The Importance of Biological Diversity and Impacts of Its Loss

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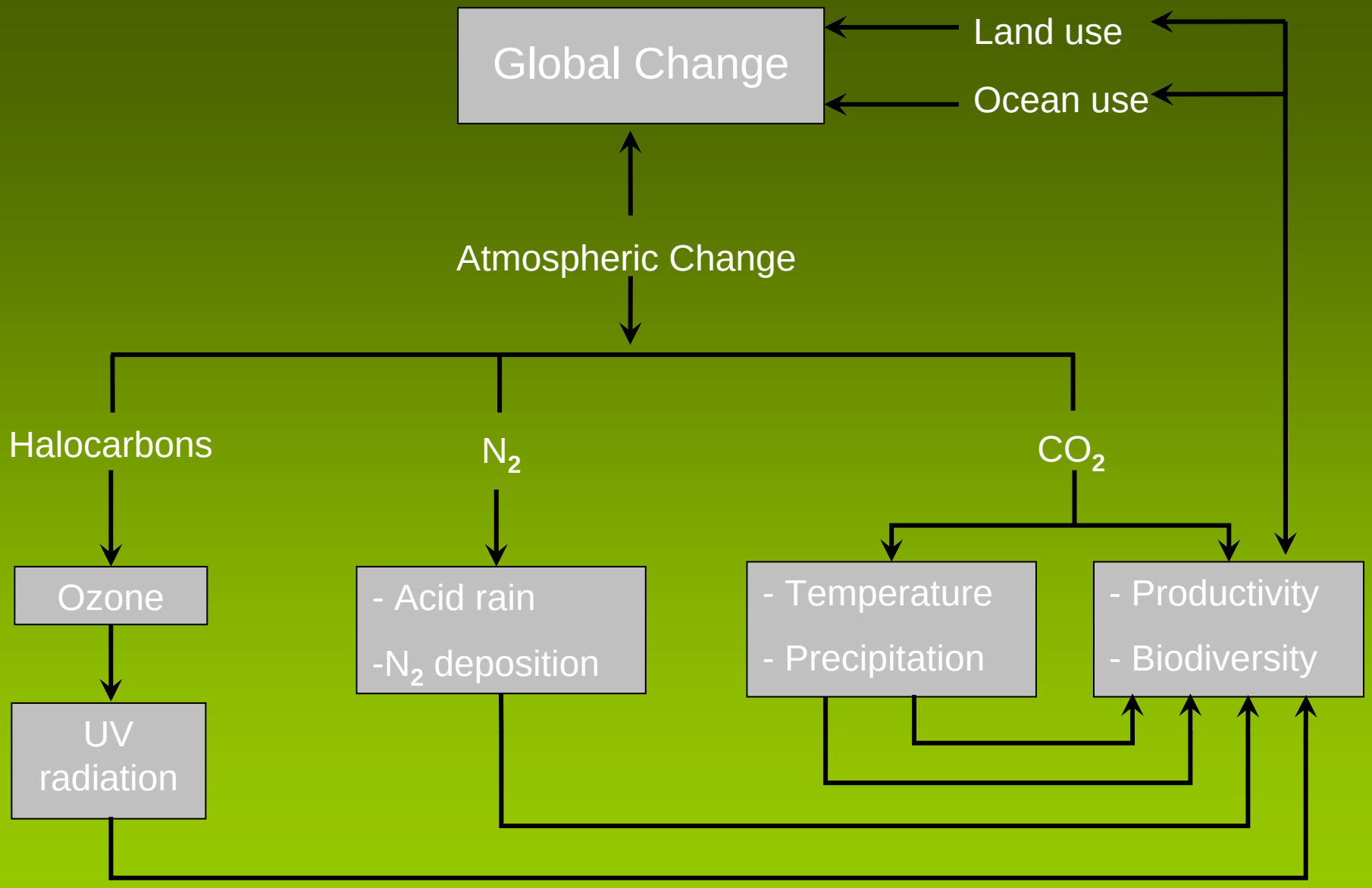
Criteria of Good Governance

- The effectiveness and efficiency of resource management;
- The clear accountability of all relevant actors, including through effective reporting;
- High transparency of decision-making and of its consequences;
- The legitimacy and consistency of decision-making; and
- The clear rule of law.


Global Change
Land use
Ocean use
Atmospheric Change
Halocarbons
N_2
CO_2
Ozone
UV radiation
- Acid rain
-N_2 deposition
- Temperature
- Precipitation
- Productivity
- Biodiversity

Global Environmental Changes

- Climate change
- Loss of biological diversity
- Land degradation and desertification
- Deforestation and forest degradation
- Depletion of stratospheric ozone
- Pollution of fresh and marine waters
- Accumulation of persistent organic pollutants

Responsibility and Impacts of Global Changes

- Differ among countries and people
  - The rich contribute disproportionately
  - The poor and disadvantaged are the most vulnerable
- Poverty and inequity exacerbate global changes

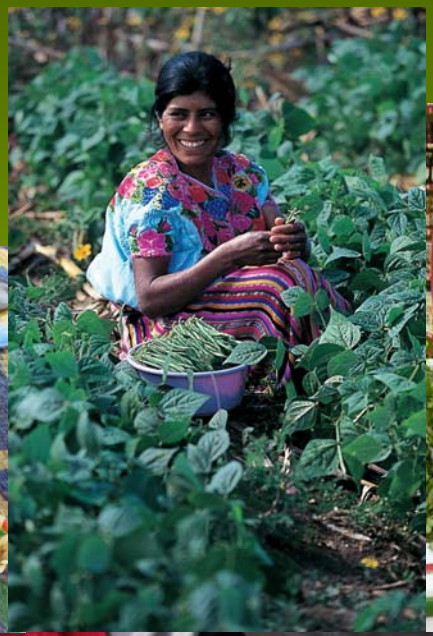
Major Global Revolutions

- Economic and cultural globalization (trade liberalization/global markets)

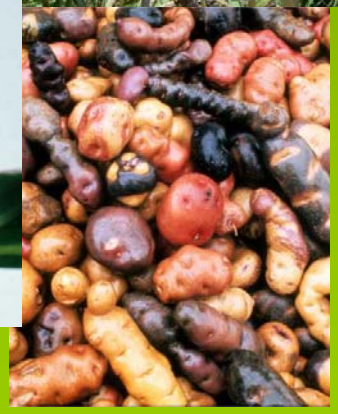
- Technological innovation (information technology and biotechnology)

- Communication revolution

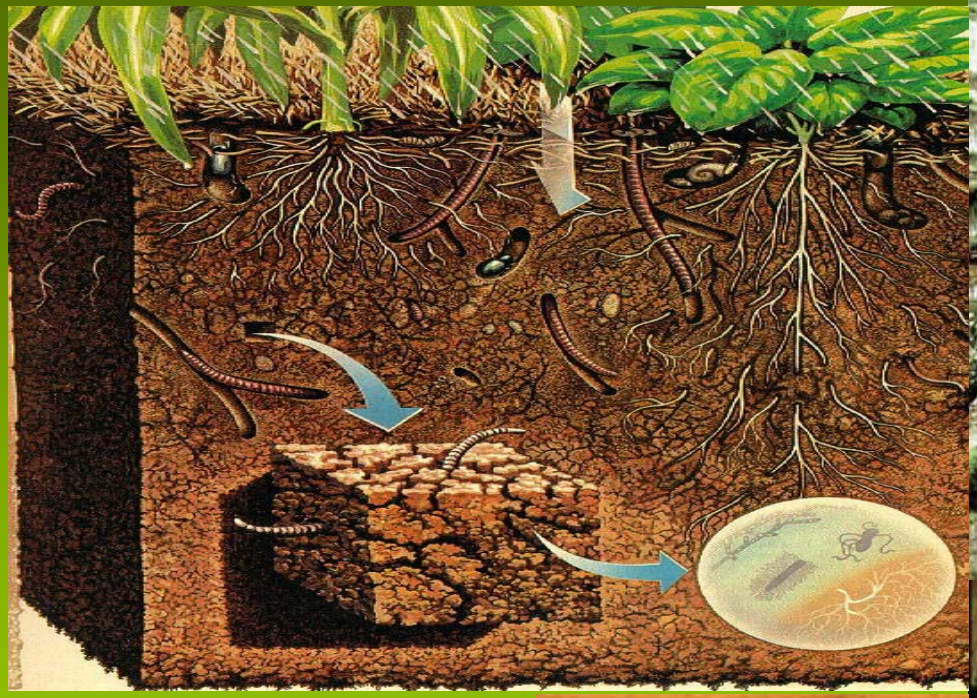
Species Diversity



Genetic Diversity



Ecosystem Diversity



Ecosystem Goods and Services

Provisioning

Goods produced or provided by ecosystems

- food
- fresh water
- fuel wood
- fiber
- biochemicals
- genetic resources

Regulating

Benefits obtained from regulation of ecosystem processes

- climate control
- disease control
- flood control
- waste detoxification and decomposition
- drought moderation

Cultural

Non-material benefits obtained from ecosystems

- spiritual
- recreational
- aesthetic
- inspirational
- educational
- communal
- symbolic

Supporting

Services that maintain the conditions for life on earth.

- Soil formation
- Nutrient cycling
- Pollination and seed dispersal

PUTTING A PRICE ON BIODIVERSITY GOODS AND SERVICES

Some 40% of the world's economy is derived directly from biodiversity	
Ecosystem services worldwide	US$18-61 trillion per year
Soil microbial services	US$33 billion per year
Global benefits from coral reefs	US$30 billion per year
Insect pollination of over 40 commercial crops in the United States	US$30 billion per year
Total seed-sector activities worldwide	US$45 billion per year
Global market for herbal drugs	US$47 billion in 2000

Ecosystem Products and Services	Estimated Value (US Dollars)
Economic activity generated by the 350 million visitors to U.S. national parks, wildlife refuges and other Department of the Interior and Department of Agriculture public lands through expenditures on fishing, hiking, hunting, whale watching and wildlife photography	**More than 400,000 jobs and 28 billion per year**

Ecosystem Products and Services	Estimated Value (US Dollars)
Commercial and sport fishing revenue lost because of destruction of U.S. estuaries between 1954 and 1978	**More than $200 million**
Annual ocean fish catch worth to the U.S.	**$2.5 billion**
Genetic Traits from wild crop varieties introduced into domestic agricultural crops in the U.S.	**$ 8 billion per year**
Sales of prescription drugs containing ingredients from wild plants in the U.S.	**$ 15 billion in 1990**

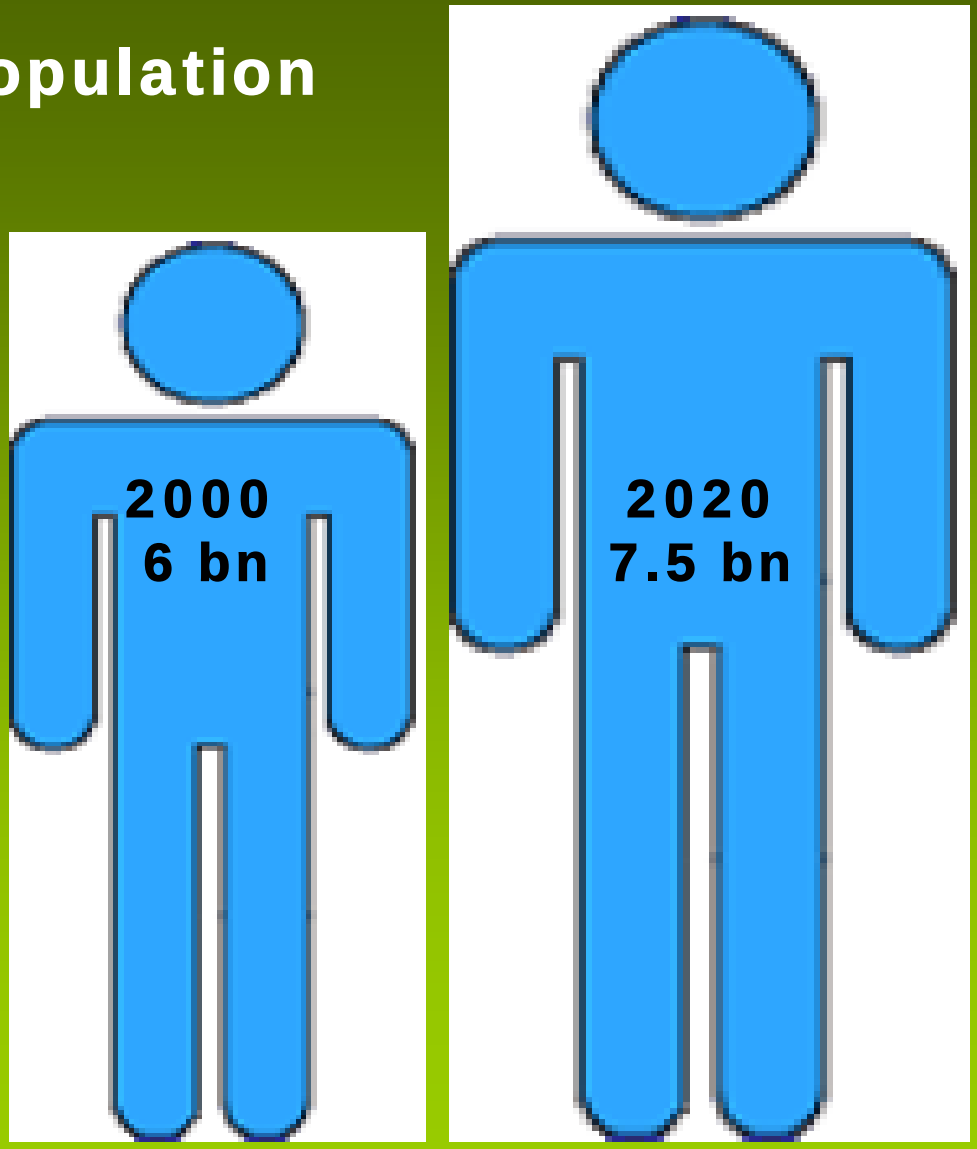
Ecosystem Products and Services	Estimated Value (US Dollars)
Value of flood control services provided by marsh-lands near the Charles River in Boston, Massachusetts	**$72,000 per acre of marshland**
Contribution to U.S. economy of products from natural and managed forests including timber, fuelwood, game, fruits, nuts mushrooms, honey, etc	**$3 billion - $8 billion per year**

The Importance of Biodiversity for Medicine

- 60% of world population relies on plants for primary healthcare
- 80% of population in developing countries rely on traditional medicines
- 25% of prescriptions in United States contain plant extracts or active principles from plants
- 50% of the top 150 prescription drugs in the US are synthetic versions of agents found in plants, fungi, bacteria and vertebrates

Global Change, Global Challenges

Projected Population Increase



Direct Drivers of Biodiversity Loss (Human Induced Actions)

- Habitat conversion
- invasive alien species
- Climate change
- Pollution
- Over-exploitation of species
- Natural causes

Indirect Drivers of Biodiversity Loss

- Economic (e.g. globalization, trade, market and policy frameworks)
- Demographic (e.g. population growth and density)
- Socio-political (e.g. governance, institutional and legal frameworks)
- Cultural and religious (e.g. choices about what and how much to consume)
- Science and technology

The Loss of Biodiversity

- Scientists believe that under natural extinction rates, the Earth should be losing one species every four years; however present estimates put the loss at about 17,000 species each year.
- Distribution of species is becoming more homogenous and the population size or range (or both) of the majority of species across a range of taxonomic groups is declining.
- More land was converted to cropland in the 30 years after 1950 than in the 150 years between 1700 and 1850.

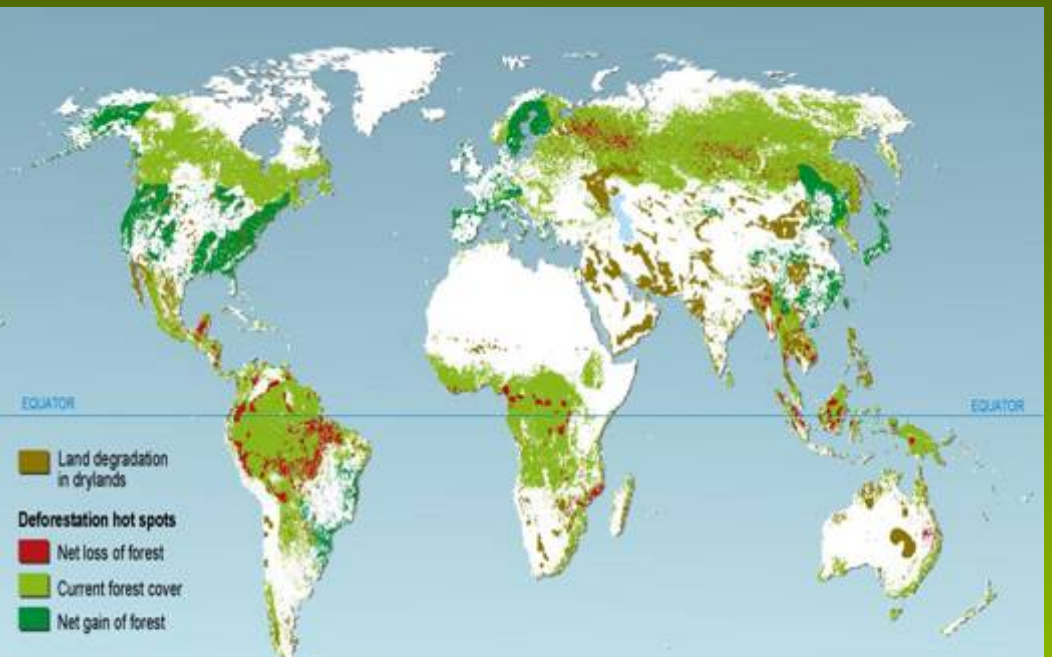
High Rates of Extinction

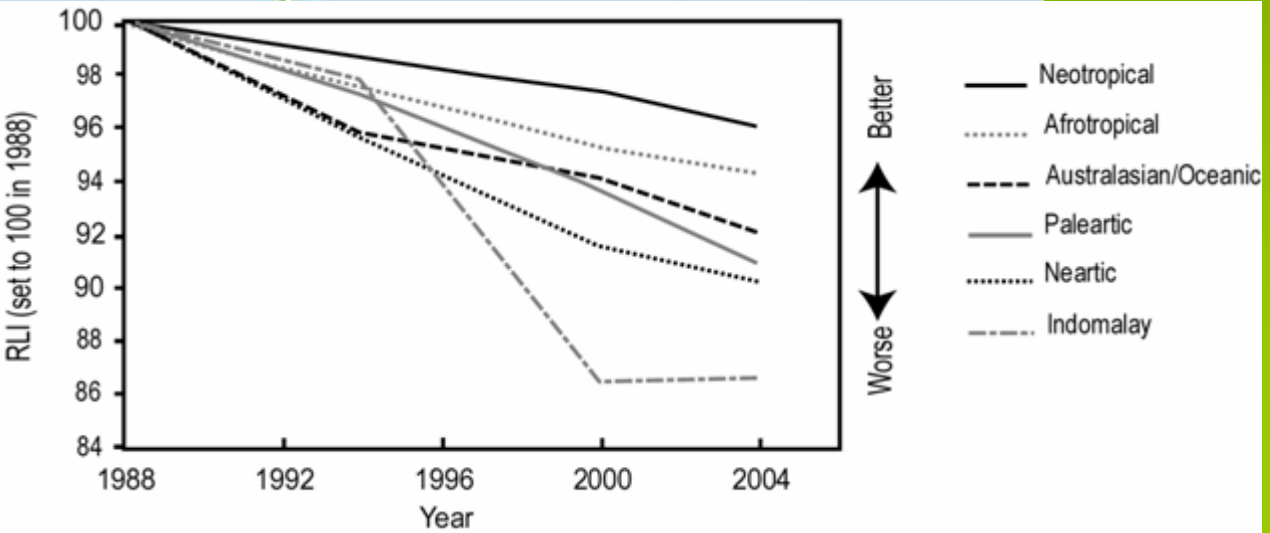
Extinction rates are 50 to 500 times higher than background rates in last century. Many species are at risk.

- 12% of all bird species
- 25% of all mammal species
- 20% of all amphibians
- 30% of fish species
- 23% of all conifers

Loss of genetic diversity is acute among cultivated species

Habitat Destruction and Degradation





- 20% of world's coral reefs were lost and 20% degraded in last several decades
- 50% of the world's wetlands were lost in the past century
- 35% of mangrove area has been lost
- 80% of grasslands are suffering from soil degradation
- 9 million hectares of forests are lost annually
- Roughly 10-15% of plants species would be lost from habitat loss over 1970-2050

Risk from and Economic Damage of Invasive Alien Species

- Since 1600, 39% of species extinctions are believed to have been caused by IAS.
- One study in six selected countries estimates economic damage from IAS at US$ 336 billion per year.
- Worldwide cost of damage from IAS is estimated at US$ 1.4 trillion per year.
- Annual IAS costs to individual states are staggering, and steadily increasing. Some examples:

Australia	US$ 13 billion
Brazil	US$ 50 billion
India	US$ 116 billion
South Africa	US$ 7 billion
United Kingdom	US$ 12 billion

- Economic impact of invasive weeds in Australia is calculated to be at least $4 billion each year

Risk from and Economic Damage of Invasive Species (Cont'd)

- The larger grain borer was first introduced to eastern Africa in the late 1970s and within 20 years destroyed up to 70% of stored dried cassava and a wide range of other crops.
- *Parthenium hysterophorus* was introduced in Ethiopia in the 1980s in shipments of wheat grain and today this aggressive invader has been known cause sorghum crop losses of up to 97% if left uncontrolled.
- The European Gypsy moth was introduced to North Carolina in 1993 and took four years to eradicate at a cost of US$19 million.
- The US Department of State spends more than US$10 million annually to control the Sea Lamprey which has invaded the Great Lakes of the Unites States and Canada.
- Control efforts against the Brown Tree Snake have cost the US military at least US$2 million annually since 1993.

Risk from Climate Change

- In 2004, a report published in a scientific journal states that among the risk of climate change alone **one million** of species of mammals, birds, frogs, reptiles, invertebrates and plants are likely to become extinct by the year 2050.

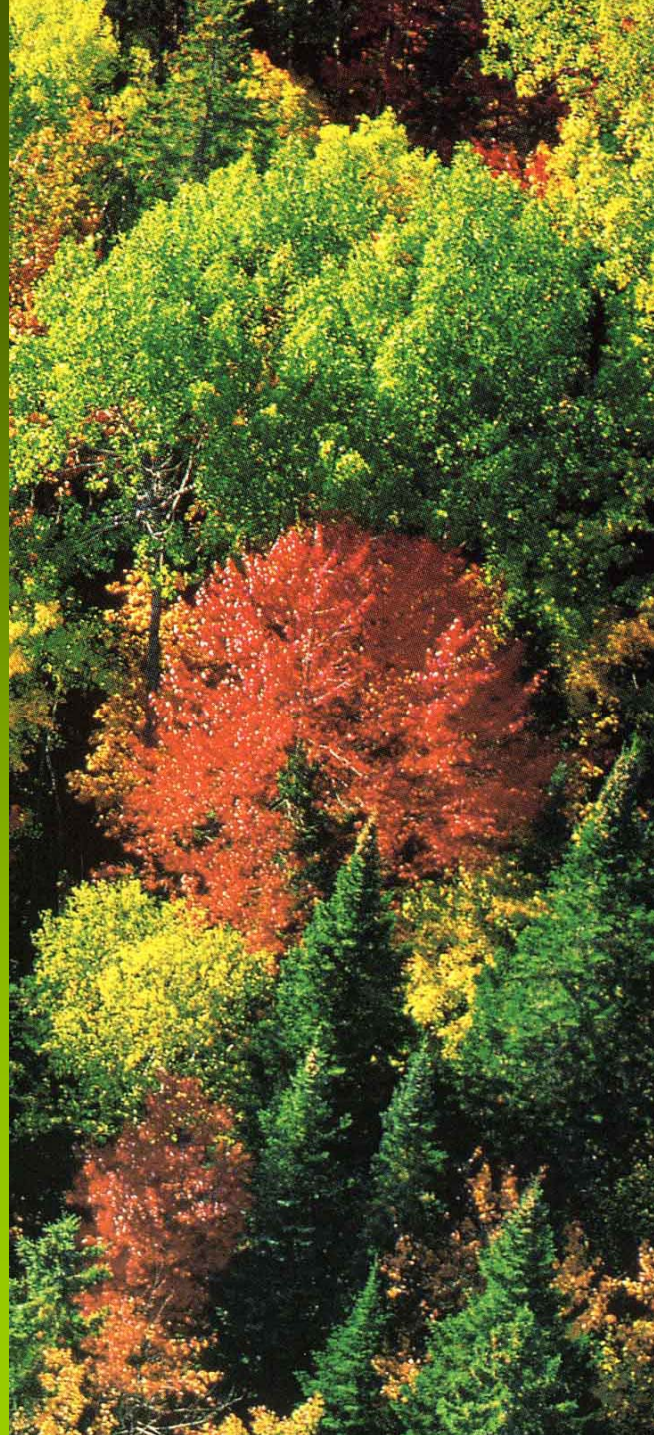
Consequences of Biodiversity Loss (Reasons for Concern)

- Decline in ecosystem services
  - Required for human-well-being
- Reduction in options for diverse nutrition, improved food production, health care, coping with environmental change
- Loss of ecosystem resilience
  - Can exacerbate shocks & produce surprises
- Impact on the poorest
  - May prevent attaining the MDGs
- Loss and degradation of natural capital
- Loss of unique species & habitats

The Convention on Biological Diversity

Objectives:

- Conservation of biological diversity
- Sustainable use of its components
- Fair and equitable sharing of benefits arising out of the utilization of genetic resources



Thematic Work Programmes

- Marine & coastal biodiversity
- Forest biodiversity
- Inland waters biodiversity
- Agricultural biodiversity
- Dry and sub-humid lands
- Mountain biodiversity
- Island biodiversity

Cross-cutting Work Programmes

Access and Benefit-sharing

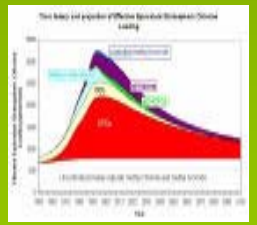
Sustainable Tourism

Traditional knowledge 8(j)

Protected areas

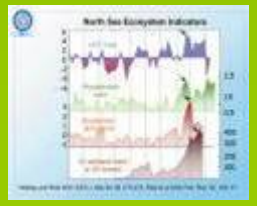
Alien species

Technology Transfer



Scientific Assessment

Global Taxonomy Initiative



Indicators

Education and Public Awareness

Principles, guidelines and other tools developed under the Convention

- Description, Principles and Operational Guidance for the Ecosystem Approach
- Bonn Guidelines on Access to Genetic Resources and Fair and Equitable Sharing of the Benefits Arising out of their Utilization
- Addis Ababa Principles and Guidelines for the Sustainable Use of Biodiversity
- Guiding Principles on Invasive Alien Species
- Akwé: Kon Voluntary Guidelines for the Conduct of Cultural, Environmental and Social Impact Assessment regarding Developments Proposed to take place on, or which are likely to impact on, Sacred Sites and on Lands and Waters Traditionally Occupied or Used by Indigenous and Local Communities
- Guidelines for incorporating biodiversity-related issues into environmental impact assessment legislation and/or process and in strategic environmental assessment
- Guidelines on Biodiversity and Tourism Development
- Proposals for the application of ways and means to remove or mitigate perverse incentives
- Principles and operation guidance for an ecosystem approach for the implementation of the Convention.

The Biosafety Protocol

In January 2000, the Conference of the Parties adopted the Cartagena Protocol on Biosafety to address potential risks posed by living modified organisms (LMOs) and to ensure an adequate level of protection in the transfer, handling and use of LMOs resulting from modern biotechnology, taking into account risks to human health. The Protocol breaks new ground through its practical application of the precautionary approach—the idea that lack of absolute scientific certainly is no reason to delay action to prevent potential risks. It also promises to make a real contribution to promoting technology transfer and to enabling developing countries to gain access to information and technology from the biotechnology industry.

The CBD Strategic Plan and the 2010 Target

The Conference of the Parties adopted a Strategic Plan, in which Parties committed themselves to a more effective and coherent implementation of the three objectives of the Convention in order to achieve by 2010 a significant reduction of the current rate of biodiversity loss at the global, regional and national level, as a contribution to poverty alleviation and for the greater benefit of all life on earth. This target was subsequently endorsed by the World Summit on Sustainable Development in 2002.

Framework for Evaluation of Progress towards the 2010 Target

- Reducing the rate of loss of the components of biodiversity, including: (i) biomes, habitats and ecosystems; (ii) species and populations; and (iii) genetic diversity;
- Promoting sustainable use of biodiversity;
- Addressing the major threats to biodiversity, including those arising from invasive alien species, climate change, pollution, and habitat change;
- Maintaining ecosystem integrity, and the provision of goods and services provided by biodiversity in ecosystems, in support of human well-being;
- Protecting traditional knowledge, innovations and practices;

Framework for Evaluation of Progress towards the 2010 Target (Cont'd)

- Ensuring the fair and equitable sharing of benefits arising out of the use of genetic resources; and
- Mobilizing financial and technical resources, especially for developing countries, in particular, least developed countries and small island developing states among them, and countries with economies in transition, for implementing the Convention and the Strategic Plan.

International Regime on Access and Benefit Sharing

The Conference of the Parties, responding to an invitation contained in the Johannesburg Plan of Implementation of the World Summit on Sustainable Development, initiated in 2005 a process to elaborate and negotiate the nature, scope and elements of an international regime on access and benefit sharing.

Parties' Obligations Under the Convention

- Implementation of thematic work programmes
- Implementation of cross-cutting programmes of work
- Use of tools and guidelines
- Achieving the 2010 Biodiversity Target
- Preparation and implementation of National Biodiversity Strategies and Action Plans (NBSAPs)
- Integration of biodiversity into national sectoral and cross-sectoral policies, plans and strategies
- Reporting on Implementation

Meeting Obligations under the CBD

- For governments to fulfill their obligations they need:
  - Good planning
  - Robust partnerships
  - Strong science
  - Sustained funding
  - National legislation
  - Monitoring mechanisms
  - Compliance mechanisms

Living up to these obligations requires that Parties:

- Outline responsibilities and commitments
- Prepare and implement NBSAPs
- Report to the COP of the Convention, the Parliament and public on the status of biodiversity and efforts to implement the Convention
- Deliver programmes aimed at increasing awareness of biodiversity at risk and conserving and protecting it.
- Adopt legislation outlining government responsibilities at all levels (federal, provincial, local)
- Develop and use of performance indicators.
- Coordinate implementation.

Constraints to meeting these obligations:

Lack of compliance information

Lack of compliance mechanisms

Role of the National Supreme Audit Institutions (NSAIs) in facilitating compliance with the CBD

- National Supreme Audit Institutions have important role to play in promoting and facilitating implementation.

- Their expertise and authority can ensure that
  - Obligations are respected
  - Policies and programmes are in place
  - Monitoring mechanisms exist
  - Sufficient budgetary resources are available

CBD welcomes

"Moving Towards Auditing Biodiversity"

NBSAPs and the Programmes of the Convention Potential dimensions of auditing by NSAIs

- Auditing should be performance-based and should use established standards and evaluation criteria.
- Contribution of National Supreme Audit Institutions:
  - Elevate biodiversity concerns in national policy, legislative and budgetary frameworks
  - Support formulation and implementation of NBSAPs
  - Ensure that funds are sufficient and used to greatest effect
  - Ensure that NBSAPs are integrated into sectoral policies
  - Raise importance of biodiversity for development frameworks
- Mechanisms for this:
  - NSAI's should require publication of reports on state of biodiversity
  - Promote legislation on specific aspects of Convention
  - Raise public awareness.

THANK YOU