



wbcd business ecosystems training

# BET India Module 1

**Understanding the Links between Ecosystem Services and Business**

**Main Presentation**

*December 2012*



# Business Ecosystems Training – Contributors

All content is based on WBCSD material and publically available reports.

BET curriculum and structure was designed by 

The structure and content development of BET was governed by an Advisory Committee consisting of WBCSD member companies and Regional Network partners, NGOs, UN and academic institutions.



# **Session 1**

## **Icebreaker and Introduction**

**Module 1: Understanding the links between ecosystem services and business**



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# Icebreaker and Introduction

- a) Your current role and scope of work
- b) Your knowledge of ecosystems
- c) What you want to learn from the course and Module 1



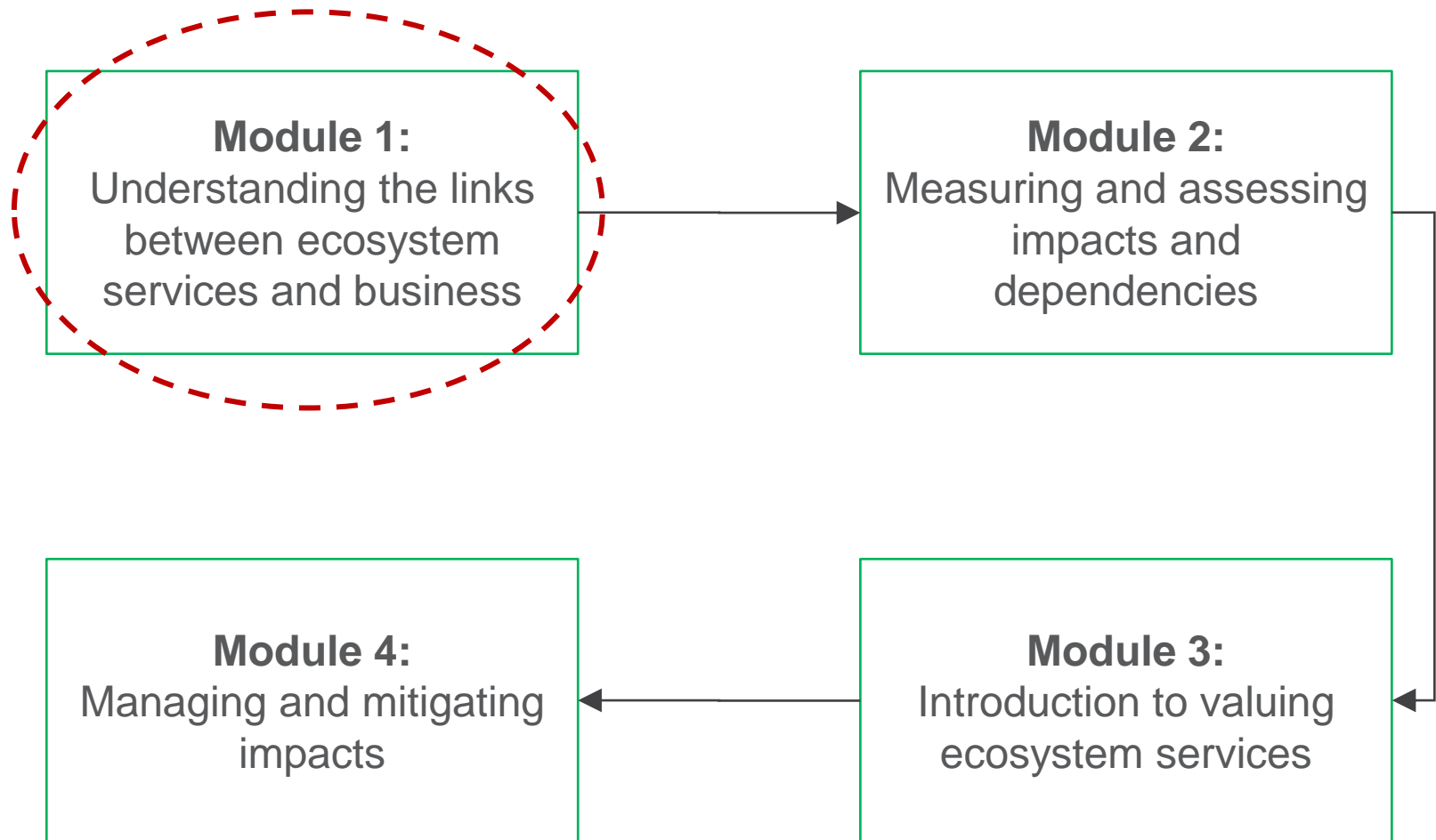
**5 minutes**



# Catch the ball!!!



# Where module 1 sit within the broader training available?



# Module 1 objectives

- ❖ Demonstrate an understanding of the key terms and concepts around biodiversity, ecosystems, ecosystem services, environment and sustainability.
- ❖ Identify the direct and indirect drivers and causes for biodiversity and ecosystem changes and impacts, and the impacts and dependency of companies on ecosystem services.
- ❖ Understand the link between ecosystem services and wider sustainability issues.
- ❖ Describe the business case for managing ecosystems and identify the specific business case for their own company from the perspective of both risk and opportunity.
- ❖ Understand some of the basic regulatory and policy frameworks currently in place as a key driver of change (expanded in module 4).
- ❖ Help participants gain knowledge that will help them add value to their organization.



# Module 1 summary – checkpoints
















- ✧ Understand the basics
- ✧ Drivers for change and business impacts and dependencies
- ✧ Links with sustainability
- ✧ Business case for action
- ✧ Policy and regulatory frameworks
- ✧ Gain useful knowledge





# BET Module 1: Understanding the Links between Ecosystem Services and business

## Timetable

Time	Duration (mins)	Session	Facilitator
 	45	<b>Session 1:</b> Icebreaker and introduction	
 	30-35	<b>Session 2:</b> Biodiversity, ecosystems and ecosystem services – the basics	
	15	<b>Session 3:</b> Introduction to policy trends	
	10-25	<b>Session 4:</b> Identifying key ecosystem services – activity	
	30	Coffee break	
 	25-30	<b>Session 5:</b> The global ecosystem challenge	
	25	<b>Session 6:</b> Case study and exercise	
	10	<b>Session 7:</b> Knowledge check	
	10	<b>Session 8 a:</b> Re-cap – the business case for action	
	5	<b>Session 8 b:</b> How can business respond?	
	25	<b>Session 9:</b> Brainstorming the business case – activity	
 	20	<b>Session 10:</b> Wrap up	

Key:  Presentation  
 Exercise



**Nature is  
DISAPPEARING.**

<https://www.youtube.com/embed/TartoYpK1yI>

**“What is nature worth?”**

Source: University of Minnesota, Institute on the Environment



# Introduction to Sustainable Development

## Brundtland definition, from Our Common Future (WCED 1987)

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

## Corporate sustainability

*“Managing resources to ensure that a business can survive and maintains conditions under which it can produce goods and services and exist in harmony with nature. It is therefore important to ensure that a business has knowledge of its dependencies on both ecology and society.”*

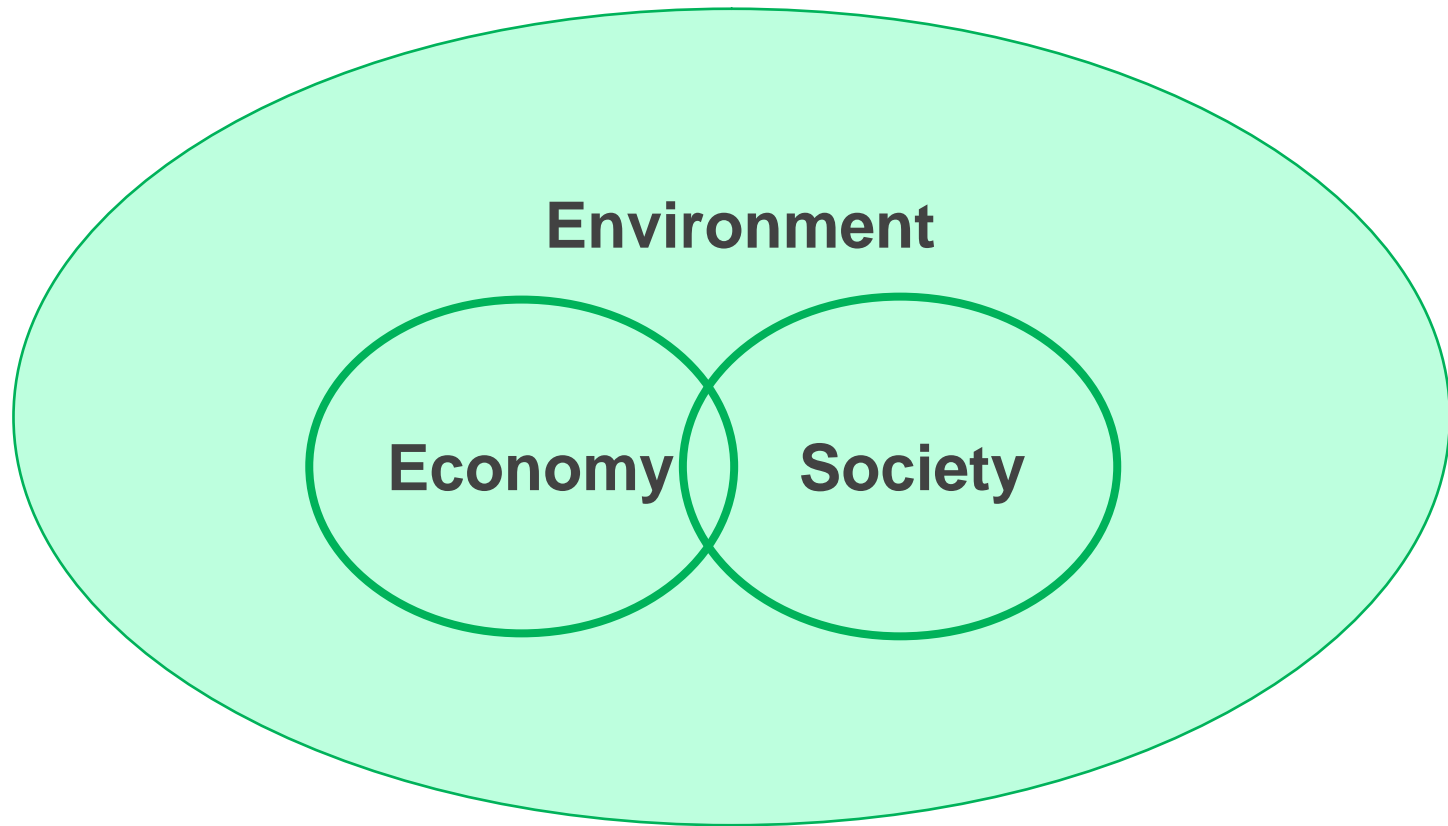
## Millennium Development Goals

*Eradicate Extreme Poverty and Hunger; Achieve Universal Primary Education; Promote Gender Equality and Empower Women; Reduce Child Mortality; Improve Maternal Health; Combat HIV/AIDS, Malaria and Other Diseases; Ensure Environmental Sustainability; and Develop a Global Partnership for Development.*

Sources: <http://www.un-documents.net/ocf-02.htm#l>  
<http://www.un.org/millenniumgoals/bkgd.shtml>



# Sustainability



# How are companies addressing this issue?

## Different ways to address the issue internationally

### Unilever:

*“By 2020 we will source 100% of our agricultural raw materials sustainably.”*

Source: <http://www.unilever.com/sustainability/environment/agriculture/index.aspx>

### Holcim:

*“Our commitment is to continuously improve our environmental performance and provide positive contributions to our business and to society.”*

Source: <http://www.holcim.com/fileadmin/templates/CORP/doc/SD/envPolicywebversion.pdf>

### Kimberly-Clark:

*“25 percent reduction in manufacturing water use by 2015”*

Source: [http://www.cms.kimberly-clark.com/UmbracoImages/UmbracoFileMedia/2010SustainabilityReport\\_umbracoFile.pdf](http://www.cms.kimberly-clark.com/UmbracoImages/UmbracoFileMedia/2010SustainabilityReport_umbracoFile.pdf)



# How are companies addressing this issue in India ?

## Different ways to address the issue in India (1/2)

### ITC:

*“ITC, the only company in the world to be carbon positive, water positive & solid waste recycling positive”*

Source: <http://www.itcportal.com/sustainability/environmental-stewardship.aspx>

### ONGC:

*“Our vision is to gradually work towards reducing our carbon and water footprint, innovate beyond compliance management of waste and prudent energy management and biodiversity conservation.”*

Source: <http://www.ongcindia.com/download/Corp%20Sust%20Report/SD-English.pdf>

### Rio Tinto, India:

*“Respect for the environment is central to our approach to sustainable development. Wherever possible we prevent, or otherwise minimise, mitigate and remediate, harmful effects of the Group's operations on the environment.”*

Source: Rio Tinto India [http://www.riotintoindia.com/ENG/ourapproach/375\\_sustainable\\_development.asp](http://www.riotintoindia.com/ENG/ourapproach/375_sustainable_development.asp)



# How are companies addressing this issue in India?

## Different ways to address the issue in India (2/2)

### TATA Chemicals:

*“Reduce water and energy consumption in usage of products through product design and promotion of better usage practices.”*

Source: [http://www.tatachemicals.com/Sustainability/downloads/2008-10/sustainability\\_report2008-10.pdf](http://www.tatachemicals.com/Sustainability/downloads/2008-10/sustainability_report2008-10.pdf)

### Reliance:

*“Utilize energy resources in a responsible and efficient manner so as to reduce emissions and generation of effluents and waste products.”*

Source: [http://www.ril.com/html/aboutus/health\\_safety\\_environment.html](http://www.ril.com/html/aboutus/health_safety_environment.html)

### Dabur:

*“At Dabur, our aim is to make our own activities more sustainable and encourage our consumers, suppliers and others to do the same”*

Source: [http://www.dabur.com/en/Investors1/Annual\\_reports/2011-12/Dabur-BR-Report-2012.pdf](http://www.dabur.com/en/Investors1/Annual_reports/2011-12/Dabur-BR-Report-2012.pdf)



## **Session 2**

# **Biodiversity, Ecosystems and Ecosystem Services – the basics**

**Module 1: Understanding the links between ecosystem services and business**



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# Basic concepts

Biodiversity is not just about:



But also about:



# A few definitions

## Biodiversity

*The variability among living organisms within species and ecosystems.*



## Ecosystem

*A dynamic complex of plant, animal, and micro-organism communities and the non-living environment.*



## Ecosystem services

*The benefits that people obtain from ecosystems – the goods and services of nature.*

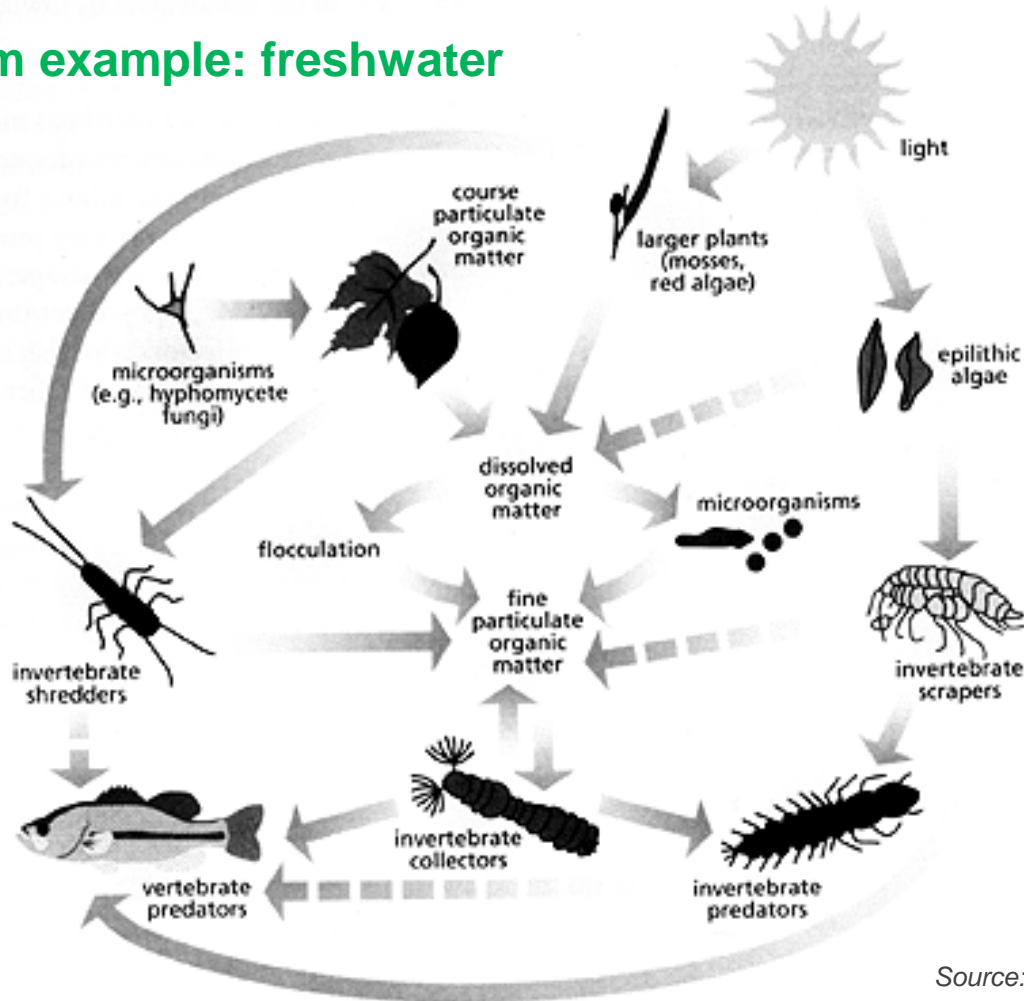


**Source:** Connecting the dots (slide 9) and WBCSD. 2008. Corporate Ecosystem Services Review [online]. [Accessed 2 August 2011]. Available from: [http://www.wbcsd.org/DocRoot/R3HpfX53CixLEiQsBRpJ/Corporate\\_Ecosystem\\_Services\\_Review.pdf](http://www.wbcsd.org/DocRoot/R3HpfX53CixLEiQsBRpJ/Corporate_Ecosystem_Services_Review.pdf)



# Basic concepts (cont.)

## Ecosystem example: freshwater



Source: [Society for freshwater science](#)



# Concepts

- ✦ **Ecosystem Dependency:** *“Environmental conditions required for successful corporate performance”*, e.g. the agricultural industry is dependent on plant pollinator species such as bees.
- ✦ **Ecosystem Impact:** *“Company affects the quantity or quality of the ecosystem service”*, e.g. mining industry has an impact on ecosystems that exist on the land occupied by extraction sites.
- ✦ **Ecosystem Priority:** *“those services on which the company has a high dependence and/or impact”*, e.g. the paper industry impacts on forests by procuring timber for their products.
- ✦ **Drivers:** *“factors—natural or man-made—that cause changes in an ecosystem and its ability to supply ecosystem services”*.
- ✦ **Resource scarcity:** Production of useful resources by ecosystems diminishes, thereby putting pressure people and industries who are dependent on them.

**Source:** Connecting the dots (slide 9) and WBCSD. 2008. Corporate Ecosystem Services Review [online]. [Accessed 2 August 2011]. Available from: [http://www.wbcds.org/DocRoot/R3HpfX53CixLEiQsBRpJ/Corporate\\_Ecosystem\\_Services\\_Review.pdf](http://www.wbcds.org/DocRoot/R3HpfX53CixLEiQsBRpJ/Corporate_Ecosystem_Services_Review.pdf)



# Ecosystem services – an overview

## Provisioning

Goods or products produced by ecosystems



## Regulating

Natural processes regulated by ecosystems



## Cultural

Intangible benefits obtained from ecosystems



## Supporting

Functions that maintain all other services

As described in the *Millennium Ecosystem Assessment*, 2005.



# Provisioning services:

## Goods produced or provided by ecosystems

### Food

- ✧ Crops
- ✧ Livestock
- ✧ Capture fisheries
- ✧ Aquaculture
- ✧ Wild foods



### Fiber

- ✧ Timber
- ✧ Cotton, hemp, silk
- ✧ Biomass fuel



Freshwater, Genetic resources, ornamental  
Biochemicals, natural medicines & pharmaceuticals



# Regulating services:

## Natural processes regulated by ecosystems

- ✧ Air quality regulation
- ✧ Climate regulation
  - Global (CO2 sequestration)
  - Regional and local
- ✧ Water purification and waste treatment
- ✧ Water flow regulation
- ✧ Natural hazard regulation
- ✧ Erosion regulation
- ✧ Disease regulation
- ✧ Pest regulation
- ✧ Pollination



# Cultural services:

## Cultural and social benefits obtained from ecosystems

- ✧ Recreation
- ✧ Ecotourism
- ✧ Spiritual and religious values
- ✧ Educational
- ✧ Ethical and “existence” values

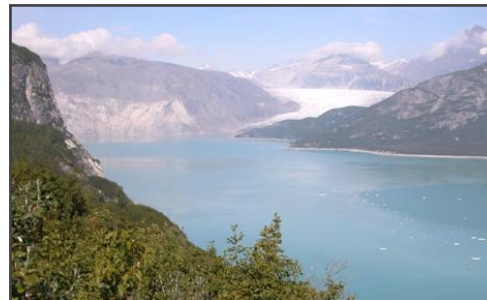
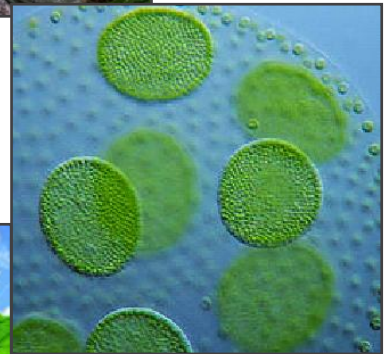




# Supporting services:

## Functions that maintain all other services

- ✧ Nutrient cycling
- ✧ Primary production
- ✧ Photosynthesis
- ✧ Water cycling



## Species Diversity

## Genetic Diversity

## Ecosystem Diversity



Source: <http://www.wbcsd.org/Pages/EDocument/EDocumentDetails.aspx?ID=27&NoSearchContextKey=true>

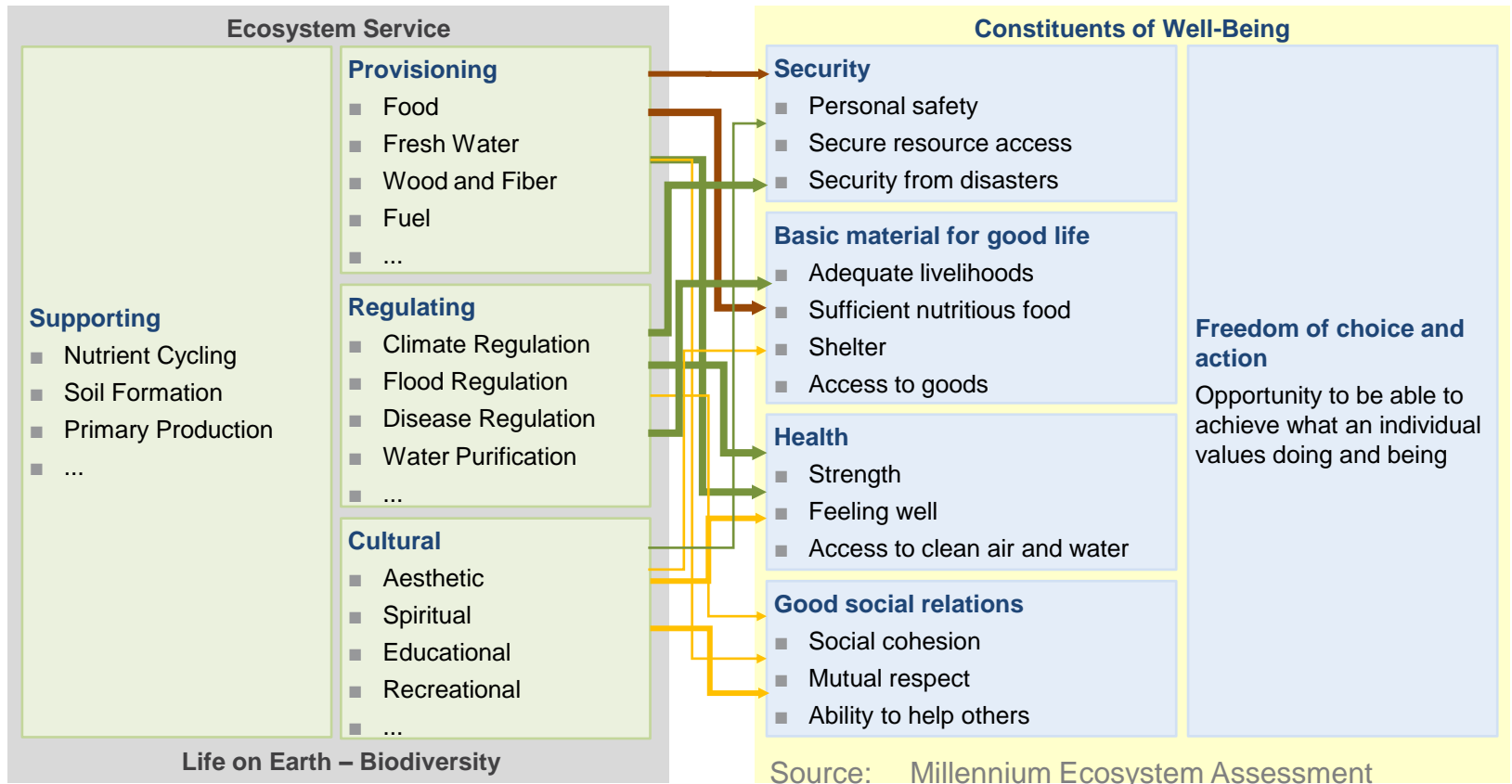


# Biodiversity, ecosystems and ecosystem services

Biodiversity	Quality	Quantity	Services (examples)
Ecosystems	Variety	Area/extent	Recreation Water regulation Biological control
Species	Diversity	Abundance	Food, fibre, medicine Design inspiration Pollination
Genes	Variability	Population	Bio-tech. inputs Disease resistance Adaptive capacity



# Link between ecosystem services and human well-being



**Arrow's Color** Potential for mediation by socioeconomic factors

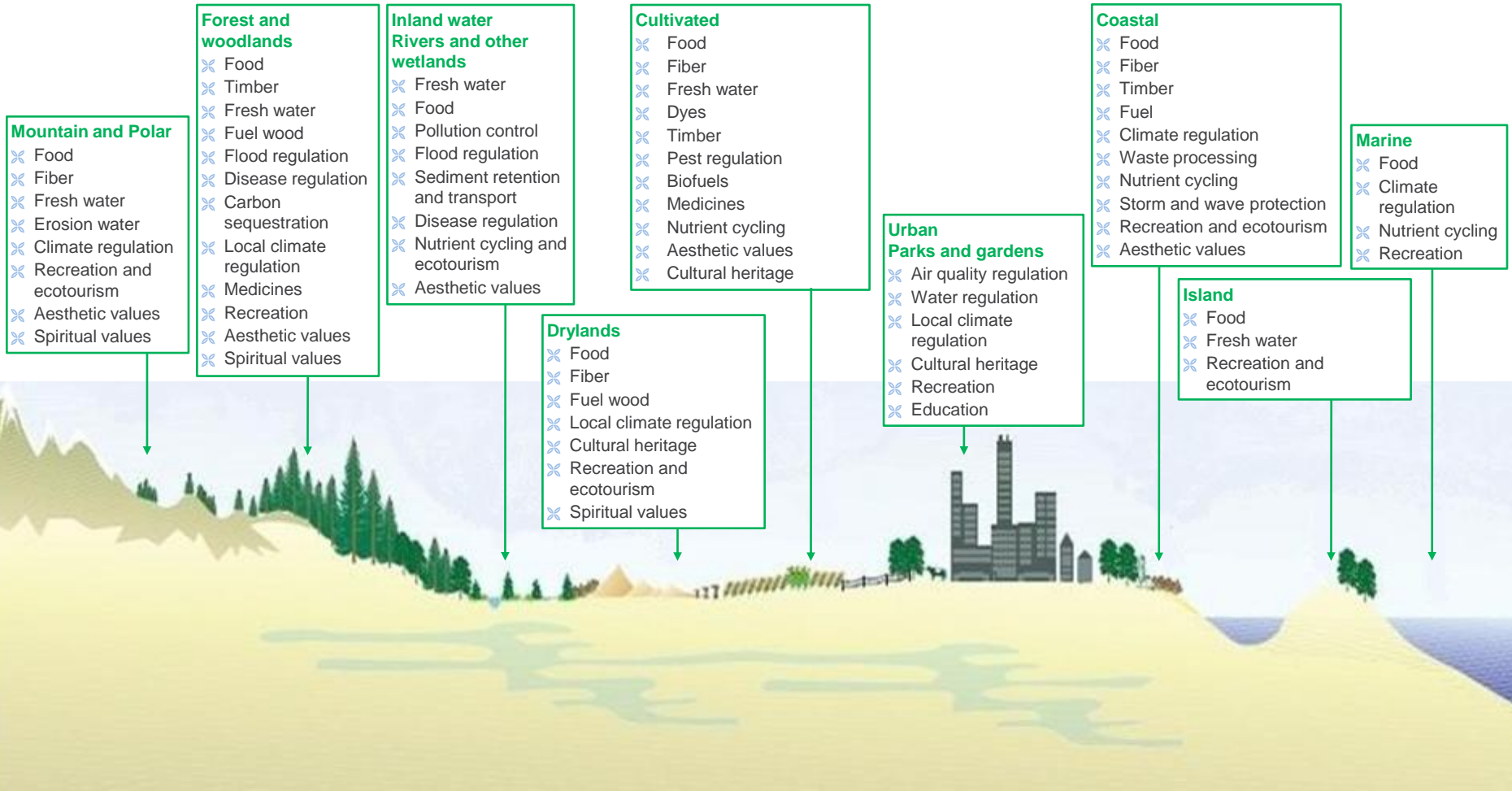
Key: ■ Low ■ Medium ■ High

**Arrow's Width** Intensity of linkages between ecosystem services and human well-being

Key: □ Weak □ Medium □ Strong

Source: Millennium Ecosystem Assessment, Synthesis

# The ecosystem landscape



Source: Millennium Ecosystem Assessment



# The ecosystem landscape [customize slide]



Source: Millennium Ecosystem Assessment



# Basic concepts (cont.) – stakeholder engagement

✦ Stakeholders are groups or individuals:

- a) that can reasonably be expected to be significantly affected by the organization's activities, products, and/or services; or
- b) whose actions can reasonably be expected to affect the ability of the organization to successfully implement its strategies and achieve its objectives.

✦ Stakeholder engagement

✦ Stakeholder mappings



# Interactive

## Key concepts

Do you know...





# Module 1, so far...

- ✧ Understand the basics ✓
- ✧ Drivers for change and business impacts and dependencies
- ✧ Links with sustainability ✓
- ✧ Business case for action
- ✧ Policy and regulatory frameworks
- ✧ Gain useful knowledge



# **Session 3**

## **Introduction to policy trends**

**Module 1: Understanding the links between ecosystem services and business**



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# Background to ecosystem policy - Global

## Long history of environmental regulation

- a) 1388 UK water pollution measures
- b) 1973 EU Action Programme on the Environment / Water

## The limits to growth (1972)

- ✦ Modelled world population, industrialization, pollution, food production and resource depletion

## Brundtland Report (1987)

- ✦ Defined sustainable development
- ✦ Called for increased international cooperation

## Conventions, treaties, protocols, agreements...

Over 250 multilateral environmental agreements exist

## The Earth Summit (1992) – start of ‘The Rio Process’



# Background to ecosystem policy in India

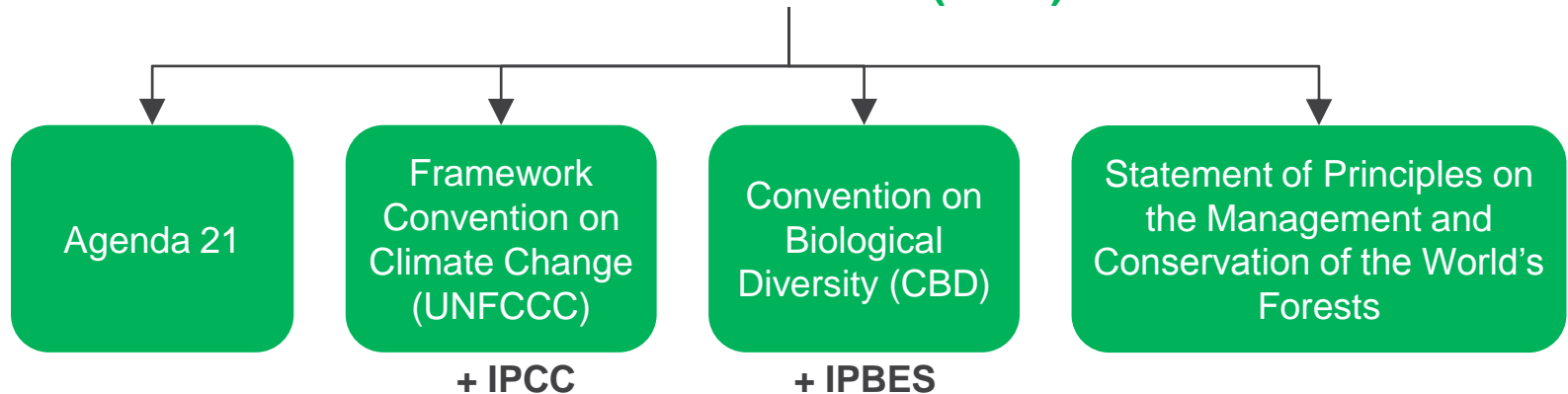
## History of environmental protection and conservation in India

- ✦ Mention of various aspects of environment protection and natural resource use in **ancient scriptures**.
- ✦ Several policies for environment safety and protection drafted during the **British Reign** in India.
- ✦ **Environment protection** is a mandate in the **Constitution of India** under Article 48-A and Article 51- A(g).
- ✦ Well developed **framework of legislation** initiated mainly after the UN Conference on Human Environment (Stockholm, 1972)
- ✦ Participated in all major international events and ratified major biodiversity and environment related global conventions over the past decades.



# Background to ecosystem policy -Global (cont.)

## The Earth Summit (1992)



### Other significant multi-lateral environmental agreements:

Ramsar Convention  
(Wetlands)  
1971

Convention on International Trade in  
Endangered Species (CITES)  
1998

Montreal Protocol (Ozone  
depletion)  
1987

Rotterdam Convention  
(Hazardous Chemicals)  
1998

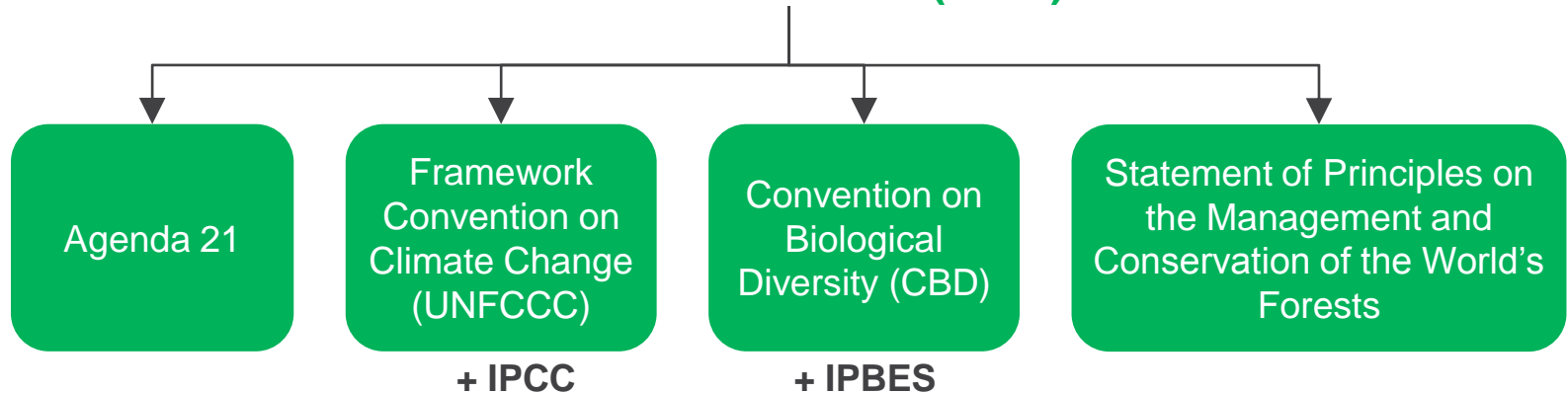
Basel Convention  
(Hazardous Waste)  
1989

Stockholm Convention (Persistent  
Organic Pollutants)  
2001



# Background to ecosystem policy -Global (cont.)

## The Earth Summit (1992)



### Other significant multi-lateral environmental agreements:

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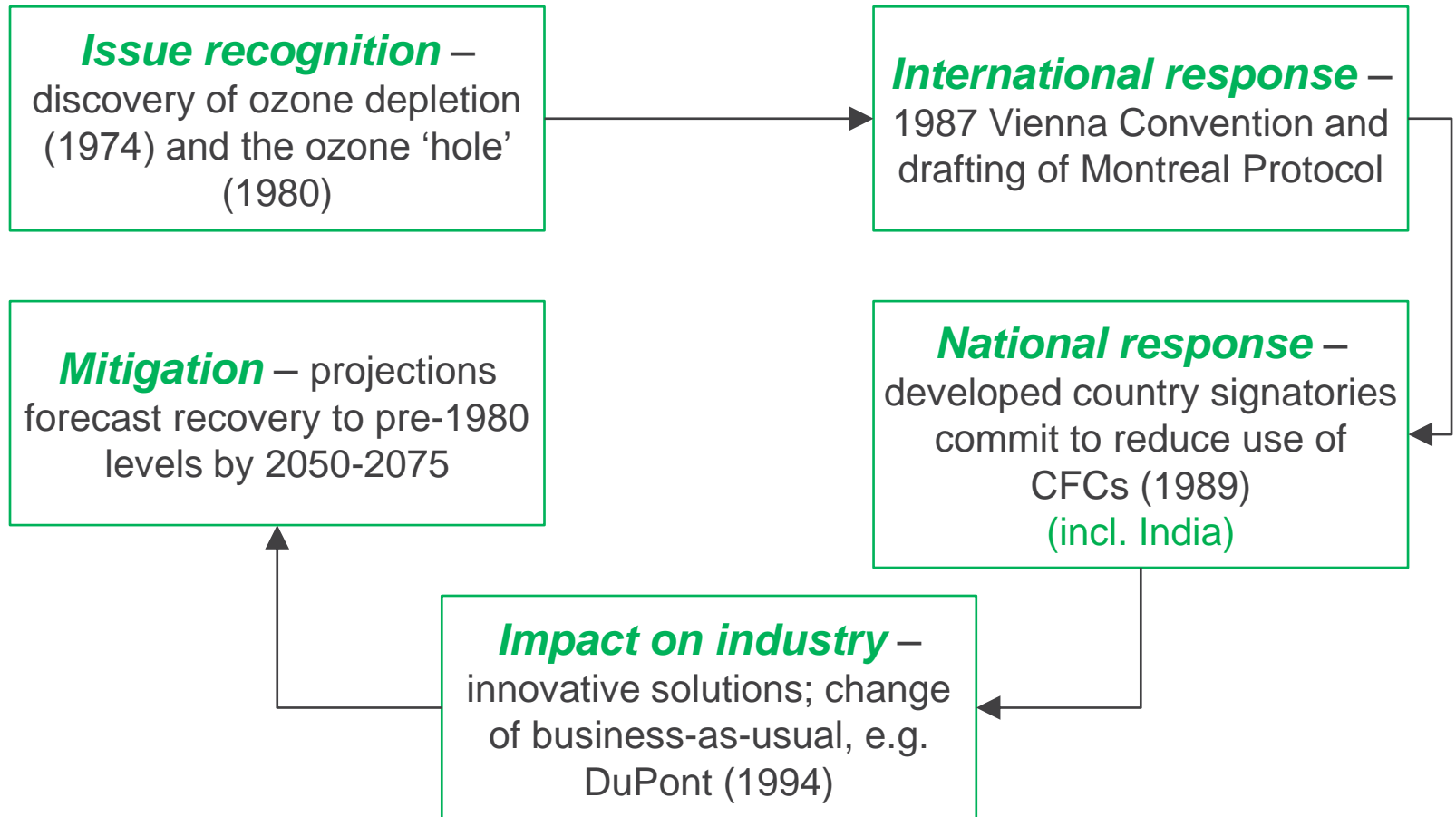
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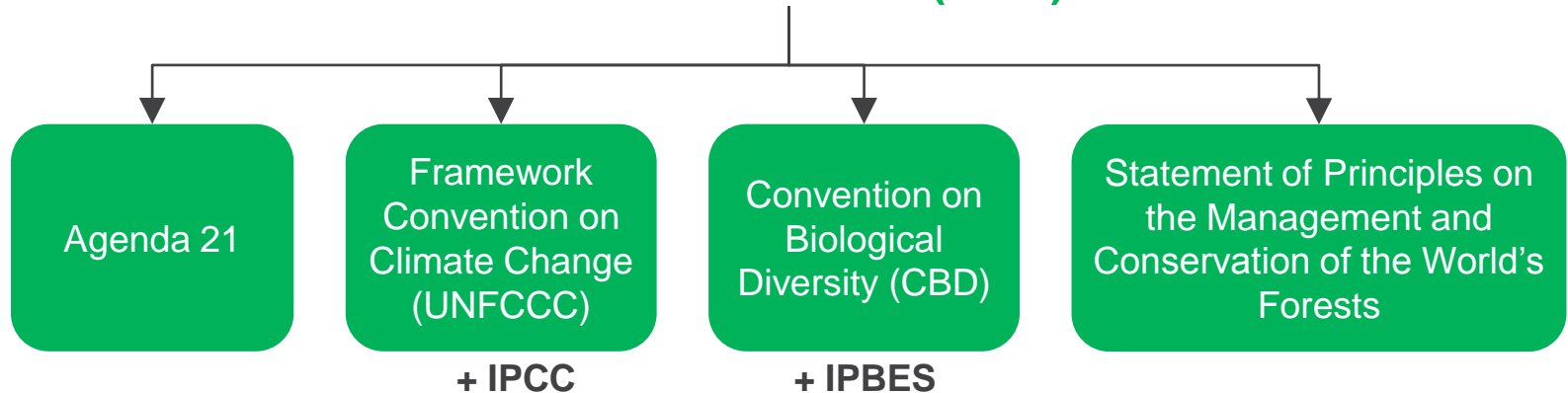


# International policy trends – ozone example



# Background to ecosystem policy -Global (cont.)

## The Earth Summit (1992)



### Other significant multi-lateral environmental agreements:

Ramsar Convention  
(Wetlands)  
1971

Convention on International Trade in  
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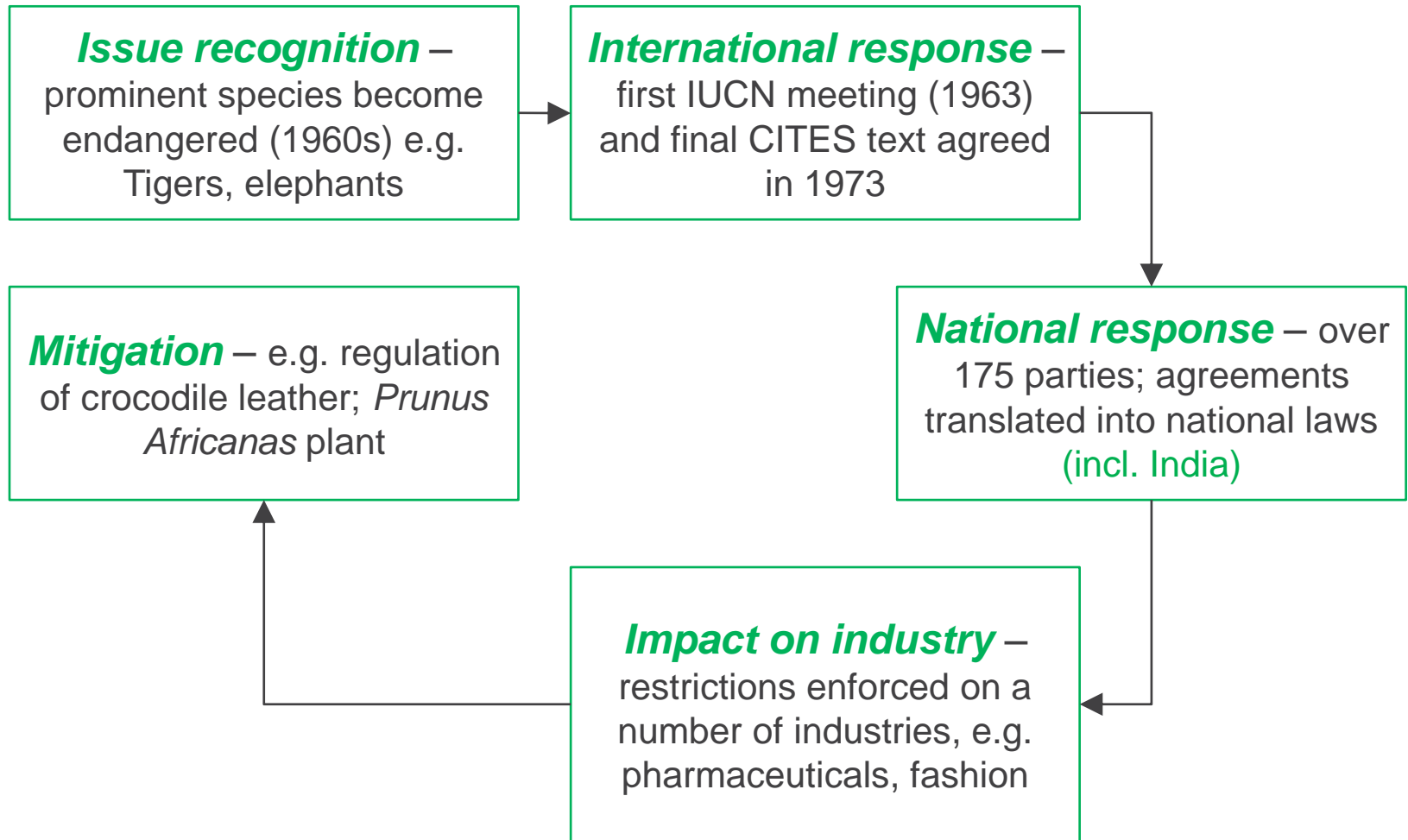
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2001



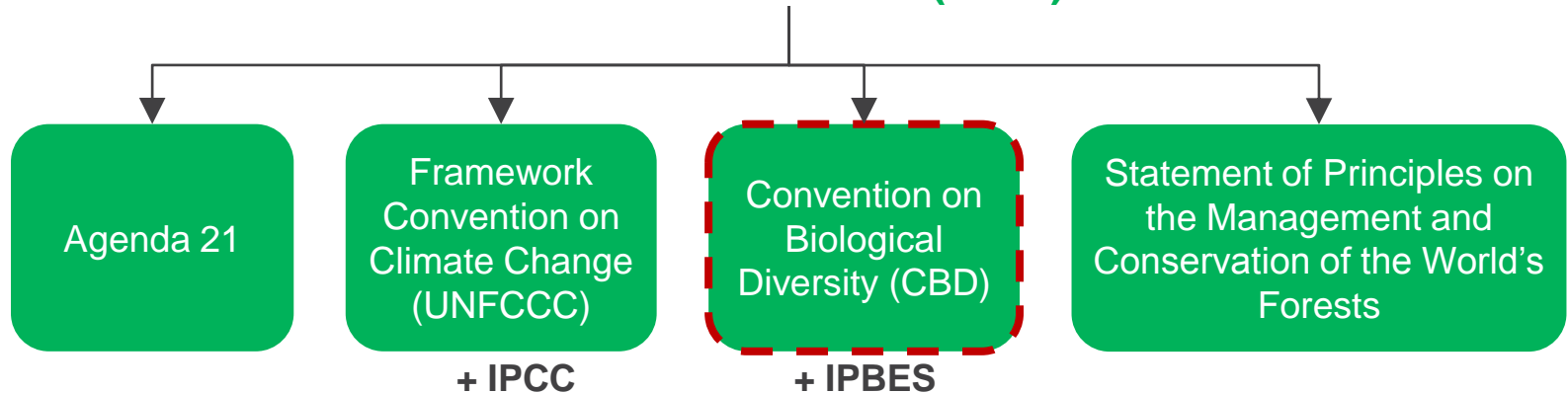


# International policy trends – CITES example



# Background to ecosystem policy -Global

## The Earth Summit (1992)



### Other significant multi-lateral environmental agreements:

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Montreal Protocol (Ozone  
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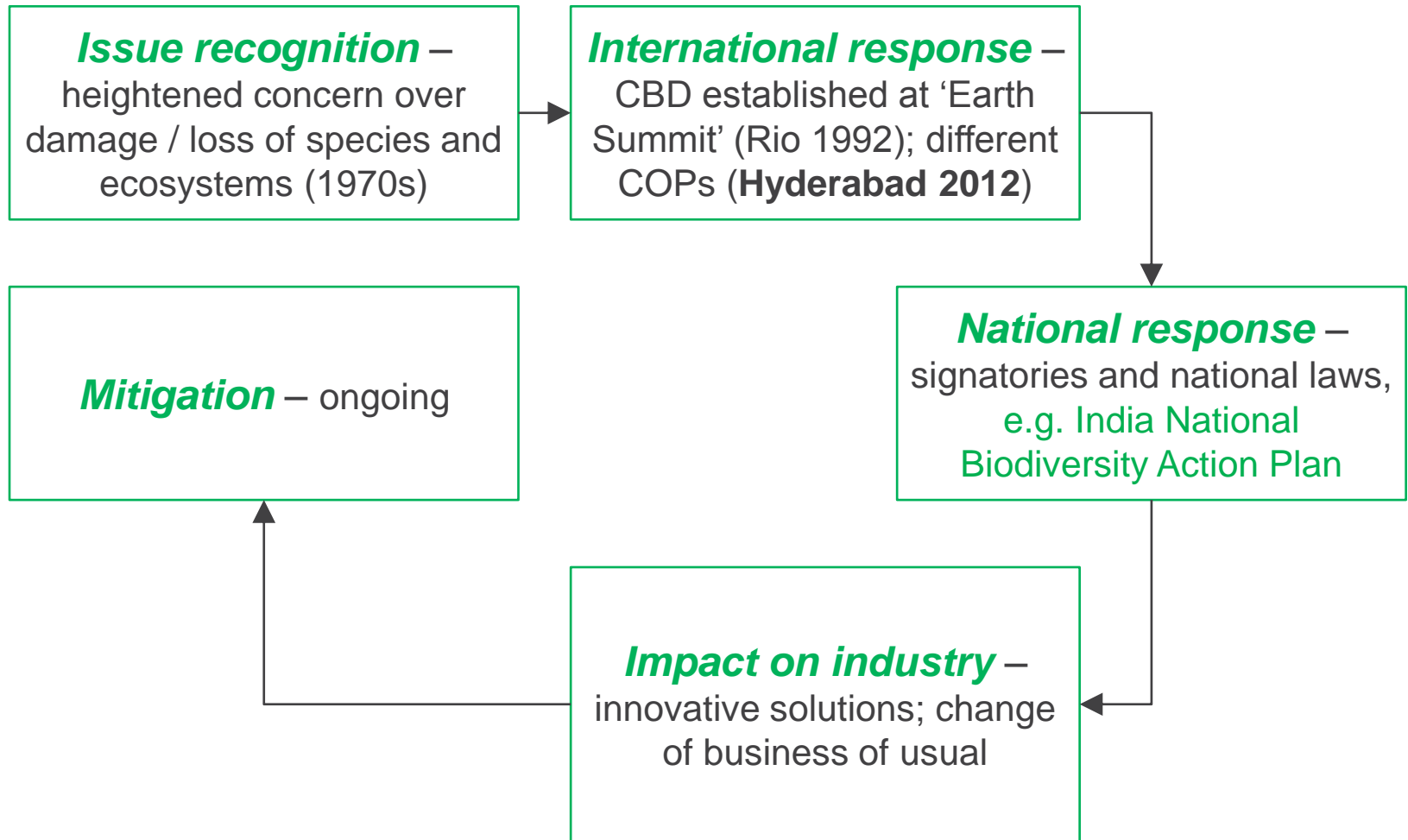
Rotterdam Convention  
(Hazardous Chemicals)  
1998

Basel Convention  
(Hazardous Waste)  
1989

Stockholm Convention (Persistent  
Organic Pollutants)  
2001



# International policy trends – Introduction to the CBD



# Focus on ecosystem-related policy in India

## ✧ **Environment (Protection) Act, 1986, amended 1991**

- Authorizes the central government to protect and improve environmental quality, control and reduce pollution from all sources, and prohibit or restrict the setting and /or operation of any industrial facility on environmental grounds.

## ✧ **The Indian Forest Act, 1927, Amendment 1984**

- Enacted to consolidate the law related to forest, the transit of forest produce, and the duty leviable on timber and other forest produce.

## ✧ **Forest (Conservation) Act, 1980, amended 1988**

- Was adopted to protect and conserve forests. The Act restricts the power of the state in respect of de-reservation of forests and use of forest land for non-forest purposes.

## ✧ **Wildlife (Protection) Act 1972 and Wildlife (Protection) Amendment Act 1991**

- Provides protection to listed flora and fauna and establishes a network of ecologically important protected areas.

## ✧ **Biological Diversity Act (BDA), 2002:**

- Enacted under the United Nations Convention on Biological Diversity.



# Focus on relevant action plan and guidelines -India

## ✧ National Biodiversity Action Plan (NBAP) 2008:

- Article 6 of the Convention (CBD) calls upon the Parties to develop national biodiversity strategies and action plans.
- India's strategy for conservation and sustainable utilization of biodiversity has evolved through various initiatives addressing specific issues viz., National Forestry Action Plan, National Conservation Strategy, National Environment Action Programme, NWAP, etc.
- The NBAP has been developed in consultation with various stakeholders to identify threats and constraints in biodiversity conservation.
- NBAP is consistent with the ecological, social, cultural and economic mosaic of the country, and provides a focus and impetus to the current efforts towards biodiversity conservation.

## ✧ National Targets for Biodiversity 2012-2020

- The National Targets (10 targets in development in 2012) will provide a national framework for better management, use and sharing of benefits of the ecosystem goods and services for every citizen of India.



# Focus on relevant action plan and guidelines -India

## ✧ **National Voluntary Guidelines on Social , Environmental and Economic Responsibilities of Business**

- The Ministry of Corporate Affairs had released Voluntary Guidelines on CSR in 2009 as the first step towards mainstreaming the concept of Business Responsibilities.

## ✧ **National Wildlife Action Plan (2002-2016)**

- Calls for adoption and implementation of strategies covering strengthening and enhancing the PA network, effective management of PAs, conservation of wild and endangered species and their habitats, restoration of degraded habitats outside PAs, control of poaching, and illegal trade in wild animal and plant

## ✧ **Sustainable Development Guidelines for Central Public Sector Enterprises**

- Assists the Central Public Sector Enterprises in aligning Sustainable Development into the core of their business planning, the Government has released these guidelines.



# Module 1, so far...

- ✦ Understand the basics ✓
- ✦ Drivers for change and business impacts and dependencies
- ✦ Links with sustainability ✓
- ✦ Business case for action
- ✦ Policy and regulatory frameworks ✓
- ✦ Gain useful knowledge



# **Session 4**

## **Identifying key ecosystem services (exercise)**

**Module 1: Understanding the links between  
ecosystem services and business**



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# Discussion questions

## Business Ecosystems Training Score Card

My company has been affected by the following challenges:			
Water scarcity	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Don't know
Climate change	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Don't know
Habitat change	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Don't know
Biodiversity loss	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Don't know
Overexploitations of oceans	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Don't know
Nutrient overloading	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Don't know
Other: .....			
My company benefits upon or impacts on the following ecosystem services:			
Provisioning <i>The goods or products obtained from ecosystems such as food, freshwater, timber, and fiber</i>	<input type="checkbox"/> Benefits	<input type="checkbox"/> Impacts	<input type="checkbox"/> Don't know
Regulating <i>The benefits obtained from an ecosystem's control of natural processes such as climate, disease, erosion, water flows and pollination, as well as protection from natural hazards.</i>	<input type="checkbox"/> Benefits	<input type="checkbox"/> Impacts	<input type="checkbox"/> Don't know



# Discussion questions (cont.)

## Business Ecosystems Training Score Card

<b>My company has been affected by the following challenges:</b>			
Cultural <i>The non material benefits obtained from ecosystems such as recreation, spiritual values and aesthetic enjoyment</i>	<input type="checkbox"/> Benefits	<input type="checkbox"/> Impacts	<input type="checkbox"/> Don't know
<i>Note: we are not asking this specific question regarding supporting services as these services are underlying the above 3 categories (Supporting services: the natural processes such as nutrient cycling and primary production that maintain the other services)</i>			
<b>My company has taken the lead on addressing ecosystems:</b>			
To manage risks	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> How? .....
To improve operational efficiencies	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> How? .....
To gain business opportunities	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> How? .....
Additional actions: .....			
<b>My company has considered the long term consequences of ecosystem degradation in its strategy:</b>			
	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> How? .....



- **Feedback...**



# Links between business sectors and ecosystem service values

Links between business sectors and ecosystem service values								
	Company 1		Company 2		Company 3		Company 4	
Key Ecosystem Services	DEPEND	IMPACT	DEPEND	IMPACT	DEPEND	IMPACT	DEPEND	IMPACT
<b>Provisioning</b>								
Food	●	●	●	●	●	●	●	●
Timber and fibres	●	●	●	●	●	●	●	●
Freshwater	●	●	●	●	●	●	●	●
Genetic / Pharmaceutical resources	●	●	●	●	●	●	●	●
<b>Regulating</b>								
Climate & air quality regulation	●	●	●	●	●	●	●	●
Water regulation & purification	●	●	●	●	●	●	●	●
Pollination	●	●	●	●	●	●	●	●
Natural hazard regulation	●	●	●	●	●	●	●	●
<b>Cultural</b>								
Recreation & tourism	●	●	●	●	●	●	●	●
Aesthetic / non-use values	●	●	●	●	●	●	●	●
Spiritual values	●	●	●	●	●	●	●	●

● Moderate to Major relevance ● Minor relevance ● No relevance

Note: "Supporting services" are not included in this table as they are already captured within provisioning, regulating and cultural services.



# Ecosystems: identifying key ecosystem services

Please discuss

Which ecosystem services do your companies rely on or benefit from?



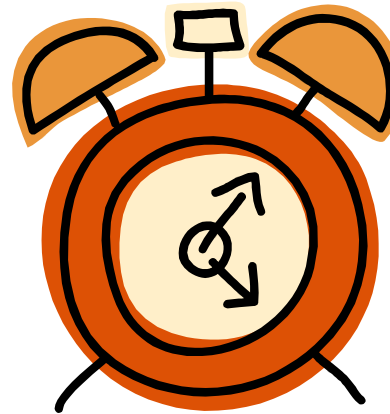
**10 minutes**



Feedback...



# Coffee break



**30 min.**



# **Session 5**

## **The global ecosystem challenge**

**Module 1: Understanding the links between ecosystem services and business**

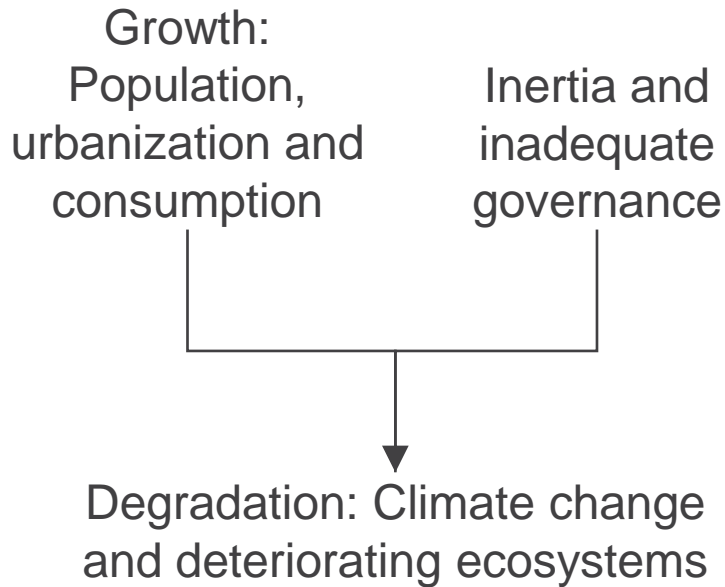


wbcsd **business ecosystems training**



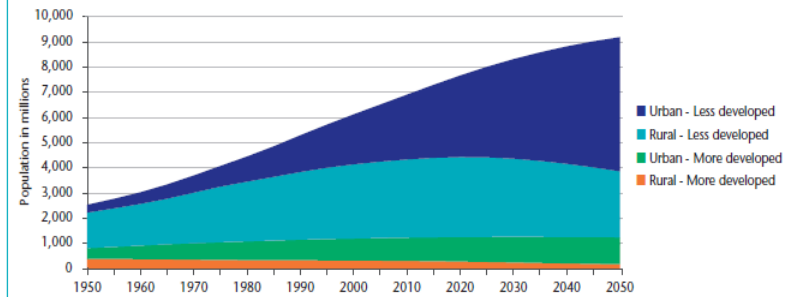
# Vision 2050 – the global challenge of Business-as-Usual

**The Vision:** In 2050, around 9 billion people live well, and within the limits of the planet.



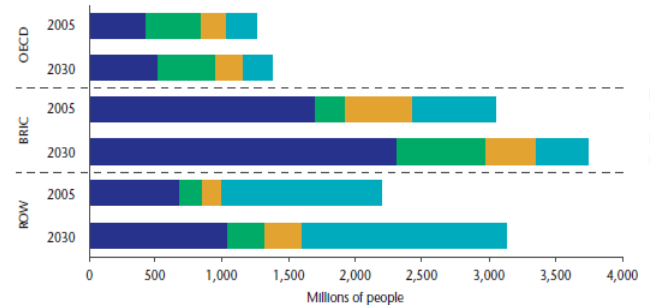
Source: WBCSD. Vision 2050

The world population is increasingly urban  
Global population by type of area and by region – 1950-2050



Source: UN Population Division, *World Population Prospects: The 2008 Revision*, 2008

Environmental degradation jeopardizes people's quality of life  
People living in areas of water stress by level of stress



Source: OECD, *Environmental Outlook to 2030*, 2008



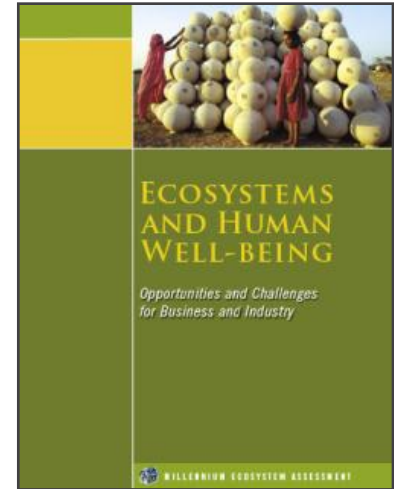
# Drivers affecting the projected future – by 2050

- ✦ **Population size** (reaching ~9 billion people)
- ✦ **Lifestyle changes** (increasing urbanisation and per capita income growing 2-4 times)
- ✦ **Governance and policy responses** (coordinating responses to global challenges)
- ✦ **Land conversion and habitat loss** (converting 10-20% of additional grassland and forestland)
- ✦ **Overexploitation incl. overfishing** (increasing pressure)
- ✦ **Invasive alien species** (continuing spread)
- ✦ **Reactive nitrogen flow** (increasing by another 66% – already doubled during the past 50 years)
- ✦ **Climate change** (continuing global warming – expected to become the predominant global cause of ecosystem degradation and ecosystem service loss)



# 2005: Millennium Ecosystem Assessment

- ✧ Many of the world's ecosystems are in serious decline
- ✧ Continuing supply of critical ecosystem services like water purification, pollination and climate regulation are in jeopardy
- ✧ 6 interconnected challenges are of particular concern for business



Water scarcity



Climate change



Habitat change



Biodiversity loss



Over-exploitation of oceans



Nutrient overloading

Sources: WBCSD, Connecting the dots presentation

Millennium Ecosystem Assessment, 2005. *Ecosystems and Human Well-being: Opportunities and Challenges for Business and Industry*



# The MA's major finding regarding ecosystems

The structure and functioning of the world's ecosystems has changed rapidly the past 50 years

- ❖ 20% of the world's coral reefs have been lost and more than 20% are degraded
- ❖ 35% of mangrove area has been lost in the last several decades
- ❖ Amount of water in reservoirs quadrupled since 1960
- ❖ Withdrawals from rivers and lakes doubled since 1960



Source: Millennium Ecosystem Assessment, 2005.



# MA major findings regarding ecosystem services

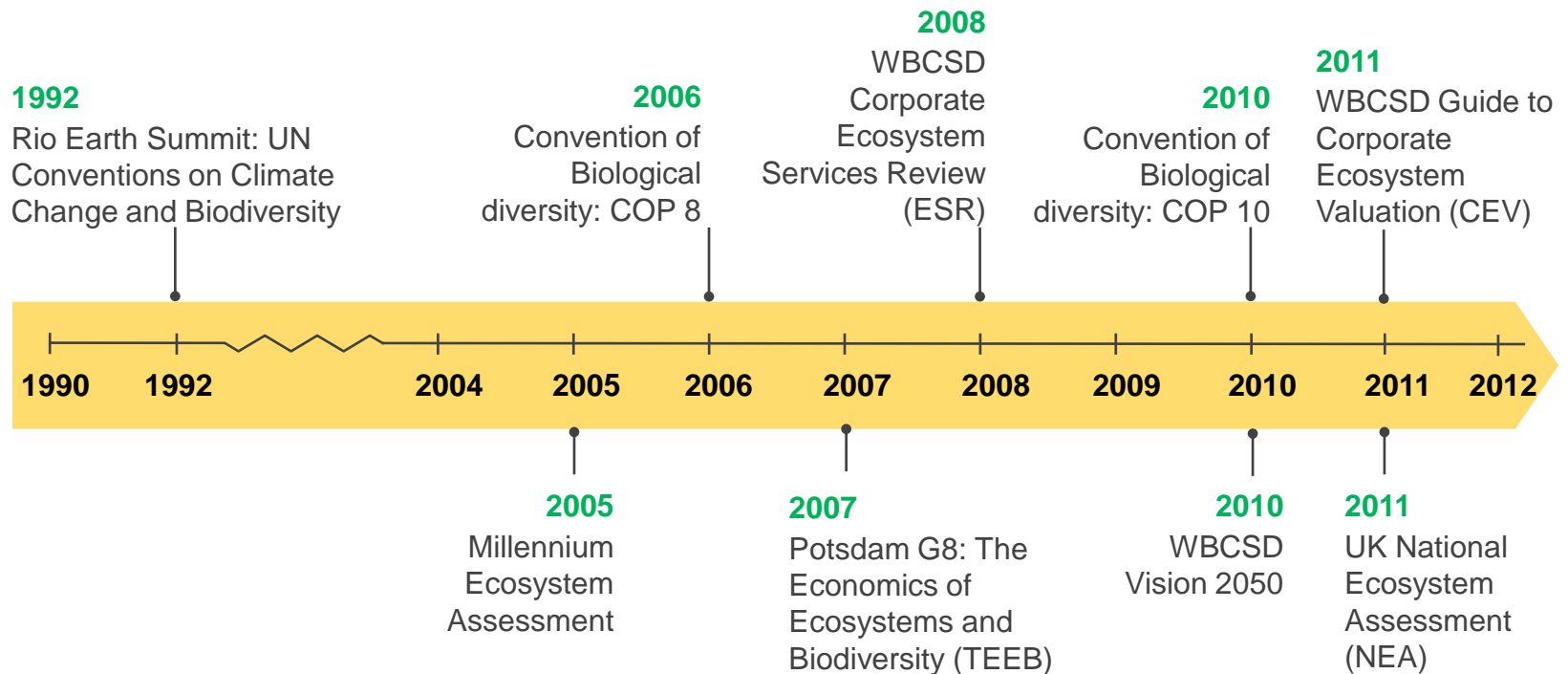
60% of the world's ecosystem services are degraded

	Degraded	Mixed	Enhanced
<b>Provisioning</b>	Capture fisheries Wild foods Biomass fuel Genetic resources Biochemicals, natural medicines, & pharmaceuticals Freshwater	Timber and wood fiber Other fibers (e.g. cotton, hemp, silk)	Crops Livestock Aquaculture
<b>Regulating</b>	Air quality regulation Regional & local climate regulation Erosion regulation Water purification & waste treatment Pest regulation Pollination Natural hazard regulation	Water regulation Disease regulation	Global climate regulation (carbon sequestration)
<b>Cultural</b>	Spiritual, religious, or cultural heritage values Aesthetic values	Recreation & ecotourism	

Source: Millennium Ecosystem Assessment, 2005.



# Timeline of major global ecosystem developments



# Global Biodiversity Outlook report (CBD)

**Continued decline** in all three major components of biodiversity:

 Genes

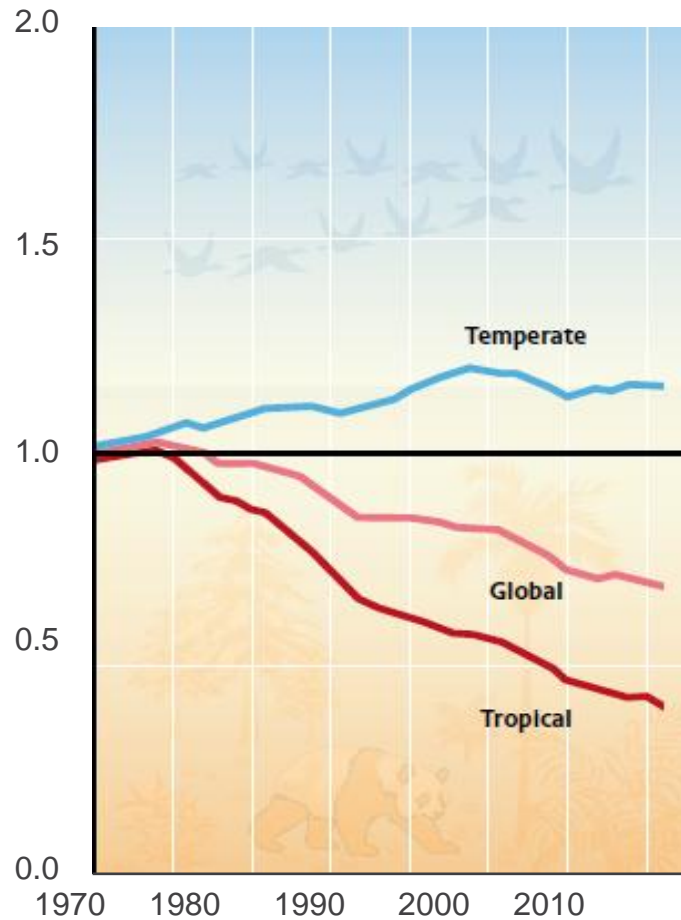
 Species

 Ecosystems



# Latest findings in this area

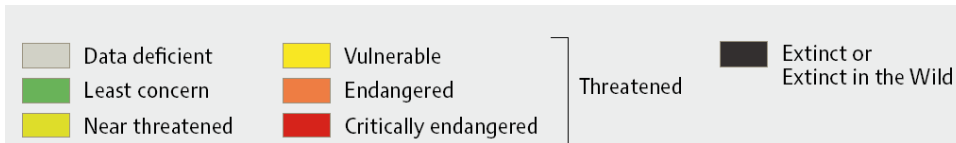
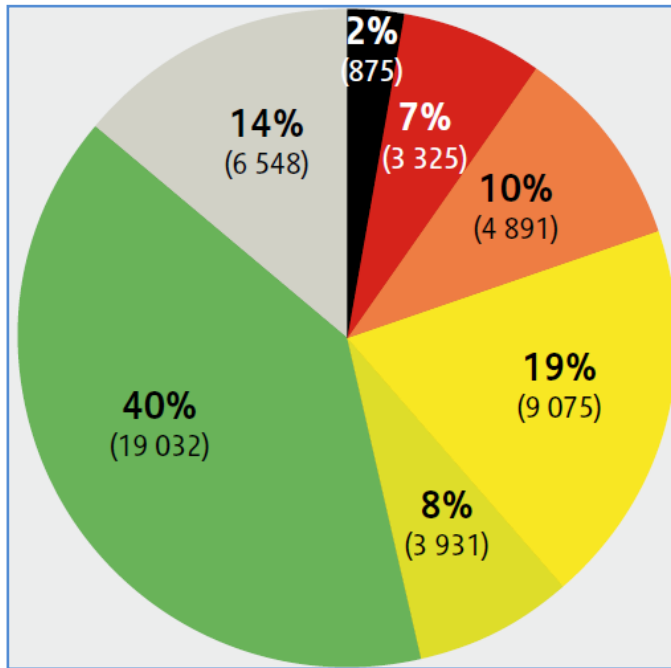
## Living Planet Index



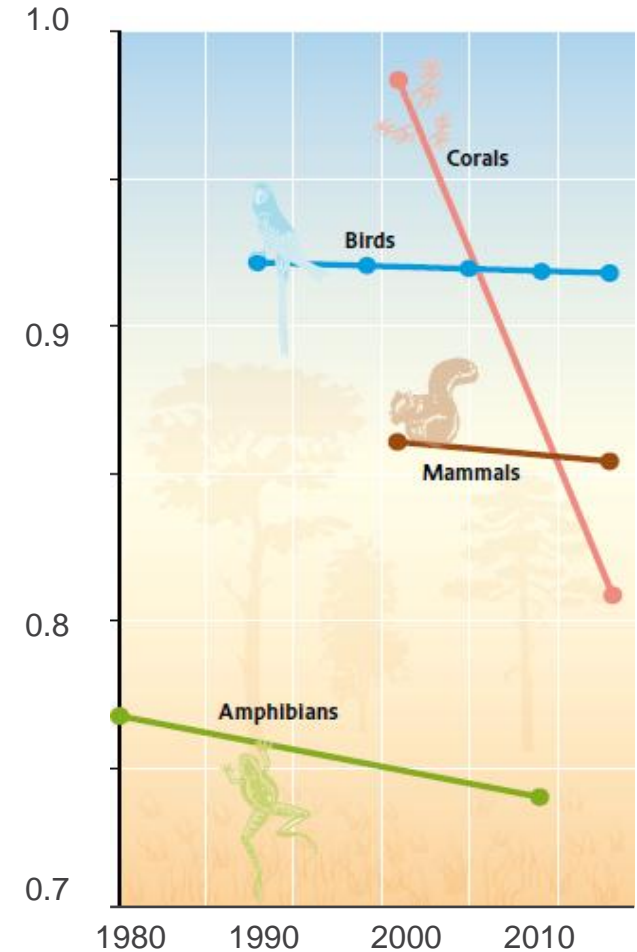


# Latest findings in this area (cont.)

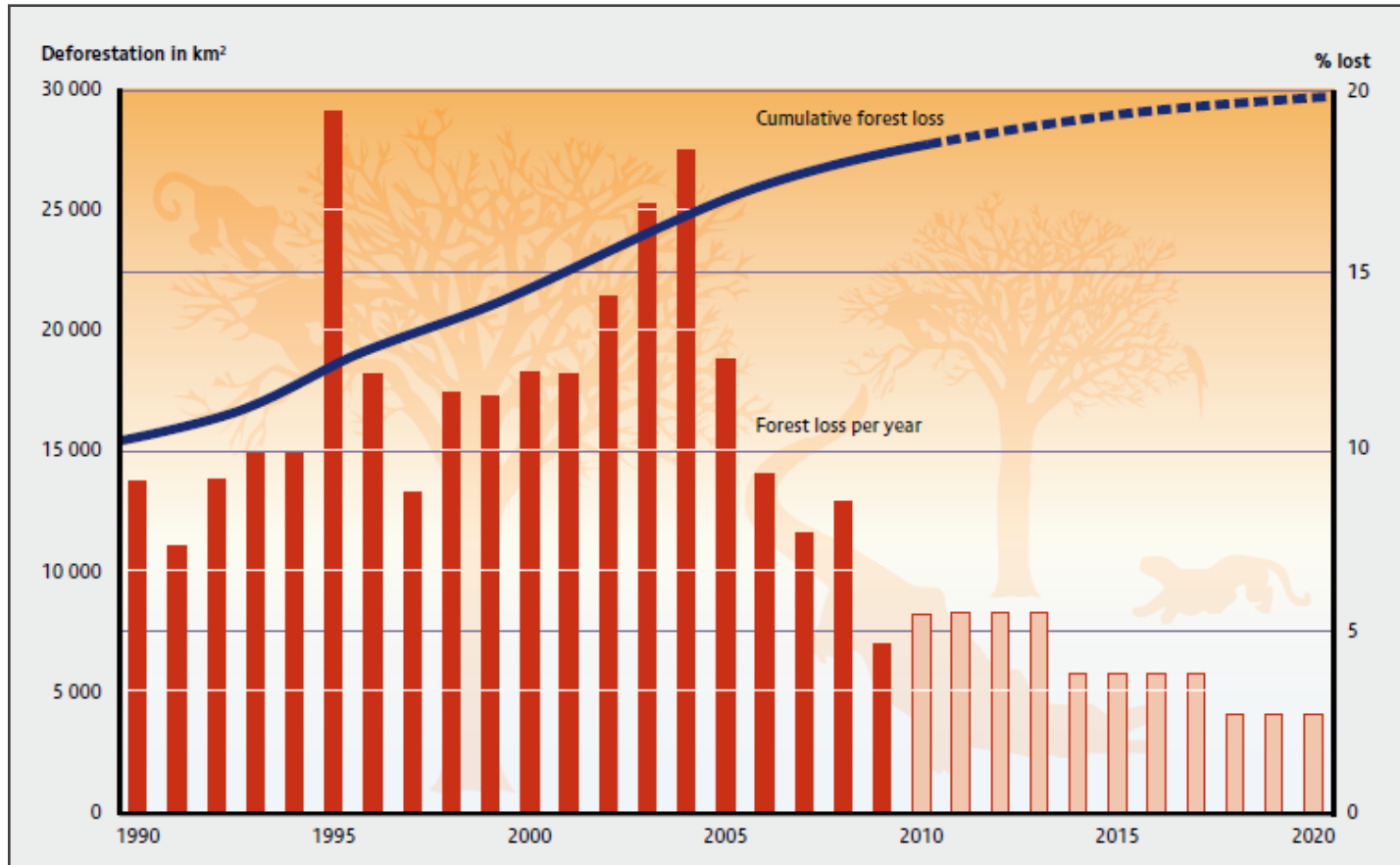
## Extinction Risk – IUCN Redlist



## IUCN Redlist Index



# Latest findings in this area (cont.)



Annual and cumulative deforestation of the Brazilian Amazon



# Status of Biodiversity in India

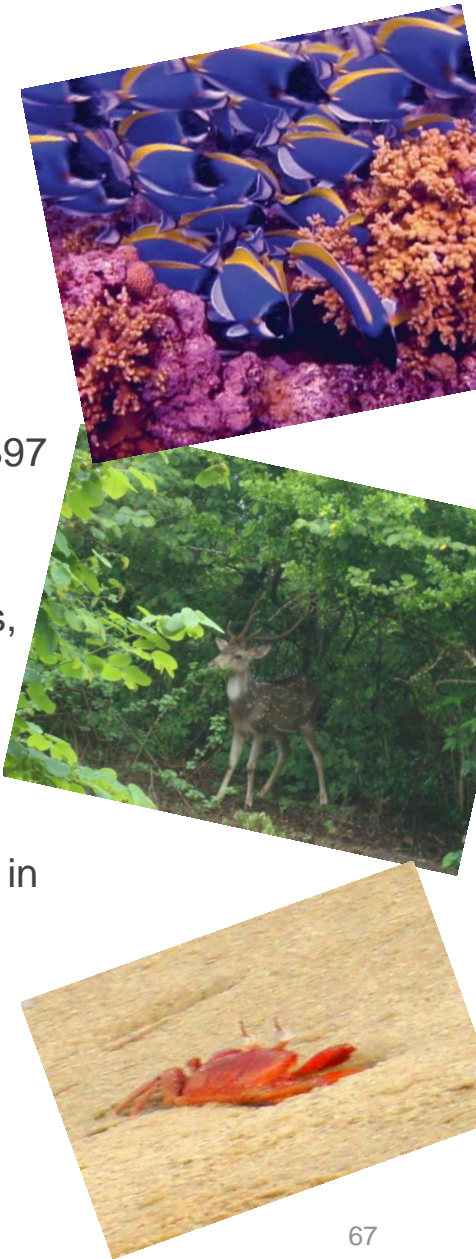
## Sneak peek to the Profile of India

- With only 2.4% of world's land area, India accounts for 7-8% of recorded species of the world
- One of the 17 identified mega diverse countries of the world.
- India has some 59,353 insect species, 2,546 fish species, 240 amphibian species, 460 reptile species, 1,232 bird species and 397 mammal species, of which **18.4% are endemic** and **10.8% are threatened**.
- The country is home to at least 18,664 species of vascular plants, of which **26.8% are endemic**.

## World Ranking

- Species richness : 7<sup>th</sup> in mammals, 9<sup>th</sup> in birds and 5<sup>th</sup> in reptiles.
- Endemism of vertebrate groups: 10<sup>th</sup> in birds with 69 species, 5<sup>th</sup> in reptile with 156 species and 7<sup>th</sup> in amphibians with 110 species
- Share of crops : 44% as compared to the world average of 11%.

Sources: Government of India, Ministry of Environment and Forests, [National Biodiversity Action Plan](#) (2008)  
National Biodiversity Authority, [Biodiversity...Future secured](#) (2011),



# Status of Biodiversity in India

## Species Profile of India

### ✧ Faunal Diversity:

- Nearly 7.43% of the world's faunal species
- 413 globally threatened faunal species, which is approximately **4.9% of the world's total number of threatened faunal species** (IUCN Red List (2008)).

### ✧ Floral Diversity:

- Nearly 11% of the world's known floral diversity
- 246 globally threatened floral species, which constitute approximately **2.9% of the world's total number of threatened floral species** (IUCN Red List (2008))

## Profile of major ecosystems

### ✧ Forest:

- Forest and Tree Cover of the country is 78.29 m ha. which is **23.81% of the geographical area of the country.**
- The forests in India **cater to the direct livelihood needs of about 200 million people** in about 1.73 lakh villages residing in and around forest areas.

Sources: Government of India, Ministry of Environment and Forests, [National Biodiversity Action Plan](#) (2008)  
National Biodiversity Authority, [Biodiversity...Future secured](#) (2011),



# Status of Biodiversity in India

## Biodiversity Hotspots in India

### ✧ Himalayas:

- Stretching in an arc over 3,000 kilometers
- 32% plants, 27 % reptiles, 40 % amphibians, 4% mammals and 1.5 % birds are endemic to the Himalaya

### ✧ Western Ghats and Srilanka:

- 1,500 species (38%) of flowering plants and 63% of evergreen woody plants are endemic.

### ✧ Indo Burma:

- 2,373,000 km<sup>2</sup> of tropical Asia east of the Ganges-Brahmaputra lowlands.
- Remarkable endemism in freshwater turtle species, most of which are threatened with extinction, due to over-harvesting and extensive habitat loss



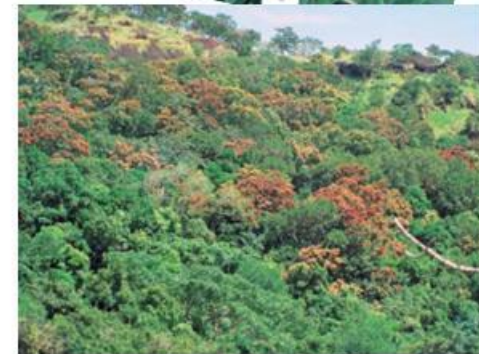
Source: Conservation International, [http://www.conservation.org/where/priority\\_areas/hotspots/asia-pacific/Pages/asia-pacific.aspx](http://www.conservation.org/where/priority_areas/hotspots/asia-pacific/Pages/asia-pacific.aspx)



# Status of Biodiversity in India

## Major Threats to Biodiversity

- ✧ At least **10% of the country's recorded wild flora**, and possibly the same percentage of its wild fauna, are on the **threatened list**, many of them on the verge of extinction.
- ✧ Since the enactment of Forest (Conservation) Act in 1980, 11.40 lakh hectares of forest area, for about 14,997 development projects, has been approved for diversion.
- ✧ An estimated **41% of the country's forest cover has been degraded** to some degree.
  - As much as 78 % of forest area is subject to heavy grazing and about 50% of the forest area is prone to forest fires.
- ✧ The Intergovernmental Panel on Climate Change estimated **huge loss of biodiversity for biodiversity-rich mega diverse countries** such as India because of **higher greenhouse gas emissions**.

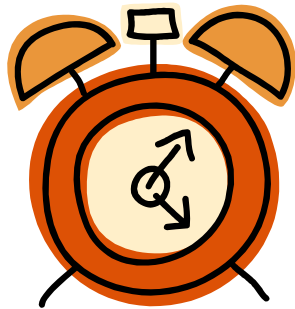


Sources: Government of India, Ministry of Environment and Forests, [National Biodiversity Action Plan](#) (2008)



# [Optional] Interactive Exercise: The drivers of ecosystem change

What do you think are the main drivers and underlying causes of ecosystem and ecosystem service change and degradation?

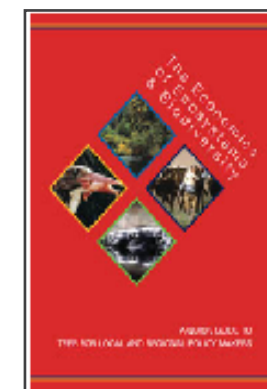
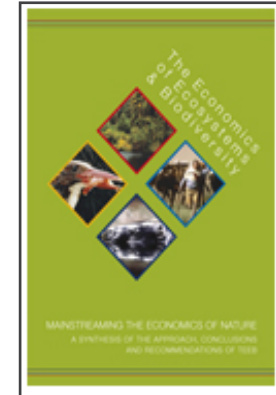


How many can you write down in 5 minutes?



# TEEB: Main Purpose

- ✧ Understanding the economics case for the conservation of ecosystems and biodiversity
- ✧ A series of reports for distinct end-users
  - for ecologists and economists (TEEB D0)
  - for international and national policy makers (TEEB D1)
  - for local and regional policy (TEEB D2)
  - for business (TEEB D3)
  - for citizens (TEEB D4)



Source: <http://www.teebweb.org/>

➔ **TEEB India report currently ongoing**



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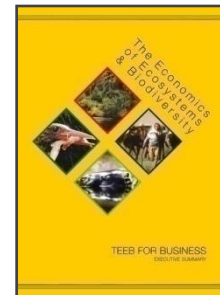
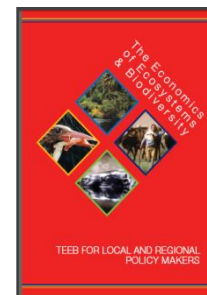
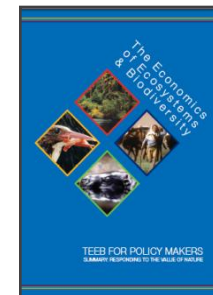
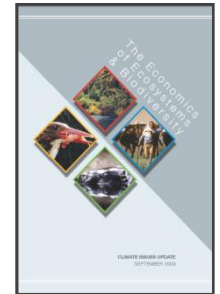
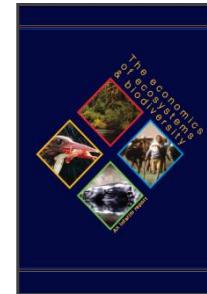
# The value of nature is changing – TEEB

## Urgent strategic priorities:

- ✧ Halt deforestation and forest degradation
- ✧ Protect tropical coral reefs
- ✧ Save and restore global fisheries
- ✧ Recognize link between ecosystem degradation and the persistence of rural poverty

## Policy solutions:

- ✧ Rewarding benefits through payments and markets
- ✧ Reforming environmentally harmful subsidies
- ✧ Adding value through protected areas
- ✧ Investing in ecological infrastructure



# **Session 6**

## **Case study and exercise**

**Module 1: Understanding the links between ecosystem services and business**



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# Case study and exercise – ArcelorMittal

Module 1: Understanding the links between ecosystem services and business



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# Creating business value – ArcelorMittal

## The issue

Water dependency

ArcelorMittal owned operations in the Great Lakes basin.

- ✦ 9 facilities throughout USA and Canada surrounding the Great Lakes
- ✦ After iron and coal, water is the most important component in the steel making process.
  - Between 13,000 to 23,000 gallons of water per ton of steel.
- ✦ Also dependent on the Great Lakes to ship raw materials for manufacturing and for product distribution.
- ✦ 37 million people, including more than 25,000 ArcelorMittal employees, live and rely on the lakes for drinking water, recreation and food sources.



# Creating business value – Exercise

ArcelorMittal decided to implement a strategy to manage their impacts and dependencies in the Great Lakes basin.

In your groups, discuss the following questions:

- 1) What ecosystems and ecosystem services apply to this case study?
- 2) What are ArcelorMittal's ecosystem service impacts/dependencies?
- 3) Based on your answers to 1 and 2, how can ArcelorMittal start to address their impacts and dependencies?



# Case study and exercise – Lafarge

Module 1: Understanding the links between ecosystem services and business



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# Creating business value – Lafarge

## The issue

Mitigating impacts and restoring biodiversity, critical steps for extractive industries.

- ✦ Lafarge is a French group operating in resources extraction and building materials
- ✦ Worldwide operations, significantly in developing countries.
- ✦ Several potentials for impacts, e.g. removal of soil and destruction of habitats.
- ✦ Managing and mitigating impacts for corporate reputation and the acceptability of mining operations.



# Creating business value – Exercise

Lafarge decided to implement a strategy to manage their impacts and dependencies on biodiversity/ecosystem services.

In your groups, discuss the following questions:

- 1) What ecosystems and ecosystem services apply to this case study?
- 2) What are Lafarge's ecosystem service impacts/dependencies?
- 3) Based on your answers to 1 and 2, how can Lafarge start to address their impacts and dependencies?





# Case study and exercise – BASF

Module 1: Understanding the links between ecosystem services and business



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# Creating business value – BASF

## The issue

BASF are a world leading chemical company.

They operate a Crop Protection division in order to work with farmers to enhance sustainable agriculture.

- ✦ BASF recognizes that the functioning of ecosystems is important for agriculture and the company's customers, the farmers.
- ✦ Acknowledge that competitive agriculture needs to be compatible with biodiversity, in order to be accepted by society.



# Creating business value – Exercise

BASF decided to implement a strategy to manage their impacts and dependencies on biodiversity/ecosystem services.

In your groups, discuss the following questions:

- 1) What ecosystems and ecosystem services apply to this case study?
- 2) What are BASF's ecosystem service impacts/dependencies?
- 3) Based on your answers to 1 and 2, how can BASF start to address their impacts and dependencies?



# Case study and exercise – Tata Chemicals

Module 1: Understanding the links between ecosystem services and business



wbcsd [business ecosystems training](#)

# Greening the Lands – Tata Chemicals

## The issue: Waste Disposal

- ❖ Tata Chemicals soda ash plant was set up in Okhamandal, Gujarat in 1939 and is the second largest producer of soda ash (sodium carbonate) in the world.
- ❖ The manufacturing process is such that more than 400kg of waste is generated for every tonne of soda ash produced
- ❖ Production volume has grown (from 80 tonnes / day in 1944 to the current 2,400 tonnes / day), the volume of wastes generated from its operation has also increased.
- ❖ Malara, a barren site, was used waste disposal.
- ❖ Solid waste disposal was building up as a big issue as the wind blew dry dust all around Malara.
- ❖ The problem escalated to such proportions, and the company having exhausted all different impact mitigation options that in 1999-00 the company considered relocating the entire site to another spot. However the cost was estimated to Rs120 million.



Source: Tata Chemicals

[http://www.tata.com/pdf/tata\\_review\\_oct\\_09/innovista\\_tata\\_chemicals\\_greens\\_land.pdf](http://www.tata.com/pdf/tata_review_oct_09/innovista_tata_chemicals_greens_land.pdf)



# Creating business value – Exercise

Tata Chemicals decided to implement a strategy to manage their impacts and dependencies on biodiversity/ecosystem services.

In your groups, discuss the following questions:

- 1) What ecosystems and ecosystem services apply to this case study?
- 2) What are Tata's ecosystem service impacts/dependencies?
- 3) Based on your answers to 1 and 2, how can Tata start to address their impacts and dependencies?



# Case study and exercise – Rio Tinto

Module 1: Understanding the links between ecosystem services and business



wbcSD business ecosystems training

# Setting up a new benchmark for mine development in India – Rio Tinto

## The Issue

- ✦ The Bunder project is Rio Tinto's first and most advanced diamond mining venture in India.
- ✦ Rio Tinto began exploration for diamonds in the central Indian state of Madhya Pradesh in late 2001.
- ✦ Diamond-bearing lamproite was discovered in the Bundelkhand region in 2004. The deposit – the first diamond discovery in India for over 50 years and one of only four new diamond mines globally that is likely to become functional in the next 10 years – consists of a cluster of eight diamondiferous lamproites (volcanic rock), the largest of which measures 18 ha.
- ✦ Construction is scheduled for 2014 and 2015, with the mine expected to be operational by 2016.



Source: Rio Tinto India,  
[http://www.riotintoindia.com/documents/Bunder\\_Project\\_Report.pdf](http://www.riotintoindia.com/documents/Bunder_Project_Report.pdf)

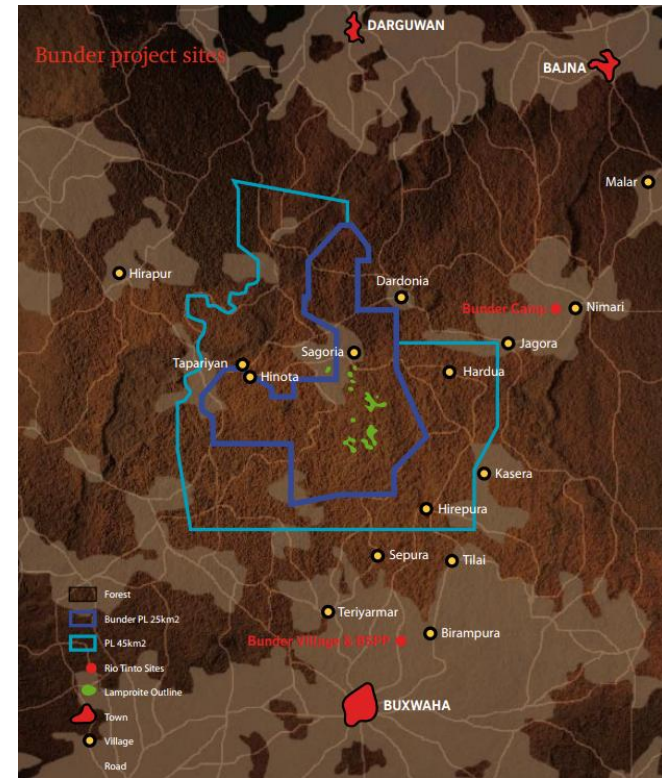




# Setting up a new benchmark for mine development in India – Rio Tinto

## The Issue (cont.)

- ✧ The region is poor, underdeveloped and drought-prone, with limited access to health, education and communication services.
- ✧ Fifteen villages with a population of around 6,000 people make up the Bunder community.
- ✧ Centuries-old water management practices can no longer keep up with people's growing needs.



Source: Rio Tinto India,  
[http://www.riotintoindia.com/documents/Bunder\\_Project\\_Report.pdf](http://www.riotintoindia.com/documents/Bunder_Project_Report.pdf)



# Creating business value – Exercise

Rio Tinto decided to implement a strategy to manage their impacts and dependencies on biodiversity/ecosystem services.

In your groups, discuss the following questions:

- 1) What ecosystems and ecosystem services apply to this case study?
- 2) What are Rio Tinto's ecosystem service impacts/dependencies?
- 3) Based on your answers to 1 and 2, how can Rio Tinto start to address their impacts and dependencies?



# **Case study and exercise – Ambuja Cements Limited**

**Module 1: Understanding the links between  
ecosystem services and business**

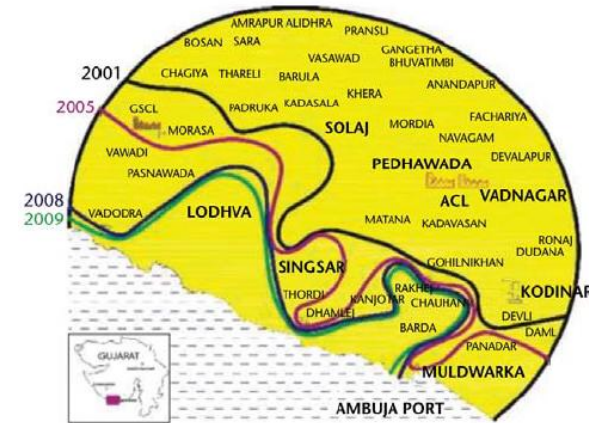


wbcsd **business ecosystems training**

# Sustaining the Ecosystem for Water, Wildlife and Community in India: Ambuja Cements Limited

## The Issue

- ❖ Ambuja Cements Limited (Group company of Holcim), is a leading supplier of cement in India
- ❖ The company operates the Ambujanagar cement plant in the Kodinar region of Gujarat, India.
- ❖ The Ambujanagar facility is located between the Arabian Sea and the Gir Sanctuary and National Park (designated protected area).
- ❖ There have been critical problems of freshwater availability in the state of Gujarat since 1970.
- ❖ Owing to over-withdrawal of freshwater and intensive land-use in the Kodinar region, there has been marked depletion of the water table and an associated serious increase in water salinity from the ingress of seawater into the water table.



# Creating business value – Exercise

Ambuja Cements Limited decided to implement a strategy to manage their impacts and dependencies on biodiversity/ecosystem services.

In your groups, discuss the following questions:

- 1) What ecosystems and ecosystem services apply to this case study?
- 2) What are Ambuja Cements Limited's ecosystem service impacts/dependencies?
- 3) Based on your answers to 1 and 2, how can Ambuja Cement start to address their impacts and dependencies?



# Feedback

## Group debrief



# Module 1, so far...

- ✦ Understand the basics ✓
- ✦ Drivers for change and business impacts and dependencies ✓
- ✦ Links with sustainability ✓
- ✦ Business case for action
- ✦ Policy and regulatory frameworks ✓
- ✦ Gain useful knowledge



# **Session 7**

## **Knowledge check**

**Module 1: Understanding the links between ecosystem services and business**



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# Interactive

Key concepts

Do you know...



## **Session 8a**

# **Re-cap – the business case for action**

**Module 1: Understanding the links between business and ecosystems**



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# Business case for action



Businesses impact on ecosystems and ecosystem services



Businesses rely and depend on ecosystems and ecosystem services



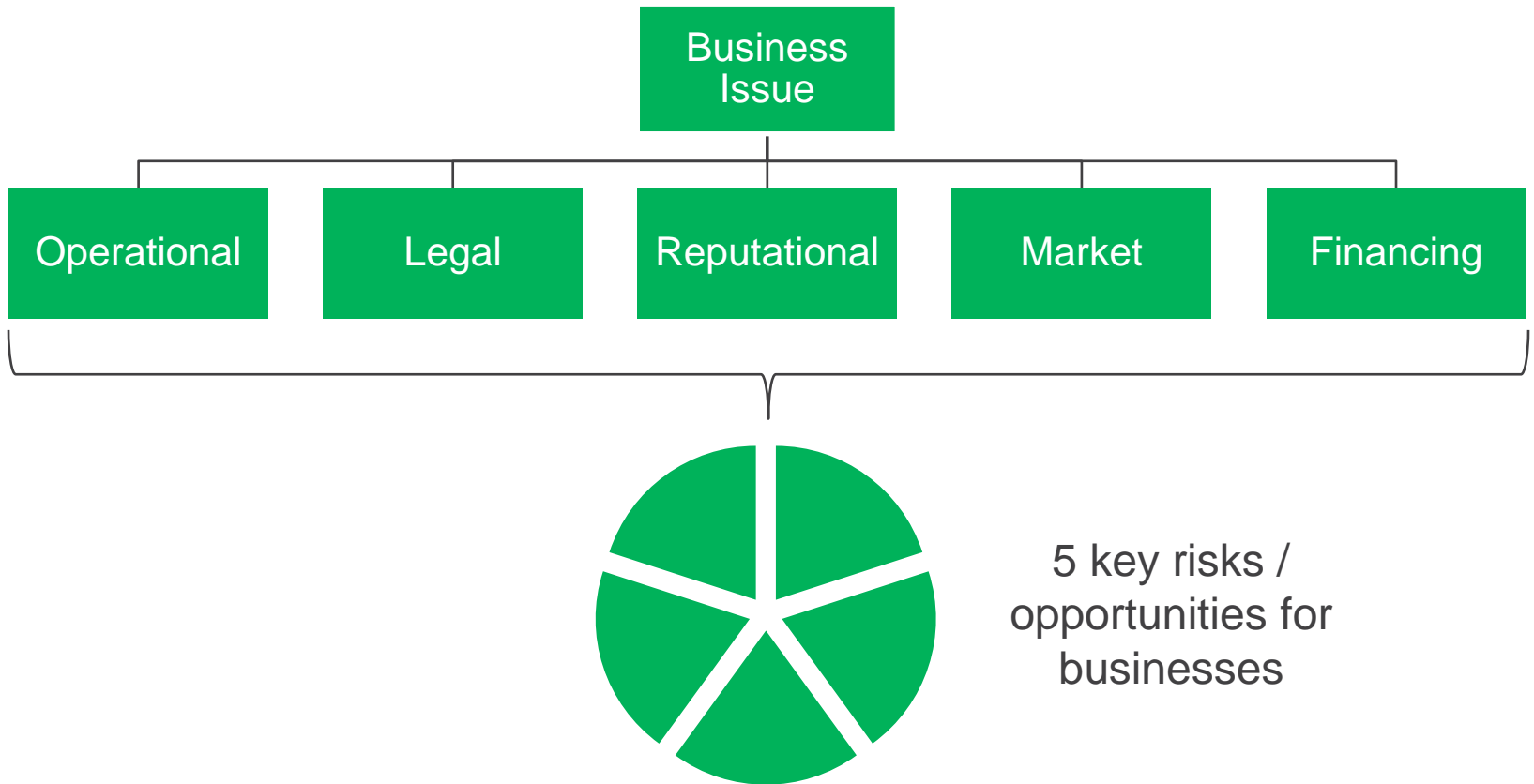
# Introduction

## Issues business can face in daily operations and supply chains:

- ❖ Water scarcity and declining water quality
- ❖ Disruption of food, fiber or other natural industrial inputs
- ❖ Increasing incidents of extreme flooding, storms or drought
- ❖ Increasing stakeholder expectations (NGOs, customers, investors etc.)
- ❖ Tightened public policies on natural resource management or operational permitting
- ❖ Traditional risk management processes do not always capture ecosystem risks / opportunities



# Different risks and opportunities – overview



# Introduction to different types of risks and opportunities



## Operational

### Risks

- ✦ Increased scarcity and cost of raw materials

### Opportunities

- ✦ Improving operational efficiencies and saving costs
- ✦ Building awareness amongst employees/stakeholders



# Introduction to different types of risks and opportunities (cont.)



## Regulatory and legal

### Risks & opportunities:

- ✦ Public policies (e.g. taxes, subsidies and moratoria on extractive activities). Examples of laws that currently consider the value of ecosystems include:
  - The water framework directive
  - The marine strategy framework directive
  - South African water white paper
  - The Environmental liability directive
  - Access and benefit sharing



# Introduction to different types of risks and opportunities (cont.)



## Reputational

### Risks

- ✦ Relationships with their customers and other stakeholders.
- ✦ Affect a company's brand, image, "goodwill" (e.g. image from media and NGOs)

### Opportunities

- ✦ Implementing and communicating sustainable purchasing, operating or investment practices in order to differentiate corporate brands





# Introduction to different types of risks and opportunities (cont.)



## Market and product

### Risks

- ✦ Relate to product and service offerings, consumer preferences, and other market factors that affect corporate performance
- ✦ Consumer preferences

### Opportunities

- ✦ Potential new revenue streams when participating in emerging environmental markets



# Introduction to different types of risks and opportunities (cont.)



## Financing

### Risks

- ✦ Affect the cost and availability of capital to companies

### Opportunities

- ✦ Could potentially include companies obtaining more favourable lending terms
- ✦ Access to new green funds



# **Session 8b**

## **Possible business responses**

**Module 1: Understanding the links between business and ecosystems**



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# How can business respond?

- ✧ Measure, manage and mitigate biodiversity & ecosystem impact and dependence **risks** and explore **new opportunities**
- ✧ Undertake **corporate ecosystem valuation** to quantify business risks and opportunities
- ✧ **Innovate** and lead the development of:
  - Markets for ecosystem services
  - Eco-efficient goods, services & technologies
- ✧ **Encourage suppliers & purchasers** – including SMEs – to adopt “best” biodiversity practices through the supply chain
- ✧ Enter into **creative partnerships** with municipalities, governments, NGOs, science community for on-the-ground solutions
- ✧ **Support “smart” ecosystem regulation** that reverses degradation, leverage market forces, “levels the playing field” for all and supports social & livelihood benefits



# **Session 9**

## **Brainstorming the business case**

**Module 1: Understanding the links between business and ecosystems**



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# Case study and exercise – ArcelorMittal

Module 1: Understanding the links between ecosystem services and business



wbcsd [business ecosystems training](https://www.wbcsd.org/)

# Creating business value – ArcelorMittal

## The issue

### Water dependency

ArcelorMittal owned operations in the Great Lakes basin.

- ✦ 9 facilities throughout USA and Canada surrounding the Great Lakes
- ✦ After iron and coal, water is the most important component in the steel making process.
  - Between 13,000 to 23,000 gallons of water per ton of steel.
- ✦ Also dependent on the Great Lakes to ship raw materials for manufacturing and for product distribution.
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# Case study and exercise – Lafarge

Module 1: Understanding the links between ecosystem services and business



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# Creating business value – Lafarge

## The issue

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# Case study and exercise – BASF

Module 1: Understanding the links between ecosystem services and business



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# Case study and exercise – Tata Chemicals

Module 1: Understanding the links between ecosystem services and business



wbcsd business ecosystems training

# Greening the Lands – Tata Chemicals

## The issue: Waste Disposal

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Source: Tata Chemicals

[http://www.tata.com/pdf/tata\\_review\\_oct\\_09/innovista\\_tata\\_chemicals\\_greens\\_land.pdf](http://www.tata.com/pdf/tata_review_oct_09/innovista_tata_chemicals_greens_land.pdf)



# Case study and exercise – Rio Tinto

Module 1: Understanding the links between ecosystem services and business



wbcSD business ecosystems training

# Setting up a new benchmark for mine development in India – Rio Tinto

## The Issue

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- ✦ Diamond-bearing lamproite was discovered in the Bundelkhand region in 2004. The deposit – the first diamond discovery in India for over 50 years and one of only four new diamond mines globally that is likely to become functional in the next 10 years – consists of a cluster of eight diamondiferous lamproites (volcanic rock), the largest of which measures 18 ha.
- ✦ Construction is scheduled for 2014 and 2015, with the mine expected to be operational by 2016.



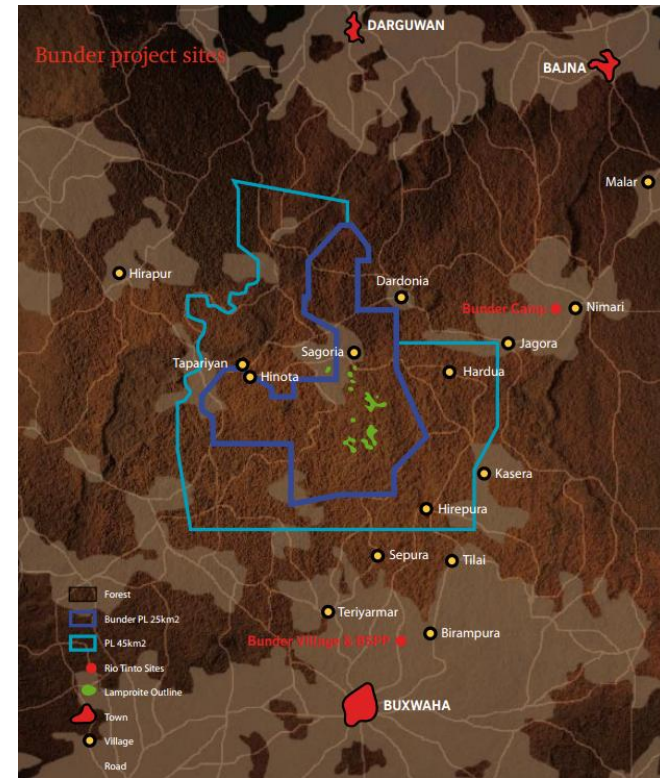
Source: Rio Tinto India,  
[http://www.riotintoindia.com/documents/Bunder\\_Project\\_Report.pdf](http://www.riotintoindia.com/documents/Bunder_Project_Report.pdf)



# Setting up a new benchmark for mine development in India – Rio Tinto

## The Issue (cont.)

- ✦ The region is poor, underdeveloped and drought-prone, with limited access to health, education and communication services.
- ✦ Fifteen villages with a population of around 6,000 people make up the Bunder community.
- ✦ Centuries-old water management practices can no longer keep up with people's growing needs.



Source: Rio Tinto India,  
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# **Case study and exercise – Ambuja Cements Limited**

**Module 1: Understanding the links between  
ecosystem services and business**

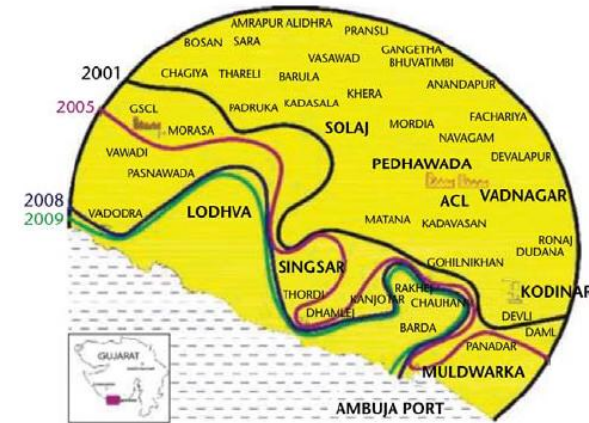


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# Sustaining the Ecosystem for Water, Wildlife and Community in India: Ambuja Cements Limited

## The Issue

- ❖ Ambuja Cements Limited (Group company of Holcim), is a leading supplier of cement in India
- ❖ The company operates the Ambujanagar cement plant in the Kodinar region of Gujarat, India.
- ❖ The Ambujanagar facility is located between the Arabian Sea and the Gir Sanctuary and National Park (designated protected area).
- ❖ There have been critical problems of freshwater availability in the state of Gujarat since 1970.
- ❖ Owing to over-withdrawal of freshwater and intensive land-use in the Kodinar region, there has been marked depletion of the water table and an associated serious increase in water salinity from the ingress of seawater into the water table.



# Business risks and opportunities

Type	Risk	Opportunity
Operational		
Legal and political		
Reputational		
Market and product		
Financing		



## **Debrief**

# **Case study and exercise – ArcelorMittal**

**Module 1: Understanding the links between ecosystem services and business**



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# Creating business value – ArcelorMittal

## The issue

### Water dependency

ArcelorMittal owned operations in the Great Lakes basin.

- ❖ 9 facilities throughout USA and Canada surrounding the Great Lakes
- ❖ After iron and coal, water is the most important component in the steel making process.
  - Between 13,000 to 23,000 gallons of water per ton of steel.
- ❖ Also dependent on the Great Lakes to ship raw materials for manufacturing and for product distribution.
- ❖ 37 million people, including more than 25,000 ArcelorMittal employees, live and rely on the lakes for drinking water, recreation and food sources.



# Creating business value – ArcelorMittal

## The response

### “Sustain Our Great Lakes” Public Private Partnership

- ✦ In 2007, ArcelorMittal joined the National Fish and Wildlife Foundation, U.S. Environmental Protection Agency, U.S. Fish and Wildlife Service, U.S. Forest Service and the National Oceanic and Atmospheric Administration.
- ✦ Collaborative ecosystem restoration. Partners work together to leverage resources and educate decision makers on the importance of the Great Lakes to the region's economic vitality and quality of life, the needs and priorities of the ecosystem, and to identify potential actions.
- ✦ Sustain Our Great Lakes program aims to restore the ecological integrity of the Basin. Financial gains:
  - Increase capacity and collaboration of environmental initiatives; and
  - Enable NGOs to provide on-the-ground impact toward restoration goals, thereby increasing the overall health of the Great Lakes.

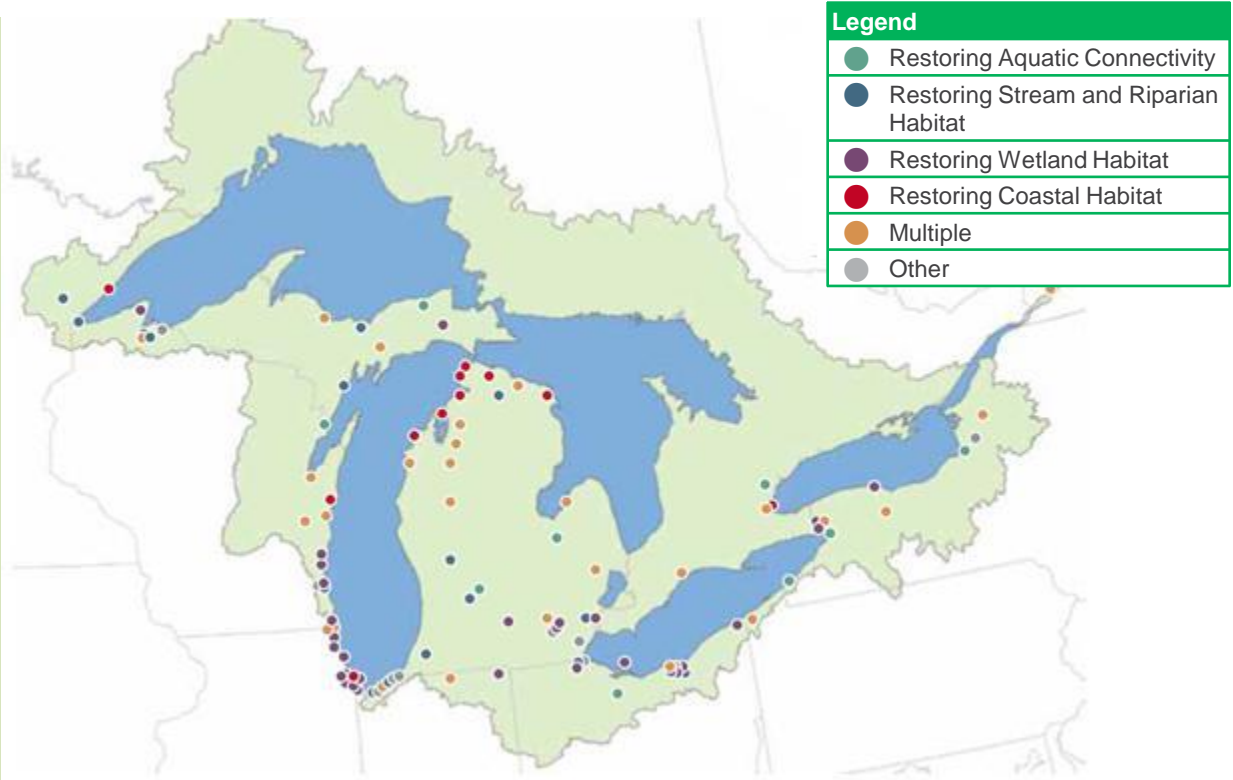


# ArcelorMittal Case study

## “Sustain our Great Lakes” Project Location by Focal Issue (2006-2010)

From 2006 through 2010, the program awarded 103 grants for projects across all eight Great Lakes states and both Great Lakes provinces.

All but nine of the 103 grants directly addressed one or more of the focal issue categories.



Note: Projects that address multiple focal issues are coded as 'Multiple.' Projects that did not fit the any of the focal issues are coded as 'Other'.



# Creating business value – ArcelorMittal (cont.)

## The results

### Different projects for the same objective: biodiversity conservation

- ✦ Public-private partnership model
- ✦ Grants are leveraged two to one
- ✦ Since 2006, 103 grants totalling \$29 million USD in conservation investment (\$12.1 million cash funded by the partnership, \$16.9 million provided in matching funds)
- ✦ Supports the implementation of the Great Lakes Restoration Initiative and is designed to protect, maintain and restore the basin's ecosystems
- ✦ In the long term, ArcelorMittal's involvement in these projects demonstrate its responsibility and strengthens its license to operate in the Great Lakes region





## **Debrief**

### **Case study and exercise – Lafarge**

**Module 1: Understanding the links between ecosystem services and business**



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# Creating business value – Lafarge

## The issue

### Mitigating impacts and restoring biodiversity, critical steps for extractive industries.

- ✦ Lafarge is a French group operating in resources extraction and building materials.
- ✦ Worldwide operations, significantly in developing countries.
- ✦ Several potentials for impacts, e.g. removal of soil and destruction of habitats.
- ✦ Managing and mitigating impacts very impact for corporate reputation and the acceptability of mining operations.



# Creating business value – Lafarge

## The response

### Plant nurseries as part of biodiversity restoration

- ✦ Lafarge has developed a biodiversity management system, including tools and best practices.
- ✦ Local nurseries important feature of rehabilitation as plants ensure soil stability and landscape integration. Local nurseries respect indigenous species, adaptation to the local biogeographical context, and avoid spread of invasive species.
- ✦ Specific rehabilitation programs in Uganda and the Philippines. Seeds and material for vegetative multiplication are collected directly in the vicinity of the quarry.
- ✦ Local know-how plays an important role by helping to choose the most adapted species and build the protocols for planting and care. Partnerships with botanical authorities the ultimate stage of the process.



# Creating business value – Lafarge (cont.)

## The results

### Different projects for a same objective: biodiversity conservation.

- ❖ In Uganda, the nursery production capacity is 100,000 seedlings per year.
- ❖ 30,000-50,000 seedlings are used for alternative fuel plantations and 12,000-15,000 seedlings are used for rehabilitating the mined area.
- ❖ The local communities receive 30,000 to 50,000. The nursery projects employ more than 30 people.
- ❖ These actions, whilst helping Lafarge rehabilitate its former quarry, have also helped the company secure its operations in the region.



## **Debrief**

### **Case study and exercise – BASF**

**Module 1: Understanding the links between ecosystem services and business**



# Creating business value – BASF

## The issue

BASF are a world leading chemical company.

They operate a Crop Protection in order to work with farmers to enhance sustainable agriculture.

- ✦ BASF recognizes that the functioning of ecosystems is important for agriculture and the company's customers, the farmers.
- ✦ Acknowledge that competitive agriculture needs to be compatible with biodiversity, in order to be accepted by society.



# Creating business value – BASF

## The response

BASF implemented 3 different projects:

- ✦ **Project 1 – Testing methods of biodiversity enhancement (UK):** partnered with a commercial farm to implement and monitor new biodiversity methods suggested by the Farming and Wildlife Advisory Group and the Royal Society for the Protection of Birds (RSPB).
- ✦ **Project 2 – Planting trees for a more sustainable agriculture (Brazil):** education of farming communities and action on biodiversity restoration and conservation. Partnered with local organizations and planted over half a million native Brazilian trees, covering around 300 hectares.
- ✦ **Project 3 – Protecting and preserving bees (France):** Increasing mortality rates for pollinating insects such as bees has a direct impact on agriculture. Partnered with the French Bee Biodiversity Network to protect honeybees and other pollinators in France. Special ‘bee pastures’ have been set up on more than 2500 hectares every year.



# Creating business value – BASF

## The results

**Three different methods – providing habitats and food supply to local species, reforestation and education programs.**

The expected outcomes are:

- ✦ Demonstrate that modern and registered crop protection and good agricultural practices are compatible with biodiversity;
- ✦ Improve and strengthen the relationship with farmers, by providing solutions that are compatible with farming practices; and
- ✦ Enhance the reputation of the farming sector and BASF's industry as a provider of agricultural solutions.





## **Debrief**

# **Case study and exercise – Tata Chemicals**

**Module 1: Understanding the links between ecosystem services and business**



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# Greening the Lands – Tata Chemicals

## The issue: Waste Disposal

- ❖ Tata Chemicals soda ash plant was set up in Okhamandal, Gujarat in 1939 and is the second largest producer of soda ash (sodium carbonate) in the world.
- ❖ The manufacturing process is such that more than 400kg of waste is generated for every tonne of soda ash produced
- ❖ Production volume has grown (from 80 tonnes / day in 1944 to the current 2,400 tonnes / day), the volume of wastes generated from its operation has also increased.
- ❖ Malara, a barren site, was used waste disposal.
- ❖ Solid waste disposal was building up as a big issue as the wind blew dry dust all around Malara.
- ❖ The problem escalated to such proportions, and the company having exhausted all different impact mitigation options that in 1999-00 the company considered relocating the entire site to another spot. However the cost was estimated to Rs120 million.



Source: Tata Chemicals

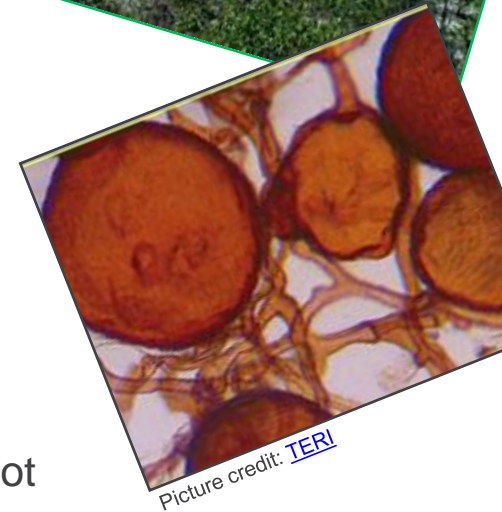
[http://www.tata.com/pdf/tata\\_review\\_oct\\_09/innovista\\_tata\\_chemicals\\_greens\\_land.pdf](http://www.tata.com/pdf/tata_review_oct_09/innovista_tata_chemicals_greens_land.pdf)



# Greening the Lands – Tata Chemicals

## The response

- ✧ A team was constituted to work on alternative solutions and they came up with an innovative one: the use of **bio fertilizers and bioremediation techniques to remediate the solid wastes and develop a green cover.**
  - TCL engaged the services of experts of TERI's Centre for Mycorrhizal Research, Biotechnology and Management of Bioresources
  - Special microorganisms (that were observed) were identified and isolated
  - Pure culture of the same was prepared in their laboratory.
  - Similar compatible bacterial and mycorrhizal consortiums were also brought and inoculated to the root systems of saplings in their young age.
  - Sediments were also treated the same way.



Picture credit: [TERI](#)



# Greening the Lands – Tata Chemicals

## The Results

- ✧ The success of this bioremediation technique using mycorrhizal microorganisms has had a number of positive fallouts.
  - Tata Chemicals has saved the Rs 120 million it would have spent on relocating the site.
  - A lifeless dumpsite was converted into a new green ecosystem.
  - The project gave a direct boost to the sustainability of synthetic soda ash manufacturing facilities.
  - Of the 30-acre dump site, 22 acres have been transformed into lush green belts of plants and shrubs.
  - More than 20,000 plants of as many as six different varieties are growing at Malara.



## **Debrief**

### **Case study and exercise – Rio Tinto**

**Module 1: Understanding the links between ecosystem services and business**



wbcasd **business ecosystems training**

# Setting up a new benchmark for mine development in India – Rio Tinto

## The Issue

- ✦ The Bunder project is Rio Tinto's first and most advanced diamond mining venture in India.
- ✦ Rio Tinto began exploration for diamonds in the central Indian state of Madhya Pradesh in late 2001.
- ✦ Diamond-bearing lamproite was discovered in the Bundelkhand region in 2004. The deposit – the first diamond discovery in India for over 50 years and one of only four new diamond mines globally that is likely to become functional in the next 10 years – consists of a cluster of eight diamondiferous lamproites (volcanic rock), the largest of which measures 18 ha.
- ✦ Construction is scheduled for 2014 and 2015, with the mine expected to be operational by 2016.



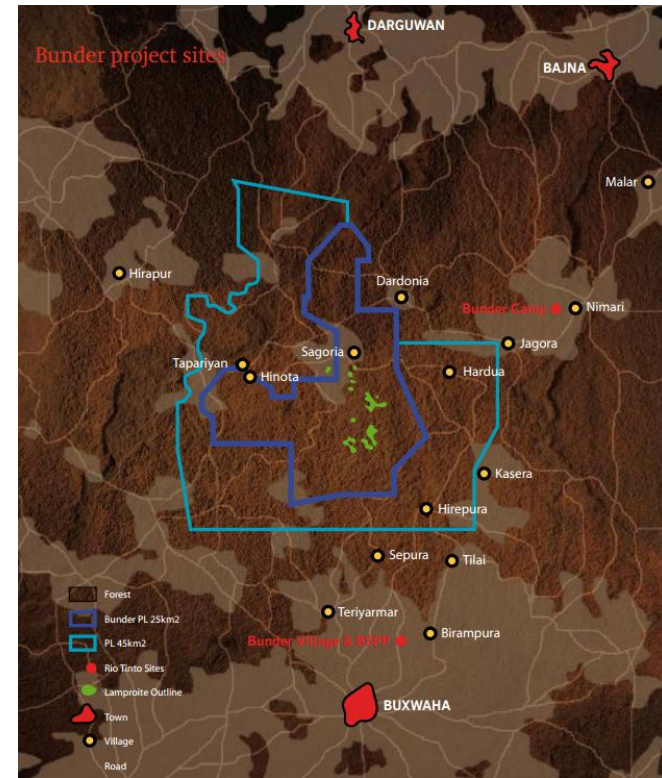
Source: Rio Tinto India,  
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# Setting up a new benchmark for mine development in India – Rio Tinto

## The Issue (cont.)

- ✧ The region is poor, underdeveloped and drought-prone, with limited access to health, education and communication services.
- ✧ Fifteen villages with a population of around 6,000 people make up the Bunder community.
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# Setting up a new benchmark for mine development in India – Rio Tinto

## The Response

### ✧ Biodiversity and regeneration initiatives

- Baseline information on local flora and fauna was collected in 2007 and, in early 2011, the State Forest Research Institute, Jabalpur began a study to look at the environmental impact of drilling.
- Organised a large-scale eradication drive of the invasive plant Lantana, in an area of more than 100 hectares.

### ✧ Water conservation activities included:

- Harvesting of rain water at the Bunder camp and processing plant;
- Use of waterless urinals and pour-flush toilets;
- Use of drip irrigation for the camp gardens.

Source: Rio Tinto India,  
[http://www.riotintoindia.com/documents/Bunder\\_Project\\_Report.pdf](http://www.riotintoindia.com/documents/Bunder_Project_Report.pdf)





# Setting up a new benchmark for mine development in India – Rio Tinto

## The Response (cont.)

- ✦ Processing plant at Bunder is also designed to reduce water consumption through recycling and water harvesting. Waste water from the sample processing plant is monitored daily
- ✦ Processed water is released into the gardens, that have been established to reuse domestic and industrial waste water (medicinal plant garden, a kitchen garden and fruit trees planted around the camp premises)
- ✦ Water monitoring studies initiated to better understand the availability of water in a region traditionally considered to be water-deficient.
- ✦ To ensure that the rainwater that may overflow from the tailing pond in monsoon season is not contaminated, a garland drainage system has been constructed.



Source: Rio Tinto India,  
[http://www.riotintoindia.com/documents/Bunder\\_Project\\_Report.pdf](http://www.riotintoindia.com/documents/Bunder_Project_Report.pdf)



# Setting up a new benchmark for mine development in India – Rio Tinto

## The Result

- ✧ The Bunder project has not reported a single environmental incident in the past five years.
- ✧ These messages have been further reinforced in local communities through the organisation of clean-up campaigns
- ✧ The Bunder project teams working closely with the State Forest Department to assess the impact of its operations on the local environment.



Source: Rio Tinto India,  
[http://www.riotintoindia.com/documents/Bunder\\_Project\\_Report.pdf](http://www.riotintoindia.com/documents/Bunder_Project_Report.pdf)



## Debrief

# Case study and exercise – Ambuja Cements Limited

Module 1: Understanding the links between ecosystem services and business

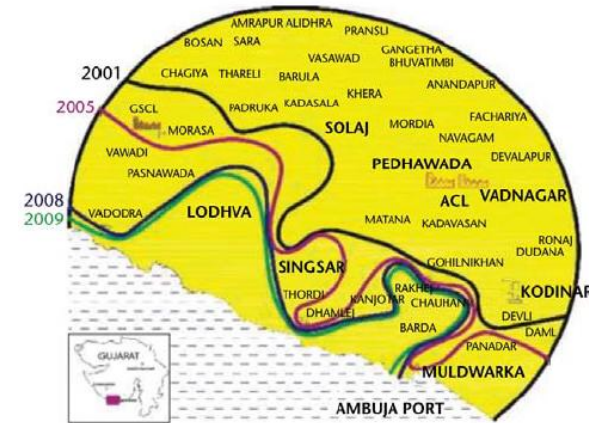


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# Sustaining the Ecosystem for Water, Wildlife and Community in India: Ambuja Cements Limited

## The Issue

- ❖ Ambuja Cements Limited (Group company of Holcim), is a leading supplier of cement in India
- ❖ The company operates the Ambujanagar cement plant in the Kodinar region of Gujarat, India.
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- ❖ Owing to over-withdrawal of freshwater and intensive land-use in the Kodinar region, there has been marked depletion of the water table and an associated serious increase in water salinity from the ingress of seawater into the water table.



# Sustaining the Ecosystem for Water, Wildlife and Community in India: Ambuja Cements Limited

## The response

Ambuja has adopted a landscape approach in addressing impacts of the quarrying activities.

### Capturing and preserving freshwater

- Implementation of several measures to improve water management in the area, through rainwater harvesting, and converting the mined-out pits into artificial lakes and wetlands.
- Interlinking of fresh water wetlands/ water reservoirs (mined out pits) through link canals, construction of percolation wells, renovation and deepening of ponds and runoff diversion systems.

### Quarry rehabilitation through tree planting

- Different tree species have been planted as part of the Van Vihar project, the Eco Park Project and the mini Gir project, in the mined-out areas and surrounding zone.
- Small patches of land are earmarked to grow medicinal plants and fodder-yielding plants.

### Conserving the flora and fauna of Gir Under the “Mini Gir project”, a large number of tree species native to the Gir Forest are being planted in the reclaimed mines.

### Protecting coastal zones through mangrove development

- Mangroves Plantation in Coastal area near Surat, South Gujarat, India for protecting coastal zones , flood & salinity control , supporting marine flora & faunas , as well providing livelihood to local community.



# Sustaining the Ecosystem for Water, Wildlife and Community in India: Ambuja Cements Limited

## The Results

- ✦ The water management program has raised the water table by 8 meters, controlled the water salinity problem and made quality freshwater easily available to the communities.
- ✦ Wells, previously dry for at least 7 months a year, now contain water all year round, which has made it possible for local farmers to grow two to three crops per year.
- ✦ Other significant results of the project include:
  - By March 2012 the company had rehabilitated approximately 330 ha of area and planted nearly 275,000 trees
  - Artificially created water reservoirs have enhanced the wildlife of the area, becoming breeding grounds and visiting spots for a large number of migratory birds;
  - A planting density of 3,000 plants per hectare has been maintained in the mangrove plantation project, which will provide multiple benefits, such as flood protection, supporting marine life and climate regulation.



Feedback...



# Wrap-up

**Module 1: Understanding the links between business and ecosystems**



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# Module 1 objectives – recap

- ✧ Demonstrate an understanding of the key terms and concepts around biodiversity, ecosystems, ecosystem services, environment and sustainability.
- ✧ Identify the direct and indirect drivers and causes for biodiversity and ecosystem changes and impacts, and the impacts and dependency of companies on ecosystem services.
- ✧ Understand the link between ecosystem services and wider sustainability issues.
- ✧ Describe the business case for managing ecosystems and identify the specific business case for their own company from the perspective of both risk and opportunity.
- ✧ Understand some of the basic regulatory and policy frameworks currently in place as a key driver of change (expanded in module 4).
- ✧ Help participants gain knowledge that will help them add value to their organization.



# Module 1

- ✦ Understand the basics ✓
- ✦ Drivers for change and business impacts and dependencies ✓
- ✦ Links with sustainability ✓
- ✦ Business case for action ✓
- ✦ Policy and regulatory frameworks ✓
- ✦ Gain useful knowledge ✓



# Review...

Have we achieved your objectives?



# Action planning

Identify how ecosystem services relate to your own company's situation.



# BET: Understanding the Links between Ecosystem Services and Business

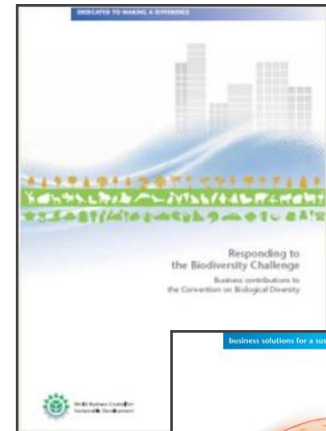
## Action Planning

### Step 1: Build awareness

- ✦ Consider the use of BET either within your company or as an industry initiative in partnership with other companies

### Step 2: Use other publicly available resources

- ✦ Review WBCSD case study examples and publications, which include:
  - Case studies: more than 50 examples, from 16 different countries and 15 sectors complemented by specific Corporate Ecosystem Valuation Road testers
  - Publications: [Guide to Corporate Ecosystem Valuation](#), [Corporate Ecosystem Valuation: Building the Business Case](#), [The Corporate ESR](#), [Responding to the Biodiversity Challenge](#), [Biodiversity and ecosystem services: scaling up business solutions](#).
- ✦ Other key resources: The Economics of Ecosystems and Biodiversity ([TEEB](#)) reports (specifically TEEB for business), The Millennium Ecosystem Assessment and the UK National Ecosystem Assessment



# BET: Understanding the Links between Ecosystem Services and Business

## Action Planning

### Step 3: Join networks and contact experts

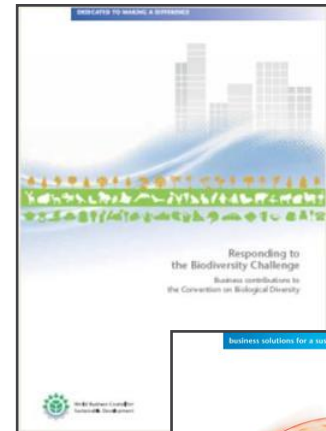
- ✦ Consider joining the WBCSD Ecosystems Focus Area (<http://www.wbcds.org/work-program/ecosystems.aspx>)
- ✦ Make use of the WRI's Ecosystem Services Experts Directory (<http://projects.wri.org/ecosystems/experts>)

### Step 4: Piloting

- ✦ Pilot biodiversity risk and opportunity assessments internally
- ✦ Pilot the Corporate Ecosystem Valuation or Ecosystem Services Review for a selected project, site or stage of your supply chain

### Step 5: Implementation

- ✦ Contact the WBCSD Ecosystem Focus Area team (overleaf) and plan a full implementation strategy with the assistance of international experts



# Main References – Weblinks

- ✧ [Brundtland report outputs](#)
- ✧ [Brundtland report, 20 years on](#)
- ✧ Conservation International, [The Biodiversity Hotspots](#)
- ✧ Millennium Ecosystem Assessment. 2005. [Ecosystems and Human Well-being: Opportunities and Challenges for Business and Industry](#)
- ✧ Millennium Ecosystem Assessment, 2005. [Ecosystems and Human Well-being: Synthesis](#)
- ✧ [TEEB](#)
- ✧ [TEEB for business](#)
- ✧ [United Nations, Millennium development goals](#)
- ✧ University of Minnesota, [“What is Nature worth?” video](#)
- ✧ WBCSD. [Connecting the Dots presentation](#)
- ✧ WBCSD. [Corporate Ecosystem Services Review](#)
- ✧ WBCSD. [Responding to the Biodiversity Challenge: Business contributions to the Convention on Biological Diversity](#)
- ✧ WBCSD. [Biodiversity and ecosystem services: scaling up business solutions](#)
- ✧ WBCSD. [Vision 2050](#)



# Main References – Weblinks(cont).

## Policy frameworks chapter:

- ✧ [CITES](#)
- ✧ [Plant example](#)
- ✧ [Crocodile example](#)
- ✧ [UK Environmental Law Association guide](#) –
- ✧ [Limits to growth](#)
- ✧ [UN Earth Summit Fact Sheet](#)
- ✧ [CBD](#)





# Disclaimer

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