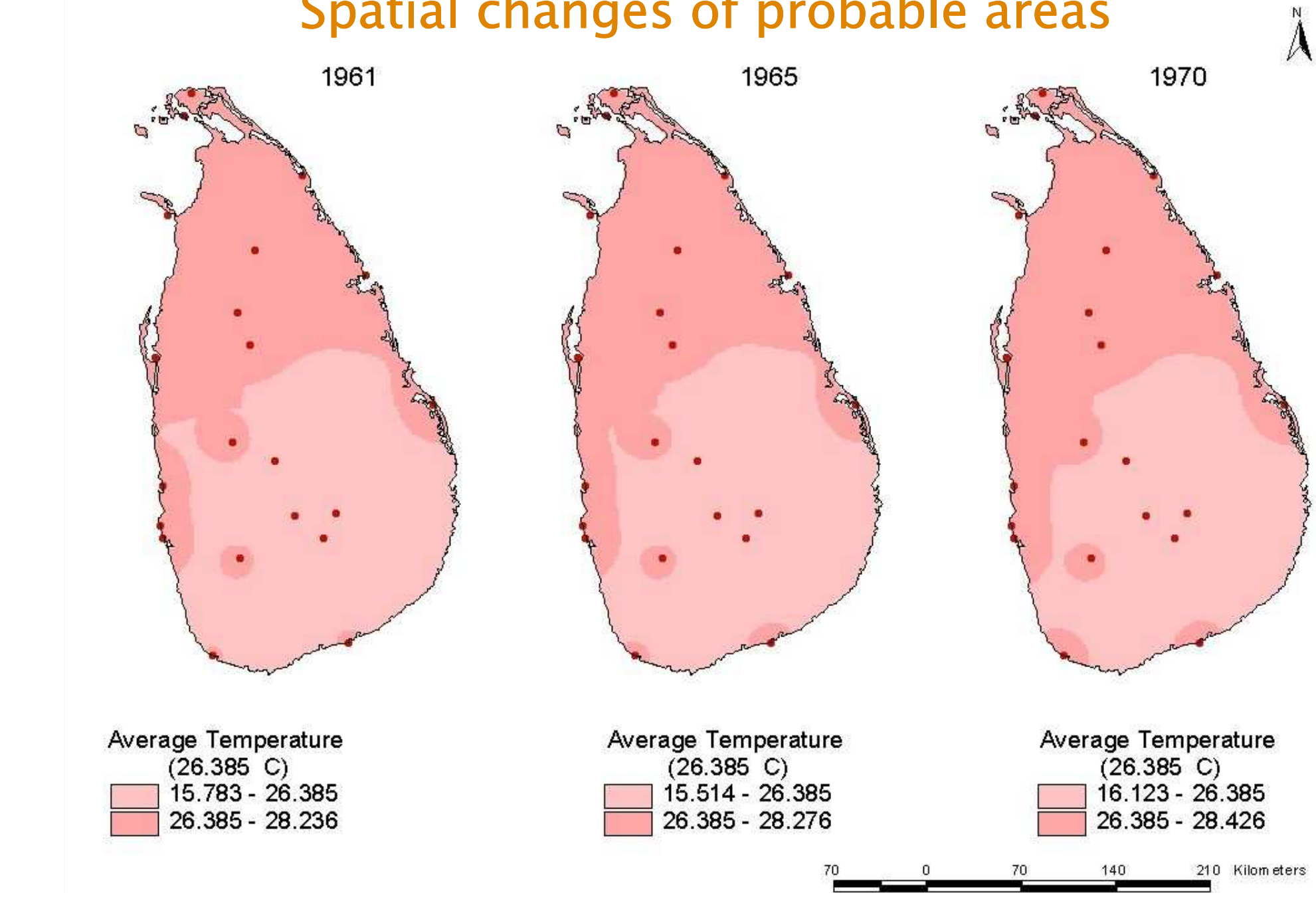
Case Study Trend of Rainfall (ARF)

Spatial changes of probable areas

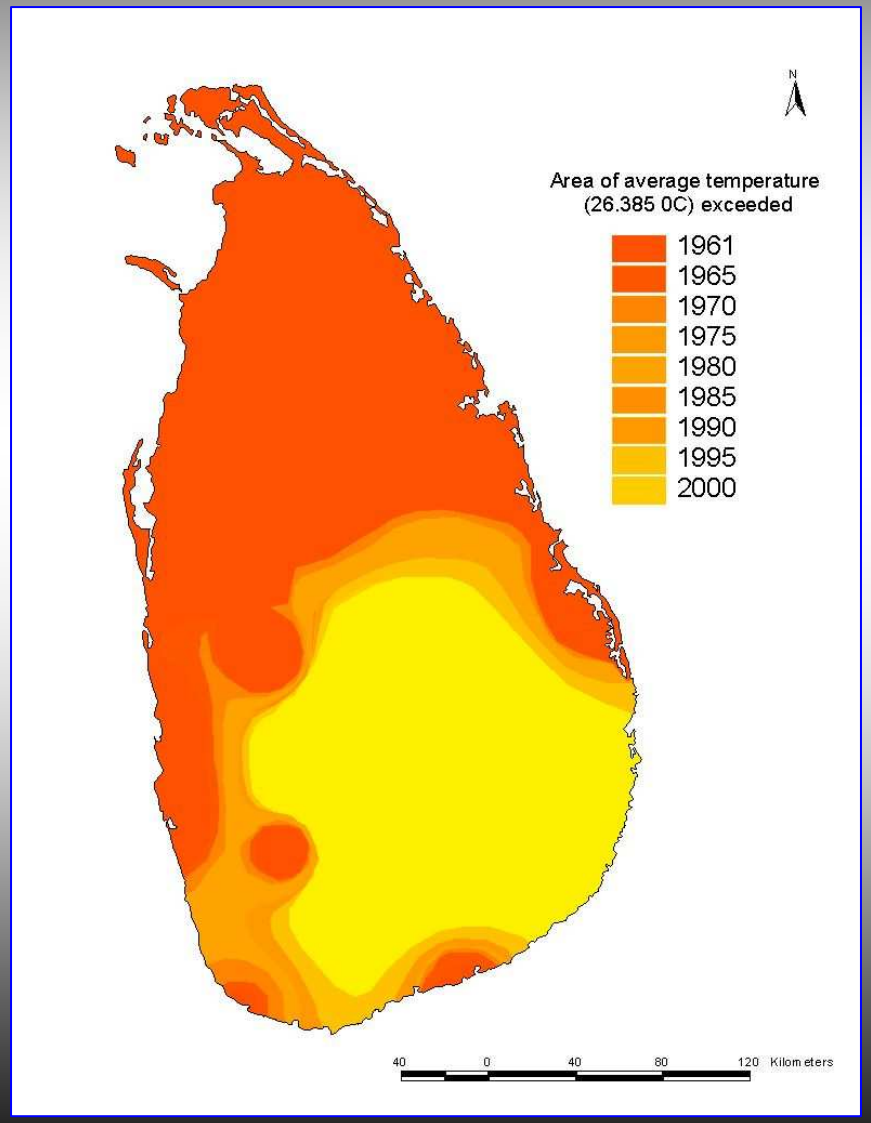


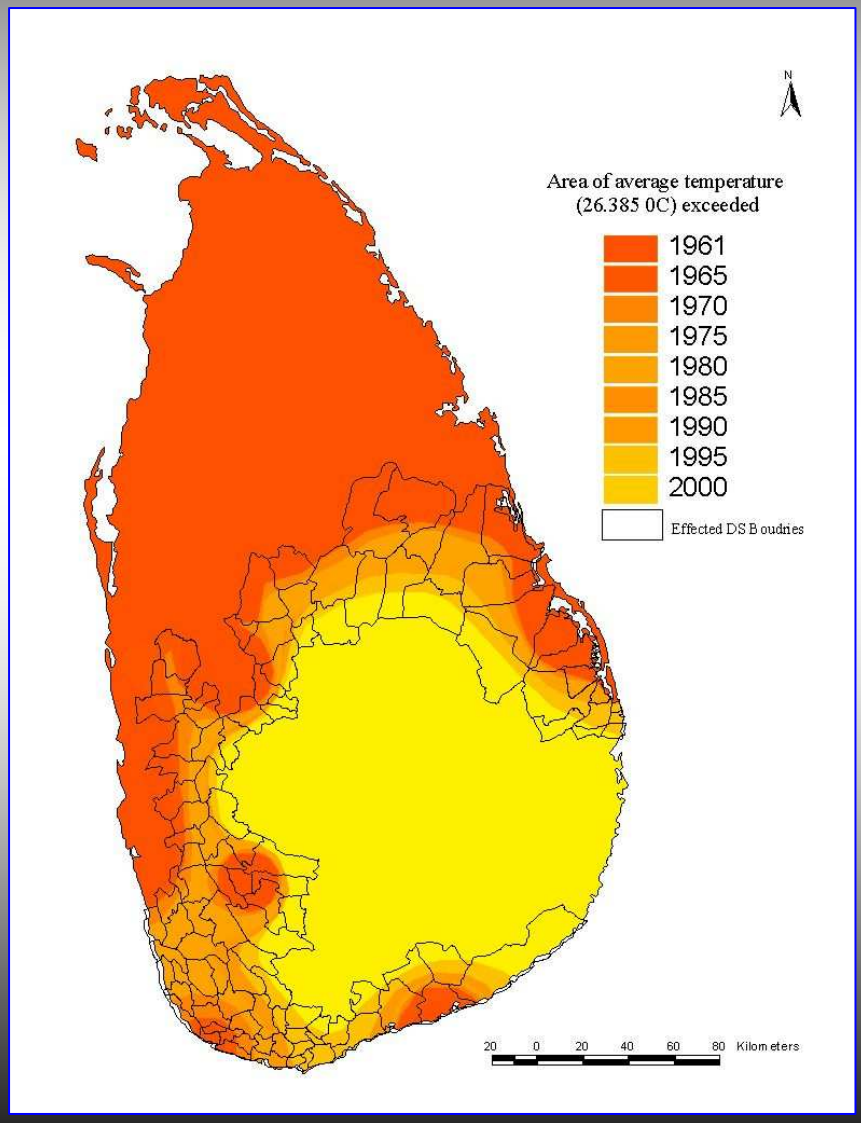
Case Study 5: Trend of Temperature

Spatial changes of probable areas



MOST CRITICAL AREAS





Lessons Learned

- The loss of biodiversity results due to three main reasons
- Lack of Data & information on many of our species
- Lack of Data & information on Ecological Values of our Biodiversity
- Inadequacy of our protected area network to provide adequate protection to Sri Lanka's Biodiversity
- Lack of Data & information on Our Environmental Changes (EC)Spatial/Temporal
- Need to create awareness and establish better coordination mechanisms between line agencies that are dealing with use or management of biodiversity
- Develop restoration/recovery plans and implementation

Acknowledgement …

SCBD , Japan Ministry of Environment ,WRC, GEF-UNDP

Dr Jinie Dela – National Consultant 4NR

Dr Devaka Weerakkoon National Red List Specialist (Fauna)

Working Group Chairpersons

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Mr.Prasad Attyagalle-NBSAPs

Mr. Ranjan Marasinghe – BD Estimates

Mr. Lasantha Manawadu – GIS Specialist

Thank You…