

# **The Global Biodiversity Outlook 3 and the Post-2010 Target**

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# 2010 Biodiversity Target

- Agreed by the world's Governments during the World Summit on Sustainable Development in 2002
- “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 to the benefit of all life on Earth”



# 2010 is Now

- The Biodiversity Target has not been Met
- The world has failed to meet its target to achieve a significant reduction in the rate of biodiversity loss by 2010

# SPECIES

- Species which have been assessed for extinction risk are on average moving closer to extinction
- Amphibians face the greatest risk and coral species are deteriorating most rapidly in status
- Nearly a quarter of plant species are considered to be threatened with extinction

# SPECIES

- The abundance of vertebrate species, based on assessed populations, fell by nearly a third on average between 1970 and 2006
- And continues to fall globally, with especially severe declines in the tropics and among freshwater species

# ECOSYSTEMS

- Natural habitats in most parts of the world continue to decline in extent and integrity, although there has been significant progress in slowing the rate of loss for tropical forests and mangroves in some regions
- Freshwater wetlands, sea ice habitats, salt marshes, coral reefs, seagrass beds and shellfish reefs are all showing serious declines

# ECOSYSTEMS

- Extensive fragmentation and degradation of forests, rivers and other ecosystems has also led to loss of biodiversity and ecosystem services



## Genes

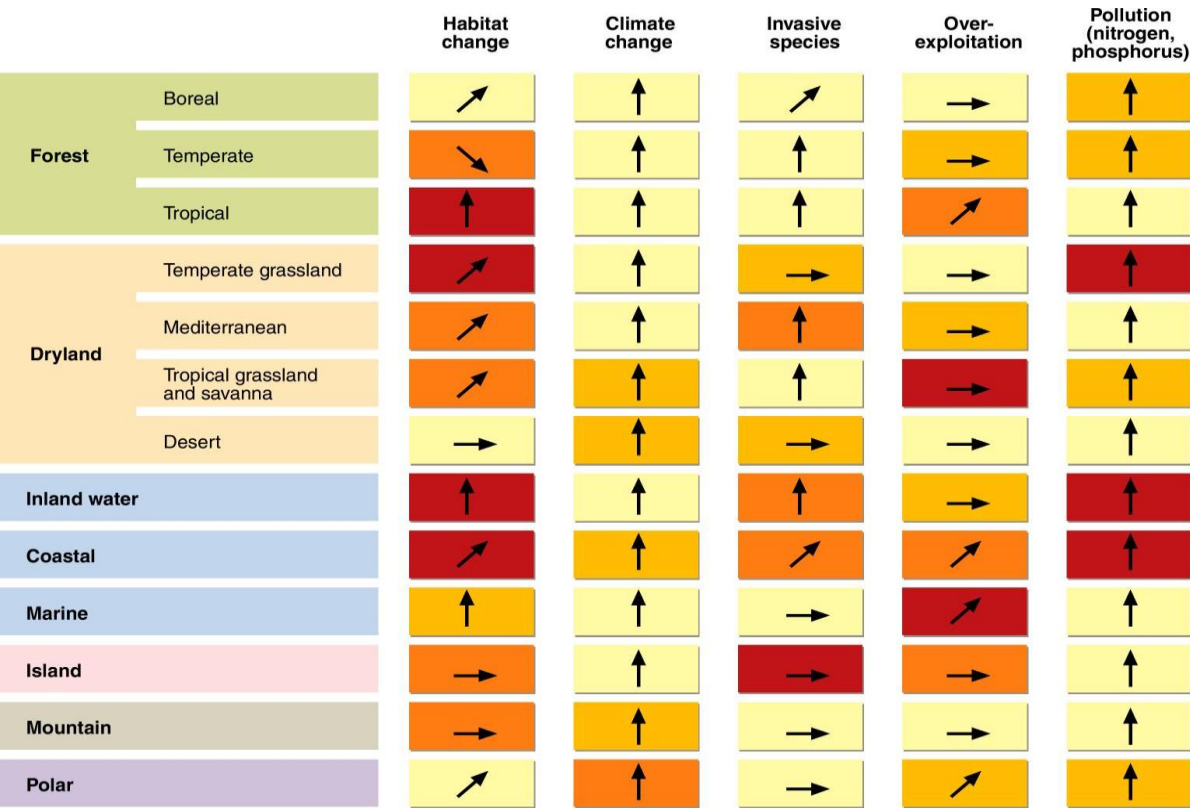
Crop and livestock genetic diversity continues to decline in agricultural systems . For example, more than sixty breeds of livestock are reported to have become extinct since 2000



# DRIVERS OF BIODIVERSITY LOSS

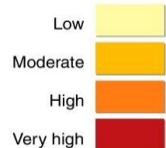
- Habitat Change
- Overexploitation
- Pollution
- Invasive Alien Species
- Climate Change

# Direct drivers growing in intensity

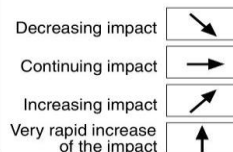


Most direct drivers of degradation in ecosystem services remain constant or are growing in intensity in most ecosystems

Driver's impact on biodiversity over the last century



Driver's current trends

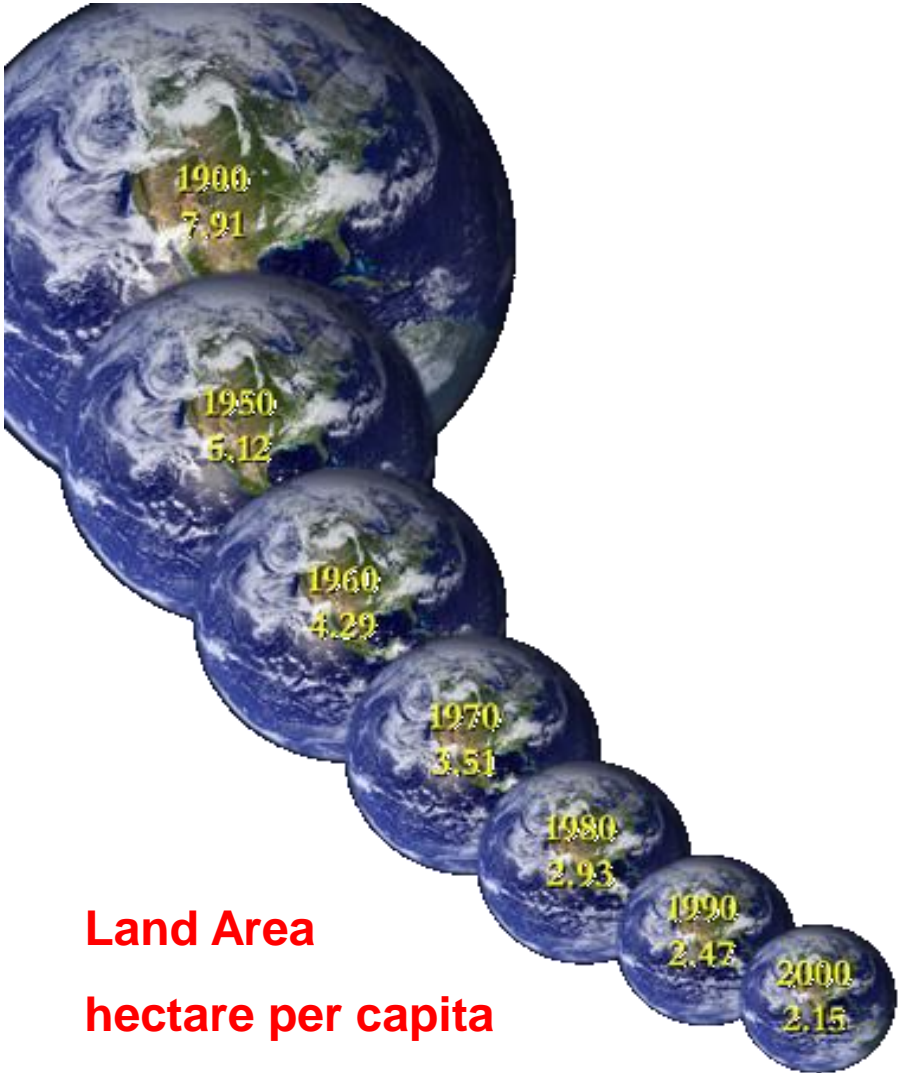


Source: Millennium Ecosystem Assessment

# ECOLOGICAL FOOTPRINT

The ecological footprint of humanity exceeds the biological capacity of the Earth and has increased since the 2010 biodiversity target was agreed

# Earth's Shrinking Biosphere



**Land Area**  
**hectare per capita**

# BIODIVERSITY AND HUMAN WELLBEING

- **The loss of biodiversity is an issue of profound concern for its own sake**
- **Biodiversity also underpins the functioning of ecosystems which provide a wide range of services to human societies**
- **Its continued loss, therefore, has major implications for current and future human well-being**

# Ecosystem Services = Benefits people obtain from ecosystems

- Provisioning Services

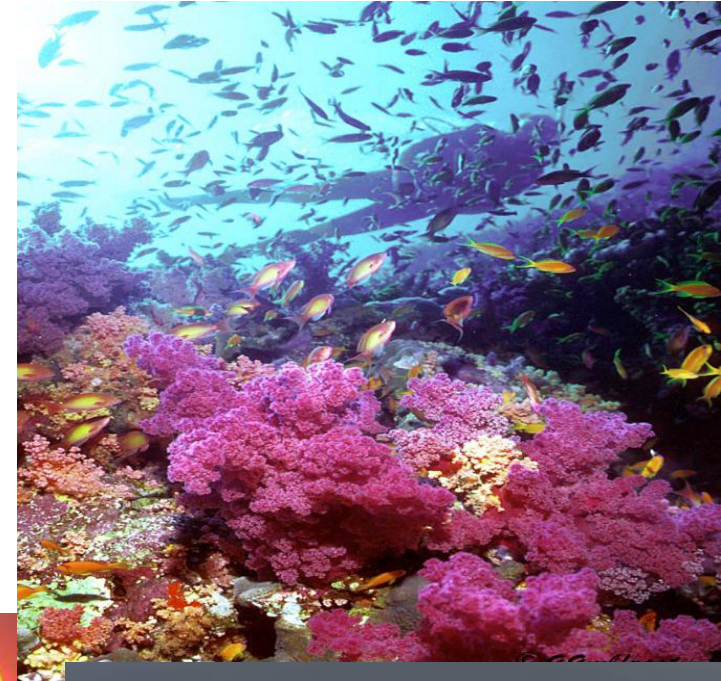
- Regulating Services

- Climate Regulation
- Flood Regulation
- Disease Regulation
- Water Purification



# Ecosystem Services = Benefits people obtain from ecosystems

- Provisioning Services
- Regulating Services
- Cultural Services
  - Aesthetic
  - Spiritual
  - Educational
  - Recreational
  - Social Relations



# Ecosystem Services = Benefits people obtain from ecosystems

## • Provisioning Services

- Food
- Freshwater
- Wood fuel
- Timber
- Fiber
- Genetic Resources



# Satoyama

## Satoyama Landscape



里地里山の保全・再生モデル事業イメージ



# Satoyama-like landscapes in Asia-Pacific

Cambodia	<i>Chamkar</i>	
Indonesia	<i>Hutan kepungan sialang pekarangan</i>	Melayu Riau
India	<i>Sacred groves</i>	
Malaysia	Kampong; desa	
Philippines	<i>muyong, uma, payuh</i>	<i>Ifugao/</i> indigenous people
Republic of Korea	<i>maeul/</i> <i>maeulsoop</i>	
Thailand	Satoyama-like landscape established by the King	



# **2010 biodiversity target stimulated important action to safeguard biodiversity**

- More areas for protection (on both land and in coastal waters)
- Conservation of particular species
- Addressing some of the direct causes of ecosystem damage, such as pollution and alien species invasions
- Some 167 countries now have national biodiversity strategies and action plans
- At the international level, financial resources mobilized and progress made in developing mechanisms for research, monitoring and scientific assessment of biodiversity

# Implementation of CBD - slow

- **Insufficient implementation of CBD to address the pressures on biodiversity**
- **Insufficient integration of biodiversity issues into broader policies, strategies and programmes**
- **Consequently the underlying drivers of biodiversity loss not addressed significantly**

# Lack of Biodiversity Mainstreaming

- Actions to promote the conservation and sustainable use of biodiversity receive a tiny fraction of funding compared to activities aimed at promoting infrastructure and industrial developments
- Moreover, biodiversity considerations are often ignored when such developments are designed, and opportunities to plan in ways that minimize unnecessary negative impacts on biodiversity are missed
- Actions to address the underlying drivers of biodiversity loss, including demographic, economic, technological, socio-political and cultural pressures, in meaningful ways, have also been limited

# GBO3 scenarios project continuing high levels of extinctions and loss of habitats throughout this century

- **Tropical forests would continue to be cleared** in favour of crops and pastures, and potentially for biofuel production
- **Climate change, invasive alien species, pollution and dam construction** would put further pressure on freshwater biodiversity and the services it underpins.
- **Overfishing would continue** to damage marine ecosystems and cause the collapse of fish populations, leading to the failure of fisheries

**Changes in the abundance and distribution of species may have serious consequences for human societies. The geographical distribution of species and vegetation types is projected to shift radically due to climate change, with ranges moving from hundreds to thousands of kilometres towards the poles by the end of the 21st century**

# GB03 SCENARIOS

- Migration of marine species to cooler waters could make tropical oceans less diverse, while both boreal and temperate forests face widespread dieback at the southern end of their existing ranges, with impacts on fisheries, wood harvests, recreation opportunities and other services



# GB03 SCENARIOS

- **There is a high risk of dramatic biodiversity loss and accompanying degradation of a broad range of ecosystem services if ecosystems are pushed beyond certain thresholds or tipping points**
- **The poor would face the earliest and most severe impacts of such changes, but ultimately all societies and communities would suffer**

# GB03 SCENARIOS

- **The Amazon forest**, due to the interaction of deforestation, fire and climate change, **could undergo a widespread dieback** with parts of the forest moving into a self-perpetuating cycle of more frequent fires and intense droughts leading to a shift to savanna-like vegetation
- While there are large uncertainties associated with these scenarios, it is known that such dieback becomes much more likely to occur if deforestation exceeds about 20 – 30% (it is currently above 17% in the Brazilian Amazon) or if global warming exceeds an average of two degrees. It would lead to regional rainfall reductions, compromising agricultural production
- **There would also be global impacts through increased carbon emissions, and massive loss of biodiversity**

# GB03 SCENARIOS

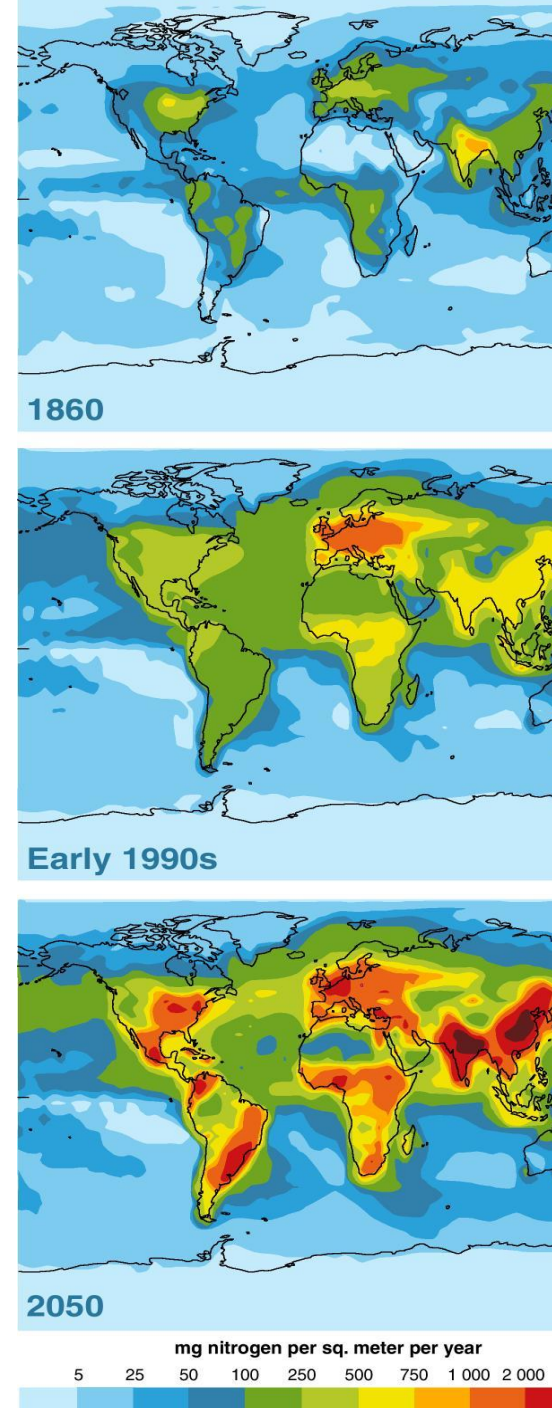
- The build-up of phosphates and nitrates from agricultural fertilizers and sewage effluent can lock freshwater lakes and other inland water bodies into a long-term, algae-dominated (eutrophic) state
- This could lead to declining fish availability with implications for food security in many developing countries
- There will also be loss of recreation opportunities and tourism income, and in some cases health risks for people and livestock from toxic algal blooms
- Similar, nitrogen-induced eutrophication phenomena in coastal environments lead to more oxygen-starved dead zones, with major economic losses resulting from reduced productivity of fisheries and decreased tourism revenues

# Changes in direct drivers: Nutrient loading

- Humans have already doubled the flow of reactive nitrogen on the continents, and some projections suggest that this may increase by roughly a further two thirds by 2050

## Estimated Total Reactive Nitrogen Deposition from the Atmosphere

Accounts for 12% of the reactive nitrogen entering ecosystems, although it is higher in some regions (e.g., 33% in the United States)



# GB03 SCENARIOS

- The combined impacts of ocean acidification, warmer sea temperatures and other human-induced stresses make tropical coral reef systems vulnerable to collapse
- More acidic water — brought about by higher carbon dioxide concentrations in the atmosphere — decreases the availability of the carbonate ions required to build coral skeletons
- Together with the bleaching impact of warmer water, elevated nutrient levels from pollution, overfishing, sediment deposition arising from inland deforestation, and other pressures, reefs increasingly become algae-dominated with catastrophic loss of biodiversity and ecosystem functioning, threatening the livelihoods and food security of hundreds of millions of people

# Basic Global Scenario, to 2050

- Population will increase, unevenly
- Energy use will approximately triple
- Food production must double
- Waste generation will escalate
- With current technologies and energy sources
  - Climate change will continue
  - More species will be lost, faster than ever
  - Nature's buffers will diminish (reefs, forests, mangroves, etc.)
  - Land degradation will continue
  - Fisheries will continue to decline/disappear
  - Oceans will become more acidic (CO<sub>2</sub> uptake)
  - Soils and waterways will undergo nitrification
  - Fresh water availability and quality will decline in many regions

These are our life-support systems. They provide the basic inputs and stability required for health and survival.

# Opportunities to address the biodiversity crisis

- Climate Change could be mitigated by maintaining and even expanding the current extent of forests and other natural ecosystems (avoiding additional habitat loss from the widespread deployment of biofuels)
- “Rewilding” abandoned farmland in some regions, and the restoration of river basins and other wetland ecosystems to enhance water supply, flood control and the removal of pollutants

# Overcoming Challenges

- **Even though it will be extremely challenging to prevent further human-induced biodiversity loss for the near-term future, well-targeted policies focusing on critical areas, species and ecosystem services can help to avoid the most dangerous impacts on people and societies**



# Overcoming Challenges

- In the longer term, biodiversity loss may be stopped or even reversed, if urgent, concerted and effective action is initiated now in support of an agreed long-term vision
- Such action to conserve biodiversity and use its components sustainably will reap rich rewards - through better health, greater food security, less poverty and a greater capacity to cope with, and adapt to, environmental change

# Overcoming Challenges

- **Placing greater priority on biodiversity is central to the success of development and poverty-alleviation measures**
- Continuing with “business as usual” will jeopardize the future of all human societies, and none more so than the poorest who depend directly on biodiversity for a particularly high proportion of their basic needs
- The loss of biodiversity is frequently linked to the loss of cultural diversity, and has a particularly high negative impact on indigenous communities

# Overcoming Challenges

- **The linked challenges of biodiversity loss and climate change must be addressed by policymakers with equal priority and in close co-ordination, if the most severe impacts of each are to be avoided**
- Reducing the further loss of carbon-storing ecosystems such as tropical forests, salt marshes and peatlands will be a crucial step in limiting the build-up of greenhouse gases in the atmosphere
- At the same time, reducing other pressures on ecosystems can increase their resilience, make them less vulnerable to those impacts of climate change which are already unavoidable, and allow them to continue to provide services to support people's livelihoods and help them adapt to climate change

# Overcoming Challenges

- **Better protection of biodiversity should be seen as a prudent and cost-effective investment in risk-avoidance for the global community**
- The consequences of abrupt ecosystem changes on a large scale affect human security to such an extent, that it is rational to minimize the risk of triggering them - even if we are not clear about the precise probability that they will occur
- Ecosystem degradation and the loss of ecosystem services has been identified as one of the main drivers of disaster risk. Investment in resilient and diverse ecosystems, able to withstand the multiple pressures they are subjected to, may be the best-value insurance policy yet devised

# Overcoming challenges

- **Scientific uncertainty surrounding the precise connections between biodiversity and human well-being, and the functioning of ecosystems, should not be used as an excuse for inaction**
- **No one can predict with accuracy how close we are to ecosystem tipping points**, and how much additional pressure might bring them about
- **What is known from past examples, however, is that once an ecosystem shifts to another state, it can be difficult or impossible to return it to the former conditions** which will often have shaped economies and patterns of settlement for generations

# Effective action needs addressing the drivers

- Much greater efficiency in the use of land, energy, fresh water and materials to meet growing demand.
- Use of market incentives, and avoidance of perverse subsidies to minimize unsustainable resource use and wasteful consumption.
- Strategic planning in the use of land, inland waters and marine resources to reconcile development with conservation of biodiversity and the maintenance of multiple ecosystem services. While some actions may entail moderate costs or tradeoffs, the gains for biodiversity can be large in comparison
- Ensuring that the benefits arising from use of and access to genetic resources and associated traditional knowledge, for example through the development of drugs and cosmetics, are equitably shared with the countries and cultures from which they are obtained.
- Communication, education and awareness-raising to ensure that as far as possible, everyone understands the value of biodiversity and what steps they can take to protect it, including through changes in personal consumption and behaviour.

# Benefits/Loss need to be reflected Economically

- Perverse subsidies and the lack of monetary value attached to hugely important services provided by ecosystems have been important factors contributing to the loss of biodiversity
- Through regulation and other measures, markets can and must be harnessed to create incentives to safeguard and strengthen, rather than to deplete, our natural infrastructure
- The re-structuring of economies and financial systems following the global recession provides an opportunity for such changes to be made
- Early action will be both more effective and less costly than inaction or delayed action

# Urgent action is needed to reduce the direct drivers of biodiversity loss

- The application of best practices in agriculture, sustainable forest management and sustainable fisheries should become standard practice, and approaches aimed at optimizing multiple ecosystem services instead of maximizing a single one should be promoted
- In many cases, multiple drivers are combining to cause biodiversity loss and degradation of ecosystems
- Sometimes, it may be more effective to concentrate urgent action on reducing those drivers most responsive to policy changes. This will reduce the pressures on biodiversity and protect its value for human societies in the short to medium-term, while the more intractable drivers are addressed over a longer time-scale
- For example the resilience of coral reefs – and their ability to withstand and adapt to coral bleaching and ocean acidification – can be enhanced by reducing overfishing, land-based pollution and physical damage



# Direct Action

- **Direct action to conserve biodiversity must be continued, targeting vulnerable and culturally-valued species and ecosystems, combined with a priority to safeguard key ecosystem services, particularly those of importance to the poor**

# Direct action

- Activities could focus on the conservation of species threatened with extinction, those harvested for commercial purposes, or species of cultural significance
- They should also ensure the protection of functional ecological groups – that is, groups of species that collectively perform particular, essential roles within ecosystems, such as pollination, control of herbivore numbers by top predators, cycling of nutrients and soil formation

# Restoration

- **Increasingly, restoration of terrestrial, inland water and marine ecosystems will be needed to re-establish ecosystem functioning and the provision of valuable services**
- Economic analysis shows that ecosystem restoration gives good economic rates of return
- However the biodiversity and associated services of restored ecosystems usually remain below the levels of natural ecosystems
- This reinforces the argument that, where possible, avoiding degradation through conservation is preferable (and even more cost-effective) than restoration after the event

# Mainstreaming Biodiversity

- **Better decisions for biodiversity must be made at all levels and in all sectors, in particular the major economic sectors, and government has a key enabling role to play**
- National programmes or legislation can be crucial in creating a favourable environment to support effective “bottom-up” initiatives led by communities, local authorities, or businesses
- This also includes empowering indigenous peoples and local communities to take responsibility for biodiversity management and decision-making; and developing systems to ensure that the benefits arising from access to genetic resources are equitably shared

# Mainstreaming Biodiversity

- **We can no longer see the continued loss of and changes to biodiversity as an issue separate from the core concerns of society** : to tackle poverty, to improve the health, prosperity and security of our populations, and to deal with climate change
- Each of those objectives is undermined by current trends in the state of our ecosystems, and each will be greatly strengthened if we correctly value the role of biodiversity in supporting the shared priorities of the international community
- Achieving this will involve placing biodiversity in the mainstream of decision-making in government, the private sector, and other institutions from the local to international scales

# CONCLUSION

- **The action taken over the next decade or two, and the direction charted under the Convention on Biological Diversity, will determine whether the relatively stable and benign environmental conditions on which human civilization has depended for the past 10,000 years will continue beyond this century**
- **If we fail to use this opportunity, many ecosystems on the planet will move into new, unprecedented states in which the capacity to provide for the needs of present and future generations is highly uncertain**