Making Ecosystems work for Development

Balakrishna Pisupati
Head, IUCN Regional Biodiversity Programme, Asia

Ecosystems

- Ecosystems are **not readily defined and measured**

- They are **complex, self-organised** units within which particular sets of species interact with each other and with the physical environment of their habitats

- These interactions are the **ecological processes** to which life in the ecosystem is adapted and upon which that life depends

- Classifications of ecosystems exist at regional to global scales: for example, **94 global scale classes**, based on land cover, vegetation and climate, have been proposed

Biodiversity, or biological diversity, is everything that contributes to variety in the living world

Biodiversity is the life insurance policy for.....
life itself

IUCN
The World Conservation Union

Species diversity

Species are the most obvious manifestation of the variability of life on Earth (**only 1/3rd of these are known**)

Protoctists (viruses, algae, protozoa …)	80,000 known species
Bacteria	4,000
Fungi	72,000
Plants	270,000
Animals: invertebrates	1,360,000
Animals: vertebrates	48,500
TOTAL	**1,834,500 known species**

Global biodiversity conservation priorities

- **Hotspots (Conservation International)**
  - 25 of the most species rich terrestrial areas on Earth, also experiencing significant threat
  - 1.4% of Earth's land surface contains 35-44% of species

- **Global 200 (WWF)**
  - 14 major habitat types are defined, and many key eco-regions for each type are identified for action
  - about 240 eco-regions are currently selected, representing the breadth of biodiversity
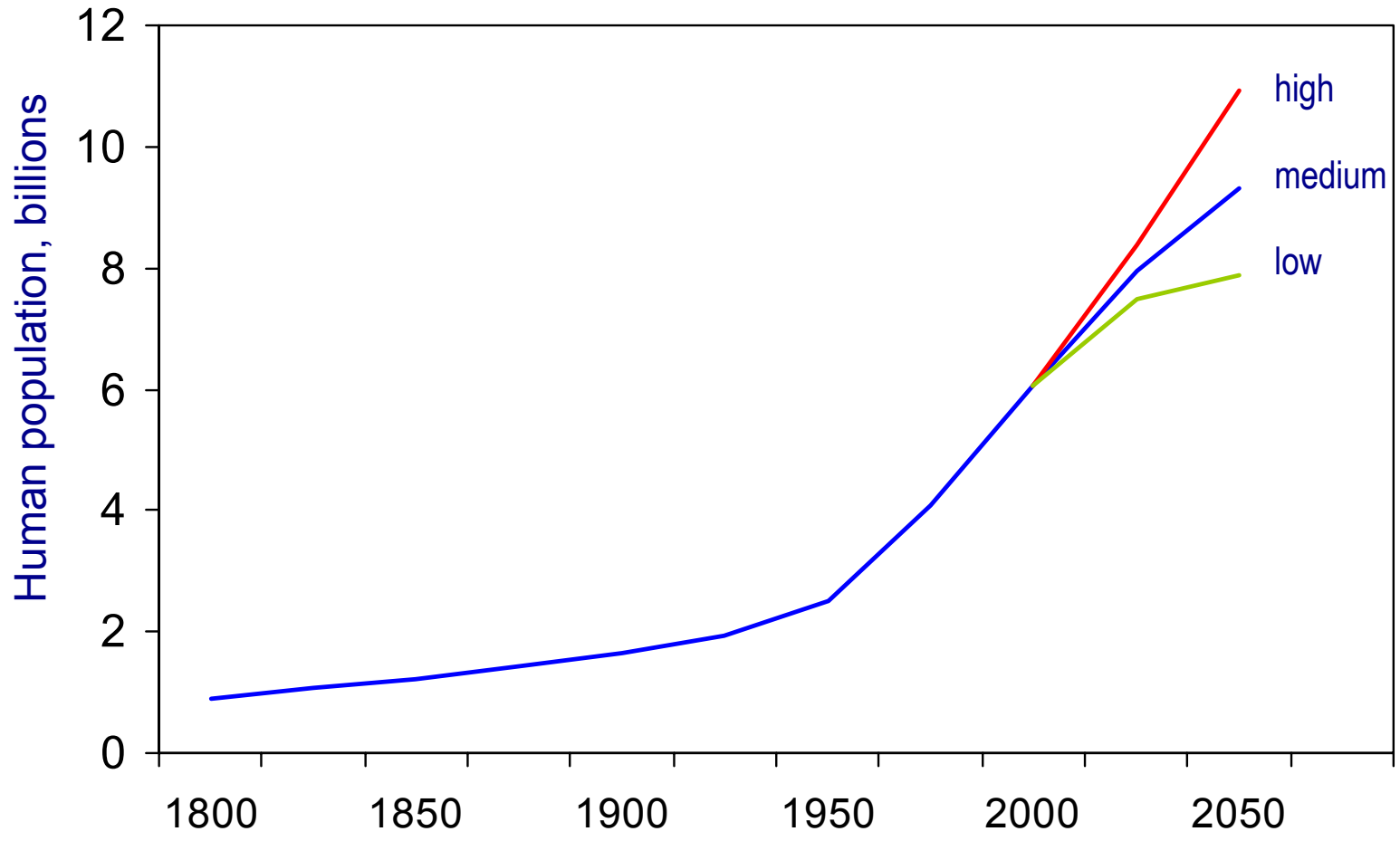
Speciation and extinction rates

- Speciation takes between 100 and 1,000,000 years, providing between 10 and 10,000 new species per year

- **We are living through the sixth extinction spasm, which is largely driven by human activities**

- Current extinction rates are 100 to 1,000 times, and perhaps as high as 10,000 times background rates

- Somewhere between 45 and 275 species are going extinct every day as a result of human activities

- These rates are accelerating: by 2100 there could be many hundreds of thousands of extinctions annually

IUCN
The World Conservation Union

Biodiversity loss: threats and trends

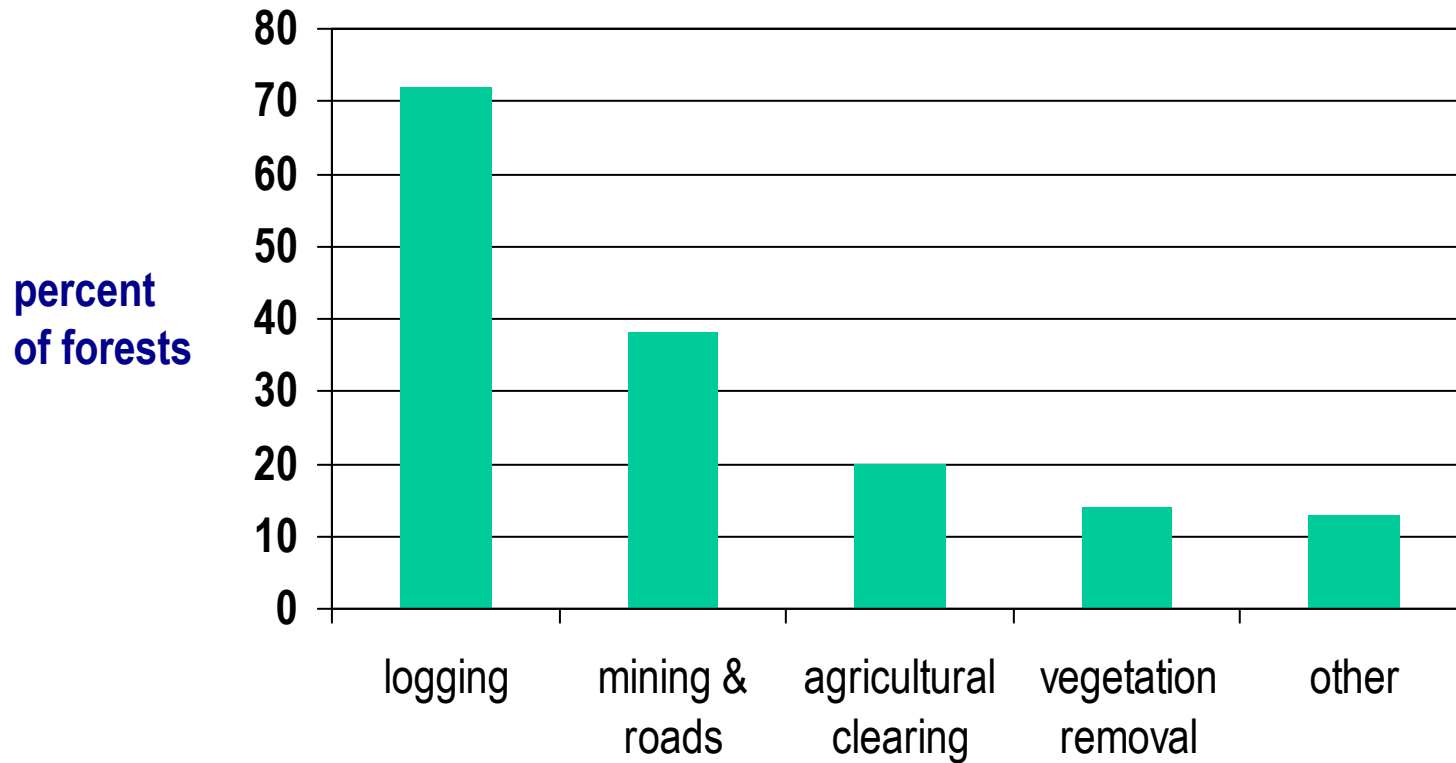**Human activities are directly responsible for current high rates of biodiversity loss, through**

– habitat loss, fragmentation and degradation

– invasive species

– over-exploitation of wild living resources

– pollution of atmosphere, water and soil

– global climate change

IUCN
The World Conservation Union

Estimated human population: 1800–2050

IPIECA

Threats to "frontier forests"

IPIECA

Sources of pollutant emissions

carbon monoxide

sulphur oxides

transport

energy

industry

households

other sources

nitrogen oxides

volatile organic compounds

IPIECA

IUCN
The World Conservation Union
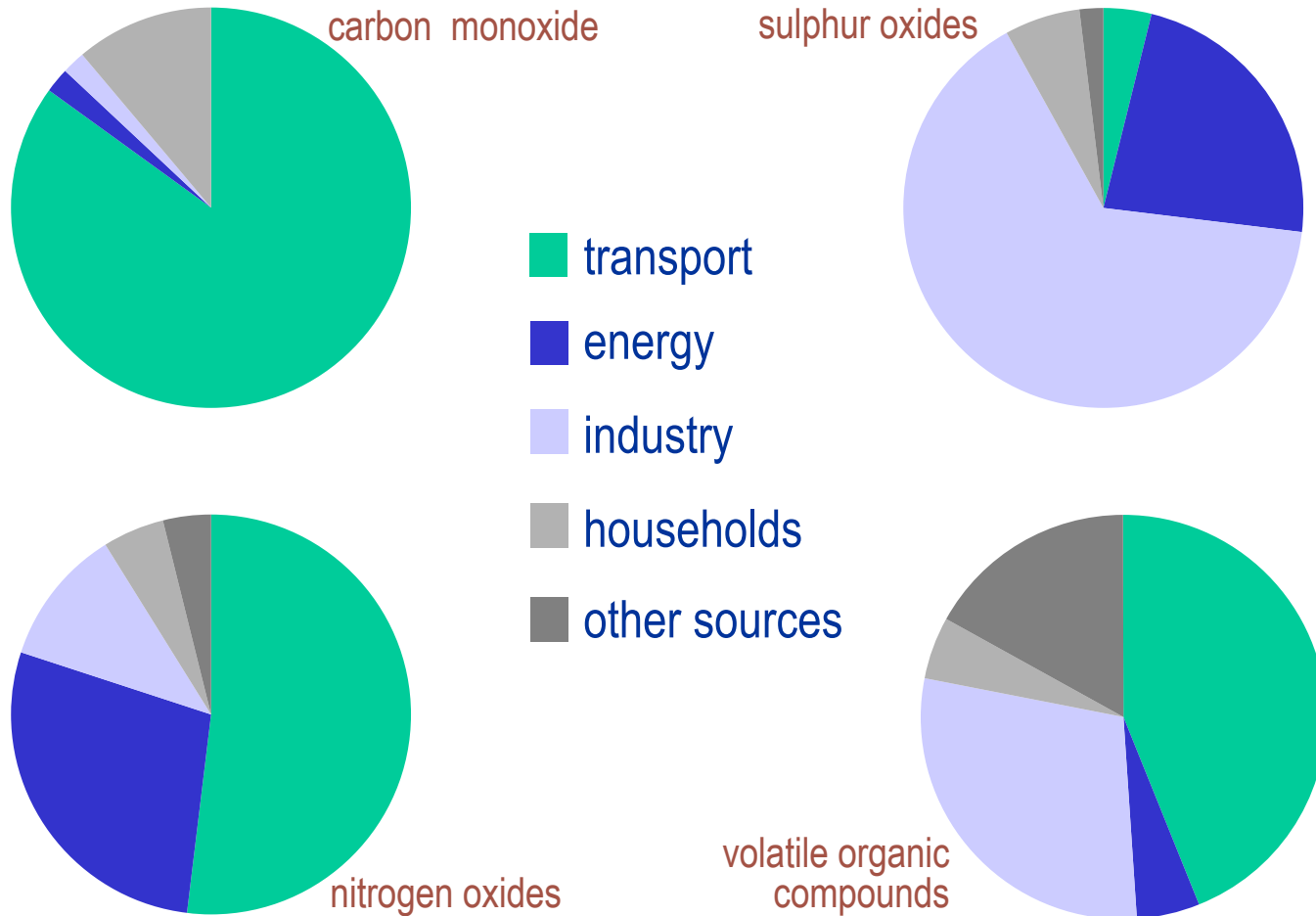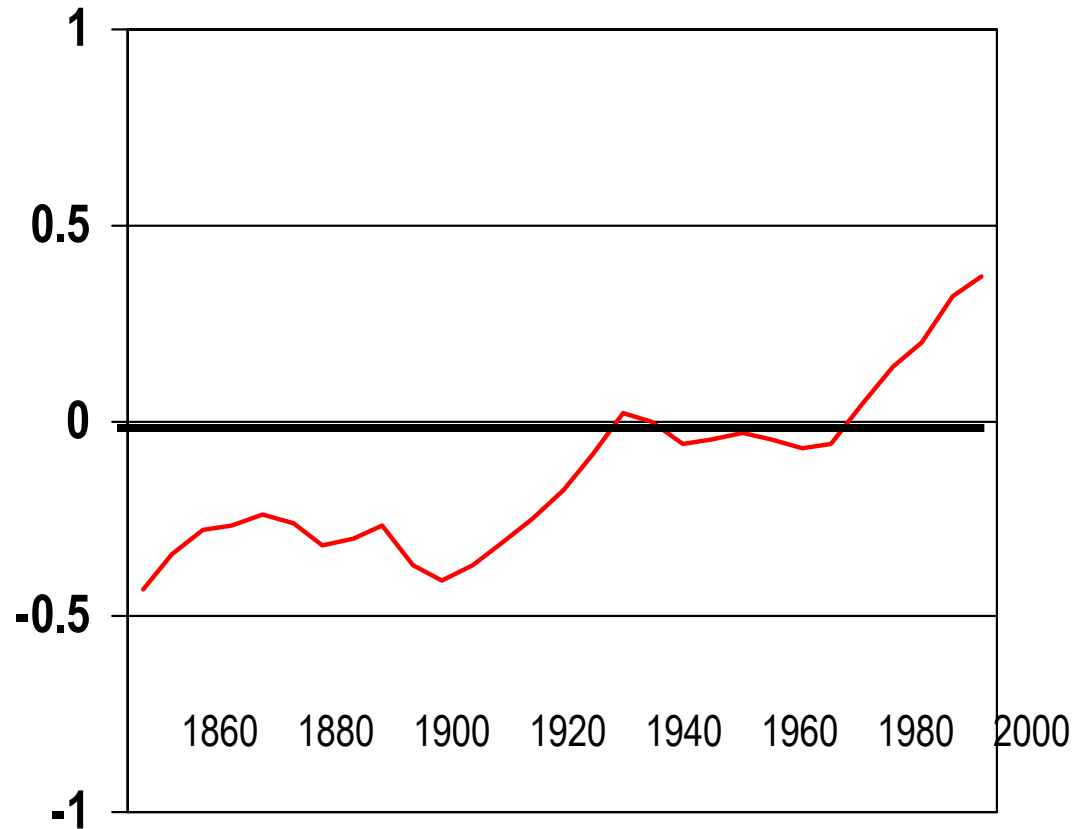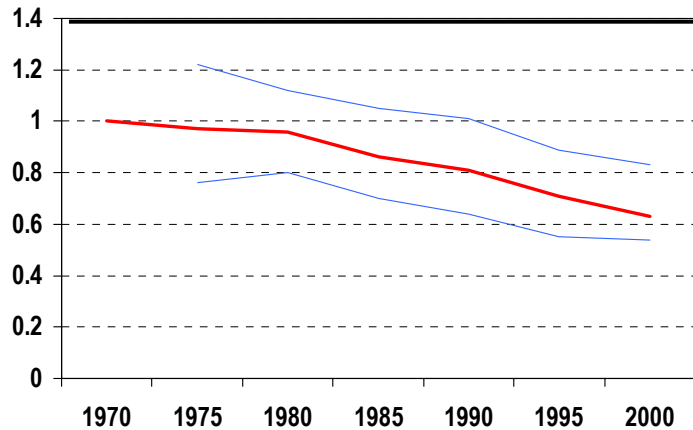
Change in global surface temperature, 1860-2000

Anomaly in degrees C (compared with 1961-1990 average)

IPCC

Living Planet Indices, 2002

Living Planet Index

Forest Species Population Index
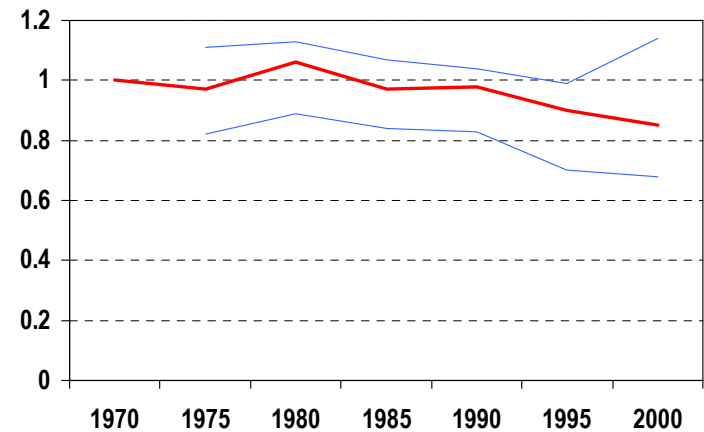
Freshwater Species Population Index
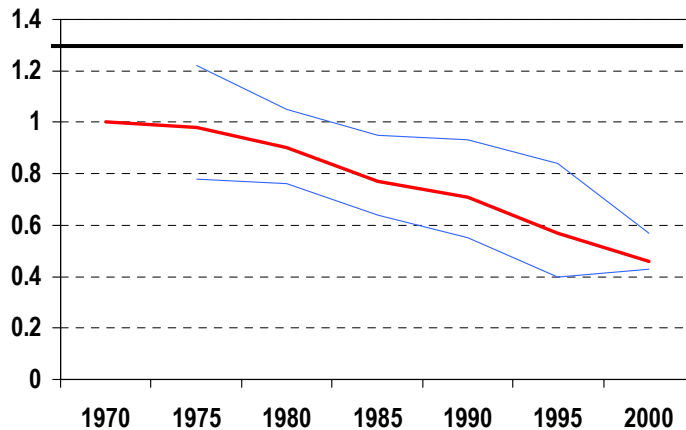
Marine Species Population Index

WWF
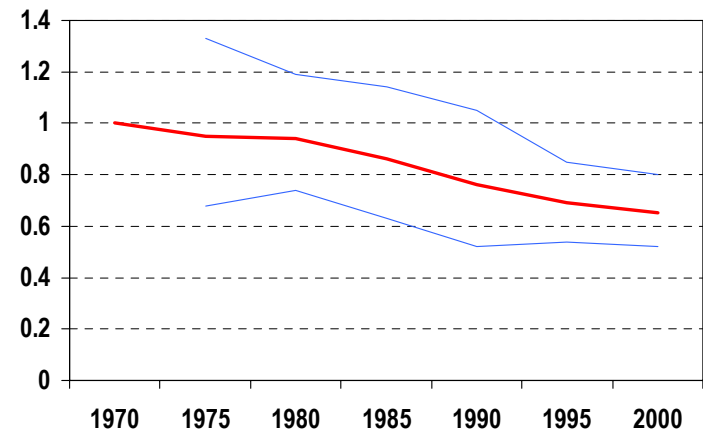
Value of biodiversity: dimensions and perspectives

In keeping with the notion of sustainability, biodiversity value can be perceived in three dimensions

- economic value

- environmental value

- social value

Total Biodiversity Value

USE VALUES	NON-USE VALUES

direct indirect option existence other
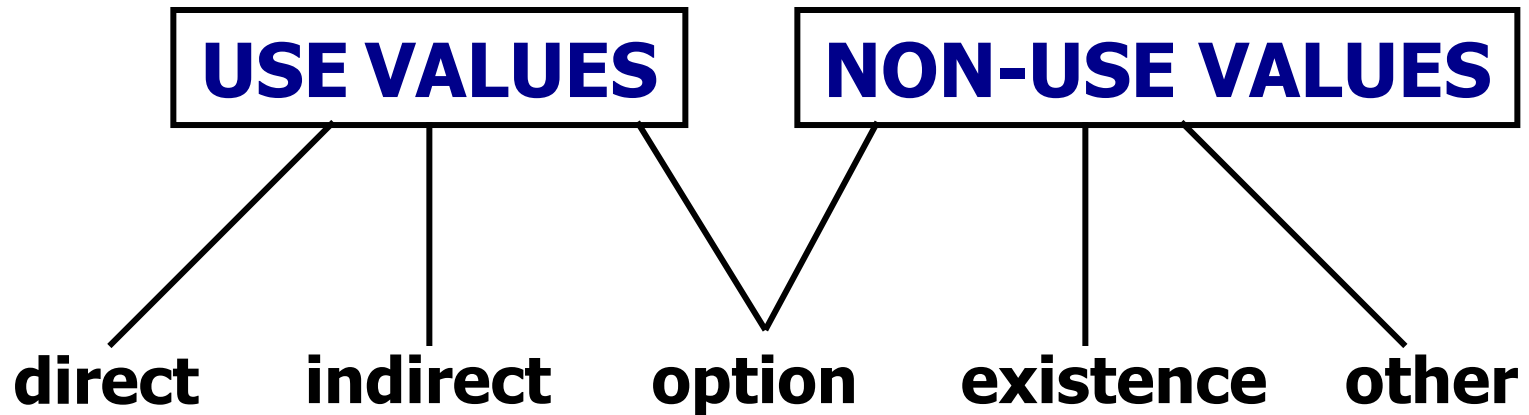
Economic value of biodiversity

- **Biodiversity provides goods (food, medicines, raw materials etc) and services (tourism, recreation etc) that are of direct economic value**

- **An estimated 40% of the global economy is based on biological products and processes**

Biodiversity's environmental value

Climate regulation	regulation of temperature and precipitation at global and local scales through greenhouse gas regulation, di-methyl sulphide production, humidity control
Gas balance	regulation of atmospheric chemical composition (such as CO_2 balance, SO_x levels)
Water regulation and supply	water storage, river bank stabilisation, river sedimentation, flooding, land fertility, fire protection, flash-flood risk, drought regulation, water for agriculture and industry
Disturbance regulation	ecosystem resistance and resilience – maintenance of ecosystem integrity under environmental fluctuation/disturbance – such as flood control, drought recovery, ability to withstand climate change
Soil engineering	soil formation and maintenance (such as weathering of rock), accumulation of organic matter, prevention of soil erosion and loss, nitrogen fixation – land fertility
Nutrient cycling	acquisition, storage, processing and internal cycling of nutrients (such as nitrogen fixation and carbon bio-geochemical cycling)
Waste treatment	breakdown of excess nutrients or compounds, providing, for example, pollution control and detoxification
Pollination	crop pollination
Biological control	regulation of populations through herbivory, predator control of prey (which may be a pest species), competition for resources

Social value: the missing dimension

- "Biodiversity" does not have much meaning in the world of people's everyday lives. As a result it does not translate easily into principles to guide corporate and social action

- Expressing "biodiversity" in terms of social values is this important

IUCN
The World Conservation Union

Biodiversity & sustainability

	Biodiversity	Sustainable development	Sustainable business	Triple bottom line
Planet	biodiversity conservation	environmental protection	environmental protection	environmental value
Profits	sustainable use of biodiversity	economic development	economic growth	economic value
People	fair & equitable benefit sharing	social development	social equity	social value

Economic–environmental systems
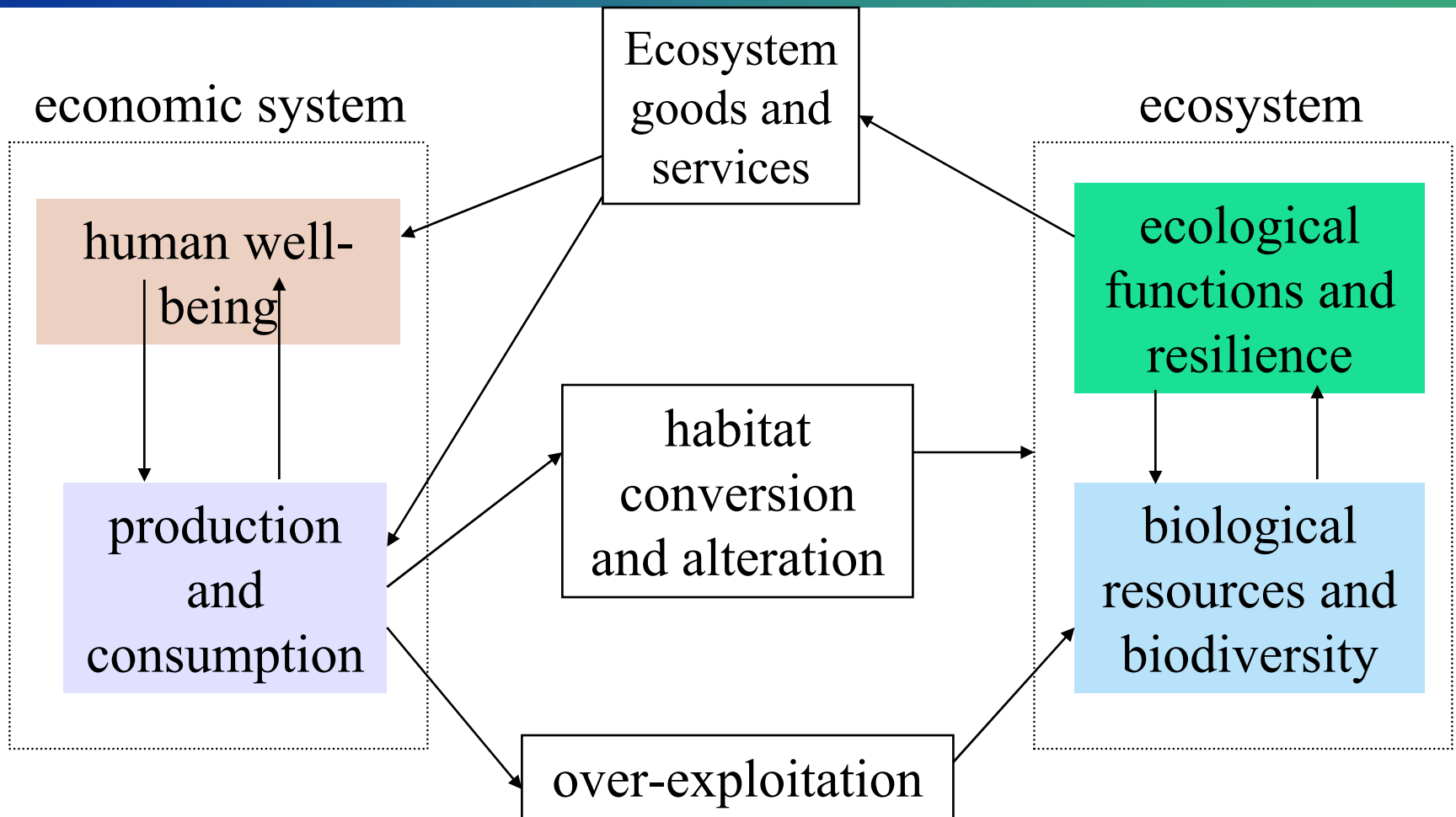
Wetland benefits and beneficiaries – Example from Muthurajawela

Flood control 66%

$7.8 million/year $2,500/ha

Domestic water 0.52%

Resource use 10%

Agriculture 4.17%

Lagoon fishing 2.75%

Marsh fishing 0.86%

Recreation 0.73%

Firewood 1.10%

Waste treatment 23%

Carbon sink 0.11%
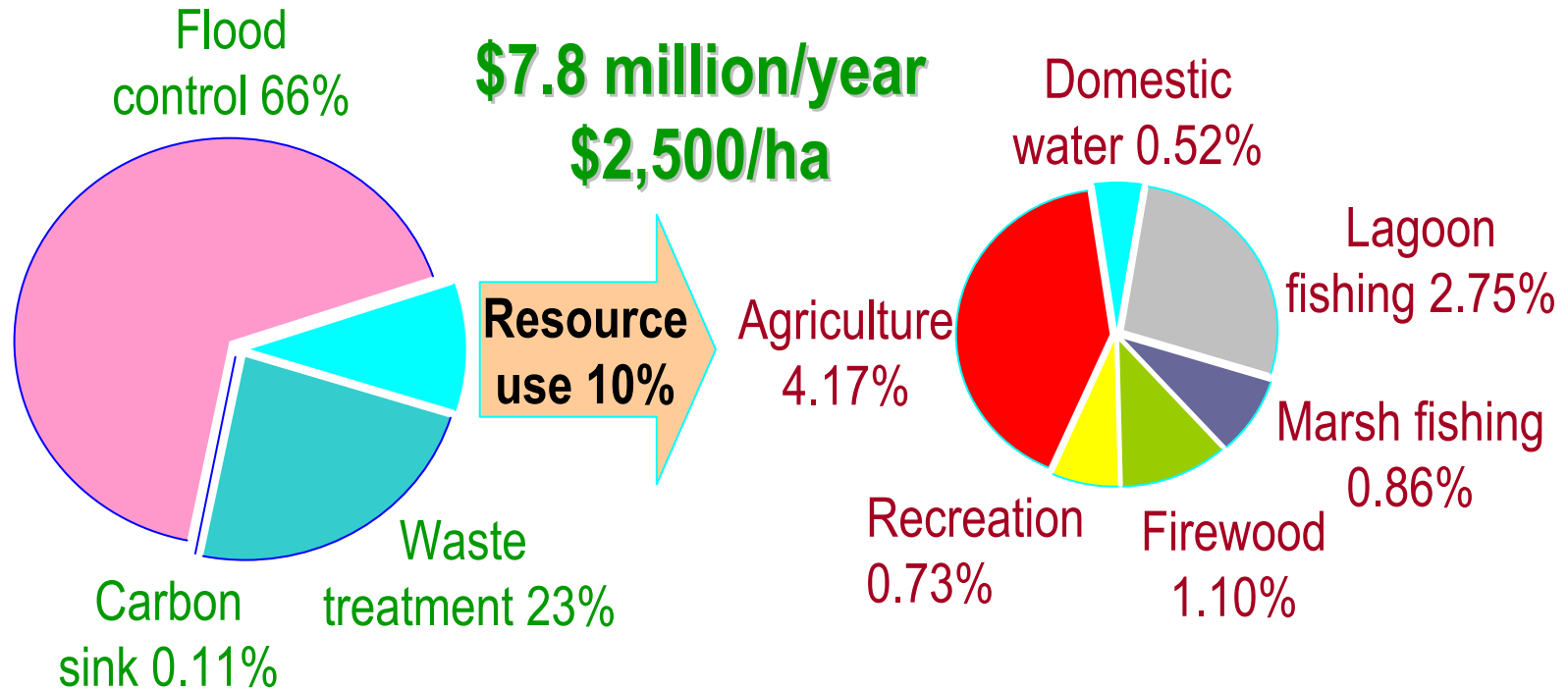
- **3,000 households living on marsh fringes**
- **12,000 lagoon fisherfolk**
- **150 industries**
- **25,000 semi-urban dwellers**

IUCN
The World Conservation Union

Biodiversity and Human well-being

Example of Biodiversity Factors

- Ecological integrity
- Ecosystem Approach to conservation
- Access to Resources
- Benefit Sharing
- In-situ Conservation
- Sustainable Use
- Environmental Management

Dimensions of Poverty

- Vulnerability to biodiversity loss (incl. Food and nutritional securities)
- Access to income and resources
- Life insurance policy for life
- Health, Sanitation, Energy, Water and governance

Elements of Well-being

- Sustainable Livelihoods
- Reducing vulnerability

IUCN
The World Conservation Union

What have we done?

- **More land was converted to cropland since 1945 than in the 18th and 19th centuries combined**

- **25% of the world's coral reefs were badly degraded or destroyed in the last several decades**

- **35% of mangrove area has been lost in this time**

- **Amount of water in reservoirs quadrupled since 1960**

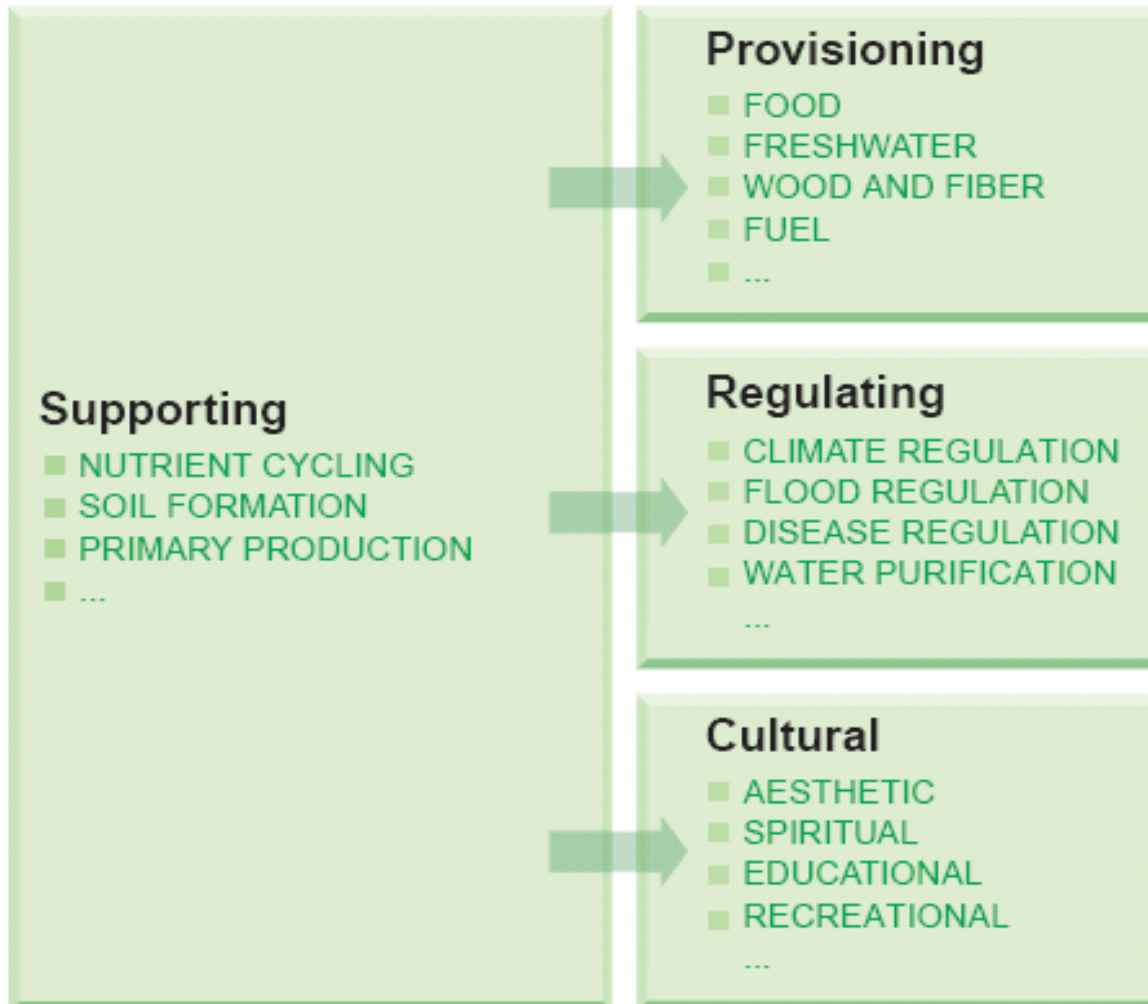- **Withdrawals from rivers and lakes doubled since 1960**

MEA Report

IUCN
The World Conservation Union

40 years of the environment

Public interest in the environment

World Summit on Sustainable Development - 2002
FTSE4Good - 2001
Antarctic ozone hole largest yet - 2000
Human population reaches 6 billion - 1999
Forest fires in Indonesia and Amazon - 1998
Kyoto Protocol - 1997
Brent Spar - 1997
ISO14000 - 1996
World Business Council for Sustainable Development - 1995
International Conference on Population and Development - 1994
Convention on Biological Diversity - 1992
Caring for the Earth - 1991
Intergovernmental Panel on Climate Change - 1989
Exxon Valdez - 1989
Our Common Future - 1987
Chernobyl - 1986
Bhopal - 1984
World Conservation Strategy - 1980
Three Mile Island - 1979
Seveso - 1976
Convention on International Trade in Endangered Species - 1973
The Limits to Growth - 1972
Apollo 11 – 1969
Silent Spring - 1962

1962   1972   1982   1992   2002

MEA

Ecosystem Services

ECOSYSTEM SERVICES

Provisioning
- FOOD
- FRESHWATER
- WOOD AND FIBER
- FUEL
- ...

Supporting
- NUTRIENT CYCLING
- SOIL FORMATION
- PRIMARY PRODUCTION
- ...

Regulating
- CLIMATE REGULATION
- FLOOD REGULATION
- DISEASE REGULATION
- WATER PURIFICATION
- ...

Cultural
- AESTHETIC
- SPIRITUAL
- EDUCATIONAL
- RECREATIONAL
- ...

Scenario in Asia

NBSAPs address elements of these

However, the **supporting role of ecosystems** are poorly understood

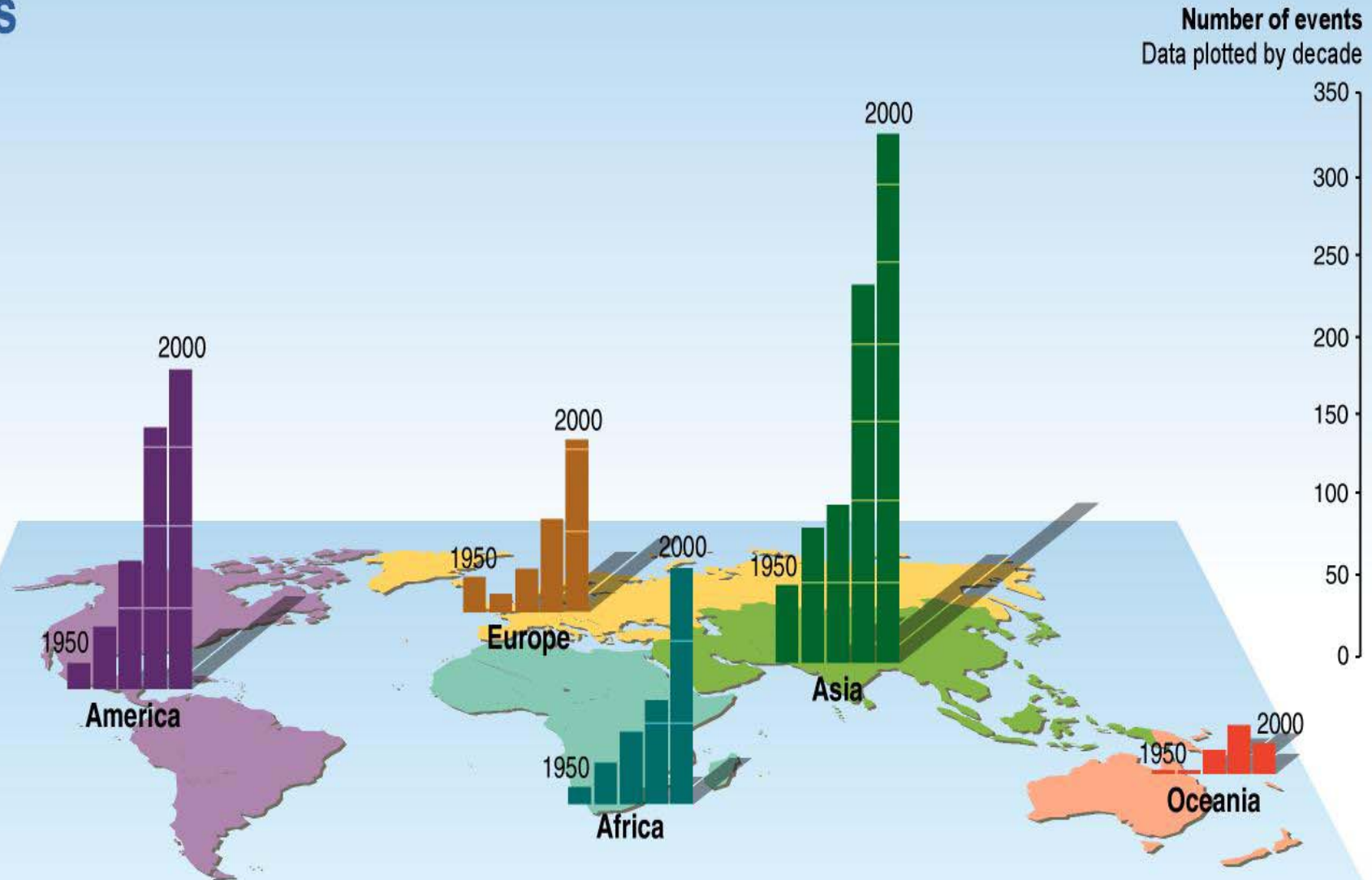Implementation of **regulatory issues** often are weak

IUCN
The World Conservation Union
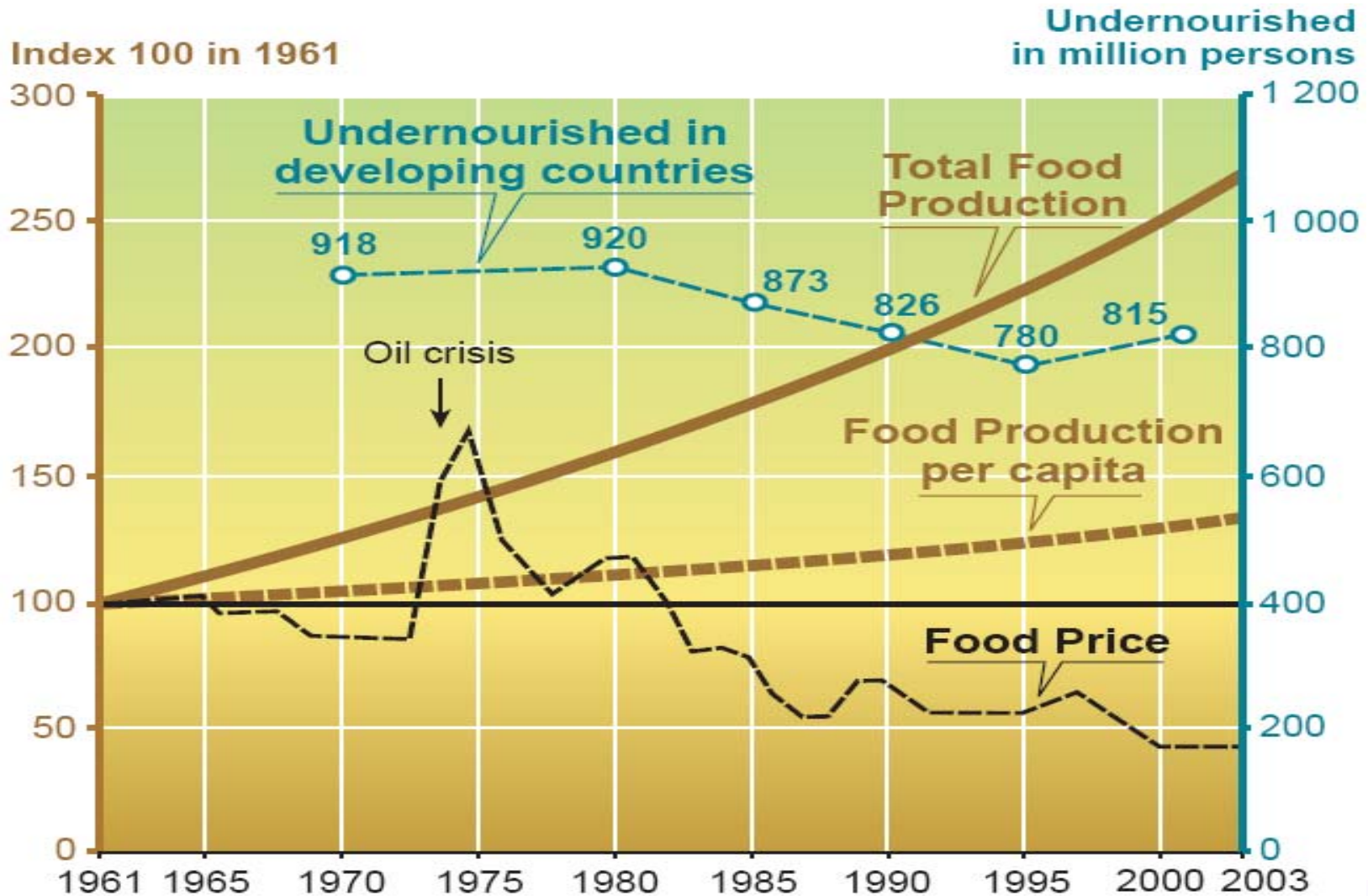
Biodiversity Status and Trends

Service		Status
Food	crops	↑
	livestock	↑
	capture fisheries	↓
	aquaculture	↑
	wild foods	↓
Fiber	timber	+/−
	cotton, silk	+/−
	wood fuel	↓
Genetic resources		↓
Biochemicals, medicines		↓
Water	fresh water	↓

MEA

Emerging Concerns

Floods — Number of events. Data plotted by decade. Source: Millennium Ecosystem Assessment

Food availability and Undernourishment

Index 100 in 1961

Undernourished in million persons

Undernourished in developing countries

Total Food Production

918   920

873

826   815

780

Oil crisis

Food Production per capita

Food Price

1961 1965   1970   1975   1980   1985   1990   1995   2000 2003
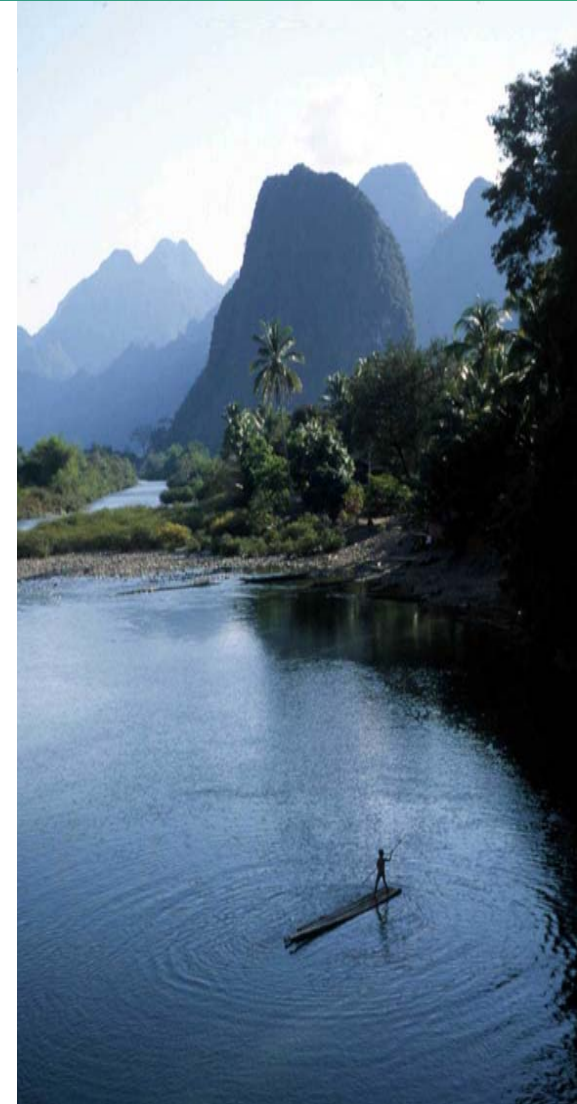
Source: FAOSTATS, SOFI.

Ecosystems, Biodiversity and Development

If biodiversity and ecosystem services are worth the Billions and Trillions

Why are people still poor ?

Because

They are unable to use the resource sustainably

They are unable to add value

They are marginalised in global market economy

Making Systems Work

Short-term   Medium-term   Long-term

| 1. Make Policies and Strategies that are responsive to local / national needs	2. Develop human, institutional and financial capacities to implement the policies and strategies	3. Improve Governance and Accountability
• *What is the overall aim of the policy/project/plan?* • *How do local conditions influence this aim?* • *What local variable/situation need to be considered and/or change to achieve the aim?*	• *Capacity assessment, mapping* • *Capacity Development* • *Capacity Retention* • *Capacity use*	• *Management principles and options* • *Informed and participatory decision-making* • *Ownership*

Sharing experiences, networking, knowledge generation and analyses, reviewing implementation and evaluation

IUCN
The World Conservation Union

Achieving Sustainable Development
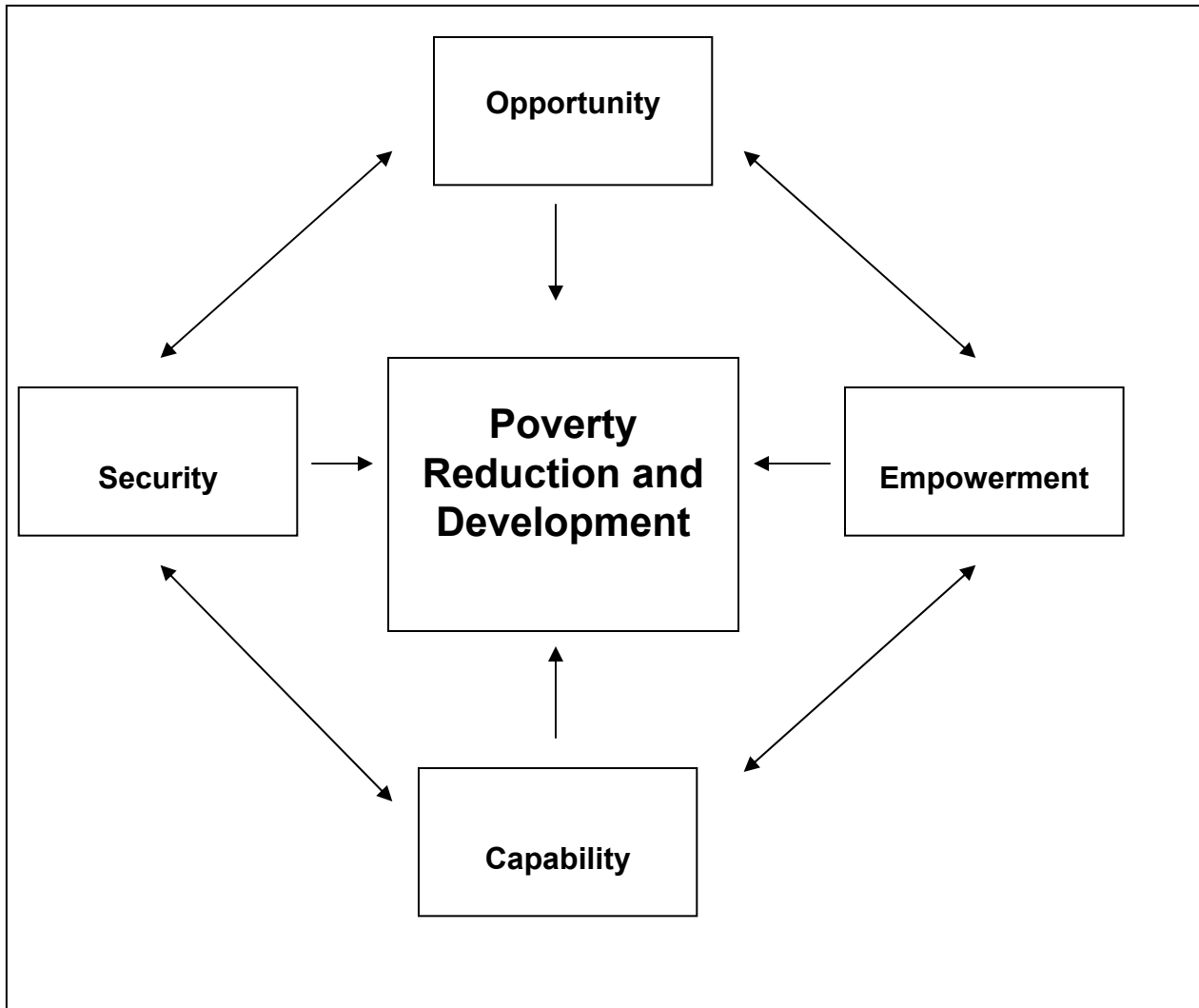
Millennium Development Goals

Goal 1 - Eradicate Extreme Poverty and Hunger

Goal 2 - Achieve Universal Primary Education

Goal 3 - Promote Gender Equality and Empower Women

Goal 4 - Reduce Child Mortality

Goal 5 - Improve Maternal Health

Goal 6 - Combat HIV/AIDS, Malaria and other Diseases

Goal 7 - Ensure Environmental Sustainability

Goal 8 - Develop a Global Partnership for Development

- 8 goals, 14 targets

- Dealing with issues of poverty eradication, education, gender equality, health, environmental sustainability and building partnerships for development.

- Framework for measuring development progress

- New stimulus for development planning, focusing donor priorities

MDG 1
Eradicate Extreme Poverty and Hunger

Way Forward

- Achieve minimum nutritional standards of people

- Promote sustainable agricultural practices

- Understand the economic values of biodiversity and empower local communities on achieving economic gains

- Raise the awareness of communities, stakeholders and policy-makers on values of biodiversity

IUCN
The World Conservation Union

MDG 2 - Achieve Universal Primary Education

MDG 3 - Promote Gender Equality and Empower Women

MDG 4 - Reduce Child Mortality

MDG 5 - Improve Maternal Health

MDG 6 - Combat HIV/AIDS,
Malaria and other Diseases

Way Forward

- Promote conservation of biodiversity through ecosystem approach for watershed management

- Strengthen primary health care and nutrition through the use of traditional knowledge and traditional medicine

- Develop suitable management methodologies for addressing issues of ecosystem imbalance and increases in incidence of diseases

- Promote agronomic practices that can provide better house-hold nutrition

IUCN
The World Conservation Union

MDG 7 - Ensure Environmental Sustainability

Way Forward

- Integrate national action plans dealing with Convention on Biological Diversity, UN Framework Convention on Climate Change (UNFCCC) and the Convention to Combat Desertification (CCD) and their implementation

- Link ecological sustainability with sustainable development (economic, social and environmental well-being)

- Integrate biodiversity concerns into environmental impact assessments, strategic environmental assessments and others

MDG 8 - Develop a Global Partnership for Development

Way Forward

- Encourage regional mechanisms and cooperation on addressing issues of open-trading systems

- Provide inputs into the decision making process under WTO to deal with issues of rule based and non-discriminatory trading, including addressing the special needs of LDCs, SIDS and landlocked countries.

- Increase the awareness and understanding on issues of debt for nature swaps and structural adjustment policies and enhance capacities of countries in negotiating such agreements

Concluding Remarks

- MDGs can be better achieved if biodiversity is conserved and its benefits distributed evenly.

- As noted in the CBD, effective conservation and sustainable use of biodiversity is a precondition for sustainable development.

IUCN
The World Conservation Union

Linking MEA and Development

⊙ Relate outcomes and priorities to development planning

⊙ Mainstream recommendations into economic plans

⊙ Communicate the relevance at local level

⊙ Enhance the ownership

THANK YOU !

IUCN
The World Conservation Union