



BIODIVERSITY CONSERVATION & SUSTAINABLE DEVELOPMENT



THE NEED TO MAINTAIN NATURAL RESOURCES
FOR FUTURE GENERATIONS

10

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What is **biodiversity conservation**? Who's involved? What do they do? How does biodiversity conservation fit into other big picture goals like **sustainable development**? What exactly is sustainable development? This chapter takes a closer look at biodiversity conservation and how it fits within the larger concept of sustainable development.

WHAT IS SUSTAINABLE DEVELOPMENT?

Humans use the planet's resources such as forests, oil and minerals. Many of these resources have accumulated or have grown over thousands or even millions of years!

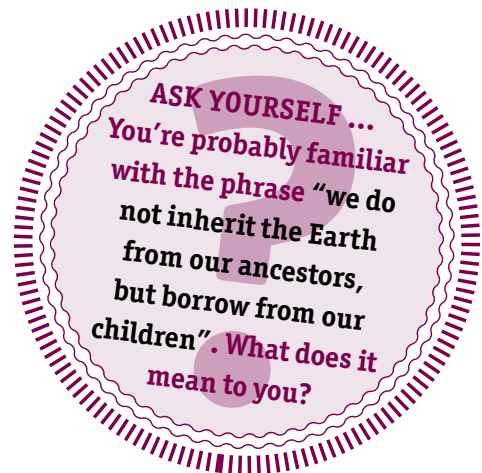
The 2010 WWF Living Planet Report estimates that we'll need the equivalent of two planets by 2030 to support human populations if we continue with our current consumption patterns!



**Where will we find that second planet?
What happens if we don't find it?
What alternatives are there?**

Sustainable human development is about living on Earth without taking more than can be naturally replaced. It is about good health, good living conditions and long-term wealth creation for everybody. All these things must occur within the **carrying capacity** of the planet.

To understand sustainable development, think about its three pillars: "economic wealth", "social **equity**" and "environmental health"; or in other words "profit", "people" and "planet". All three are linked to each other. In other words, any development has to be not only economically sound but also beneficial to social equity and environmental health. See the box: "Defining Sustainable Development" to read the various definitions of sustainable development.



DEFINING SUSTAINABLE DEVELOPMENT

There are many ways to define sustainable development. Use the following definitions to inspire your own.

“Improving the quality of human life while living within the carrying capacity of supporting ecosystems.”

The World Conservation Union (IUCN), United Nations Environment Programme (UNEP) and World Wide Fund for Nature/World Wildlife Fund (WWF)

“Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs.”

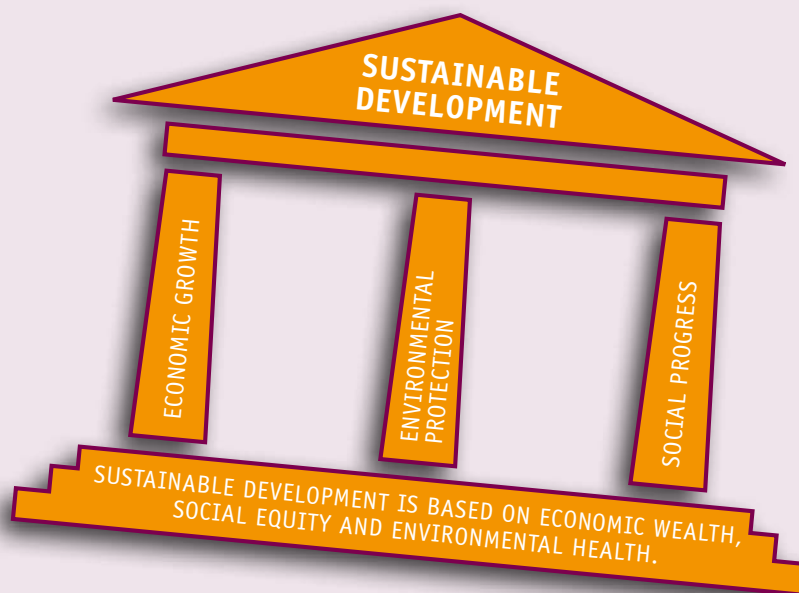
United Nations in “Our Common Future, the Brundtland Report”

“Taking from the Earth only what it can provide indefinitely, thus leaving future generations no less than we have access to ourselves.”

Friends of the Earth Scotland

“Sustainable development involves the simultaneous pursuit of economic prosperity, environmental quality and social equity. Companies aiming for sustainability need to perform not against a single, financial bottom line but against the triple bottom line.”

World Business Council on Sustainable Development



CONNECTING BIODIVERSITY CONSERVATION TO SUSTAINABLE DEVELOPMENT

What does “biodiversity” mean for people and for human development? The health of an ecosystem is closely related to the quality of life of its inhabitants. Biodiversity, as described in previous chapters, is a key component of the “environmental health” pillar of sustainable development.

Biodiversity provides people with basic **ecosystem goods and services**. It provides goods such as food, fibre and medicine, and services such as air and water purification, climate regulation, erosion control and nutrient cycling.

Biodiversity also plays an important role in economic sectors that drive development, including agriculture, forestry, fisheries and tourism. More than three billion people rely on marine and coastal biodiversity, and 1.6 billion people rely on forests and non-timber forest products (e.g. the fruits from trees) for their livelihoods. Many people depend directly on the availability of usable land, water, plants and animals to support their families. In fact, ecosystems are the base of all economies.

BIODIVERSITY CONSERVATION



PEOPLE

SUSTAINABLE DEVELOPMENT

ASK YOURSELF...

It may be hard to see it at first, but when you look closely at the relationship between people and biodiversity, you will certainly recognise unsustainable behaviours. Try asking yourself some difficult questions!

'WHAT IF I DIDN'T OWN THIS?'

'DO I NEED EVERYTHING I OWN?'

'WHAT ARE MY REAL NEEDS?'

'AM I AWARE OF WHAT I EAT, HOW IT IS PRODUCED AND HOW FAR IT HAS TRAVELLED?'

'IS MY HOUSE ENERGY-EFFICIENT?'

'IS MY COMPUTER FREE OF PERSISTENT ORGANIC POLLUTANTS (POPS)?'

'WHAT ARE THE SOCIAL AND ENVIRONMENTAL IMPACTS OF MY LIFESTYLE?'

'WHAT IS MY FAVOURITE MEANS OF TRANSPORTATION?'

'WHAT CAN I DO TO BE MORE SUSTAINABLE?'

'DO I KNOW HOW TO SAVE ON ELECTRICITY AND GAS?'

CONSERVATION MECHANISMS

There is more than one way to conserve biodiversity. As biodiversity and its use to communities vary, so too should conservation mechanisms. Biodiversity conservation plans for a rainforest will be different from plans for a grassland or a swamp. There are different approaches involving different groups of people. There are different types of landscapes, each being used or protected for different purposes. There are different strategies and timeframes for achieving similar goals.

IN SITU AND EX SITU CONSERVATION

In situ and *ex situ* are the Latin words for “on-site” and “off-site”. They are two different, but complementary approaches to biodiversity conservation; each plays a distinct and important role. *In situ* conservation occurs in nature, for instance in a protected area, traditional farm, nature reserve or national park. *Ex-situ* conservation occurs when a specimen of a species is set in artificial conditions such as in a zoo or a botanical garden.

In situ conservation helps to guarantee the survival of a species in its natural habitat.

It is important for observing the behaviour of a species, understanding how individuals interact with other members of their species and with other species, and classifying a species as endemic (e.g. exists exclusively in a particular region), rare or under threat of extinction (see box: “*In Situ* Conservation of Great Apes”). *In situ* conservation also enables researchers to determine the distribution of a species throughout the world, to assess traditional communities’ contribution to conservation, and to inform local conservation initiatives.

The IUCN, with the help of various UN agencies and governments, classifies protected areas into seven main categories:

- **Category Ia:** Integral Natural Reserve
- **Category Ib:** Wild Nature Zone
- **Category II:** National Park
- **Category III:** Natural Monument
- **Category IV:** Managed area for habitat and species
- **Category V:** Terrestrial and marine landscape
- **Category VI:** Protected area for managed natural resources.

Ex situ conservation should be used as a “last resort” or as a supplement to *in situ* conservation. *Ex situ* conservation is rarely enough to save a species from extinction. However, it is a key element for environmental and species education programmes because it provides the public with an opportunity to observe rare species from around the world in one location. If you’ve ever visited a zoo, animal sanctuary, botanical garden or seedbank, you’ve seen *ex-situ* conservation.

Different types of *ex situ* conservation have different goals and characteristics.

IN SITU CONSERVATION OF GREAT APES

Did you know that all great apes are endangered species? There are four types of great apes worldwide: gorillas, chimpanzees, bonobos and orangutans. They all live in unstable and poor regions of the world such as central Africa and southeast Asia.

The Democratic Republic of the Congo (DRC) is a natural home to three of the four great apes, including the bonobo, which is endemic to the country.



MOUNTAIN GORILLAS, RWANDA.
© TKnoxB

ASK YOURSELF ...
What protected areas exist in your country?
Do they house any animal species at risk of extinction?

DIFFERENT **TYPES** OF *EX SITU* CONSERVATION



Zoos focus on public education, conservation science and animal management research.

A YOUNG BOY MEETS TALINI, A POLAR BEAR CUB, AT THE DETROIT ZOO.
© David Hogg/www.flickr.com



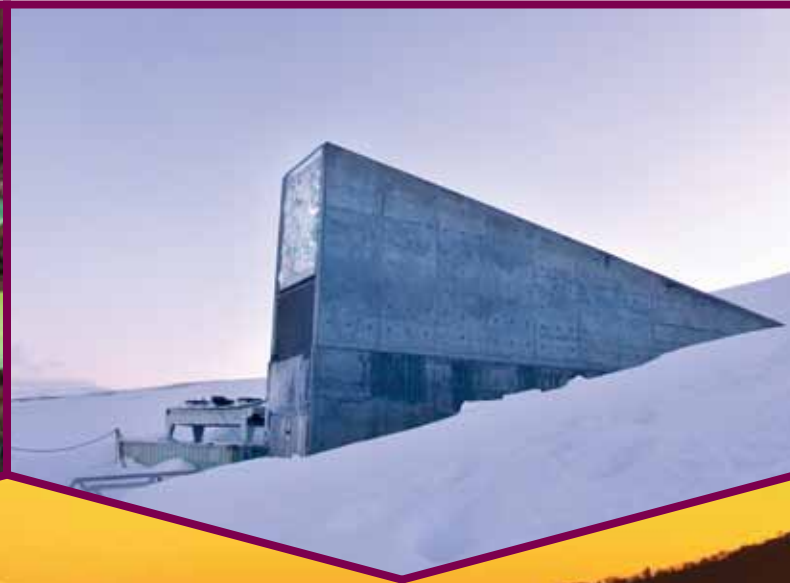
Sanctuaries aim to protect animals and eventually release them into the wild. Most of the animals are confiscated from poachers (illegal hunters), pet traders, etc. The Pan African Sanctuaries Alliance (PASA), for example, was created to unite the African sanctuaries that had emerged in response to the deforestation, bushmeat hunting, human encroachment and disease that were decimating wild primate populations.

EASTERN COMMON CHIMPANZEES IN MAHALE MOUNTAINS NATIONAL PARK,
WESTERN TANZANIA.
© G. Wales



Botanical gardens are meant for plant research, display of specimens and training.

A *VRIESEA BROMELIAD* AT THE BOTANICAL GARDEN OF MONTREAL.
© Christine Gibb



Seedbanks are more like museums; they house plant material that can be used as a source for planting if seed reserves – in cultivation or in nature – are destroyed or extinct. Seedbanks also provide researchers and breeders with crop seeds important for agriculture.

THE SVALBARD SEED VAULT IN NORWAY IS THE ULTIMATE SAFE PLACE FOR CROP DIVERSITY.
© Global Crop Diversity Trust

CONSERVATION ON PRODUCTIVE LANDSCAPES

While protected areas and parks remain a cornerstone for biodiversity conservation worldwide, conservation efforts are not limited to these places. Large productive landscapes with no specific conservation objective can contain lots of biodiversity while offering food, shelter and other ecosystem services for humanity.

Agricultural lands, timber forests, grasslands, rivers and marine areas are productive landscapes that are also important for biodiversity. These landscapes are managed with the aim of producing and harvesting food, timber, energy and marine resources. Even though biodiversity conservation is not the main objective, the management of these landscapes must be sensitive to biodiversity.

If it's not, resource exploitation can harm the long-term health of the ecosystem and its ability to supply food, timber, energy and other resources. This recognition has led to the promotion of sustainable agriculture, sustainable forestry, sustainable grassland management and sustainable fisheries.



CERULEAN WARBLER.
© Jerry Oldenettel/www.flickr.com

COFFEE BEANS.
© Jeff Chevrier

Opposite page

A SHADE-GROWN COFFEE PLANTATION IS AN EXAMPLE OF A PRODUCTIVE LANDSCAPE THAT ALSO PROVIDES HABITAT FOR OTHER FORMS OF BIODIVERSITY. THIS COLOMBIAN COFFEE FARM PROVIDES CRITICAL WINTER HABITAT FOR DECLINING SPECIES SUCH AS THE CERULEAN WARBLER.

COFFEE PLANTATION.
© Brian Smith/American Bird Conservancy

MONITORING

Close monitoring of biodiversity is another important conservation practice; it involves regular checking of the overall health of ecosystems and the species living within it. The data collected from ongoing monitoring programmes can help inform management plans and improve the sustainability of activities in productive landscapes. Monitoring is especially important when the activities are carried out on an industrial scale because their impact is greater than the impact of similar activities carried out on a smaller subsistence scale by local communities.

LAW AND COMMUNITY ENFORCEMENT

Conservation mechanisms may include law or community enforcement. Biodiversity conservation officers make sure the communities relying on the site's natural resources are totally involved in conservation initiatives. Officers enforce the laws and record the details of community participation. When the laws are not respected, illegal logging, mining and bushmeat hunting erode the benefits of conservation efforts.

TRADITIONAL KNOWLEDGE AND PRACTICES

In many cases, traditional knowledge has contributed to protecting wildlife and ecosystems and to ensuring a “natural balance”. Traditional knowledge comprises of “knowledge, innovations and practices of indigenous and local communities around the world, developed from experience gained over centuries and adapted to the local culture and environment, which is transmitted orally from generation to generation”, according to the Convention on Biological Diversity (CBD).

Traditional knowledge is collectively owned and takes the form of stories, songs, folklore, proverbs, cultural values, beliefs, rituals, community laws, local languages and agricultural practices, including the development of plant species and animal breeds. Article 8(j) of the CBD calls for countries to respect, preserve and maintain knowledge, innovations and practices of indigenous and local communities embodying traditional lifestyles relevant to the conservation and sustainable use of biodiversity.

Biodiversity conservation practitioners must therefore ensure that the communities relying directly on natural resources are involved in conservation initiatives, and guarantee their active participation during the whole conservation process. Some form of community engagement is essential for the success of any biodiversity conservation project.

There are also many good examples of community conserved areas around the world. These sites have been managed by communities for generations for the sustainable use of natural resources such as medicinal plants and water springs, or even for religious purposes. These sites may or may not have government protection or written management regulations. However, the community members have developed well-recognised and respected rules that are often stronger than any law and have been practised for generations. The end result is the conservation and sustainable use of resources. Some governments now legally recognise traditional practices and treat indigenous and local communities as the customary stewards of the biodiversity.

ROLE OF RESEARCH & TECHNOLOGY FOR BIODIVERSITY CONSERVATION

Biodiversity conservation doesn't happen in a vacuum. As we've seen, it requires the participation of many different groups of people, working with various conservation mechanisms both *in situ* and *ex situ*. Biodiversity policy and conservation activities are informed, enhanced and driven by research and technology.

Researchers such as biologists, ecologists and social scientists play various roles in conservation. They identify species and their habitats, they locate areas of high ecological value, they pinpoint threats, and they propose innovative strategies and solutions. Researchers use various methods such as field surveys, observations and experiments, and technologies including remote sensing devices, data analyses, software and laboratory tests.



A RESEARCHER DOCUMENTS ILLEGAL LOGGING WITH A GLOBAL POSITIONING SYSTEM AT BUSINGIRO, BUDONGO FOREST IN UGANDA.
© Zinta Zommers, University of Oxford, UK.

Research results are very important for biodiversity conservation. They can be woven into community development programmes. In fact, local communities can be important contributors to biodiversity conservation research, and should be involved in all steps of the research and conservation processes. Research results are also used by conservation and development activists, journalists, government

decision-makers and even businesses. The creation and application of technologies are also benefits of biodiversity conservation research. Technologies are invented, selected, evaluated, tested and applied to solve specific problems. Technologies can be transferred from rich countries to poor countries and vice versa; this process can be essential to community development. Before using any

technology, however, it's critical to have a clear understanding of its characteristics so that the intervention does not harm local livelihoods, traditions, cultures or the environment.

The box: "Technological and Management Considerations for Conservation in Developing Countries" presents some of the considerations for technologies and management plans for developing countries.

TECHNOLOGICAL AND MANAGEMENT CONSIDERATIONS FOR CONSERVATION IN DEVELOPING COUNTRIES

Biodiversity conservation in developing countries has its own set of challenges. Not only are there natural issues, such as climate change and climate variability effects, but many local communities rely on the natural resources they harvest and hunt in protected areas. In these situations, it is especially important to ensure the management plans and technologies are considerate of community needs and capacities, and are endorsed by the affected communities.



KOALA, AUSTRALIA.
© Rosaria Macri

CONCLUSION

Biodiversity conservation and sustainable development are two inter-related branches focusing on social progress, economic growth and environmental protection on one side, and ecosystem conservation on the other.

Conservation includes the efforts carried out in protected areas such as national parks and community reserves, and in other areas with rich and important biodiversity where conservation is not the main focus. It is in these latter productive landscapes where sustainability is needed most. Sustainable agriculture, sustainable fisheries and sustainable management of natural resources are the main approaches for preserving these landscapes for long-term social, economic and ecological benefits.

LEARN MORE

- :: The Pan African Sanctuaries Alliance: www.panafricanprimates.org
- :: WWF Living Planet Report: wwf.panda.org/about_our_earth/all_publications/living_planet_report

