



Biodiversity, global situation, problems and solutions for Vietnam and region

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What is biodiversity ?

Why save biodiversity ?

The sixth mass extinction

What is the CITES ?

General state of biodiversity

Co-extinction of species

What's left to discover ?

Protected areas

Biodiversity in Vietnam





What is biodiversity ?

18th General Assembly of the World Conservation Union (IUCN)
Costa Rica, 1988

“ Biodiversity, or biological diversity, is the variety and variability of all living organisms. This includes genetic variability within species and their populations, the variability of species and their life forms, the diversity of complexes of associated species and their interactions, and that of ecological processes that they influence or upon which they are actors “.



What is biodiversity ?

The Convention on Biological Diversity (CBD)

- International treaty, under UN
 - signed at Rio de Janeiro, in June 5th, 1992
 - by 183 countries (excepted USA)

Objectives

- *Conservation of biological diversity*
 - *Sustainable use of its components*
 - *Fair & equitable sharing of the advantages derived from exploitation of genetic resources*

► Diversity of ecosystems (oceans, forests, deserts...)

► Diversity of species (animals, plants, algae, fungi, parasites, bacteria, virus...)

➤ Genetic biodiversity (genes = phenotypes, physiology, disease resistance...etc)



Why “save” Biodiversity ?

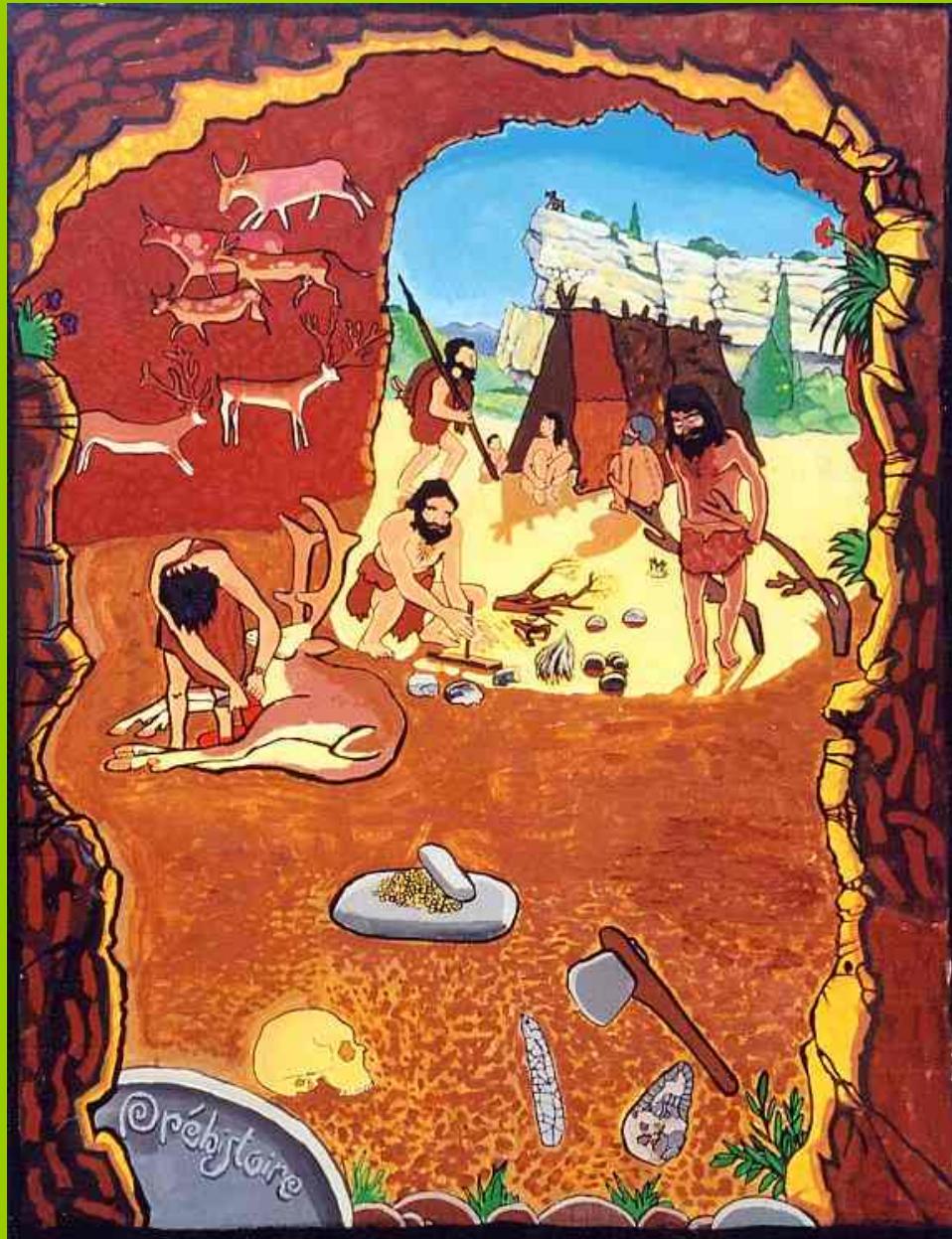
***Common world heritage and resource
that have value on many levels:***

- **Ethical value** (history of our planet, evolution of living world, interventions of our ancestors)
- **Cultural value** (identifying component, symbolic, religious, for human groups or societies...)
- **Ecological value** (base of ecosystems maintenance, provided services, soil fertility, water purification, climate regulation...)
- **Economic value** (source of richness, food, clothing, shelter, pharmaceutical substances...)
- **Potential value** (unexploited potentialities, reservoir of genes...)

It is necessary to act on every level, because erosion of biodiversity is evident and principally due to direct or indirect human action



From the Paleolithic age (-10.000 B.C.)



- Human interacts on environment
- Wide ecosystems
- Hunting wild animals
- Populations rounding up
 - Settled villages
 - Animal domestication
- Mainly natural selection (Darwin)

Nowadays (+2.000 A.C.)



- Important negative Human interactions on environment

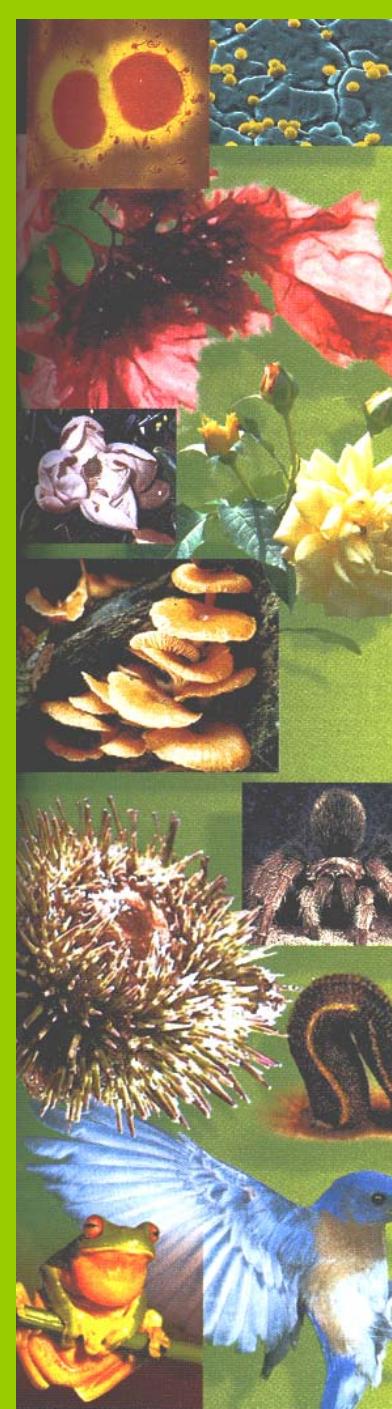
- Explosion of human population

- Concentration & Intensification
(human & animal populations)

- Strong and long time contacts

- Stress => dysfunctions

- Breeding of monoclonal strains
= loss of diversity



Biological diversity is not only descriptions => Interactions + Variability

Conservation of biodiversity and interactions between species and their natural surroundings will ensure an evolutionary potential for the earth planet, a sustainable capability to adapt changes and to maintain life on Earth

- Global changes (climat...)
- Gene mutations (Darwin / natural evolution)
- Extinction process

The 6th mass extinction



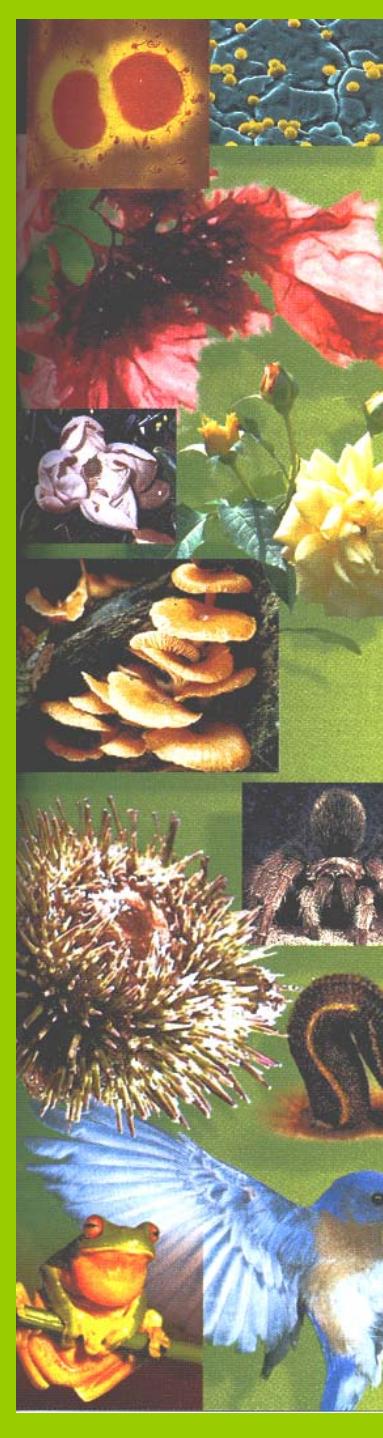
- Rule of evolution = all species will one day disappear
- Hundred thousands years < Average life span > Several millions
- 99% of species that have lived on Earth since the life began (4.5 billion years ago) are already extinct !
- Ordovician -440 M, Devonian -367 M, Permian – 245 M, Trias -208 M, Cretaceous -66 M
- Nowadays = 6th crisis in the Earth story,
extinction level > x100 x1000 !
- Megafauna is the most threatened
7.000 animal sp. on UICN Red list,
25% of 4600 mammals are endangered



What is the CITES ?

**Convention on International Trade in
Endangered Species of wild fauna and flora**

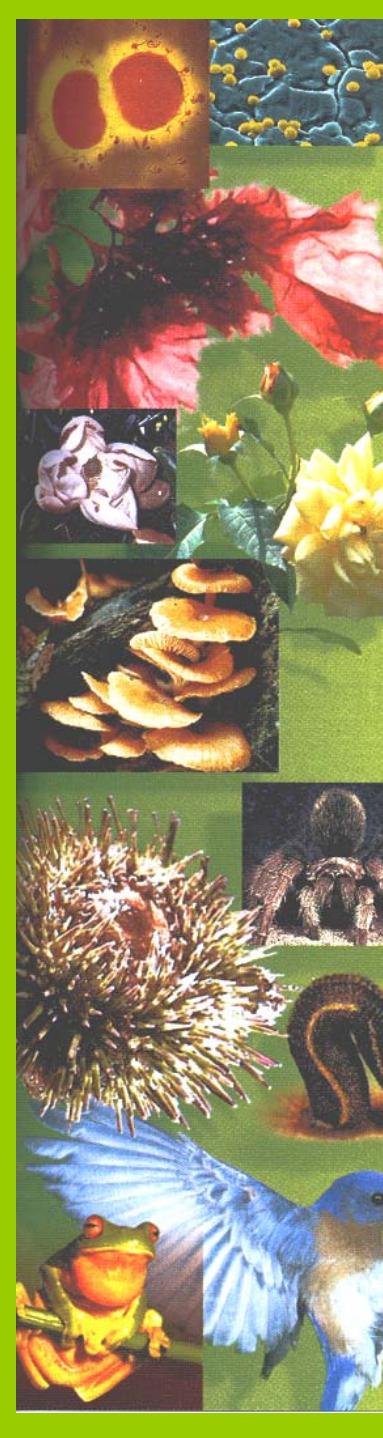
- 1963 – IUCN resolution
- 1973 – Washington meeting (80 countries)
- 1975 – Ratified by 166 countries
- Permanent secretariat in Geneva
- 7.000 animals + 28.000 plants species in 3 annexes
 - Annex I: **prohibition of international trade**
(except in special case as scientific research)
 - Annex II: **species with trade regulation**
(to avoid extinction)
 - Annex III: **species specifically registered**
(to prevent illegal exploitation)



General state of biodiversity in 2005

Endangered species on the planet

- on 5-30 millions species,
 < 2 millions are described
 75% are insects
- 35.000 species (7.000 animals) are listed
 as threatened of extinction in the IUCN Red list
- on 350.000 plant species, 17% are threatened with extinction
- on 10.000 birds, 11% are threatened with extinction
- on 5.000 mammals, 25% are threatened with extinction
- current rate of species extinction is
 $\times 100 \times 1000 >$ natural rate
- degradation and lost of habitat,
 affects 86% birds and 88% amphibians



General state of biodiversity in 2005

Forest biodiversity

- Tropical forests are shelter of
 - 90% species on the planet
 - 60% plant species
 - 50% known vertebrates
- Between 1850-1980, 15% world forests disappeared
- Every year, 14 millions hectares (0.2 %) disappeared
- Philippines: forests = 50% (1960) => 25% (2000)
- Brasil: between 1980 – 1990, 50 millions hectares disappeared (14% of Amazonian forest)

Consequences of deforestation:

- impact on global climate,
- disappearance or fragmentation of habitats



General state of biodiversity in 2005

Marine biodiversity

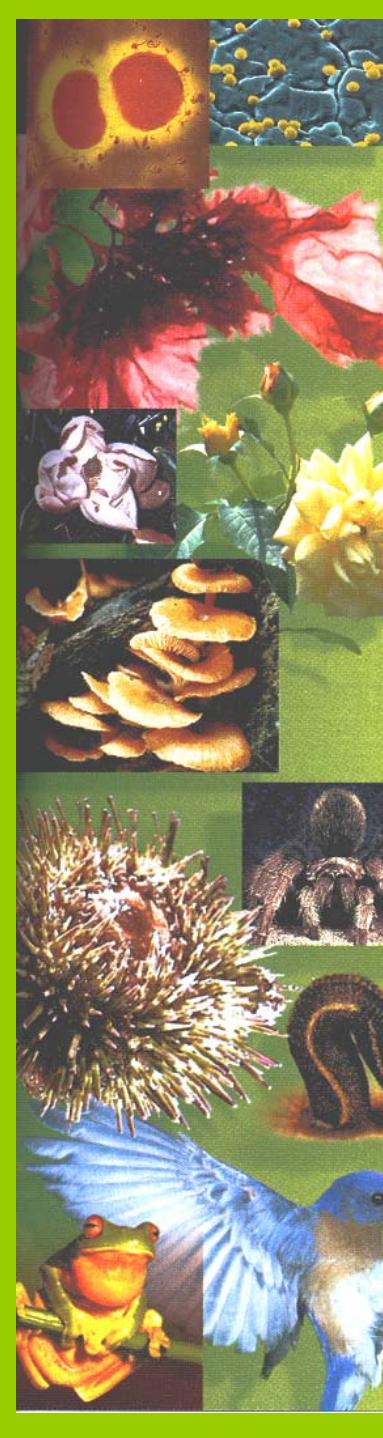
- 275.000 marine species are recorded
15% of the total known world species
- Marine biomass (animals + plants) = 30 billion tonnes
= 200 times less than the terrestrial biomass
- A lot of high depth species (abyssal zone)
are still unknown
- Over exploitation: wheals, sharks, skates, turtles...



General state of biodiversity in 2005

Agricultural biodiversity

- on 500.000 plant species identified
 - 30.000 are eatable
 - 7.000 are used by human (culture, gathering...)
 - 30 species = 90% of total plant consumption
 - 3 species (wheat, rice, corn) = 50% consumed in the world
- on 50.000 known mammals
 - 30 are domesticated and bred on large scale
 - 15 breeds = 90% of breeding in the entire world
- in 15 years, on 6.000 breeds inventoried by FAO
 - 300 have disappeared
 - 1.350 are endangered of extinction
- in 100 years, in Europe
 - 50% of domesticated breeds disappeared



General state of biodiversity in 2005

Soil biodiversity

- Soil is the superficial layer of the terrestrial crust
 - Seeds germinate and organic matter is recycled
 - One square meter of prairie contains
 - 260 million animals « macro- & micro-fauna »
 - of 1000 different species
(insects, worms, larvae, bacteria...)
 - 150 grams of biomass
 - Threatened by pesticides, ploughing, polluants, fires.
 - Maintained by perennial cultivation,
permanent pastures, agro-forestry methods...
- 



Co-extinction of species

Co-extinction define the disappearance of interacting species (parasitism, predation, different relationships...)

- 6.300 species are « co-threatened » by extinction
(not taking in account the micro organisms !!)

Underline the importance of ecological inter relationships within ecosystems, and the cascading risks of extinction



What's left to discover

A lot ...!!!!

- Every year 10.000 new species are discovered by systematists from bacteria, insects, plants and trees ...to big mammals (Saola, monkeys...)
- Due to:
 - new scientific methodologies (biomol)
 - technical access to difficult habitats
(ocean depths, micro-ecosystems...)
- 2 million species described on 30 millions !
=> a lot of species will disappear from Earth without to never be known !!
- Lack of researchers in systematics !
...which is the key to understanding the living world !



Protected areas

“Protected areas” cover a large range of instruments from “integral reserves” (strictly forbidden access) to “natural regional parks” to reconcile development and conservation, without prohibiting access.

- 2005 UN list = 100.000 protected areas worldwide
- 20 million km² = 15% of the world terrestrial area
- UNESCO defines 450 « Biosphere reserves » in 100 countries



Biodiversity in Vietnam

One of the world hotspot of biodiversity !

- Vietnam = 10% of the world mammals, birds and fishes present on the Earth planet
- 275 mammals, 850 birds, 260 reptiles, 100 amphibians, 500 fresh water fishes, 2000 sea water fishes, 12.000 plants
- Due to diversified environment, topography (N to S, coastal region to 3000m mountains), huge mosaic of ecosystems and micro-climates.



Biodiversity in Vietnam

- From the last 50 years, geographical and historical reasons protected VN mountain areas
 - = preservation by limiting human pressures (deforestation, poaching, crossbreeding...)
- Economic and demographic development become more and more a threat for VN biodiversity ...
- Biodiversity Action Plans (BAP)
1995-2000 / 2000-2005 / 2005-2010 ...

It is now urgent to set up sustainable conservation actions as well *in situ, ex situ, in vivo, in vitro* methods

Thank you for your attention

