Exibition "Biodiversity is life, biodiversity is our life"

THEME 1: WHAT IS BIODIVERSITY?
Panel 1.1 – What is biodiversity?

Biodiversity or biological diversity is the variety of life on Earth. It comprises all living things including their unique genetic make-up and ranges from microscopic viruses to the largest animals on the planet such as the blue whale, small algae and big plants such as the giant sequoia, and the expansive landscapes comprised of a variety of ecosystems. Humans are also an integral part of biodiversity.

Biodiversity as a concept is both simple and challenging. We are familiar with the wide range of animals and plants that share our planet but are less familiar with the vital role biodiversity plays in maintaining our mutual life support system, and in both the physical and mental aspects of our well-being.

This exhibition will help uncover the extent of our links with the natural world and why conserving the Earth's biodiversity is fundamental to a healthy future for humanity. It will also introduce what we could do to reduce biodiversity loss for future generations.

This exhibition will show you that **Biodiversity is the living part of nature. Biodiversity is our life**.

(1083)

Photo's caption:
P113 - baleine
In Winter, humpback whales swim off East Australian coasts to breed and give birth.
© IRD / BORSA Philippe

P115 - Terre
The Earth is a living planet where all the living things, the atmosphere, hydrosphere and lithosphere interact.
© Nasa John Space Center

P111 - chromosome
Compacted in chromosomes, all the genetic information of an individual is contained in DNA, whose variability may cause functional anomalies.
© CNRS Photothèque / PILLAIRE Marie Jeanne

P112 - bactérie
This cyanobacteria is the smallest photosynthetic organism (0.5 micrometer) but also the most abundant on Earth.
© CNRS Photothèque / PARTENSKY Frédéric, LI William K.W.

P114 - récif
The "Forgotten coast" in the South-East of New Caledonia is of a great interest for the richness of its specific but fragile biodiversity.
© IRD / WIRRMANN Denis

生物多样性是生命，物种多样性是我们的生活

主题 1：什么是生物多样性

生物多样性，英文为 biodiversity 或 biological diversity 是指生活在地球上的不同生命。它包含所有生命的物体及其独有的基因组成和排序：从微生物到大型动物比如蓝鲸，从小型藻类植物到巨杉。这个广阔的领域是由很多不同的生态系统组成的，而人类也是这复杂系统中的一个组成部分。

生物多样性是一个简单而又富于挑战的概念。我们熟悉很多动物和植物，但是，我们对他们在维持与保护我们的生态系统中所起到，还需要进一步的了解。

这个展览将帮助我们揭示人与自然的联系，让我们了解保护地球生物多样性是人类拥有健康未来的基础这一重要事实。这也能帮我们了解如何减少对生物多样性的破坏以及影响。

这个展览将向我们展示生物多样性是自然的一部分，也更是我们生活的一部分。

P-113 冬天驼背鲸游向澳大利亚的东海岸区繁殖后代

P-115 地球是个载有生命体的星球，大气层，水层，岩石层的生物相互作用

P-111 携带着基因信息的 DNA 紧凑排列染色体中，不同的 DNA 排序可能导致个体的异常

P-112 这个细菌是地球上最小的光和（自养）生物（0.5 微米），同时也是地球上最多的生物

P-114 位于新喀里多尼亚（岛）（南太平洋）东南的"Forgetten "海滩有着极其丰富而且脆弱的生物多样性。

Panel 1.2 – Variety of life, at different levels

Biodiversity is made up of all the genes, species, ecosystems and landscapes that comprise our world.

Biodiversity includes **genetic variation**, which defines the unique nature of any living thing and brings about differences between any two individuals within a species. For example, genetic variation in rice is vital for resilience and its ability to adapt to changing climatic and soil conditions. Humans have used genetic variation to breed thousands of varieties of food crops as well as domesticated animals.

Biodiversity includes **species** of plants such as the baobab, animals such as the panda and microorganisms such as marine plankton.

Biodiversity comprises **ecosystems** - dynamic groupings of animals, plants and microorganisms, in close interaction with each other, and the physical environment in which they live, for example, wetlands or coral reefs.

Biodiversity includes **landscapes**, with mosaics and clusters of interacting ecosystems such as farmland, forests and lakes.

Biodiversity is therefore constantly interacting at all levels.

(1080)

Photos' caption:

P124 - baiehalong
In Hoa Lu (Vietnam), also know as "Halong Bay on land", rice terraces shape the landscape.
© INRA / BOSSENNEC Yves

P123 - rizinvitro
Whether cultivated or wild, the genetic diversity of rice varieties enables disease resistance, adaptation to environment and climate change, nutritional richness... Rice plants grown by tissue culture.
© IRD / MONTOROI Jean-Pierre
© INRA / GENOPLANTE / CHATIN J.

P125 - culture malgache
North-East of Antananarivo (Madagascar), the field plots follow the contour lines without reference to ownership. This prevents soil erosion.
© IRD / MOIZO Bernard

P122 – baobab
The famous trees of the "baobab avenue", known as "Renala", in the Morondava region (Madagascar), attract many tourists.
© IRD / MOIZO Bernard

生命在不同水平的变化
生物多样性是由构成我们这个世界的所有的基因，物种，生态系统以及景观组成。
生物多样性包含遗传变异,从而使任何生物甚至同一物种的不同个体都会体现不同的生命特征。例如，大米的遗传变异使其有更强的适应力去应对气候和土壤条件的改变。人类利用遗传变异繁殖了上千种的粮食作物以及家畜。
生物多样性包含动植物的种类，比如植物中的猴面包树，动物界的熊猫以及微生物中的浮游生物
生物多样性包含生态系统，动植物以及微生物的群体， 与之生存的环境相互作用，比如湿地和珊瑚礁
生物多样性包含地形地貌，他们与生态系统完美结合，比如农田，森林和湖泊
因此，生物多样性不停的相互作用。
P124-在越南的华闾，也就是知名的下龙湾，梯田形成的美丽风景
P123-无论是种植的还是野生的，转基因大米在预防病虫害，适应环境以及气候变化，以及营养丰富程度上都有所提高。大米是通过组织培养进行栽培的。
P125-马达加斯加塔那那利佛的东北方，土地被等高线划分出来，这是为了预防土壤侵蚀
P122-在马达加斯加的穆隆达瓦地区，著名的猴面包树林荫道吸引着很多游客

Panel 1.3 – Communities and relationships

All living things inhabit dynamic ecosystems where they share the same habitat and physical conditions linked through a **web of life**. In this shared environment their lives are interwoven in a web of relationships regulated by cooperation, competition, predation, symbiosis or parasitism. This delicately balanced interconnected system provides food and shelter, cycling of energy, and reproduction. Every member of this community plays an essential role in keeping this web in balance.

People are very much part of biodiversity. No matter how far removed we may seem from the "natural" environment in our increasingly urban lifestyles, we remain intimately connected with ecosystems and their processes through our diets, recreational activities, use of materials, water and much more.
(814)

Photos' caption:

P133 - Crevette
This Periclimenes shrimp lives within the tentacles of host anemone "*anemonia viridis*" and enjoys peaceful cohabitation (France)
© CNRS Photothèque / FONTANA Yann

P136 – Web of life
The extinction of a species may lead to several other extinctions because of links between them in the web of life.
© Fundación Biodiversidad

P131 - dévidage soie
Silk production is based on the interaction between caterpillars and mulberry leaves. Unravelling the silk from a cocoon in Beijing (China).
© INRA / BEGUEY Alain

P132 compétition et P134 - plante carnivore
Competition between sponges and corals in Nosy Be waters (Madagascar).

To meet their nutritive needs, carnivorous plants trap insects. The pitcher of this "*Nepenthes rafflesiana*" from Brunei (Borneo) holds a viscous fluid.

© IRD / LABOUTE Pierre
© CNRS Photothèque / GAUME-VIAL Laurence

P135 - parasite
This parasitic wasp lays its eggs in caterpillars and simultaneously injects viral particles to delude the host's immune defence system. A genetic study shows that this wasp "domesticated" the virus.
© CNRS Photothèque/ IRBI / BEZIER Annie

沟通和联系

地球上所有的生物都生活在动态的生态系统中。它们共享共同的栖息地和外部环境，并通过生命网络联系在一起。在这种共享的环境中，各个生物被一个由合作，竞争，捕食，共生或寄生等不同关系构成的网络联系在一起。这微妙的平衡互联系统，提供了人与动物生存、生活错必须的食物和住所，并产生了能源循环和物质再生产，对维持每一个生命体，保持并平衡生命网络发挥着重要作用。

人类也是生物多样性的一个重要部分。无论我们日新月异的城市生活环境离所谓的自然环境有多么大的差别，我们仍然通过饮食娱乐活动，原材料和水的使用等多种途径与生态系统紧密联系。

P-133 Periclimenes 虾和平的寄生在"anemonia 狗尾草"中（法国）

P-136 某一物种的灭绝可能会导致生命网络中与其有联系的其他物种的灭绝。

P-131 丝绸生产是基于蚕和桑叶之间的相互作用。 丝正在被从茧上抽出来。中国 北京

P-132 P134 在贝岛海域的海绵和珊瑚在为了生存竞争（马达加斯加）。

食虫植物靠捕捉昆虫获取食物。这种生长在文莱（婆罗洲）的"猪笼草 rafflesiana"分泌一种粘性液体来捕捉昆虫。

P-135
这种寄生蜂把卵产在毛毛虫的卵旁，同时注入病毒颗粒欺骗宿主的免疫防御系统。一个遗传研究表明，这种寄生蜂可以自己培殖病毒。

Panel 1.4 - <u>Understanding its importance</u>

The diversity of ecosystems delivers a number of ecosystem services. For example, marine ecosystems regulate the Earth's temperature, and provide food and recreation for human populations. A tropical forest provides building material and food for local communities and helps reduce global warming by absorbing carbon dioxide from the atmosphere.

Greater species diversity in ecosystems results in ecosystems that are more adaptable and resilient to changing environmental conditions. Each species fulfils a specific role in the web of life, relying on other species for its survival. The web of life loses its balance when a species disappears, eventually affecting the ecosystem services we enjoy.

A greater number of individuals in a population of a particular species increases the genetic pool in the population for better adaptation in a changing world.

Genetic diversity is the basic resource that enables species to respond to environmental change and pathogens, both in wild and domesticated species.

(1034)

Photos' caption:

P161-balise en mer
The marine environment is carefully studied to understand its role in climate regulation on the Earth (Pacific Ocean near the Equator)
© IRD / SERVAIN Jacques

P165 - patrimoine culturel
Batu Gajah or stone elephant, ornate megalith from Pasemah region (South Sumatra), features a man kneeling near an elephant.
© IRD / FORESTIER Hubert

P162-fibre des palmiers
Piassaba palm fibres are bundled up and sent from the Amazonian forest to Manaus (Brazil) to make brooms.
© IRD / EMPERAIRE Laure

P163 - poisson Essaouira
Fish preparation in Essaouira Harbour (Morocco)
© IRD / SIMONNEAUX Vincent

P164 - étude biomasse
Off the Island of Tidra (Mauritania), "*Cymodocea*" seagrass respiration is measured under a benthic bell glass.
© CNRS Photothèque / AMICE Erwan

理解他的重要性

生态系统的多样性使其具有很多功能。例如，海洋生态系统调节地球的温度，并为人类提供食物和娱乐。热带森林为当地社区提供建设材料和食品，并通过大气中的二氧化碳来减缓全球变暖。

更多的物种可以帮助生态系统更好地适应不断变化的环境条件。每个物种都在的生命网络中起着不同的作用，每个物种的生存都需要依赖其他物种。当一个物种消失时，生命网络就会失去平衡，并最终影响到我们获得的生态系统服务。

一个特定物种种群个体数量的增加可以增加其基因储备，使其能更好地适应不断变化的环境。

遗传多样性是基本的资源，它可以使物种更好地应对环境变化和病原体，无论野生或是驯化物种。

P-161 海洋环境需要仔细研究，以了解其对地球气候的作用（太平洋赤道附近的海洋规例）

P-165 巴都牙，也被叫做石头大象，在 Pasemah 区（南苏门答腊）华丽的巨石，像一个人跪在大象旁边。

P-162 成捆的 Piassaba 棕榈纤维要被发送到马瑙斯的亚马逊森林（巴西）制作扫帚

P-163 在 Essaouira 港（摩洛哥）的鱼类加工
P-164 提德拉岛（毛里塔尼亚）旁，海底玻璃钟备用于测量"Cymodocea"海草的呼吸作用

Panel 1.5 – Where is biodiversity?

Biodiversity can be found everywhere on Earth, from extreme environments such as the North and South Poles, to deep rocks beneath the Earth's surface, to the deepest oceans and the highest clouds. Whether found in the wilderness or protected natural areas or even in areas altered by humans such as farms, forest plantations and cities, biodiversity surrounds us all. Distinctive patterns of biodiversity exist around the world, made up of recognized bio-geographic realms with a shared evolutionary and climatic history.

There are an estimated 10 to 100 million species on Earth, but scientists have only identified around 1.75 million species. Only some groups of species, among them mammals, birds, amphibians and conifers are well documented and benefit from conservation status. We lack knowledge about many others, including deep-sea species, fungi or microorganisms.

Some geographical regions are centres of both high species diversity and endemism. These 34 "hotspots" represent only 2.3% of the Earth's surface yet concentrate 50% of the world's plants and 42 % of all terrestrial vertebrates. They are frequently concentrated in isolated or topographically variable regions (islands, mountains, peninsulas) and are particularly vulnerable.

(1269)

Photos'caption:

P141 – sous la glace
Under sea ice, off Terre Adélie (Antarctica), algae samples are collected to identify the living forms feeding on this peculiar meadow.
© CNRS Photothèque / IPEV / AMICE Erwan

P145 – carte Hotspot
Map of the hotspots (in orange) created by Fundación Biodiversidad – Spanish government – from Conservation International 2005 data.
© CI / Fundación Biodiversidad

P143 - Hot spot Ncaledonie
Corals living at the water surface (New Caledonia)
© IRD / BORÉ Jean-Michel

P142 – Nosybe
Richness of Nosy Be sea bed (Madagascar).
© IRD / LABOUTE Pierre

P144 – Crépis de nîmes
Crepis sancta settles in the most unexpected places. Thanks to its two kinds of seeds, the species evolves and adapts to urbanisation (France).
© CNRS Photothèque / BEILHE Fabien

生物多样性在哪里？

生物多样性可以在地球上随处可见，从极端环境，如南北两极，到地球表面下的深岩，从最深的海洋到最高的云端。无论是在旷野或受保护的自然区域，甚至在已经被人类发现并改变区域，如农场，种植园和城市，生物多样性包围着我们。生物多样性的独特模式存在于世界各地，由共同进化和气候历史以及生物地理领域组成。

据估计，地球上约有一千万到 10 亿种生物，但科学家目前只发现了 175 万左右。只有某些群体种，其中哺乳动物，鸟类，两栖类和针叶林是有案可稽并且受到保护。我们对其他生物知之甚少，包括深海物种，真菌或微生物。

一些地理区域集中了高物种多样性和特殊性。这 34 个"热点"地区只占地球表面的 2.3%，却集中了地球上 50%植物和 42％的陆地脊椎动物。他们经常集中在偏远地区或地形可变区（岛屿，山区，半岛），并且极易遭到破坏。

P141-在阿德利岛（南极洲）旁的海冰面下，人类通过采集和研究藻类样品，以确定在这个特殊的草地觅食的生物的生活形式。

P-145-图中橙色的地区是由西班牙政府的 Biodiversidad 基金会创建 - 保护国际 2005 年的数据。

P-143-生活在水面的珊瑚（新喀里多尼亚岛）

P-142 物种丰富的诺西贝海床（马达加斯加）

P-144 Crepis sancta 落户在最意想不到的地方。由于它有两种种子，帮助它进化并适应在城市中生长（法国）。

Panel 1.6 – Extinction and evolution over time

The Earth is estimated to be 4.6 billion years old. Scientists estimate that life on Earth first emerged 3.8 billion years ago. Biodiversity has continued to evolve in its nature, variety and quantity ever since.

Due to drastic changes in the Earth's environment, species have evolved to survive and thrive, some have decreased or become extinct. Climatic changes, volcanic activity and the impact of asteroids on the Earth have led to major evolutionary changes in the Earth's biodiversity. Ecosystems have, as a result, changed over time.

From the fossil record we know of five major extinctions affecting biodiversity in the Earth's history. The most well known is the extinction of dinosaurs during the Cretaceous-Tertiary period about 65 million years ago. Unfortunately, over the past 50 years human activity has sharply increased the natural extinction rate, calculated at 100 to 1000 times that of the geological record, and much greater than the rate at which new species arise resulting in a net loss of biodiversity.

Halting biodiversity loss is now in our hands.

(1115)

Photos' caption:

P153 - Tortue luth
To improve conservation policy, an Argos float tracks the routes of this leatherback turtle and identifies the threats it face (Guyana).
© CNRS Photothèque / GEORGES Jean-Yves

P151 - palmier endémique
The geological evolution of New Caledonia contributed to the differentiation of a specialised flora and a high level of species endemism.
© IRD / JAFFRÉ Tanguy

P155 – homo erectus
In Casablanca, a complete mandible of *Homo erectus* was discovered. This human fossil shows the earliest evidence of settlement in this region (Morocco).
© CNRS Photothèque / GALLOTTI Rosalia

P154 - origine vie
3.45 billion year-old evidence of fossil microorganisms in Pilbara Australian sediments.
© F. Westall et al. / Geol. Soc. Amer. Spec. Pub.

P152 - traces de dinosaure
Footprints of sauropod dinosaurs from the Upper Jurassic (France).
© CNRS Photothèque / RAGUET Hubert

随着时间的灭绝和进化

地球大约已经有 4.6 亿岁了。科学家估计，地球上的生命首次出现在 38 亿年前。生物多样性在种类和数量上发展至今。

由于地球环境的急剧变化，有些物种得到了进化和发展，有些物种减少或灭绝。气候变化，火山活动和小行星对地球的冲击，导致地球生物多样性的进化转变。因此，生态系统随着时间的推移而改变。

通过研究生物化石，我们知道在地球历史上，有 5 种主要生物的灭绝影响了生物多样性。最有名的是恐龙灭绝，大约在 6500 万年前的白垩纪第三纪。不幸的是，在过去 50 年来由于人类活动导致自然灭绝速度的急剧增加，是地质记录的 100 到 1000 倍，远远大于新物种出现的速度，造成生物多样性的净损失。

让我们行动起来，遏制生物多样性的消亡。

P153 为了提高保育政策，一只阿尔戈斯浮游艇跟踪一只棱皮龟的爬行路线，并确定它面对的威胁（圭亚那）。
P151 新喀里多尼亚地质演化促成了某一特定植物的物种分化和极高的地域特殊性。
P155 在卡萨布兰卡，一个完整的直立人下颌骨被发现。这种人类化石是显示这一地区（摩洛哥）有人类居住的最早证据。
P154 澳大利亚皮尔巴拉山的沉积物中发现的三十四亿五千万年前的微生物化石
P152 晚侏罗世的蜥脚类恐龙的足迹（法国）。

THEME 2: HOW DOES BIODIVERSITY SERVE US?

Panel 2.1 - Biodiversity, spring of our well-being

Our well-being depends on the state of our physical and emotional welfare. When we live healthy, contented, and secure lives, and when our social needs are met, our way of life and sense of community belonging add to the value we attach to our world.

Biodiversity contributes to key aspects of our well-being, which we cannot live without and include:
Basic goods - sufficient food of good quality, building materials for shelter, clothing, fibre and access to fuel such as firewood;
Security - secure access to natural and other resources, personal safety, and security from natural and human-made disasters;
Health – a sense of wellness and strength that comes for a healthy physical environment that provides us with clean air, water and medicines;
Good social relations and freedom of choice and action – conservation of biodiversity, fair access to it and the equitable sharing of the benefits deriving from its use enhance mutual respect for others and a sense of purpose and ability to provide for children, and to contribute to the social cohesion of the community as well as to individual and collective freedom of choice and action.

(1176)

Photos'caption

213 - durian season
The durian season in the agroforests of Maninjau is a feast for all (Indonesia).
© IRD / Geneviève Michon

215 - Diagram MEA
Under the influence of change factors, biodiversity participates in ecosystem function contributing to the goods and services provided by it.
© Millenium Ecosystem Assessment

211 - gd-mother and child in garden
Practical lesson in the natural sciences by sowing beans.
© INRA / Christophe MAITRE

212 - Gymnastics thai
Morning group gymnastic lessons with fans in Mumpini Park(Thailand).
© IRD / Jean-Pierre Montoroi

214 - Plants on Lava
The early succession of vegetation 5 years after a volcanic flow on Réunion Island. Lichens appear first, followed by ferns.
© CNRS Photothèque / PONTAILLER Jean-Yves

生物多样性对人类的贡献
我们的幸福取决于我们的身体和心理健康状态。当我们生活健康，满足和安全时，当我们的社会需要得到满足时，我们的生活方式和社会意识会为我们对社会增添附加值。
生物多样性有助于我们的福祉，是我们生活不可或缺的一部分：
基本商品 - 优质充足的食品，住房建筑，服装，纤维和燃料，例如木柴;
安全 - 安全的利用自然和其他资源，人身安全，遇到自然和人为灾害时的安全保障;
健康 - 健康和力量源于一个健康的物质环境所提供的清洁的空气，水和药品;
良好的社会关系及选择和行动自由 - 保护生物多样性，公平地使用和分享它并从它的使用所产生的惠益，可以增进相互尊重以及为后代造福的理念，并增强社会凝聚力以及个人和集体的选择和行动自由。
213-在 **Maninjau** 的 **agroforests**，榴莲季节是一个为所有人提供的盛宴（印度尼西亚）。
215-在变化的因素影响下，生物多样性为生态系统的功能和所提供的服务做出了贡献
211-孩子们在自然科学课上实践播种
212-早晨在 Mumpini 公园（泰国）晨练的人们在练习扇子体操
214-留尼汪岛的火山溶岩通过 5 年后，植被的早期恢复情况。首先出现的是青苔，其次是蕨类植物。

Panel 2.2 - Linked to ecosystem services

Ecosystem services are the benefits people obtain from ecosystems and all their components. Ecosystems provide us with such benefits as food, water, disease management, climate regulation, spiritual fulfilment, aesthetic enjoyment and many others. Our well-being depends on the ability of ecosystems to continually provide these benefits for our use, which in turn relies on ecosystem resilience and their capacity to quickly recover from adverse changes.

It is the effect of human action that is driving the changes in ecosystems and ecosystem services, which are gravely affecting our well-being. It is therefore our responsibility to think wisely about our attitude and behaviour towards the environment, and in particular to the conservation of biodiversity.

(789)

Photos'caption

222 - diversity training quinoa
Training students in Bolivia by IRD through an experiment comparing ten agricultural varieties of quinoa (Bolivia).
© IRD / Jean-Pierre RAFFAILLAC

225 - Diagram of links to ecosystem services
Diagramme of links to ecosystem services, constituents of well-being.
© Millenium Ecosystem Assessment

221 – Pollination
Artificial pollination, here of *Arabidopsis thaliana*, allows the crossing of varieties (France).
© CNRS Photo Library / IBMP / RAJAU Benedict

223 - Hydrobiological study
Study of water quality of a river in the Andes.
© IRD / DEJOUX Claude

224 - Coring tree
Extracting a core sample to study growth and wood quality, without damage to the tree (France).
© INRA / GELHAYE Pierre

与生态系统服务的联系

生态系统服务是指人类从生态系统及其所有组成部分获得的利益。生态系统提供食物，水，疾病管理，气候调节，精神上的满足，审美的享受等等。我们的幸福取决于生态系统可以不断提供这些服务的能力，而这些取决于生态系统的恢复能力以及快速应对不利变化。

人的行为影响着生态系统和生态系统服务，严重影响了我们的福祉。因此我们有责任去思考我们的行为与态度对环境的影响，特别是对生物多样性保护的影响。

P222 税务局在培训学生通过实验辨别 10 个不同的藜类植物（玻利维亚）

P225 生态系统服务的流程以及福祉成分。

P221 在拟南芥，通过人工授粉培育交叉物种（法国）。

P223 在安第斯山的一个河流调查水质

P224 在不对树木进行损害的基础上提取样本进行生长和木材品质的研究（法国）。

Panel 2.3 - <u>Provisioning services</u>

Ecosystems provide us with the basic elements for life including food, fresh water, wood, fibre, genetic resources, medicines, and ornamental and cultural products. These services are provided by biodiversity, which forms the basis of the provisioning services of ecosystems. They are essential for sustaining and securing livelihoods, and they ensure the health of communities, their security and well-being.

Humans have directly used, and domesticated, many species of wild plants and animals for food, fibre and shelter. Biodiversity is the basis for a large part of local and international economies. About 2.6 billion people rely directly on agricultural systems, be it farming, livestock production, forestry or fishery.

Medicines, including traditional medicines and the pharmaceutical industry greatly rely on plant biodiversity, which is a valuable source of genetic resources.

As the human population grows, together with an ever-increasing demand for food and other resources, pressure on ecosystems has severely affected the quality of these services, a situation which has worsened over the past 50 years.

(1137)

Photos'caption

231 - Tuna fishing
Tuna fishing using rods and live bait off Cape Verde (Senegal).
© IRD / CAYRE Patrice

232 - Market biodiversity
Young messenger with his wheelbarrow in the Calle América market, Cochabamba (Bolivia).
© IRD / JEGU Michel

234 - agroforests - benefit crops
Poplars and crops complement each other for more productive agroforestry plots: here biodiversity is richer, especially in the uncultivated soil around the trees (France).
© INRA / DUPRAZ Christian

233 - corals pharmaceutical interest
Inventory of corals and their pharmaceutical value in Souzy Bay: here crinoids and "*Capillaster multiradiata*" (Madagascar).
© IRD / LABOUTE Pierre

235 - shares meals ana.PN01NAAC_002.jpg
Sharing a biodiversity-rich meal at the World Heritage Kuk Early agricultural site (Papua New Guinea).
© OUR PLACE *The World Heritage Collection*

供应服务
生态系统为我们的生活提供基本的要素，包括食物，淡水，木材，纤维，基因资源，药品，观赏和文化产品。这些服务是由生物多样性提供的，从而形成了生态系统的服务基础。他们是社会健康，安全和福祉必不可少的支撑和生计保障。

人类直接使用，培育以及驯化，野生动物，植物以获取食物，纤维和住所。生物多样性是本地及国际经济的基础。约 2.6 亿人直接依赖农业系统生活，无论是农业，畜牧生产，林业，渔业。

药物，传统药物和制药业很大程度上依赖于植物多样性，这是宝贵的基因资源的来源。

随着人口的增长，粮食和其他资源的需求与日俱增，对生态系统的压力不断增加的需求，严重影响了这些服务的质量，过去 50 年这种情况每况愈下。
P-231 佛得角海域的金枪鱼利用鱼棒和活饵捕食（塞内加尔）
P232 年轻的送信员在科恰班巴的卡勒美洲市场骑独轮车送信（玻利维亚）
P234 杨树与农作物互补提高农林业生产：在这里的生物多样性更加丰富，特别是在树木周围未开垦的土地（法国）。
P233 研究苏齐湾的珊瑚及其药用价值：海百合和"Capillaster multiradiata"（马达加斯加）。
P235 在 KUK 早期农业遗址享受生物多样性丰富的食物。（巴布亚新几内亚）

Panel 2.4 – Regulating services

Healthy ecosystems through their **regulating services** help regulate our climate and other aspects of our natural environment. Forests and oceans regulate climate and moderate global warming by absorbing greenhouse gases from the atmosphere.

Healthy ecosystems and their biodiversity help maintain air quality, purify water, treat waste, and protect us from natural hazards, erosion, pests and diseases.

For example, the unique biodiversity of wetland ecosystems assists in the natural purification of water, trees in cities reduce air pollution, and mangrove forests and coral reefs protect coastal communities and their coastlines from erosion and the full force of tsunamis and storm surges. Vegetation cover helps prevent landslides and soil erosion. The spread of diseases such as cholera is controlled by access to clean water, a product of ecosystem services.

The regulating services of ecosystems therefore make an important contribution to the natural equilibrium of our planet, which in turn benefits human security and well-being.

(1055)

Photos'captions

241 - Sea Cloud
View of the glaciated Cayambe volcano emerging from a sea of clouds (Ecuador).
© IRD / KUNTZ Jean-Philippe

242 - around the River
Doing laundry along the Mandrare River in the south of Madagascar.
© IRD / SIMONNEAUX Vincent

245 - boreal forest photosynthesis measure
Tower to measure the flux of CO_2 and water vapor between the boreal forest and the atmosphere (Canada).
© CNRS Photothèque / PONTAILLER Jean-Yves

243 - Cherry blossoms
Ohanami, the flowering of Cherry Blossom : an unmissable event (Japan).
© DR / Centre.Sciences

244 - Pelican Sanctuary
Classified World Heritage by UNESCO, the Djoudj National Park Bird Sanctuary is essential for wintering migratory birds from Northern Europe and West Africa: nearly 3 million birds winter, and over 400 species are present (Senegal).
© IRD / LEMASSON Jean-Jacques

调节性服务

健康的生态系统通过调节性服务体现在气候和自然环境的调节等方面。森林和海洋通过从大气中吸收温室气体来帮助调节气候以及全球变暖。

健康的生态系统及其生物多样性有助于维护空气质量，净化水质，处理废弃物，保护我们免受自然灾害，水土流失，虫害和疾病的侵扰。

举例来说，独特的湿地生态系统生物多样性帮助水的自然净化，在城市中的树木减少空气污染，森林和红树林和珊瑚礁保护海岸社区和他们的海岸线免受侵蚀，以及海啸和风暴的影响。植被覆盖有助于防止山体滑坡和水土流失。清洁用水可以预防疾病蔓延比如霍乱，这也是一种生态系统服务。

生态系统的调节性服务，为我们这个星球的自然平衡作出了重要贡献，从而惠及人类的安全，生存与发展。

241 云海中的冰川凯扬波火山（厄瓜多尔）
232 在马达加斯加南部的曼德拉雷河洗衣服
524 塔测量寒带森林和大气之间的二氧化碳和水蒸气通量（加拿大）。
243 在樱花花期看花会不可错过（日本）。
244 由联合国教科文组织列为世界遗产地 Djoudj 国家公园为来自北欧和西非候鸟鸟类提供越冬的栖息地：在冬天这里会有将近 300 万只禽鸟，目前超过 400 种 （塞内加尔）。

Panel 2.5 – Supporting services

The supporting services of ecosystems such as nutrient cycling are the fundamental but often invisible processes, on which all the other ecosystem services depend, including the production of food and water, and climate regulation. They create the basic conditions for life on Earth.

For example, food production depends on **soil formation**, which itself greatly depends on climatic conditions as well as chemical and biological processes carried out by bacteria and fungi, which decompose waste and make nutrients available to food crops. Food crops use CO_2 in the air during **photosynthesis** to produce the sugars and **biomass** that we consume for energy. These processes depend on **nutrient** and **water cycling**, which in turn influences the amounts available to plants and animals in a finely-tuned cyclic system.

Human-induced reduction in biodiversity therefore disrupts the way ecosystem processes function causing the supporting ecosystem services to degrade, which ultimately affects our well-being.

(1016)

Photos'caption:

253- study litter
Collection and sieving litter to extract arthropods, to improve knowledge of forest soils.
© CNRS Photothèque / DELHAYE Claude

252 – Waters'fall and forest off Igaçu
Iguaçu Falls on the border between Brazil and Argentina are a UNESCO natural World Heritage site.
© IRD / CHANGEUX Thomas

255 - Rain and fog
Yungas landscape, narrow deep valleys of the Andes, covered with tropical rainforest.
© IRD / LAURE Joseph

251 - Towards the canopy
A scientist accessing the upper part of trees, the canopy, to inventory the biodiversity of the forest of Guyane.
© CNRS Photothèque / CHAVE Jerome

254 - Bacteria fixe nitrogen
These plant filaments in the soil of a paddy field fix atmospheric nitrogen and contribute to the maintenance of soil fertility (Philippines).
© IRD / ROGER Pierre

支持服务

生态系统的支援服务是最根本的，但往往是看不见的，比如其他生态系统服务所依赖的养分循环，包括食品和水的生产以及对气候的调节。他们为地球上的生命创造最基本生存条件。

例如，粮食生产依赖于土壤的形成，这本身就大大依赖于气候条件以及化学和生物过程，而这些化学和生物过程是通过细菌和真菌分解废物，以及为粮食作物提供营养物质来完成的。粮食作物中使用二氧化碳光合作用产生的糖和生物能为人类提供能源，我们在空中。这些进程取决于养分和水分循环，这反过来又影响了精细调谐系统中植物和动物可获得的养分和水分。

人类引起的生物多样性减少，因此破坏了生态系统进程的方式，造成支持生态系统功能的生态服务下降，最终影响我们的福祉。

253 垃圾收集和筛选，提取节肢动物，提高森林的土壤知识
252 巴西和阿根廷之间的伊瓜苏边境瀑布是联合国教科文组织的世界自然遗产地
255 永加斯景观，安第斯山脉的窄深的峡谷，被热带雨林覆盖
251 科学家在圭亚那森林的树冠，调查生物多样性
254 这些稻田土壤中的植物纤维固定大气中的氮，并有助于增强土壤肥力（菲律宾）。

Panel 2.6 – Cultural Services

Cultural services are the non-material benefits people obtain from ecosystems through spiritual enrichment, cognitive development, reflection, recreation, and aesthetic experiences.

Our various spiritual and religious beliefs and customs are often connected to nature. Stories around biodiversity shape our legends and ground our sense of belonging to a distinct place or community. Many communities around the world have a spiritual relationship with nature. Biodiversity has greatly contributed to, and inspired our cultures, history, and arts. Our cultural heritage, our knowledge and educational values are all rooted in our natural environment.

Biodiversity has measurable economic value in relation to recreation and ecotourism, but its value in terms of spiritual enrichment and aesthetic enjoyment is beyond measure.

(839)

Photos'caption:

261 - Culture reindeer
Dolgans preparing a team of reindeer; all their traditions are based on the reindeer and its multiple uses. Atchaïvaïam Region, Kamchatka (Siberia).
© CNRS Photothèque / programme "Adaptation biologique et culturelle : le système renne"

264 - Games Tuareg
Around a checkerboard traced in the sand, the game of Dera refers to the everyday world of the Tuareg mainly to livestock.
© IRD / BERNUS Edmond

265 - head of deer violin
A Huichol shamanic violin carved like a head of a deer (Mexico).
© CNRS Photothèque / SAUMADE Frédéric

263 - garland of skulls
Inside the Uma, the traditional house of the flower people on the Island of Siberut, the garland of skulls is a hunting trophy (Indonesia).
© IRD / FORESTIER Hubert

262 - driftwood sculptor
A Nakapiak, sculpting a spoon, an everyday object from spruce drift wood (Alaska).
© CNRS Photothèque / ALIX Claire

文化服务

文化服务是人类通过精神充实，认知发展，思索，娱乐和审美体验从生态系统获得的非物质利益，
我们的各种精神，宗教信仰及习俗，往往与大自然息息相关。围绕生物多样性的传说故事丰富了我们的想象， 并提升了我们的地域归属感。世界上许多地方都与大自然的有着某种精神联系。生物多样性为丰富我们的文化，历史和艺术作出了巨大贡献。我们的文化遗产，我们的知识和教育价值，都植根于我们的自然环境。

生物多样性在生态旅游经济方面的价值是可以被估量的，然而，它在丰富人类的精神享受和审美方面的价值是无法计量的。
261-Dolgans 准备的驯鹿队，他们的一切都是基于传统的驯鹿和它的多种用途。 Atchaïvaïam 地区，堪察加半岛（西伯利亚）。
264 大约在沙追查一棋盘，游戏的德拉指的是图阿雷格人日常世界主要牲畜。
265 甲惠考尔萨满教小提琴被雕刻成鹿头的形状（墨西哥）。
263 在西比路岛花朵人的传统房子-乌玛里面，头骨花环被当作狩猎奖杯（印度尼西亚）。
262 一个 Nakapiak 在用每天都会见到的云杉漂木雕刻一个汤匙（阿拉斯加州）。

THEME 3 : WHY ARE WE LOSING BIODIVERSITY ?

Panel 3.1 - Alarming rate of biodiversity loss

We are losing species at an alarming rate. The International Union for Conservation of Nature (IUCN) notes that 1 species of bird out of 8, 1 mammal out of 4, 1 conifer out of 3, 1 amphibian out of 3, and 6 marine turtles out of 7, are all threatened with extinction. In addition, 75% of genetic diversity of agricultural crops has been lost and 75% of the world's fisheries are fully or over-exploited.

With increasing population, aspirations for better living conditions and economic development leading to environmental changes, biodiversity is being lost through direct causes such as habitat loss and land use changes, climate change, invasive species, over-exploitation and pollution, and underlying causes such as poor governance and legal and institutional frameworks with respect to its conservation. All these causes interact with each other.

Biodiversity is a central element to the services the Earth's ecosystems provide for human well-being. Scientists estimate that 60% of the Earth's ecosystems have reduced their capacity to deliver the vital ecosystem services on which we all depend, including the provision of clean fresh water and food, the regulation of climate and the formation of fertile soil.

Degraded ecosystems and a fall in the numbers of species erode the natural capital and the genetic resources from which we derive all our crops and domesticated animals, leading to lesser resilience and an inability to adapt to future environmental changes. Loss of biodiversity also leads to loss of cultural diversity.

(1570)

Photos'caption:

311 - Hermit crab
Hermit crab in Thailand with a glass bottle top as shell. "www.seethebiggerpicture.org".
photo by Alex Marttunen, 11 (Finland)

315 diagramme of species
Percentage of species in danger of extinction. Birds, amphibians, mammals and conifers are the only groups known and evaluated in their entirety, but it is estimated that the threat is similar to other groups of species.
© Red List 2009 UICN

314 - Perte des sols
Erosion from agricultural practises destroys 10 million hectares of cropland on the planet per year (Laos).
© IRD / PIERRET Alain

312 - mangrove dévastée
Mangroves are among the most fragile ecosystems of our planet (Venezuela).
© CNRS Photothèque / BLASCO François

313 - Charançon du palmier
The red palm weevil, native to Asia, has invaded the Middle East, and from 1992, the shores of the Mediterranean countries (Egypt).
© IRD / SILVAIN Jean-François

我们为什么正在失去生物多样性

我们正以惊人的速度失去物种。根据国际自然保护联盟（IUCN）的一项研究，每 8 种鸟类中的一种，每 4 种哺乳动物的一种，每三种针叶树的一种，每三种两栖类动物中的一种以及每 7 种海龟中的 6 种，都面临着灭绝威胁。此外，75％的农作物遗传多样性已经丧失，世界上 75%的渔业资源被完全或过度捕捞。
随着人口不断增加，在创造更好的生活条件和经济发展过程中，环境和生物多样性遭到破坏，直接原因包括，栖息地丧失和土地利用变化，气候变化，外来物种入侵，过度开发和污染，间接原因包括如治理不善以及法律和体制框架。所有这些原因相互影响。
生物多样性是地球的生态系统为人类福祉提供生态服务的核心要素。科学家们估计，有 60％的地球生态系统已经丧失了它们为人类提供重要的生态系统服务的能力，包括清洁的淡水和食物的提供，气候调节和使土壤肥沃。
退化的生态系统和物种数量的减少在严重损害着自然资本和基因资源，从而影响我们的庄稼和家畜，导致未来环境的变化适应性减弱。生物多样性的丧失，也导致文化多样性的丧失。

311 - 寄居蟹在泰国作为玻璃瓶盖的外壳。
315-面临灭绝的物种百分比。目前我们只掌握了鸟类，两栖类，哺乳类和针叶林的数据，但据估计，其他物种群体也面临类似的威胁。
314 - 从农业种植以 10 万公顷每年的速度侵蚀着我们的农田（老挝）。
312 - 红树林是我们这个星球最脆弱的生态系统（委内瑞拉）。

313 地中海岸边的红棕象甲，原产于亚洲，从 1992 年侵入了中东（埃及）。

Panel 3.2 – Habitat loss

Habitat loss can occur naturally through drought, disease, fire, volcanoes, earthquakes, slight changes in seasonal temperature or rainfall, but it is the changes in land use through human activities particularly agriculture, but also cattle rearing, construction of infrastructure, logging, mining and rapid urbanization, which are the main drivers of habitat fragmentation, deterioration and loss. Croplands account for more than 25% of land surface excluding Antarctica.

In recent times, the Earth's forest surface has been reduced by 40%, wetlands by 50%, coral reefs by 20% and mangroves by 35%. Deep-sea fishing is causing considerable damage to sea beds with the potential loss of millions of species and their genetic resources.

Dams and canals have fragmented 60% of large rivers. Humans use 45% of the water running into rivers. The Aral Sea, for example, was once the fourth biggest lake in the world. It is now predicted to disappear within the next decade.

(985)

Photos'caption:

323 - lac asséché
Abandoned boat in what was once one of Europe's most important wetlands, now almost dried, Las Tablas de Daimiel Spanish National Park (Spain).
© Santi Burgos

324 - pollution fond de mer
Waste accumulated on the shore near urbanized areas. The Mediterranean currents contribute to its spreading over large areas (France).
© CNRS Photothèque / HARMELIN

322 - pâturage brésilien
Large areas of rainforest are cleared for pasture. The Brazil nut tree, even protected, dies when isolated from the forest (Brazil).
© CNRS Photothèque / LE TOURNEAU François-Michel

321 - déforestation
Deforestation to the north of Caceres, Mato Grosso (Brazil)
© Yann Arthus-Bertrand/ « La Terre vue du ciel » /UNESCO

326 - Agroforesterie
Logging of whole areas of agroforests due to the installation of industrial mills... while cocoa seedlings indicate a radical change of land management (Indonesia).
© IRD / DE FORESTA Hubert

3.2 – 栖息地丧失

自然栖息地可能由于干旱，疾病，火灾，火山爆发，地震，温度和降雨量的季节性的变化而丧失，但人类对土地的利用特别是农业，牲畜饲养，基础设施建设，伐木，采矿以及快速城市化，是栖息地破碎化，退化和丧失的主要驱动力。耕地占超过陆地面积的 25%，不包括南极洲。

近些年来，地球表面森林面积已减少了 40%，珊瑚礁减少了 50%，湿地减少了 20%，红树林减少了 35%。深海捕鱼造成海床被严重破坏，数百万的物种及其基因资源的可能被破坏。

水坝和运河破坏了 60%的大江大河。45%的人类使用过的水被排入江河。咸海，曾是世界上第四大的湖泊，科学家们预测，它会在未来十年内消失。

323 一艘船废弃在拉斯维加斯布拉斯代代米耶尔西班牙国家公园，这里曾是欧洲最重要的湿地，现在几乎干涸（西班牙）。

324 –垃圾堆积在靠近城市的海岸边。地中海的潮汐把它带到了远方（法国）。

322 -大面积的热带雨林被变成了牧场。巴西坚果树虽然受到保护，但是由于其他树木被砍伐，也干枯了。

321 -北卡塞雷斯的森林砍伐，马托格罗索州（巴西北部）

326 由于工业开采，整个地区的森林被破坏.而可可树苗可以看出土地管理造成的巨大变化。（印度尼西亚）

Panel 3.3 - Climate change

Biodiversity is being affected globally by climate change as the average temperature on Earth becomes warmer, with more frequent extreme weather events negatively affecting biodiversity, ecosystem functioning and ultimately the provision of ecosystem services and human well-being.

The distribution of wild and domesticated animal and plant species is sensitive to such climatic conditions as temperature and humidity. Due to increases in ocean temperature and changes in sea water chemistry due to carbon sequestration, Australia's Great Barrier Reef could lose up to 95% of its living coral by 2050. In Africa, elephants have become highly vulnerable to climatic change with longer dry periods and shrinking habitats. In Asia, projected rises in sea levels could result in the disappearance
of mangrove forests, threatening livelihoods.

Temperature fluctuations affect the life cycles of crops and domesticated animals. Disturbances in plant flowering and fructification can cause crop varieties to fail. Shifts in breeding periods and migrations can adversely affect both wild and domesticated animals. Cultural practices linked to the agricultural calendar are also ultimately affected by climate change.

(1220)

Photos'captions :

335 - marigot et paludisme
Study of aquatic larvae of mosquito vectors of malaria. Climate change will increase distribution of these diseases (Burkina Faso).
© IRD / GIMONNEAUX Geoffrey

331 - maison sur ile
One of the Thousand Islands of Lake Ontario which separates Canada from the United States.
© IRD / BOURNOF Marc

332 - phoque au soleil
The shrinkage of sea ice on which bearded seals raise their young also threatens their main predator, the polar bear. Bearded seal lazing on an iceberg near Spitzbergen (Norway).
© CNRS Photothèque / ANDRE Marie-Françoise

333 - Pollution Mexico
Air contamination in Mexico, largely due to the industries located in the valley (Mexico).
© IRD / DEJOUX Claude

334 - Vigne du cap
Weather Station in the vineyards of the Cape region, to study trends in and impact of the evolution of global warming (South Africa).
© CNRS Photothèque / QUENOL Hervé

3.3 - 气候变化

生物多样性正在受到全球平均温度升高的影响，更频繁的极端天气对生物多样性，生态系统功能，最终对生态系统服务和人类福祉产生不利影响。
无论野生或是家养的动植物，物种的分布是由温度和湿度等气候条件共同影响的。由于海洋温度上升，海水化学成分的变化以及碳固存，澳大利亚的大堡礁到 2050 年可能会失去多达 95%的活珊瑚。在非洲，大象已成为较长的干旱期，栖息地减少等气候变化的受害者。在亚洲，预计的海平面上升可能导致红树林的消失，严重威胁生计。
温度波动影响农作物和家畜的生命周期。如果植物开花结果被干扰，可能导致作物无收。繁殖期和迁徙的变化也可能对野生动物和家畜产生不利影响。与农历相关的文化习俗也最终会被气候变化所影响。

335 -蚊子的水生幼虫可以传播疟疾。气候变化将增加这些疾病的传播（布基纳法索）。
331 安大略湖的千岛群岛中的一个岛，分隔了美国和加拿大。
332 髯海豹在冰面上抚育幼仔，由于海洋冰面的减少，髯海豹的抚育地受到了威胁，而这也同样威胁着他们的天敌-北极熊。髯海豹在斯皮茨伯根附近的冰山上休息（挪威）。
333 - 在墨西哥的空气污染，主要是由于位于山谷的工业基地（墨西哥）。
334 -开普地区的葡萄园里的气象站，以研究全球变暖的趋势和影响（南非）。

Panel 3.4 - Invasive alien species

The introduction, whether accidental or intended, of alien invasive species of plants, such as water hyacinth in the tropics, or animals such as the grey squirrel in Europe, can have a devastating impact on natural and cultivated species and ecosystems.

After habitat loss, invasive alien species are the second most important driver of species extinction. Invasive species interfere with the web of relationships and distort the services provided by the ecosystem particularly in isolated ecosystems such as rivers and islands.

The rate and risk associated with the introduction of alien species have in recent years significantly increased due to human population growth and activities, as well as the opportunities for species to spread due to travel, trade and tourism.

The economic and human costs can be considerable. In the United States, the economic costs of non-native species invasion exceed US$ 137 billion each year, more than the combined total of all other natural disasters. The introduction of the Nile perch in Lake Victoria in Africa caused the extinction of 200 native fish species along with the loss of cultural practices related to traditional fishing of the extinct species.

(1208)

Photos'caption :

341 - Invasion au Kerguelen
Dandelion, introduced into the Kerguelen Islands in the late nineteenth century, is an invasive species that takes advantage of changing climatic conditions.
© CNRS Photothèque / LEBOUVIER Marc

342 - Poisson dragon rouge
The red dragon, an endemic fish species in Lake Sentarum (Borneo) is endangered. It is the subject of an IRD programme on the reproduction of the species.
© IRD / POUYAUD Laurent

344 - Caulerpa taxifolia
The seaweed "*Caulerpa taxifolia*", native of Australia, has invaded the Mediterranean seabed. These are areas of competition with "*Posidonia oceanica*", which is one of the major constituents of the Mediterranean ecosystem.
© CNRS Photothèque / GRAILLE Roland

343 - Teigne de la patate
Potato ringworm native to Central America (Ecuador).
© IRD / DANGLES Olivier

345 – écrevisse de Louisianne
The Louisiana crayfish, introduced into Europe, is considered an invasive species that disrupts the ecosystem of local species.
© INRA / MAITRE Christophe

外来入侵物种
无论意外或者有意，外来植物的入侵，例如热带的水葫芦，或者动物的入侵，例如欧洲灰松鼠，可以对自然和栽培物种和生态系统造成毁灭性的影响。

在栖息地丧失之后，外来侵入物种是第二个物种灭绝的原因。外来入侵物种的干扰物种间的关系，扰乱生态系统提供的生态服务，特别是在孤立的生态系统，如河流和岛屿。

外来物种引入的几率和相关的风险在最近几年已大大增加，原因是人口增长和人类活动，以及由于旅行，贸易和旅游业使物种的传播机会增加。

经济和人力成本可能是巨大的。在美国，非本土物种入侵的经济代价每年超过 1,370 亿美元，超过所有其他自然灾害相结合的总和。而在非洲维多利亚湖引入的尼罗河鲈鱼造成 200 种原生种鱼的灭绝并对传统捕鱼文化习俗造成了损害。
341 蒲公英，在 19 世纪后期被引入凯尔盖朗群岛，这种入侵物种极易适应气候条件的变化。
342 - 红龙，是在 Sentarum 湖中（婆罗洲）特有的濒临灭绝鱼类。它也是一个项物种繁殖计划的对象。
344 - 海藻“Caulerpa taxifolia”，原产于澳大利亚，已经侵入了地中海海底，并与那里的“Posidonia oceanica”产生竞争，而后者是地中海生态系统的一个主要组成部分。
343 -马铃薯癣原产于中美洲（厄瓜多尔）。
345 -路易斯安那州的小龙虾，传入欧洲，被视为是破坏当地的生态系统的入侵物种。

Panel 3.5 – Over-exploitation and Pollution

The over-exploitation of biodiversity on the Earth's ecosystems by humans through unsustainable hunting, fishing and the extraction of raw material is increasing the ecological footprint, a measure of human demand on the Earth's ecosystems.
Over-exploitation erodes the natural capital, disrupts the relations in the ecosystem, decreases the number of species and the diversity of the genetic pool and can lead to species extinction.

At the current rate of extraction, it is estimated that the world's current commercial fish species will be extinct by 2048. The Atlantic cod fishery, once the world's most productive is now estimated at less than 1% of its original capacity with devastating effects on local communities. Logging of tropical timber in Asia is destroying large tracts of biodiversity-rich tropical forests. Animal hunting, particularly in Africa is reducing the numbers of megafauna such as the elephant, rhinoceros and giraffe.

Pollution occurs when humans emit more waste than the absorption capacity of the ecosystem. Greenhouse gases, fertilizers, agricultural and toxic waste all disturb interactions impacting on biodiversity. For example, agricultural waste leads to the eutrophication of rivers and the widespread death of fish species.

(1290)

Photos'caption:

354 - macrodéchets
Waste dumped at sea is the visible part of the pollution along the coast.
© CNRS Photothèque / HARMELIN Jean-Georges

353 - Chasse baleine
Gray whale brought to a yupik village for butchering. Traditional whale hunting is sustainable. Novo Tchaplino, Chukotka (Siberia).
© CNRS Photothèque / CHICHLO Boris

351- Pêche au thon
Fishing for tuna (Seychelles).
© IRD / PEIGNON Christophe

355 - Swan in a river
A swan in the polluted Segura River in Murcia, Spain. "www.seethebiggerpicture.org".
photo by Sara Cuenca Uñac, 13 (Spain)

352 - Banc de baliste
School of triggerfish "*Canthidermis maculatus*" in a wreck (Indian Ocean).
© IRD / IFREMER Fadio / TAQUET Marc

3.5 - 过度开采和污染

人类由于无节制的狩猎，捕鱼和原材料开采，导致地球生态系统生物多样性过度开发，增加了生态足迹，生态足迹是人类对地球生态系统的需求的一种测量方法。
过度开发侵蚀了自然资本，破坏了生态系统的关系，减少了物种的数量和基因库的多样性，并可能导致物种的灭绝。
以目前的开采速度，据估计，世界上现有的商业鱼类将于 2048 年灭绝。大西洋鳕鱼渔业，曾经是全球产量最高的，但是现在的产量不及原产量的 1%，严重影响了当地居民的生活。在亚洲，热带木材采伐严重破坏生物多样性丰富的热带森林。在非洲，狩猎使巨型动物的数量急剧减少，如大象，犀牛和长颈鹿。

当人类排放的废弃物超过了生态系统的吸收能力，污染就产生了。温室气体排放，化肥，农业和有毒废料都在干扰和影响着生物多样性。例如，农业废物导致河流富营养化和鱼类大量死亡。
354 - 在海上倾倒废物只是海岸污染的可见部分。
353 -灰鲸在尤皮克村被捕杀。传统的鲸鱼狩猎是可持续的（西伯利亚）。
351 – 捕捞金枪鱼（塞舌尔）。
355 – 一只天鹅在被污染的穆尔西亚的塞古拉河中。（西班牙）

352 -学校鲀"Canthidermis 斑"在击毁（印度洋）。

Panel 3.6 - Underlying causes of biodiversity loss

Biodiversity loss is directly caused by habitat loss, climate change, invasive species, over-exploitation and pollution, which are the consequences of other root or underlying causes which ultimately drive biodiversity loss. These include population and economic growth, the social and political context, and scientific, technological, cultural or religious factors.
The rising global population from today's 6.8 billion people to around 9 billion by 2050 is increasing pressure on ecosystems with a projected loss of biodiversity. While economic activity is expected to multiply by a factor of 3 to 6 by 2050, the status of biodiversity will improve only if future economic growth is sustainable and resource-efficient.

Democratic societies in which local communities, especially women and vulnerable communities are involved in decision-making, and where there is an investment in science and technology, particularly science education, can positively influence the institutional arrangements for ecosystem management as well as rights over ecosystem services.

Our culture, ethics and perceptions of the world influence the way in which we consume and the importance we attribute to biodiversity conservation.

(1248)

Photos' caption:

364 - herbier au féminin
Scientists estimate between 10 and 100 million the number of species yet to be discovered. Botanical Garden "*Orto Botanico*", Padua (Italy).
© OUR PLACE *The World Heritage Collection*

362 - bidonville New Dehli
Slum resulting from growth and urban segregation in the floodplain of the Yamuna in New Delhi (India).
© CNRS Photothèque / THERY Hervé

361 - ville USA
The megalopolis of Los Angeles, California (USA)
© Yann ARTHUS-BERTRAND/ « La Terre vue du ciel » /UNESCO

365 - camp Clipperton
Clipperton, called Island of Passion by the French, was the site of a scientific expedition in 2005 to conduct an inventory of the fauna and flora.
© IRD / CHARPY Loïc

363 - Boutique Ginseng
Shop with substances used in traditional medicine, particularly ginseng, in Shanghai (China).
© IRD / FAVIER Marie-Noëlle

3.6 – 造成生物多样性损失的根本原因
生物多样性损失的直接原因包括栖息地丧失，气候变化，外来物种入侵，过度开发和污染，而根本原因是人口和经济增长，社会和政治，科学，技术，文化或宗教因素。
全球人口从目前的 68 亿人口到 2050 年的 90 亿左右，生态系统的压力与日俱增， 生物多样性的损失不可避免。人类的经济活动到 2050 年预计将增加 3 至 6 倍，生物多样性的状况只将靠未来的经济增长是可持续和能源效率的提高来改善。
民主社会，，特别是妇女和弱势群体可以参与决策的地方社区，以及存在科学和技术的投资，尤其是科学教育投资的地区，能积极影响生态系统管理的体制安排，以及对生态系统服务的权利。
我们的文化，道德和对国际影响的诠释影响着我们的消费方式，以及我们对生物多样性保护的贡献。
364 -科学家估计，1 千万到一亿种物种的数量还没有被发现。
“Orto Botanico”植物园，帕多瓦（意大利）。
362 -在新德里亚穆纳河的漫滩，由于城市隔离造成的贫民窟（印度）。
361 -洛杉矶的大都市，加利福尼亚州（美国）
365 -克利珀，在法语中时热情之岛，是 2005 年进行的动物和植物科学考察的现场。
363 -在上海购买人身等中药材（中国）。

THEME 4: BIODIVERSITY, ECONOMY AND DEVELOPMENT

Panel 4.1 – <u>The economic value of biodiversity</u>

To estimate the value of biodiversity is a challenge, particularly the economic value in terms of the ecosystem services to which it contributes, such as the provision of food, the regulation of climate, the formation of soil and to cultural and spiritual fulfilment.

Studies such as ***The Economics of Ecosystems and Biodiversity*** (TEEB) draw attention to the economic benefits of biodiversity and highlight the growing economic costs of environmental degradation. They estimate the total value of biodiversity and its services at US$ 33000 billion/year, or twice the value of the world economy.

We can estimate the economic value of services such as food, wood and pharmaceutical products by taking into account their market value. For example, we can calculate the cost of wood from a logged forest, but how can we measure other valuable ecosystem services such as soil retention, climate regulation, water purification, pollination, and food sources for local communities? These services, if diminished, need to be compensated, sooner or later, by investment. Attributing market value to these undervalued services can help us understand their real value and can facilitate decision-making. Disregarding their value today could prove extremely costly in the future.

(1300)

Photos' caption:

P411 - résine
Trading superior quality damar resin extracted from trees of *Shorea javanica*. Krui region (Indonesia).
© IRD / DE FORESTA Hubert

P412 – Ladybird
Ladybird on a leaf in Jork, Germany. "www.seethebiggerpicture.org".
photo by Julia Kresse, 15 (Germany)

P415 - Maïs huichol
The chromatic variety of corn is the pride of the Huichol Indians, and constitutes a genetic resource; but consumption patterns are tending to go over to commercial maize meal, from transgenic plants. San Andrés Cohamiata Tatei Kie (Mexico).
© CNRS Photothèque/ SAUMADE Frédéric

P413 - culture du thé
Tea fields along the Mountain Railways World Heritage site (India).
© OUR PLACE *The World Heritage Collection*

P414 - pollinisation naturelle / artificielle
Honey bee visiting the flower of an apple tree. Pollen sticks to its hind legs.
© INRA / CARRE Serge

主题 4：生物多样性，经济和发展
---小组 4.1 - 生物多样性的经济价值
评估生物多样性的价值是一个挑战，特别它通过生态服务而贡献的经济价值，如提供食品，气候调节，土壤形成以及对文化和精神的丰富。
目前有一些关于生物多样性的经济效益和环境恶化的经济成本方面的研究，例如生态系统和生物多样性经济（TEEB）。生物多样性以及生态服务的估计价值 33 万亿美元/年，相当于世界经济价值的两倍。
我们可以通过生态服务所提供的食品，木材和医药产品的市场价格来估计生态服务的价值。例如，我们可以计算出一个森林的木材成本，但如何才能衡量其他生态系统服务的价值，如土壤保持，气候调节，水净化，授粉，并为当地社区提供食物来源？这些服务，如果减少，迟早需要投资来补偿。市场价格可以帮助我们了解这些被低估服务的真实价值，并能促进决策。今天的熟视无睹可能导致将来高昂的代价。
P411 交易从“Shorea javanica“树上提取出的优质达马尔对望天树树脂。克鲁伊地区（印度尼西亚）。
P412 -就在乔克叶上的小鸟儿，德国。
P415 -该品种是玉米色是惠邱族印第安人的骄傲，并形成了一种基因资源，但是商业消费模式却倾向于转基因玉米生产出的玉米。（墨西哥）。
P413 - 世界遗产地沿着山区铁路的茶园（印度）。
P414 -蜜蜂在采集苹果树花蜜。花粉粘在了它的后腿上。

Panel 4.2 – Green economy: business case for biodiversity

The "green economy" describes the recent business trend towards the production of environmentally-friendly goods and services that are more sustainable in the long-term and can thus moderate climate change. Examples of green economy industries include: renewable energy production, green transportation, carbon capture, green building practices, organic agriculture and eco-tourism. It is a rapidly growing and increasingly important sector of the global economy.

Biodiversity is the source of raw materials for a lot of the world's industries. New market opportunities are emerging with private equity firms investing in natural capital, and buying rights to environmental services generated by tropical rainforest reserves. They recognize that services such as water storage, biodiversity maintenance and rainfall regulation provide an excellent return on investment.

For example, the estimated market value of coral reefs ranges from US$ 10 000 to US$ 60 000 per hectare/year, while the conservation cost is equal to only 0.2 % of this value. In Thailand, profits obtained by the conversion of mangroves into commercial shrimp farms, is around US$ 1 220 per hectare/year while the benefits of only some of its services (wood and forest products, fish nurseries, disaster mitigation) is in the order of US$ 12 000 per hectare/year.

(1377)

Photos'caption :

P421 – Mangrove
The bay of Paranaguá (Brazil) where neighboring ecosystems, coastal mudflats, often covered with prairies, and mangroves coexist. A possible major climate change will result in expansion or regression of vegetation belonging to one of these two areas.
© CNRS Photothèque / FOURNIER Jérôme

P422 - huitres et mangroves
Artisanal growing of oysters on mangrove roots. Collected by women, dried and sold in local markets, their shells are processed into lime for use in homes or exported to the Gambia (Senegal).
© IRD / TURMINE Vincent

P423 - récifs coraliens
The Great Barrier Reef (Australia).
© Yann ARTHUS-BERTRAND/ « La Terre vue du ciel » /UNESCO

P425 - Clairière tropicale
Low-lying forest on granite soils of Mount Arawa (Guyana). The forest glade illustrates the floristic diversity of rare and fragile environments.
© IRD / SABATIER Daniel

P424 - Palmes et déchets Ird - 00040721 et Ird 00040720
Palm oil is extracted from the fruit of *"Elaeis guineensis"*. By a natural process of bioconversion, IRD is studying the transformation of resulting waste into innovative uses including aquaculture (Indonesia).
© IRD / SAURIN Hem

4.2 - 绿色经济：生物多样性的商业案例

"绿色经济"描述了最近的一种生产和提供环境友好型产品和服务的趋势，它有利于可持续发展以及减缓气候变化。绿色经济产业包括：可再生能源，绿色交通，碳捕获，绿色建筑，有机农业和生态旅游。这是一个快速发展，日益重要的全球经济的一部分。生物多样性为世界工业提供了原材料。由私人股权投资公司投资自然资本的新的市场机会出现了，如购买所产生的热带雨林储备的环境服务。他们认识到，如储水，维护生物多样性和降雨调控等生态服务有良好的投资回报。

例如，每公顷珊瑚礁的市场价格从$ 10 000 美元/年至 60 000 美元/年不等，而养护成本只相当于此价格的 0.2%。在泰国，红树林的保护与虾养殖结合在了一起，每公顷收益为 1220 美元 /年，而其他任意一类服务（如木材和林产品，鱼类养殖，减灾）的价值是在每公顷 12 000 /年。

P421 -在巴拉那瓜湾（巴西）周围，被草原覆盖的海岸滩涂，和红树林共存。一个重大的气候变化将导致这些地区的植被面积扩张或者退化。

P422 –养育在红树林根部的蚝。妇女们把它们收集，干燥，并在当地市场出售，它们被加工成石灰为家庭使用或出口到冈比亚（塞内加尔）。

P423 -大堡礁（澳大利亚）。

P425 -低洼的山阿拉瓦（圭亚那）花岗岩土林。这说明了森林沼泽稀有植物区系的多样性和脆弱的环境。

P424 -从棕榈油是从"油棕果"中榨取出来的。IRD 正在进行一项通过生物转化把废弃物再利用的研究，比如水产养殖废物转化（印尼）。

Panel 4.3 – Biodiversity and innovation

What do Velcro, infrared, sonars and self-cleaning surfaces all have in common? They are examples of biomimicry, a growing scientific field of study where modern engineers, scientists and architects are turning to biodiversity, not to extract products from nature, but for inspirational, innovative and sustainable solutions to technically challenging problems. This is vitally important to such industries such as biomedicine, nanotechnology and materials science.

Some industries are inspired by nature like aviation, which is based on mimicking birds' wings and behavior: sea birds react to rising air by adjusting the shape of their feathers to decrease lift. Likewise, a plane adjusts the surface of his wings. Another example, the Eastgate Centre building in Zimbabwe is modeled on termite mounds which can maintain a stable inner temperature even when outside temperatures fluctuate between 3°C and 42°C. The building uses only 10% of the energy consumed in a conventional air-conditioned building, thus reducing energy costs and CO_2 emissions.

Losing biodiversity means losing the potential to find innovative solutions to future problems faced by humankind.

(1191)

Photos'caption:

P435 - Insectes et brouillard
Standing on its hind legs, back to the wind, this beetle captures fog moisture... imitating nature, a fog net can collect water in the Namibian Desert.
© CNRS Photothèque / DEVEZ Alain

P431 – Gekko
The paws of a Gecko have the best-known adhesive. This small reptile, the size of a lizard, can develop a force of contact of over 100 kg.
© Kellar Autumn / Lewis & Clark College-Portland

P434 - Insectes et pharmacopée
Insect *Tenebrio molitor* quickly fights microbial infection, and then, for several days, produces an antimicrobial agent. Research could be inspired for medical treatments to reduce the development of multi-resistance to antibiotics.
© CNRS Photothèque / Biogéosciences-Dijon / MORET Yannick

P433 - aile avion et ailes d'oiseau
Similar to sea birds (here, a ganet), the Airbus A350 aircraft uses alpha probes located at the nose to detect gusts ahead of the wing, which allows deployment of movable control surfaces on the wing, delivering a more efficient plane.
© GaryTack / Alamy
© Airbus, partner of UNESCO in the International Year of Biodiversity

P432 – Termitière
The University of Leicester owns a building topped by 13 feet high chimneys to ensure its air conditioning like a termite mound.
Photo by T. Berrod / Mona Lisa Production - France.

4.3 - 生物多样性与创新

什么是魔术贴，红外，声纳和自清洁表面的共同点？他们是仿生学的例子，这个集合了现代的工程师，科学家和建筑师的新兴学科，不是从天然产物中提取产品，而是用鼓舞人心的，创新和可持续的技术解决具有挑战性的问题。这对生物医药等行业，纳米技术和材料科学是非常重要的。

一些行业的灵感来自于大自然比如航空，以模仿鸟的翅膀和行为为基础：当遇到上升气流，鸟类通过调整其羽毛形状，以减少空气升力。飞机同样靠调整其机翼表面。又例如，津巴布韦的伊斯特盖特中心大楼仿照了白蚁土墩，，即使外部温度最低达到 3 ° C 最高达到 42 ° C，它仍能保持一个稳定的内部温度。该建筑的能源消耗只相当于传统空调建筑的 10%，从而降低能源成本和二氧化碳排放量。

失去生物多样性，就失去了找到人类未来面临问题的创新解决方案。

P435 –背向着风用后腿站立，甲虫这样捕捉雾中的水分...模仿自然，雾网可以收集纳米比亚沙漠中的水。

P431 -壁虎的爪子是最著名的粘合剂。这个小爬行动物，只由蜥蜴的大小，却有着超过 100 公斤的接触力。

P434 -黄粉虫遭遇微生物感染，数天后，产生一种抗菌剂。这项研究可以用于治疗减少多重耐药性的。

P433 –像海鸟一样，空中客车 A350 型飞机使用在位于机头的阿尔法探针检测阵风，帮助部署可移动控制翼面，使飞行效率增加。

P432 -英国莱斯特大学一个建筑顶上装有一个 13 英尺高的烟囱，帮助进行空气调节，像白蚁土墩。

Panel 4.4 – Biodiversity and development

Most of the world's poorest people, particularly in rural areas, depend directly on biodiversity for as much as 90% of their needs including food, fuel, medicine, shelter and transportation. Bushmeat, fish and plant products are traded to obtain such basic items as soap, clothing and school equipment. Conserving biodiversity is just one way of providing these communities with income security in the short-term, and the raw materials for development in the long-term.

Biodiversity is the basis on which to build local industries such as the perfume industry in Madagascar which uses ylang ylang, vetiver, vanilla and a local forest orchid, *Angraecum*. Losing biodiversity also means losing genetic variability in crops and livestock, which threatens the food security of one billion of the world's most vulnerable people.

It is predicted that the loss of biodiversity, the disruption in ecosystem services, and the effects of climate change will result in 200 million eco-migrants by 2050.

Biodiversity is thus an insurance policy for the world's poorest communities.

(1093)

Photos'caption :

P442 - Enfant et banane
Selling bananas in the market (Vietnam).
© IRD / FAVIER Marie-Noëlle

P441 - Femme et microcommerce
Women are often the main actors in local trade (Senegal).
© IRD / DUKHAN Michel

P444 - marché équatorien
On this important market for potatoes and a variety of vegetables, most sellers are farmers of the ethnic group Quechua (Ecuador).
© IRD / CAYRÉ Patrice

P445 - Vivre la mer
Essential for the Icelandic economy, commercial fishing is subject to quotas since 1983. Adapted to large reductions in sea catches, the population is developing innovative ways to "live the sea" (Iceland).
© CNRS Photothèque / MARIAT Emilie

P443 – Yémen
City of Hababa, a stopover for caravans. Thousand year old architecture overlooks the large tank where the population comes to draw water (Yemen).
© IRD / FAVIER Marie-Noëlle

4.4 - 生物多样性与发展

大部分的世界上最贫穷的人民，特别是在农村地区，直接从生物多样性中获取多达 90％的日常必需品，包括食物，燃料，药品，住房和交通。人们通过交易灌木果肉，鱼和植物产品，以获取如肥皂，衣物和学校设备等基本物品。保护生物多样性的仅仅为这些社区提供短期的收入保障，以及长期发展的原材料。

生物多样性是许多工业的基础，如马达加斯加的香水行业，需要依兰，香根草，香草和以及一种叫 Angraecum 的森林兰花。失去生物多样性还意味着失去了庄稼和牲畜，这威胁到世界上最贫困的十亿人口的粮食安全。

据预测，生物多样性的丧失，生态系统服务的中断，以及气候变化的影响，到 2050 年将导致 2 亿生态移民。

生物多样性因此成为世界上最贫穷的社区保险政策。

P442 -在市场上贩卖香蕉（越南）。

P441 -妇女是当地贸易的主要参与者（塞内加尔）。

P444 -在这个重要的土豆和蔬菜市场，大多数卖家都是克丘亚族农民（厄瓜多尔）。

P445 –捕鱼业是冰岛经济的基础，自 1983 年以来执行商业捕捞配额。冰岛人在发展创新的方式使“海复活”来应对海上捕捞大量减少（冰岛）。

P443 - 也门 Hababa 市，大篷车的驿站。千年古建筑俯瞰着人们用来取水的水罐（也门）。

Panel 4.5 – biodiversity and the millennium Development Goals

The Millennium Development Goals (MDGs) were established by the United Nations in 2000 to promote development by 2015 in eight specific areas of human well-being.

Ensuring environmental sustainability is Goal 7 and includes a specific biodiversity target that aims to achieve a significant reduction in the rate of biodiversity loss by 2010 – the 2010 Biodiversity Target. Biodiversity is also an important factor in achieving the other development goals.

Eradicating extreme poverty and hunger (MDG 1) depends on sustainable and productive agricultural practices, whereby crop varieties, fertile soils and abundant water provided by healthy ecosystems are available. For example, healthy mangroves and coral reefs with their biodiversity intact can provide fish to local coastal communities.

MDGs 4, 5 and 6, aim to improve health and sanitation, which require adequate supplies of clean water that can be provided from healthy ecosystems. Securing resource access and rights and recognizing the important role that women play in managing biodiversity resources, such as water and fuel woods, contributes to the empowerment of women and gender equality. (MDG3)

(1210)

Photos'caption:

P455 - enfant portant du bois
Child carrying fire-wood at the World Heritage Kuk Early Agricultural Site (Papua New Guinea).
© OUR PLACE *The World Heritage Collection*

P453 - femmes et cultures
Sustainable timber production in Giam Siak Kecil. Bukit Batu, Sumatra (Indonesia).
© Sinar Mas Forestry and Indonesian MAB Committee Programme.

P454 - prevention HIV
Campaign against AIDS organized by South African artists from "APT ARTWORKS " in 1996. Batho, Bloemfontein Township. (South Africa).
© IRD / DELIRY ANTHEAUME Elisabeth

P452 - battage du blé en Bolivie
Traditional agriculture in Bolivia.
© IRD / POUILLY Marc

P451 – Artisanat
Local crafts based on traditional natural dyes; the commercial activity generated benefits from fair-trade tourism (Togo).
© Photo by Anne BURILLE-MERET

4.5 - 生物多样性与千年发展目标

联合国千年发展目标（MDGs）建立于 2000 年，是致力于至 2015 年促进人类福祉的 8 个具体领域的发展。

确保环境的可持续发展是目标 7，包括一个具体的生物多样性目标，旨在实现在 2010 年的生物多样性丧失速度显著降低 - 2010 年生物多样性目标。生物多样性也是实现其他发展目标的重要因素。

消除极端贫困和饥饿（千年发展目标 1）关于可持续农业和生产实践，即由健康的生态系统提供的农作物，肥沃的土壤和足够的水源。例如，健康的红树林和珊瑚礁的生物多样性可为当地沿海社区提供鱼。

千年发展目标第 4，第 5 和第 6，目的是改善健康和卫生，这需要健康的生态系统提供充足清洁的水。确保诸如水和燃料等资源的使用和拥有权，承认妇女在管理生物多样性资源中发挥的重要作用，在管理诸如水和燃料森林生物多样性资源，这有助于赋予妇女更多的权力以及两性平等。（千年发展目标 3）

P455 -儿童在搬运火木在在期农业遗址（巴布亚新几内亚）。

P453 -在 Giam Siak Kecil 进行可持续木材生产。武吉峇都，苏门答腊（印度尼西亚）。

P454 -1996 年，防治组织，由“亚太艺术作品”的南非作家组织的艾滋病运动鲍托，布隆方丹乡 （南非）。

P452 -玻利维亚的传统农业。

P451 -传统的天然染料的地方工艺品; 由公平贸易旅游催生的商业活动。

Panel 4.6 - Reconciling biodiversity conservation and development

UNESCO's Man and the Biosphere Programme (MAB) launched in the early 1970s aims through the ecological and social sciences, including the knowledge of indigenous and local communities, to reconcile humans and nature by promoting sustainable development and human well-being.

The MAB programme promotes biodiversity conservation, economic and social improvement, and respect for cultural values. Sub-programmes and activities focus on specific ecosystems: mountains, drylands, tropical forests, urban systems, wetlands, island and marine and coastal ecosystems and savannas. It uses its World Network of Biosphere Reserves as vehicles for knowledge-sharing, research and monitoring, education and training, and participatory decision-making.

Biosphere reserves are 'learning sites' that innovate and demonstrate site-specific approaches to biodiversity conservation and sustainable development. They are under national sovereign jurisdiction yet share their experience and ideas nationally, regionally and internationally within UNESCO's World Network of Biosphere Reserves. There are over 550 biosphere reserves in over 100 countries.

(1187)

Photos'caption:

P461 – Canaries
Fuerteventura, an island of the Canaries archipelago, includes a wide range of ecosystems from desert or semi-desert areas to coastal and marine habitats (Spain).
© UNESCO / Cabildo de Fuerteventura

P462 – Betancuria
Betancuria which was the capital of the island until the nineteenth century, remains one of the main attractions of Fuerteventura (Spain).
© UNESCO / Cabildo de Fuerteventura

P465 – Plage_MAB - australia08
Tourism on the Fraser Island with its freshwater dune lakes, inscribed on UNESCO's World Heritage List. Great Sandy (Australia).
© Fraser Coast South Burnett Tourism

P463 –Renard
Wildlife in the lagunas of Montebello, the reserve is spread over a hydrological zone of high biological diversity (Mexico).
© UNESCO/Favio Mayorga

P464 - EEDD Allemagne
Young people at Bliesgau where the coexistence of man and nature, and the close integration with urban regions, gives this biosphere reserve its specificity (Germany).
© Biosphärenzweckverband Bliesgau

4.6 - 调和生物多样性的保护和发展

联合国教科文组织人与生物圈计划（MAB）在 70 年代初推出，旨在通过对生态和社会科学，包括土著和地方社区的知识，通过促进可持续发展和人类福祉来调和人类和自然。

人与生物圈计划促进生物多样性保护，经济和社会进步，尊重文化和价值观。分支计划以及项目的具体方案着眼于特殊的生态系统：山区，旱地，热带森林，城市系统，湿地，海岛，海洋和沿海生态系统和草原。它利用其全球生物圈保护区网络，为知识共享，研究和监测，教育和培训，以及决策参与提供载体。

生物圈保护区是通过地域针对途径维护生物多样性保护和可持续发展的创新和展示的学习地。他们打破国别的界限，在不同区域，不同国家乃至世界范围内通过联合国教科文组织世界生物圈保护区网络分享他们的经验和想法。在 100 多个国家有超过 550 个生物圈保护区。

P461 -富埃特文图，加那利群岛的一个岛屿，包括了从沙漠或半沙漠地区到沿海和海洋生境的多种生态系统（西班牙）。

P462 -贝坦库里亚而直到 19 世纪仍然一个岛国的首府，至今仍是是富埃特文图的首府的主要景点之一（西班牙）。

P465 –游客在弗雷泽岛淡水沙丘湖-联合国教科文组织世界遗产名录。（澳大利亚）。

P463 -在蒙特贝罗的拉古纳斯野生动物保护区分散在一个高生物多样性的水文区（墨西哥）。

P464 -在 Bliesgau 的年轻人与自然共存并与城市地区的紧密结合，使这个生物圈保护区的极具特殊性（德国）。

THEME 5: HOW IS BIODIVERSITY LINKED TO THE WORLD'S CULTURES?

Panel 5.1 - Links between cultural and biological diversity

Since their first appearance on Earth, humans have engaged in a creative dialogue with biological diversity. People shape and manage the living world, contributing to the diversity of its species, ecosystems and landscapes.

Cultures have in turn been shaped by their natural environments, a process that has contributed to an astounding variety of practices, ways of life and worldviews. This is particularly evident amongst indigenous and local communities, who have elaborated and continue to maintain complex systems of knowledge and practice as a result of their long-standing histories of interaction with their natural surroundings.

(685)

Photos'caption:

P514 - Art pariétal
Rock art from the World Heritage Site of Tsodilo (Botswana).
© OUR PLACE *The World Heritage Collection*

P511 - village namibien
Himba village in the region of Kaokaland (Namibia).
© Yann ARTHUS-BERTRAND / « La Terre vue du ciel » / UNESCO

P515 - recherche ethnopharmacopée Cnrs
Researcher collects the bark of a shrub rich in alkaloids (New Caledonia).
© CNRS Photothèque / SEVENET Thierry

P512 - Soins et plantes
A mother takes care of her daughter suffering from "*xooc dom*" (headache) and "*cer ke sum*" (body heat). The beverage and massage are based on different plants, including leaves of neem (*Azadirachta indica*) that cover her head (Senegal).
© IRD / LEMASSON Jean-Jacques

P513 – Hibiscus
"Bissap" (*Hibiscus sabdariffa*) is very popular in Africa. The bitter-tasting leaves and fragrant flowers are used as a food, condiment and beverage. Rich in vitamin C, the infusion is known to facilitate intestinal transit and lower blood pressure (Senegal).
© IRD / LEMASSON Jean-Jacques

主题 5：生物多样性如何与国际文化接轨？

5.1 -文化和生物多样性之间的联系

人类自出现，就与生物多样性进行着富有创造性的对话。人类勾勒和管理着生活形态，促进物种，生态系统和景观的多样性。

文化来源于自然的环境，这个过程造成了生活方式和世界观的惊人变化。土著和地方社区通过长期与自然环境互动而铸就了一个复杂的知识和实践系统， 因此它们的变化最为明显。

P514 -世界遗产的措迪罗岩石艺术（博茨瓦纳）。

P511 – 位于 Kaokaland 地区的 Himba 村（纳米比亚）。

P515 -研究人员在收集含有丰富灌木生物碱的树皮（新喀里多尼亚）

P512 -一位母亲在照顾她饱受头痛和体热折磨的女儿。饮料和按摩采用不同的植物，包括盖在她头上的印度楝树叶（印楝），（塞内加尔）。

P513 - "Bissap"（玫瑰茄）是在非洲很受欢迎。它有点苦的叶子和芬芳的花用作食品，调味品和饮料。它富含维生素 C，有利于促进肠蠕动，降低血压（塞内加尔）。

Panel 5.2 - Indigenous and local communities and their biodiversity

Indigenous and local communities play a key role in biodiversity conservation. Their territories are among the most biologically diverse on the planet. Traditional indigenous territories are estimated to cover up to 24 % of the world's land surface and contain 80 % of the Earth's remaining healthy ecosystems. Many protected areas are located on indigenous lands.

This remarkable spatial convergence is due in part to indigenous peoples actively managing the biodiversity of their lands, and protecting them from outside exploitation. This presents an enormous opportunity and a considerable challenge to conservation managers. They must learn to work with indigenous peoples as full partners and to understand and respect indigenous ways and worldviews.

(811)

Photos'caption:

P523 - pêche sur les coraux
Moken woman harvests urchins from the intertidal zone of the Surin Islands (Thailand).
© UNESCO / Narumon Hinshiranan

P521- Culture de la patate
Traditional agriculture favours biodiversity; here crops of potatoes (Ecuador).
© IRD / DANGLES Olivier

P525 – Anthropologue
Local Aboriginal authorities at work in collaboration with an anthropologist. Fitzroy Crossing (Australia).
© IRD / MOIZO Bernard

P524 - forêt sacré
The sacred forest of Kpassè (Benin) is protected from logging and over-use. It has become a recognized tourist site and cultural heritage for the people of Benin.
© CNRS Photothèque / JUHE-BEAULATON Dominique

P522 - soigneur ougandais
Plants form an important part of traditional medicines, reflected in the leaf materials gathered by an herbalist. Traditional knowledge of medicinal plants is actively sought after by scientists working on ethnopharmacology (Uganda).
© UNESCO / A. B. Cunningham

5.2 - 土著和地方社区及其生物多样性

土著和地方社区在生物多样性保护中起着关键作用。它们的领土是地球上生物多样性最丰富的地方。传统的土著领土，估计覆盖了 24%世界陆地面积却包含了 80％的地球健康的生态系统。许多保护区位于土著人的领地。

这种汇聚，部分由于土著局们积极地管理他们的土地生物多样性，并保护他们免受外来侵袭。这对保护管理者是机遇也是巨大的挑战。他们必须学会把土著居民作为正式合作伙伴，了解和尊重他们的方式和世界观。

P523 -莫肯女子在素林岛的潮间地带收获海胆（泰国）。

P521 -传统农业有利于生物多样性，这里的作物是马铃薯（厄瓜多尔）。

P525 -当地原住民政府与人类学家合作。菲茨罗伊隧道（澳大利亚）。

P524 -神圣的 Kpassè 林（贝宁）由于受到保护而免受采伐和过度使用。它已成为一个贝宁人民公认的旅游及文化遗产地。

P522 -植物是传统医药的重要组成部分，主要体现在由当地医生采集的叶片当中。类似这样的传统知识，制药认知学领域，正得到科学家更为密切的关注（乌干达）。

Panel 5.3 - Indigenous management of biodiversity

Indigenous and local communities have developed a vast array of social arrangements for biodiversity management. Indeed, virtually all modern management techniques have equivalents in traditional practice.

Sustainable harvests are ensured through social controls on the types of resources that can be taken in specific seasons or places. In some cases, indigenous management extends across entire landscapes. Examples include Australian Aboriginal use of fire to create and maintain vast habitat mosaics rich in biodiversity. Aboriginal firestick management has become part of national park policy in Australia. Forest biodiversity in Sumatra, Indonesia, is also managed by local communities, creating "agroforests" where a selection of species is carefully maintained or cultivated.

(820)

Photos'caption:

P531 - brulis Bosawas
Slash and burn agriculture was once highly criticized. Today, it is recognized that many systems of shifting agriculture contribute to the maintenance of high biological diversity. Here in the Bosawas Biosphere Reserve, Nicaragua.
© Menuka SCETBON DIDI

P532 – Atelier
Training session on the Management Plan for the Pendjari Biosphere Reserve (Benin).
© UNESCO / M. BOUAMRANE

533a - feu arborigène
The use of fire to shape savannah landscapes and heighten their biodiversity is an age-old practice mastered by numerous traditional cultures. While scientific recognition has been slow in coming, today indigenous firestick management has in some cases become part of State conservation policy.
National Park, Northern Territory (Australia),
Kruger National Park (South Africa),
Forests of Luberon (France),
Flowers after the fire (Burkina Faso).

© IRD / INTES André
533b - Kruger Park © IRD / MONTOROI Jean-Pierre
533c - brulis ONF© INRA / MAITRE Christophe
533d - Plantes perce feu © IRD / FOURNIER Anne

534 - Transmission savoir
A fisherman in Vao (New Caledonia) teaches his grandson the art of making a net using the measure "*kwa*". The wood tool gives the desired size of the mesh.
© CNRS Photothèque / LEBLIC Isabelle

5.3 - 土著管理生物多样性

土著和地方社区制定了对生物多样性管理的诸多社会安排。事实上，几乎所有的现代管理技术都等同于传统做法。

通过对特定的季节或地区资源的社会控制，确保可持续的收成。在某些情况下，土著管理横跨整个地域。例子包括：澳大利亚土著使用火来创造和维护广大栖息地丰富的生物多样性。原住民火棍的管理已成为澳大利亚的国家公园政策的一部分。印度尼西亚苏门答腊的森林生物多样性，也是由当地社区管理，通过精心选择和种植植物，创建了"农林符合"。

P531 -刀耕火种的农业曾经被严厉的指责。今天，人们认识到，转变农业机制有助于维护生物多样性。Bosawas 生物圈保护区，尼加拉瓜。

P532 -彭贾里生物圈保护区正在进行管理计划培训（贝宁）。

533a -用火来勾勒热带草原景观和提高其生物多样性的做法源于一个古老的传统文化。虽然科学认知已经慢慢实现，现在土著火棍管理已经被纳入国家保护政策。
国家公园，北领地（澳大利亚），
克鲁格国家公园（南非），
对鲁伯隆森林（法国），
火灾后，花（布基纳法索）。

533b - 克鲁格公园

533c –

533d -

534 -渔夫教他的孙子用"Kwa"编网。这个木制工具给出了网格所需的大小（新喀里多尼亚）。

Panel 5.4 - Creating diversity

Indigenous and local communities have in-depth knowledge and know-how about the living world. Their intimate understanding of genetic biodiversity has allowed them to create and maintain an astounding array of plant varieties, animal races and bacterial cultures.

Examples include the taro and yam clones that abound in Pacific horticultural gardens, the thousands of cheese types sustained around the world through the discerning application of bacteria, the hundreds of rice varieties cultivated throughout Asia. The peoples of the South American Andes are guardians of thousands of varieties of potatoes, ocas, mashuas, ollucos and quinoa.

This biodiversity serves both practical and symbolic ends. A higher diversity of crops ensures resilience and flexibility in the face of climate change, while some varieties are cultivated exclusively for use in festivities or rituals.

(895)

Photos'caption:

P541 – Vaches suisses
Cows in the Benedictine Convent of St John at Müstair, a World Heritage Site (Switzerland).
© OUR PLACE *The World Heritage Collection*

P542a - anes 1 berbère KZ02NAAC_008.tamgaly
Humans have selected by domestication, specific genetic traits favoring the emergence of distinct animal races. Here, in different World Heritage Sites:
Archaeological Landscape of Tamgaly, Kazakhstan,
Mount Athos, Greece,
Sangay National Park, Ecuador,
Tsodilo, Botswana.

© OUR PLACE The World Heritage Collection

P543 - vignes en cratère
Vineyards in La Geria Valley, Lanzarote, Canary Islands (Spain).
© Yann ARTHUS-BERTRAND/ « La Terre vue du ciel » /UNESCO

P544 - Diversité des blés_Inra - PCD8003-img0041
Overview of plots with different varieties of cereals: catalogue of varieties from soft winter wheat to barley. La Minière (France).
© INRA / FOUCHARD Marc

5.4 - 创建生物多样性

土著和当地社区对周围世界有着深入得了解和认识。他们密切的了解遗传多样性，这使他们能够创建和维护一大批植物，动物和细菌。

比如太平洋园艺园林比比皆是的芋头和山药无性繁殖，世界各地的数以千计的奶酪种类，通过细菌的应用，亚洲拥有数百个水稻栽培品种。在南美安第斯山区的人民拥有上千个品种的土豆，ocas，mashuas，ollucos 和藜。

生物多样性同时符合实际性和象征性。较高的作物多样性确保了其性对气候变化面前的适应性，而有一些种植品种是为节日或仪式专用的。

P541 牛在米斯泰尔圣约翰本笃会修道院，这里是世界遗产地之一（瑞士）。

P542a -人类已经被教化，特殊的遗传特性有利于不同种族的动物出现。在这里，在不同的世界遗产：
考古景观塔姆加雷，哈萨克斯坦，
阿索斯山希腊，
桑盖国家公园，厄瓜多尔，
措迪罗，博茨瓦纳。

P543 拉赫里亚谷的葡萄园，兰萨罗特，加那利群岛（西班牙）

P544 - 种植着不同谷物品种的田地：从软冬小麦品种目录到大麦（法国）。

Panel 5.5 - Biodiversity, ecosystems and worldviews

The worldviews of many indigenous peoples are founded upon relationships of reciprocity and respect that traverse the boundaries between people and nature, and interlink ecosystems and social systems. This fundamental difference from "Western" conservation philosophies, which tend to separate humans and nature, deserves recognition as a pathway towards successful collaborative ecosystem management.

Landscapes reflect the human relationships and attachments that create them. Local communities may confer special status on animal and plant species, mountains, lakes or forest groves by identifying them as sacred sites. These sacred places, protected by local custodians, often become islands of high biodiversity in otherwise degraded environments. They may serve as important reservoirs of genetic and species diversity, which can help protect ecosystems from future environmental degradation.

(936)

Photos'caption:

P551 – Mentawai
The "flower people" of the island of Siberut, located to the west of Sumatra, live in close symbiosis with the forest. Their lifestyle is a successful adaptation to a harsh environment.
Photo by Anna CLOPET

P555 - Baobab
In Africa, the palaver tree is a sacred tree, whose wood, bark, leaves, fruits and seeds serve many uses (Senegal).
© IRD / LEMASSON Jean-Jacques

P553 – Tapisserie
The Gabba is a fascinating and decorative embroidered tapestry depicting scenes of everyday life and the rich biodiversity heritage of Pakistan.
© SCBD, Museum of Nature and Culture (Montreal)

P554 - culture inca en terrasse_Cnrs - 2007n00366
Presumed to have been an early site of agricultural research where the Incas experimented with plants brought from throughout their empire, the terraces of Moray are being restored, with new experiments, here on quinoa (Peru).
© CNRS Photothèque / THERY Hervé

P552 - Tabu leaf
A tabu leaf indicator at Lamen Bay (Vanuatu) signifies that an area is closed to fishing due to the death of a clan member. There is a wide range of cultural practices relating to natural resource use across the Pacific.
© Francis R. HICKEY

5.5 - 生物多样性，生态系统和世界观

许多土著人民的世界观是建立超越了人与自然界限的互惠和尊重的基础上的，连结了生态系统和社会制度。这种世界观是与"西方"试图分隔人类与自然的理念大相径庭，是一种值得肯定的合作生态系统管理的成功途径。

地域反映了人与人之间的关系。当地社区可赋予某种动物或植物，山脉，湖泊或森林园特殊的地位，确定他们为圣地。这些神圣的地方，由当地保管人保护，往往成为高生物多样性或环境退化的孤岛。它们可作为重要的基因和物种多样性的储备库，它可以预防生态系统未来的环境退化。

P551 - 苏门答腊西部的西比路岛的"花人"，生活在丛林深处。他们的生活方式是一个成功适应恶劣环境的典范。

P555 -在非洲，洽谈树是一种神圣的树，其木材，树皮，叶，果实和种子都有许多的用途（塞内加尔）。

P553 -加巴是一种迷人的装饰刺绣挂毯，描绘了巴基斯坦人民的日常生活和丰富的生物多样性。

P554 – 马里的梯田被推断为印加人进行早期植物实验和农业研究的场所，最近，这里重新开展了藜作物的试验。（秘鲁）。

P552 -拉明湾的禁止标志，表明这里由于一位成员死亡禁止捕鱼（瓦努阿图）。在太平洋地区天然资源的使用与文化习俗有广泛的联系。

Panel 5.6 - biodiversity and languages

Nearly half of the 7000 languages spoken in the world today are in danger of disappearing during this century. Languages are vehicles for knowledge transmission, but they also demonstrate the way the speaker views and understands the world. Useful and meaningful knowledge of biodiversity may be carried in complex terminology that will be lost when a language dies.

By monitoring the vitality and diversity of indigenous languages, we may be able to identify trends in traditional knowledge relevant to biodiversity conservation. There is a visible overlap between the global mapping of the world's areas of biological "megadiversity" and areas of high cultural and linguistic diversity. For example, in 9 countries, which together account for 60 % of human languages, 6 of these are centres of cultural diversity and contain exceptional numbers of unique plant and animal species.

Since 2002, the status and trends in the numbers of speakers of indigenous languages and linguistic diversity has been designated as a 2010 Biodiversity Target Indicator in the framework of the Convention on Biological Diversity.

(1137)

Photos'caption:

P561 - Enseignement en tifinag
Education of children in the Berber language, Tifinagh, is provided by elders, while instruction in Arabic is provided by a local scholar at a school in a camp in the region (Niger).
© IRD / BERNUS Edmond

P562 - Plantes thérapeutique
Small market of medicinal plants in the region of La Paz during a festival of traditional products (Bolivia).
© IRD / JÉGU Michel

P563 - Guerrisseuse Nganga
A "Nganga" healer displaying the implements she uses in rituals (Congo).
© IRD / KATZ Esther

P565 - Caméléon protecteur
The chameleon, an emblematic animal for the Bassari group in Senegal. Tradition recognizes its power to change color to protect itself. Benefiting from their protection, the Bassari people take care not to kill them.
© IRD / BARRIÈRE Olivier

P564 - Chasseur de Sibérut
Preparation of poison for use with hunting weapons on the island of Siberut (Indonesia).
© IRD / FORESTIER Hubert

5．6 生物多样性和语言

几乎在当今世界上所讲的 7000 种语言中有一有在本世纪消失的危险。语言是传播知识的载体，也表明了说话者的观点和世界观。有用而且意义丰富的生物多样性知识，可能需要通过复杂的术语来表达，因此有可能随着一种语言的消亡而消失。
通过监测和土著语言的多样性，我们也许能够确定传统知识相关的生物多样性保护的趋势。世界"高生物多样性极"的区域和高文化及语言多样性地域是明显重叠的。例如，在使用占世界上语言种类 60%的 9 个国家，这些地区同时也是文化多样性中心，同时生长着的许多特殊动植物种类。

自 2002 年以来，土著语言使用者的和语言的多样性的数量和趋势已被指定为 2010 年生物多样性框架公约生物多样性目标的指标。

P561 -老人用柏柏尔语提非纳文给儿童上课，当地的学者在帐篷里用阿拉伯语教学（尼日尔）。
P562 -拉巴斯的传统节日集市里的药用植物市场（玻利维亚）。
P563 -一个"恩甘加的"医生在展示她在仪式中使用的工具（刚果）
P565 -变色龙，塞内加尔 Bassari 族的象征动物。它们改变颜色来保护自己。因此受到启发的 Bassari 人从不捕杀变色龙。

P564 - 西比路岛上，人们正在制作用于狩猎的毒药（印度尼西亚）。

THEME 6: WHAT CAN WE DO TO HALT BIODIVERSITY LOSS?

Panel 6.1 – <u>The Convention on Biological Diversity,</u>

At the 1992 Earth Summit in Rio de Janeiro, world leaders agreed on a comprehensive strategy and the legal instruments needed to achieve "sustainable development". One of the key instruments established at Rio was the Convention on Biological Diversity (CBD) which has three main objectives:
- the conservation of biological diversity;
- the sustainable use of its components;
- the fair and equitable sharing of the benefits from the use of genetic resources.

Today, the CBD has near universal acceptance around the world. Over 190 countries and one regional economic organization have ratified the Convention, but it is not uniformly implemented. The goal is to integrate the three main objectives into decision-making, not only in environment ministries, but also across all sectors of national government and relevant stakeholders.

In 2000, the CBD adopted a supplementary agreement known as the Cartagena Protocol on Biosafety which seeks to protect biological diversity from the risks posed by living modified organisms. It does this by creating the conditions to ensure that countries are provided with adequate information to make informed decisions about the transboundary movement of living modified organisms.

(1219)

Photos'caption:

P611 - marché flottant
Floating market of Can Tho, Mekong Delta (Vietnam).
Photo by BURILLE Vincent

P612 - réserve flickr.andriesoudshoorn 03
Protected as a Ramsar Wetland of International Importance, the National Park of Lake Nakuru (Kenya).
© Flickr.com / Andriesoudshoorn

P614 - Graine Ird – 00008433
Fruits of "*Aframomum*" (*Zingiberaceae*) in the Mayombe forest (Congo).
© IRD / KATZ Esther

P613 légende commune
To identify a specie is not always easy…
Anthurus archeri or *Clathrus archeri*? Abanqueiro, Galicia (Spain).
Pink flamingos "*Phoenicopterus sp.*" at the menagerie of the Museum of Natural History (Paris).
Poppy flower "*Papaver sp.*" in a private garden in Montreal (Canada).

© Flickr.com / Chausinho, © Mateusz Bański / SCBD, © Mateusz Bański / SCBD

P615 - Reserve Biosphere
The Archipelago Sea Biosphere Reserve, a brackish water environment, includes a shallow sea area with about 41 000 rocky islands and islets. Today, approximately 1200 people live permanently in the biosphere reserve (Finland).
© Archipelago Sea Biosphere Reserve

主题 6：我们能做些什么，制止生物多样性的损失？
小组 6.1 - 关于生物多样性公约
在 1992 年地球首脑会议在里约热内卢，世界各国领导人商定了一项全面的战略，需要实现"可持续发展"的法律文书。在里约确定的主要手段之一是生物多样性公约（CBD），其中有三个主要目标公约：
- 生物多样性的保护;
- 其组成部分的可持续利用;
- 从遗传资源的利用的惠益得到公平和公正地分享。

今天，生物多样性公约已接近全世界普遍接受。 190 多个国家和一个区域经济组织批准了公约，但它并不是统一执行。我们的目标是要纳入决策的制定，不只是在环境部的三个主要目标，而且还跨越国家政府和有关各部门的利害关系方。

2000 年，生物多样性公约通过了一项补充协议称为卡塔赫纳生物安全议定书的旨在保护改性活生物体生物多样性构成的风险。它通过创造条件，以确保各国有足够的资料，使本通知有关改性活生物体的越境转移的决定。

P611 -芹苴的水上市场，湄公河三角洲（越南）。
图片由 BURILLE 文森特

P612 -纳库鲁湖国家公园的拉姆萨尔湿地极俱保护意义（肯尼亚）。

P614 - 马永贝森林的"Aframomum" 果（姜科）（刚果）。

P613 要确定一个物种并不总是容易...
Abanqueiro，加利西亚（西班牙）。
粉红色的火烈鸟在自然历史博物馆动物展区（巴黎）。
生长在蒙特利尔一个私人花园的罂粟花（加拿大）。

P615 -一个包括约 41 万个岩石岛屿和小岛浅海海域的群岛海域生物圈保护区，苦咸水环境。目前，大约有 1200 人长期生活在生物圈保护区（芬兰）。

Panel 6.2 - Financing biodiversity

In order to achieve the three objectives of the Convention on Biological Diversity (CBD) and the 2010 Biodiversity Target, it is estimated that funding of between 10 to 50 billion US dollars per year will be needed.

The Global Environment Facility (GEF), the financial mechanism of the CBD supports developing countries and transition economies to fulfil their commitments to the CBD. The GEF has provided US$ 2.8 billion in grants and attracted US$7.6 billion more from other sources in support of 750 biodiversity projects in 155 countries. It has invested over US$ 1.5 billion in the creation and management of 2 300 protected areas covering 632 million hectares and supported 100 million hectares of land outside protected areas to advance biodiversity conservation. The GEF supported projects has helped countries to incorporate biodiversity conservation into national plans, including agriculture, fisheries, and forestry sectors. With the GEF funding, more than 122 countries improved their biosafety capacities.

Countries and concerned organizations are also encouraged to explore new and innovative financial mechanisms to reduce the financial gaps that we face today.

(1196)

Photos'caption:

P621 - blé indien
Man walking along a wheat field (India).
© Flickr.com / Andriesoudshoorn

P664b – Waterhole in Etosha
The GEF supported project in Namibia has contributed to strengthen the national protected areas system. Waterhole in the renowned Etosha National Park (Namibia).
© GEF / J. SNEESBY and B. WILKINSON

P642b – Wheat Tsideli Doli
In Georgia, the GEF supported project has contributed to conserve its agro-biodiversity while increasing income of farmers. Fields of wheat Tsideli Doli (Georgia).
© ONG Elkana, Georgia

P652 – Indian peppers
The GEF supported project in India helps build the nation's capacity to implement measures for adequate access and benefit sharing from biodiversity. Sun-drying red peppers in India.
© GEF / CARNEMARK Curt

P625 - deal de nid d'hirondelle
Trading birds'nests in Sumatra; development projects around non-timber forest products often have conflicting objectives.
© IRD / KUHN Christophe

6.2 – 为生物多样性融资

为了实现生物多样性公约（CBD）的三大目标和 2010 年生物多样性目标，每年将需要 100 至 5000 亿美元的资金。

全球环境基金（GEF）帮助发展中国家和经济转型国家在履行其生物多样性公约的承诺。全球环境基金提供了 28 亿美元，并且从其它渠道融资 76 亿美元用以资助 155 个国家开展的 750 个生物多样性项目。共有 15 亿美元用于建设和管理 2300 个保护区，保护面积达 6 亿 3 千 2 百万公顷，并在保护区外的 1 亿公顷土地上开展生物多样性保护。全球环境基金支持的项目已帮助各国将生物多样性保护纳入各国的国家计划，覆盖的领域包括农业，渔业和林业。借助全球环境基金的资金，超过 122 个国家提高了生物安全能力。

我们也希望有关国家和组织积极探索新的创新的金融机制以减少我们今天所面临的财政缺口。

P621 -男子在麦田边散步（印度）。

P664b-全球环境基金支持纳米比亚项目有助于加强国家系统保护区。霍尔在著名的埃托沙国家公园（纳米比亚）。

P642b -在格鲁吉亚，全球环境基金支持的项目作出了贡献，以保护农业生物多样性，同时增加农民收入。小麦田 Tsideli Doli（格鲁吉亚）。

P652 -全球环境基金支持的项目帮助印度建设国家的能力，以推行适当的措施，获取和利益分享生物多样性。晒在印度红辣椒。

P625 -交易 birds'nests 在苏门答腊，大约非木材林产品发展项目往往相互冲突的目标。

Panel 6.3 – To expand and to strengthen protected areas

Protected areas are havens for biodiversity and an effective method for its conservation. These are forests, mountains, wetlands, grasslands, deserts, lakes, rivers, coral reefs, and oceans that are managed to maintain biodiversity. Protected areas are managed for multiple, yet compatible uses, including biodiversity conservation, recreation, tourism, watershed protection, sustainable forestry, hunting or fishing, scientific research, and environmental education. Over 108 000 protected areas in the world support livelihoods and the economies of local communities. Nearly 1,1 billion people depend on protected forest areas for their livelihoods.

The Convention on Biological Diversity Programme of Work on Protected Areas is a comprehensive framework for the establishment of protected area systems.

The GEF has been recognized for its substantive contribution to the global achievement of the 10 % target of the world's land area under protection. For instance, with the support of the GEF, Namibia has increased government financing for the protected areas system by more than 300 %, based on the favorable return on investment achieved through nature-based tourism. Capacity for protected area management has been strengthened and gaps in geographic coverage of important ecosystems filled.

(1219)

Photos'caption:

P631 - Paysage arbuste
A fascinating view of the Sperrgebiet National Park (Namibia). One of the last remaining wilderness areas on the Earth, protected thanks to the efforts of the GEF and the Government of Namibia. www.span.org.na
© GEF / Coleen Mannheimer

P635 - Héron cendré du Djoudj
Important wetland south of the Sahara, the Djoudj National Bird Sanctuary Park was declared World Heritage by UNESCO and protected as a Ramsar Wetland of International Importance.
© IRD / LEMASSON Jean-Jacques

P633 - Réserve lémuriens
Near the town of Ambalavao, Andja Park was created by an association of farmers for the preservation of lemurs (Madagascar).
© IRD / BLANCHON Patrick

P634 - terrier hyènes
Inspecting hyenas burrows in the Hwange National Park in Zimbabwe.
© CNRS Photothèque / HERD / DEBIAS François

P632 - Oryx
Protected areas, such as parks and nature reserves, are havens for biodiversity and an effective method for its conservation. Well adapted to the desert, an oryx among the dunes in the Namib-Naukluft National Park (Namibia).
© GEF / Midori Paxton

6.3 - 扩大和加强保护区

保护区是生物多样性的庇护所并为其提供有效保护。通过对森林，山岭，湿地，草原，沙漠，湖泊，河流，珊瑚礁和海洋的管理，来保持生物多样性。保护区管理的目，包括生物多样性保护，娱乐，旅游，流域保护，可持续林业，狩猎或捕鱼，科学研究和环境教育等，兼容并蓄。世界上超过 10 万 8 千个保护区，支持着当地社区的生计和经济。近 11 亿人的生计依靠森林保护区。保护区的生物多样性公约对是建立全面的保护区制度的框架。全球环境基金资助的项目已经超过 10%的陆地保护面积，他的贡献被广泛认可。例如，在全球环境基金的支持下，纳米比亚已经通过投资生态旅游，增加了 300%的财政收入。保护区管理能力得到加强，重要生态系统的地理间隙得到了补充。

P631 –在全球环境基金和纳米比亚政府的共同努力下，Sperrgebiet 国家公园展现着迷人风景。它是地球上所剩无几的野生保护区（纳米比亚）。

P635 -撒哈拉以南的重要湿地-Djoudj 国家鸟类保护区公园被联合国教科文组织宣布为世界遗产，它是具有国际意义的拉姆萨尔湿地。

P633 安巴拉沃镇附近的 Andja 公园是由一个农民协会为保护狐猴发起（马达加斯加）。

P634 -津巴布韦万盖国家公园的鬣狗穴。

P632 -保护区，如公园和自然保护区，是生物多样性的庇护所并为其提供有效的保护。一只在沙丘中的羚羊显然已经适应了沙漠，纳米布- Naukluft 国家公园（纳米比亚）。

Panel 6.4 – Biodiversity sustainable use

The United Nations Food and Agriculture Organization estimates that at least 40 % of our global economy is based on the use of biological resources. Sustainable use is a valuable tool to promote conservation of biodiversity, since in many instances it provides incentives for conservation and restoration because of the social, cultural and economic benefits that people derive from it.

For example, Georgia has over 350 local species of grain crops, more than 100 species of fruit-trees, nuts and wild berries, and 500 local varieties of grapes. During the past century, introduction of modern agriculture practice replaced diversified agricultural production. As a result, the cultivation of many valuable local plant varieties has been abandoned, with the loss of important native cultivars. With the support of the GEF, farmers in Georgia have resumed the use of local plant varieties, and in the process increased their income. Local farmer cooperatives have been formed to distribute seeds of local varieties which are more pest resistant and nutritious, adding to their market and consumer appeal. Diversified crop production will also ensure that crops are better adapted to climate change.

(1207)

Photos'Caption:

P641 - Bouquet of native Georgian crops.
Recovery, conservation, and sustainable use of Georgia's agrobiodiversity, GEF grants near US$ 0.9 million, cofinances US$ 1.7 million. Cluster of cereal crops with local varieties from Georgia.
© ONG Elkana, Géorgie

P642 légende commune
Thanks to GEF support, farmers in Georgia cultivate local diversified plant varieties which are more pest resistant and nutritious, adding to market and consumer appeal, and thus increasing their income (Flax and horse bean seeds).
© ONG Elkana, Géorgie

P645 - Big horn sheep
The protection of a natural site opens up new and increasing economic opportunities, like ecotourism. Bighorn sheep in Waterton Biosphere Reserve (Canada).
© UNESCO / G. PECH

P644 - EEDD Russie
Russian pupils in the Biosphere Reserve of Prioksko-Terrasnyi.
"In the end we will conserve only what we love. We love only what we understand. We will understand only what we are taught."
Baba Dioum, Senegalese environmentalist.
© Prioksko-Terrasnyi BR

6.4 - 生物多样性的可持续利用

联合国粮食和农业组织估计，至少有 40％的全球经济是以生物资源为基础。可持续利用是促进生物多样性保护的一个有效的工具，因为它创造的社会，文化和经济价值激励人们对它进行保护和修复。
例如，格鲁吉亚已拥有超过 350 个当地粮食种类，100 个当地水果，坚果和野生浆果种，以及超过 500 个本地葡萄品种。在过去的世纪，现代农业的做法被引入农业生产。因此，许多宝贵的当地植物品种的种植已被放弃，这是原生品种的重大损失。通过全球环境基金的支持，格鲁吉亚的农民已恢复了当地植物品种的种植，并在此过程中增加了收入。当地的农民合作社已经分发了具有抗虫性以及更高营养价值的植物种子，增加他们对市场和消费者的吸引力。多元化作物生产也将确保农作物更好地适应气候变化。

P641 - 全球环境基金捐赠了近 90 万美元，并融资 170 万美元用以恢复，保护，和保持格鲁吉亚的农业生物多样性。格鲁吉亚当地的谷类作物。
P642 全球环境基金的支持下，格鲁吉亚当地农民培育多元化的植物品种，更抗虫害和营养，增加市场和消费者的吸引力，从而增加他们的收入（亚麻和蚕豆种子）。
P645 -生态旅游为自然保护区开辟了新的经济机会。大角羊沃特生物圈保护区（加拿大）。
P644 -在 Prioksko - Terrasnyi 生物圈保护区的俄罗斯学生。
"最后，我们将只保存我们所爱的。我们爱我们所理解的。我们理解我们被传授的。"

Panel 6.5 – For fair and equitable sharing of benefits

Genetic resources of plants, animals, fungi, and microorganisms can be used for variety of purposes, including medicines and cosmetics. Monetary benefits include royalty payments, access fees or joint ownership of intellectual property rights. Non-monetary benefits include training and education, research and development results, or the transfer of technology.

The third objective of the Convention on Biological Diversity, the Bonn Guidelines and the proposed international regime on Access and Benefit Sharing (ABS) encourage users and providers of genetic resources to share access to, and benefits from their use in an equitable and fair way.

Users of genetic resources should seek the prior informed consent from, and negotiate the terms and conditions with, the provider country for their use. Provider countries should create conditions to facilitate access to their genetic resources for environmentally sound uses.

The GEF supports a project in India to promote access and benefit sharing of genetic resources from biodiversity by establishing laws and procedures under India's National Biological Diversity Act. India will determine how access to, and benefits from, genetic resources are to be managed by providing incentives for its conservation.

(1297)

Photos'caption:

P657 - India
Strengthening the implementation of the biological diversity act and rules with focus on its Access and Benefit Sharing provisions, GEF grants US$ 3,5 million in Índia and cofinances US$ 6,2 million. Vegetable seller on the market of Hassan (India).
© IRD / LÉVÊQUE Christian

P655 - ressources génétique
Well-adapted to the Andean climate, potatoes, ocas, ollucas and other tuberiferous crops offer many genetic resources (Peru).
© UNESCO / BENAVIDES Claudia

P653 - fleur indienne
Flowers and spices market in India
© GEF / CARNEMARK Curt

P658 – Pois de Job
Focus on the peas "Job's Tear" (*Coyx lacrimajobi*). These peas are grown in India and Asia for several millennia. Dried, they are used for making necklaces; consumed, they have anti-diabetic properties, creating a market for them in U.S.
© IRD / CAYRÉ patrice

P624a - manioc encapsulé
Gene banks are needed for biodiversity conservation policies; here, a meristem of cassava encapsulated and in vitro (Montpellier).
© IRD / RIVAL Alain

6.5 - 公正和公平地分享惠益
植物，动物，真菌和微生物的遗传资源有很多用途，包括药品和化妆品。货币的收益包括专利费，知识产权的使用和所有权收益。非货币性收益，包括培训和教育，研究和开发成果，或技术转让。
生物多样性公约的第三项内容-波恩准则以及建议建立的使用和利益分享的国际机制（ABS），鼓励使用者和遗传资源提供者用平等的方式共享资源极其收益。

基因资源的使用者应事先征得提供国家的同意，并就使用条件和细节进行沟通。提供国家应该创造条件，为良好的使用其基因资源提供便利。
全球环境基金帮助印度通过立法和建立司法程序获得和共享生物多样性基因资源的收益。印度将通过奖励保护者的方式来管理基因资源的使用和收益。
P657 -全球环境基金提供了 350 万美元并协助融资 620 万美元帮助印度加强生物多样性，以及强化基因资源获取和利益分享的规则（印度）。

P655 –已经适应了安第斯气候土豆，ocas，ollucas 和其他块茎作物提供了许多基因资源（秘鲁）。
P653 -印度的鲜花和香料市场
P658 –这种叫"工作的泪"（Coyx lacrimajobi）的豌豆，在印度和亚洲生长了几千年。它们干燥后可以用于制作项链，它们还具有抗糖尿病的性能，并已经在美国打开了市场

P624a -基因库对生物多样性保护政策是很重要的，在这里，一个封装木薯的分生组织（蒙彼利埃）。

Panel 6.6 - Future Directions

You are an integral part of nature, and your fate is intimately linked to biodiversity to provide you with food, water, fuel, medicine and life's other essential services. Yet this rich diversity is being lost at an alarming rate due to human activities. The Earth's life support system, on which we depend, is weakening its ability to respond to such threats as climate change, biodiversity loss and desertification.

2010 is the International Year of Biodiversity. We have to work to reduce biodiversity loss.

Actions around the world include:
Inspired by the success of the Intergovernmental Panel on Climate Change (IPCC) in raising awareness about climate change, governments are now considering the creation of an **Intergovernmental Platform on Biodiversity and Ecosystem Services (IPBES)** to evaluate biodiversity loss and its impact on ecosystem services and human well-being and as an aid to decision-making.

The **Lifeweb Initiative** of Germany is mobilising resources for the creation of protected areas worldwide.

In 2010, governments will agree on the new strategic plan for the CBD, and set new targets to ensure that biodiversity is protected for human well-being, and to buffer the impacts of climate change.

(1228)

Photos'caption:

P661 - Imaginer
"To imagine" – Here, an innovative building in the Prefecture of Fukuoka (Japan).
© Flickr.com / Sebke Fukuoka

P666 - Cultiver
"To grow" - Rape fields near Regensburg, Bavaria (Germany).
© Flickr.com / Christianabe

P654 Nudibranch
"To study" - The diversity of coastal reefs offers a potential genetic resource. Nudibranch "*Hypselodoris apolegma*", Okinawa Prefecture (Japan).
© Flickr.com / Pacificklaus

P662 – légende commune
On the UNESCO Palawan Biosphere Reserve (Philippines):
"To strenghten" - Culture of plants to consolidate the mangrove.
"To act" – Cleaning the beaches.
© UNESCO / BEQUETTE France

P664 Sensibiliser
"To raise awareness" - Walkers in the Picos de Europa National Park, a Biosphere Reserve, Asturias (Spain).
© Pico de Europa, Biosphere Reserve

6.6 - 未来的方向

你是自然的一个组成部分，你的命运与生物多样性密切相关，它提供了食物，水，燃料，药品和生活的其他基本服务。然而，这种丰富的多样性由于人类的活动正在以惊人的速度消失。地球的生命支持系统，是我们赖以生存并应对气候变化的重要依靠，生物多样性丧失和荒漠化等威胁的能力正在被削弱。

2010 年是国际生物多样性年。我们必须努力减少生物多样性的丧失。

世界各地的行动包括：

联合国政府间气候变化专门委员会（IPCC）号召提高对气候变化的认识，政府正在考虑搭建一个生物多样性和生态系统服务政府间平台（IPBES），以评估生物多样性的丧失和以其对生态系统服务和人类福祉的影响，并辅助政策决定。

德国 Lifeweb 倡议为建立全球保护区调动资源

2010 年，政府将为 CBD 确定新的战略计划，以确保生物多样性对人类福祉的保护，缓冲气候变化的影响。

P661 - “想像” -福冈县的一个创新建筑（日本）。

P666 - “成长” - 雷根斯堡附近的油菜田，巴伐利亚州（德国）。

P654 “学习” - 沿海珊瑚礁的生物多样性拥有潜在的基因资源。裸鳃“Hypselodoris apolegma”，冲绳县（日本）。

P662 -教科文组织巴拉望生物圈保护区（菲律宾）：

“加强” -巩固红树林的植物文化。

“行动” - 清洁海滩。

P664 “为了提高人们的认识” - 在皮科斯代欧罗巴国家公园生物圈保护区散步的人，阿斯图里亚斯（西班牙）。

THEME 7: WORLD HERITAGE (and the International Year of Biodiversity)

Panel 7.1 - <u>Caring for our World Heritage</u>

The concept of World Heritage is based on the conviction that certain sites in the world are of such outstanding universal value that they form part of the common heritage of humankind and thus require international protection. The World Heritage Convention is the only international legislative instrument that regularly monitors sites to ensure integrity, protection, and management. The World Heritage Committee has the intergovernmental mandate to intervene and plays an essential role in biodiversity protection.

Four criteria cover natural sites [(vii)(viii)(ix)(x)] with two specific biodiversity-related criteria:
Criterion (ix) refers to significant ongoing ecological and biological processes,
Criterion (x) refers to biodiversity conservation and their associated threats.

Today, 201 natural and mixed World Heritage sites in 81 countries protect over 177,000,000 ha of land and sea, or about half the size of Europe! Many of the World Heritage sites are situated in biodiversity hotspots or regions.

(1040 characters)

Légende des photos

P711 – Bird species
The New Zealand Sub-Antarctic Islands have a high level of biodiversity, wildlife population densities and endemism. [criteria (ix)(x)]
© M&G Therin-Weise

P714 – World Heritage sites and biodiversity Hotspots
Presence of World Heritage sites in the world's biodiversity hotspots and regions
© United Nations Environment Programme World Conservation Monitoring Centre (UNEP-WCMC)

P713a à P713e – Good reasons to care
Five good reasons to care. From L to R:
Lagoons of New Caledonia (France) [criteria (vii)(ix)(x)]; Komodo National Park (Indonesia) [criteria (vii)(x)]; West Norwegian Fjords – Geirangerfjord and Nærøyfjord (Norway) [criteria (vii)(viii)]; Shiretoko (Japan) [criteria (ix)(x)]; East Rennell (Solomon Islands) [criterion (ix)].
© UNESCO/Jacques Blanchard
© OUR PLACE The World Heritage Collection
© UNESCO/Lars Løfaldi
© Ministry of the Environment, Government of Japan
© UNESCO/Ryan Paddy

P712 – Giant Panda
The Giant Panda: an emblematic symbol for biodiversity protection. Sichuan Giant Panda Sanctuaries (China). [criterion (x)]
© UNESCO/Haixiang Zhou

主题七：世界遗产（以及国际生物多样性年）
7.1 - 我们的世界遗产关怀
世界遗产是指，在世界上的一些地区为人类共同遗产的形成贡献了突出的价值，因此需要国际保护。世界遗产公约是唯一的国际法律文书，定期监测并确保遗产地的完整性，及相关保护和管理工作。世界遗产委员会依照国际社会授权，对遗产保护进行必要的干预，对生物多样性保护起着至关重要的作用。

4 个有关自然遗产的标准 [（七）（八）（九）（十）]，其中两个是生物多样性相关的标准：
标准（九）是指开展大量的生态和生物过程，
标准（十）是指对生物多样性的保护及其相关的威胁。

今天，201 个世界自然和文化混合遗产保护地覆盖了 81 个国家超过 1.77 亿公顷的的陆地和海洋面积，约等于半个欧洲！许多世界遗产地的位于生物多样性热点区域。
P711 -新西兰的亚南极岛屿的生物多样性程度高，野生动物数量和种类也很丰富。 [标准（九）（十）]
P714 –许多世界遗产位于世界生物多样性热点地区
P713a à P713e -五大保护原因。从左至右：
泻湖新喀里多尼亚（法国）[标准（七）（九）（十）];科莫多国家公园（印度尼西亚）[标准（七）（十）];西挪威峡湾 - 峡湾和纳柔依峡湾（挪威）[标准（七）（八）];知床半岛（日本）[标准（九）（十）];东伦内尔岛（所罗门群岛）[标准（九）]。
P712 -大熊猫：保护生物多样性的象征符号。四川大熊猫栖息地（中国）。

Panel 7.2 - <u>Living with threats, coping with change</u>

With environmental issues and crises affecting biodiversity, whether it's climate change, deforestation or invasive species, we could easily feel helpless**.** Fortunately, the UNESCO World Heritage Centre, as Secretariat to the World Heritage Convention, acts on information gathered from monitoring missions, periodic reports, NGOs or even unsolicited reports to engage with governments and help tackle threats to World Heritage sites.

The List of World Heritage Sites in Danger is an instrument used in the preservation of sites: it helps raise the political profile and encourages greater financial and technical investments. Climate change for example (together with other stress factors) may eventually undermine the characteristics of a site, affecting its natural significance and integrity, and thus its outstanding universal value.

The widespread appreciation of listed sites can attract media attention and galvanize public support both nationally and worldwide to greater impact.

(1025 characters)

Photos'caption:

P721 – Gorilla
World Heritage in Danger: loss of habitat, poaching and armed conflict threaten the mountain gorilla in Virunga National Park (Democratic Republic of Congo).
© Juan Pablo Moreiras

P725 – graphique State of conservation
Percentage of properties affected by each primary group of threats (in 2008 and 2009)
Source: Analytical summary of the state of conservation of World Heritage properties: Main threats affecting the properties. Trends for 2008-2009

P722 – Delta du Gange
The effects of climate change are being felt in The Sundarbans (Bangladesh) with rising sea levels and habitat loss.
© USGS EROS, NASA Visible Earth

P723 – Kilimanjaro
The combined effect of global climate change and changes in local practices have caused an 82% reduction of the Mt. Kilimanjaro ice-cap (United Republic of Tanzania). In 1993 and 2002.
© NASA/Goddard Space Flight Centre

P724 – Oryx
The Arabian Oryx Sanctuary (Oman) is one of only two delisted sites (the other being the cultural site of the Dresden Elbe Valley, Germany). The protected area had been reduced by 90%.
© UNESCO/Marc Patry

(1080 characters)

面板 7.2 – 面对威胁，应对变化
环境问题和危机的影响着生物多样性，无论是气候变化，森林砍伐或入侵物种，我们很容易感到无助。幸运的是，联合国教科文组织世界遗产中心，作为世界遗产公约秘书处，承担着从监测，定期报告，并从各国政府和非政府组织组织收集信息，开展合作，共同应对世界遗产地所面临的威胁。
世界遗产濒危名单是一种保护工具：有助于提高遗产地的政治关注度，以及吸引更多的资金和技术投资。例如气候变化（连同其他因素）可能最终破坏遗产地的特点，影响其自然意义和完整性，甚至它具有的突出价值。
名单的推广能够吸引媒体的广泛关注，能对本国乃至全世界的公众起到更加深远的影响。

P721 -世界濒危遗产：在维龙加国家公园山地大猩猩饱受栖息地丧失，偷猎和武装冲突的威胁（刚果民主共和国）。
P725 –遗产地每一种特性所占比例受到基本威胁所影响在 2008 年和 2009 年（受影响物业的百分比）
P722 -气候变化导致孙德尔本斯的海平面上升和栖息地丧失（孟加拉国）。
P723 –受到全球气候以及当地习俗的综合影响，乞力马扎罗山的冰盖已经减少了 82％。（坦桑尼亚联合共和国）。在 1993 年和 2002 年。
P724 -阿拉伯大羚羊保护区（阿曼）是仅有的两个被除名的保护区之一（另一个是在德累斯顿易北河谷，德国）。该保护区的面积已被减少了 90％。

Panel 7.3 - <u>Forging partnerships for biodiversity</u>

Cooperation with governments, international institutions, NGOs and private corporations is crucial to safeguard World Heritage. In a sense, the universality of this common heritage is driving the global community to act for biodiversity's sake, and ultimately our own. This worldwide campaign is essential in order to achieve the 2010 Biodiversity Target; work that cannot be accomplished without unified action.

The World Heritage Partnerships for Conservation Initiative, launched in 2002, involves more than 70 partners; all adhere to the universal principles of the UN Global Compact.
Cooperation exists on an advisory or technical capacity with IUCN, UNDP-GEF, and other Multilateral Environmental Agreements including the Biodiversity Liaison Group, or financial, by diversifying funding sources.

The World Heritage Education Programme targets youth with projects such as the *World Heritage in Young Hands* Resource Kit (in 32 languages) and the *Patrimonito* cartoon series (8 episodes).

(1027 characters)

Photos'caption:

P735 – Patrimonito
A scene from episode 7. "Patrimonito in Australia: Climate Change and the Great Barrier Reef"
© UNESCO

P731 – Tubbataha
Watch makers Jaeger-LeCoultre and The International Herald Tribune show their committment to the World Heritage Marine Programme. The Tubbataha Reef Marine Park (Philippines) received funds from an auction organized by Jaeger-LeCoultre.
© Toppx2 ; © International Herald Tribune

P733 – Business Planning Toolkit
The Business Planning Toolkit co-developed with the Shell Foundation helps site managers improve on sustainability. At the Earthwatch research and learning centre in Malaysian Borneo.
© Monica Rahmaningsih

P734 – Management Office
World Heritage site managers working in Tubbataha Reefs Marine Park (Philippines) to increase environmental awareness among the local population with funds from WWF and UNDP-GEF.
© UNESCO/TMO-Tubbataha Reef

P732 – Dorset and Devon
The Dorset and East Devon Coast (United Kingdom) site attracted significant additional funding following designation, and the Jurassic Coast Trust was created to further strengthen partnerships.
© UNESCO/Jennifer Catherine

7.3 - 建立生物多样性合作伙伴关系

保障世界文化遗产需要各国政府，国际机构，非政府组织和企业界的通力合作。在某种意义上说，这一共同遗产的普遍性是推动全世界对生物多样性采取行动的原因，而这一行动最终保护的是我们自己。我们需要统一的行动部署以实现 2010 年生物多样性目标。

2002 年发起的世界遗产保护合作伙伴倡议，涉及 70 多个合作伙伴，符合联合国全球行动计划的普遍原则。

合作需要来自自然保护联盟，联合国开发计划署-全球环境基金和其他多边环境协议的技术支持，包括生物多样性以及资金划分，并确保多元化的资金来源。

世界遗产教育计划针对青年人开展了许多项目包括“世界遗产在青年人手中“工具包（32 种语言）和 Patrimonito 卡通系列剧（8 集）。

P735 – “Patrimonito 澳洲“第 7 集的一个镜头：气候变化与大堡礁”

P731 -手表制造商积家和国际先驱论坛报表示它们将致力于世界遗产海洋计划。图巴塔哈礁海洋公园（菲律宾）接受由几家组织举办的拍卖所获得的款项。

P733 -与壳牌基金会合作开发的业务规划工具包帮助遗产地管理员提高发展的可持续性。马来西亚婆罗洲的地球观测研究和学习中心。

P734 -图巴塔哈礁海洋公园（菲律宾）的世界遗产地管理人员在世界自然基金会和联合国开发计划署全球环境基金的资助下为当地居民提高环保意识。

P732 -多塞特和东德文海岸（英国）吸引了大量额外资金，并为进一步加强伙伴关系设立了侏罗纪海岸信托。

Panel 7.4 - <u>Biodiversity making economic sense</u>

World Heritage listing certainly enhances properties as tourist destinations. In fact, reaping the social and economic benefits is a subtle balancing act between conservation and development. Popularity brings increased tourist spending, enhanced commercial and employment opportunities, improved public infrastructure, and often, community prestige and pride.

The World Heritage Tourism Programme links biodiversity conservation and sustainable tourism by working with local communities and site managers to balance the boon in tourism with habitat protection.

In the case of the Galápagos, the growing number of migrants impact on the environment. Illegal industrial fishing adds to the strain while introduced species compete with the islands' unique biodiversity, hampering conservation efforts.

Only by instilling a deep sense of responsibility among the local communities towards World Heritage can we be confident that the planet's cultural and natural diversity will endure into the future.

(1033 characters)

"We need business to give practical meaning and reach to the values and principles that connect cultures and people everywhere."
*** Ban Ki-moon, Secretary-General of the United Nations**

Légende des iconos
P741 - Machu Picchu with tourists
Coping with popularity. Machu Picchu (Peru) struggles to reconcile tourism and conservation.
© Tim Gulick

P744 Galapagos_Ecuador_OURPLACE
Too famous for its own good? The Galápagos Islands (Ecuador) A World Heritage site in Danger.
© OUR PLACE The World Heritage Collection

P742 - Ngorongoro_Tanzania_UNESCO
Together with the United Nations Foundation and UNESCO, Expedia has created Friends of World Heritage to educate travellers and raise awareness about sustainable tourism. On safari in Ngorongoro Conservation Area (United Republic of Tanzania).
© UNESCO / Kishore Rao

P743 - Morne Trois Pitons National Park_Clusener
Informing visitors of the natural values that are ascribed to a particular World Heritage site is an important aspect of tourism management. At the Morne Trois Pitons National Park (Dominica).
© UNESCO / M.Clusener

P745 -
Learning from the chapter on tourism in the World Heritage in Young Hands resource kit.
© UNESCO / Vesna Vujicic-Lugassy

7.4 - 生物多样性的经济意义

列入世界遗产名录肯定有助提升当地的旅游业。事实上，巨大的社会和经济效益，是保护和发展之间的微妙平衡。人气增加游客消费，增加商业和就业机会，改善公共基础设施，并能提高社会信誉和自豪感。

世界遗产旅游发展计划通过与当地社区和遗产地管理员合作，将生物多样性保护和可持续旅游联系起来，以平衡栖息地的保护和旅游业的发展。

在加拉帕戈斯，越来越多的移民对环境产生了极大的影响。非法工业捕鱼，引进物种与岛屿独特的生物多样性产生的竞争，严重妨碍了保护工作。

只有培养出当地社区对世界遗产的责任意识，我们才能确信，我们这个星球的文化和自然多样性将延续到未来。

"商业需要具有把世界各地的文化和人民连接起来的实际意义以及深入的价值观和原则。"

*联合国秘书长潘基文

P741 –作为旅游胜地，马丘比丘在努力协调旅游与保护（秘鲁）。

P744 太出名真的是件好事吗？加拉帕戈斯群岛（厄瓜多尔）的世界濒危遗产地。

P742 –与联合国基金会和联合国教科文组织一起，Expedia 已经建立了"世界遗产之友"项目，教育并提高游客的可持续旅游意识。在恩戈罗恩戈罗保护区的一个旅行团（坦桑尼亚联合共和国）。

P743 -告知游客世界遗产地的是某一特定的自然价值是一个旅游管理的重要方面。Morne Trois Pitons 国家公园（多米尼加）。

P745 – 学习"世界遗产旅游资源青年人手中"工具包。

Panel 7.5 : Holistic in name – holistic in nature

One of the most original aspects of the Convention is the explicit link between natural and cultural heritage, traditionally considered as separate. In 1992 the Convention became the first international legal instrument to recognize and protect cultural landscapes. They are places where people, nature and ecosystems interact, thus shaping culture and identity, and enriching both cultural and biological diversity.

Some cultural landscapes reflect specific techniques of sustainable land-use that consider the characteristics and limits of the natural environment with often a spiritual relationship to nature. Together with sacred natural sites they are therefore important areas of *in situ* biodiversity conservation.

Certain cultural landscapes also provide the basis for the crops of tomorrow as well as medical breakthroughs because of their gene pools. Equally important are sites practicing *ex situ* plant conservation such as Kew Gardens in London.

(992 characters)

Photos'caption :

P751 - Ifuago_Harley F Palangchao et P751 Ifuago_Sarah Encabo
The terraces and the Hudhud Chants, a Masterpiece of Intangible Heritage, are intimately related and testify to the harmony between the Ifugao people and their environment. Rice Terraces of the Philippine Cordilleras (Philippines).
© Sarah Encabo and © Harley F. Palangchao

P752 - Kaya_Ribe
Sustainable land-use and spirituality are at the heart of the cultural landscape of the Kayas. Kaya Ribe in sacred Mijikenda Forests (Kenya).
© UNESCO/Steve Okoko

P753 - Agave_Mexico
The Agave Landscape Ancient Industrial Facilities of Tequila-Volcano (Mexico) has been shaped by the culture of the plant, which is part of the national identity.
© UNESCO/Carlo Tomas

P754 - Kew Gardens London
Kew's Millennium Seed Bank partnership is the largest ex situ plant conservation project in the world. Royal Botanic Gardens, Kew (United Kingdom).
© UNESCO/F. Bandarin

7.5：整体的名字 - 整体性质

该公约的最初打算，是希望将以往单独考虑的自然遗产与文化遗产，联系起来。1992 年，该公约成为第一份承认和保护文化景观的国际法律文书。它们是人与自然和生态系统的相互作用，从而形成文化和特性的地区，并拥有丰富文化和生物多样性。
一些文化景观反映了可持续的土地使用的技术，这些技术融入了自然的精神因素，参考了这些地区自然环境的特点和限制，。同自然圣地一起，这些遗产地被看作是重要的生物多样性保护区。一定的文化景观也提供了未来的农作物及其基因库的医学突破提供了基础。异地植物保护也同样重要，例如在伦敦英国皇家植物园进行的异地植物保护项目。

P751 -梯田和胡祖德咏，非物质遗产的代表作，它证明了伊富高人民与环境和谐相处。菲律宾科迪勒拉斯的水稻梯田（菲律宾）。
P752 -可持续的土地使用和灵性是卡亚什文化景观的核心。卡亚里伯在神圣的 Mijikenda 森林（肯尼亚）。
P753 - Agave_Mexico
古代龙舌兰火山的龙舌兰酒工业（墨西哥）已经被植物文化所影响，是国家认同的文化的一部分。
P754 - 伦敦英国皇家植物园
基尤千年种子库伙伴关系是世界上最大的易地植物保护项目。英国皇家植物园邱园（英国）。

Panel 7.6 - <u>Keeping track of the world's heritage</u>

With a growing number of World Heritage sites, and 16 natural listed sites In Danger, the World Heritage Committee works hard to improve monitoring and reporting. The Committee relies on the state of conservation reports, reinforced monitoring and periodic reporting to anticipate potential threats and keep track.

Reports can initiate reactive monitoring by requesting monitoring missions where specific conservation concerns may exist. The World Heritage Fund's international assistance provisions and the Rapid Response Facility are among the most important mechanisms for financial support in times of crises.

IUCN plays an important role as Advisory Body on natural World Heritage sites making recommendations on nominations, particularly from identified eco-regional gaps in the World Heritage List, or for specific actions. At the local level, where detrimental changes are often first detected, World Heritage site managers work with local communities and NGOs to place global conservation in local hands.

(1050 characters)

Photos'caption:

P762 Emas National Park_Brazil
Years of conservation efforts up in smoke. Fighting fires at the Emas National Park, Cerrado Protected areas (Brazil) thanks to RRF funding.
© Emas NP/ Oreades/ Rapid Response Facility

P761 – Graphique - Natural World Heritage Site
Natural World Heritage Site Occurrence by Continent / Region

P764a - Nepal_Chitwan associée avec P764b - Chitwan_Lumiere
A river diversion project in the Royal Chitwan National Park (Nepal) was abandoned following intervention by the World Heritage Committee in the early 1990s. The park contains one of the last populations of single-horned Asiatic rhinoceros.
© Jim Krehl ; © Lumière/Pablo Nicolás Taibi Cicaré

P765 - Ilulissat_Denmark_M&G Therin-Weise
The Arctic Region is one of the gaps on the World Heritage List. Ilulissat Icefjord (Denmark) is one of only two natural World Heritage properties north of the Arctic Circle.
© M&G Therin-Weise

P763 - Iguaçu_Brazil
The effective use of danger listing helped raise the political willingness to deal with destructive road works at Iguaçu National Park (Brazil).
© M&G Therin-Weise

7.6 – 追踪世界遗产地

随着世界遗产地的增多，以及在列的 16 个受到威胁的自然遗址，世界遗产委员会努力工作以增加监测和报告。委员会依靠保护状况报告，加强监测和定期报告，预测和跟踪潜在的威胁。

报告可以要求在存在具体的保护问题的地区进行反应性监测。世界遗产基金的国际援助和快速反应机制是在危机时提供财政支持的重要机制之一。

世界自然保护联盟对世界自然遗产提名发挥了很重要的作用，尤其是对世界遗产名录上生态区域的差距，以及具体行动，做出了合理化建议。不好的变化往往最先在地方被发现，世界遗产地管理者的工作与地方社区和非政府组织开展合作，把全球保护工作从地方开展起来。

P762 与大火和烟雾奋战多年的塞拉多保护区的埃默斯国家公园，向 RRF 组织的经费支持表示感谢（巴西）。

P761 - 世界自然遗产的陆地分布

P764a -90 年代初，皇家奇特旺国家公园河引水工程（尼泊尔）由于世界遗产委员会的干预而被放弃。该公园包含了单角亚洲犀牛种群的最后一个。

P765 -北极地区是世界遗产名录上的缺憾。伊卢利萨特冰峡湾（丹麦）是仅有的北极圈 2 个世界自然遗产的之一。

P763 –受威胁的世界遗产地名单的使用帮助提高政治意愿来处理在伊瓜苏国家公园破坏性的道路工程（巴西）。