Royal Swedish Academy of Agriculture and Forestry

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The Economics of Ecosystems and Biodiversity

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United Nations Environment Programme
Outline

- Background/Conceptual Foundations
- TEEB Process/Outputs
- Value of Valuations
- Next Steps/Recommendations
We cannot solve our problems with the same thinking we used when we created them.

-Albert Einstein
Global Footprint Network – www.footprintnetwork.org
“Over the past 50 years, humans have changed ecosystems more rapidly and extensively than in any comparable period of time in human history, largely to meet rapidly growing demands for food, fresh water, timber, fiber and fuel.”
Conversion of original biomes, 1950-2050
Indirect Drivers of Change
- Demographic
- Economic (globalization, trade, market and policy framework)
- Sociopolitical (governance and institutional framework)
- Science and Technology
- Cultural and Religious

Direct Drivers of Change
- Changes in land use
- Species introduction or removal
- Technology adaptation and use
- External inputs (e.g., irrigation)
- Resource consumption
- Climate change
- Natural physical and biological drivers (e.g., volcanoes)
ECOSYSTEM SERVICES

Supporting
- NUTRIENT CYCLING
- SOIL FORMATION
- PRIMARY PRODUCTION
- ...

Provisioning
- FOOD
- FRESHWATER
- WOOD AND FIBER
- FUEL
- ...

Regulating
- CLIMATE REGULATION
- FLOOD REGULATION
- DISEASE REGULATION
- WATER PURIFICATION
- ...

Cultural
- AESTHETIC
- SPIRITUAL
- EDUCATIONAL
- RECREATIONAL
- ...

Millennium Ecosystem Assessment
Ecosystem Services and Human Wellbeing

**ECOSYSTEM SERVICES**

- **Provisioning**
  - FOOD
  - FRESH WATER
  - WOOD AND FIBER
  - FUEL
  - ...

- **Supporting**
  - NUTRIENT CYCLING
  - SOIL FORMATION
  - PRIMARY PRODUCTION
  - ...

- **Regulating**
  - CLIMATE REGULATION
  - FLOOD REGULATION
  - DISEASE REGULATION
  - WATER PURIFICATION
  - ...

- **Cultural**
  - AESTHETIC
  - SPIRITUAL
  - EDUCATIONAL
  - RECREATIONAL
  - ...

**CONSTITUENTS OF WELL-BEING**

- **Security**
  - PERSONAL SAFETY
  - SECURE RESOURCE ACCESS
  - SECURITY FROM DISASTERS

- **Basic material for good life**
  - ADEQUATE LIVELIHOODS
  - SUFFICIENT NUTRITIOUS FOOD
  - SHELTER
  - ACCESS TO GOODS

- **Freedom of choice and action**
  - OPPORTUNITY TO BE ABLE TO ACHIEVE WHAT AN INDIVIDUAL VALUES DOING AND BEING

- **Health**
  - STRENGTH
  - FEELING WELL
  - ACCESS TO CLEAN AIR AND WATER

- **Good social relations**
  - SOCIAL COHESION
  - MUTUAL RESPECT
  - ABILITY TO HELP OTHERS

*Source: Millennium Ecosystem Assessment*
The Economics of Ecosystems & Biodiversity

TEEB’s genesis ...

2005

2006

“Potsdam Initiative – Biological Diversity 2010”

. . . the economic significance of the global loss of biological diversity . . .
Outline

• Background/Conceptual Foundations

• **TEEB Process/ Outputs**

• Value of Valuations

• Next Steps/Recommendations
Mainstreaming the Economics of Nature
The Economics of Ecosystems & Biodiversity

TEEB is ...

• A multi-donor initiative, hosted by UNEP, to explore economic perspectives on nature

• Some 200 economists & ecologists (26 countries) in 5 working groups
The Economics of Ecosystems & Biodiversity

TEEB Advisory Board

Achim Steiner
Joan-Martinez Alier
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Karl-Goran Maler
Herman Mulder
Walter Reid
Ahmed Djoghlaf
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What TEEB is aiming for...

- Synthesis of existing knowledge on economics of ecosystems and biodiversity
- Focused analysis and key messages for different end-users
- Active and worldwide dissemination to these users
- Awareness raising and mainstreaming

TEEB is not....

- Academic effort
- Global valuation study
The Economics of Ecosystems & Biodiversity

TEEB - a series of reports

www.teebweb.org
... and broad media coverage

- over 1,100 news articles in 65 countries
- more than 1300 websites
- 1800 social media fora
• G8 Carta di Siracusa

• G20 Leaders Statement

• CBD COP-10
  • Decision X/2 on the Strategic Plan for Biodiversity 2011-20
  • Decision X/21 on Business Engagement
  • Decision X/44 on Incentive Measures

• Ramsar Resolution X.12 on “Principles for partnerships between the Ramsar Convention and the business sector”
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TEEB Conceptual Framework

The Economics of Ecosystems & Biodiversity

Management/Restoration

Institutions & Human Judgments determining (the use of) services

Feedback between value perception and use of ecosystem services

Ecosystems & Biodiversity

Biophysical Structure or process
(eg. vegetation cover or Net Primary Productivity)

Function*
(eg. slow water passage, biomass)

Service
(eg. flood protection, products)

Human wellbeing
(socio-cultural context)

Benefit(s)
(contribution to health, safety, etc)

(econ) Value
(eg. WTP for protection or products)

* subset of biophysical structure or process providing the service

TEEB, Ecological and Economic Foundations, 2010
TEEB approach to “valuation”

1. Recognizing value: a feature of all human societies and communities

2. Demonstrating value: in economic terms, to support decision making

3. Capturing value: introduce mechanisms that incorporate the values of ecosystems into decision making
Different Levels of Analysis

Ecosystem Services

Qualitative Review

Quantitative Review of Effects

Monetary Value

Known and unknown

Uses: eg. health, income, well-being

Quantification: eg. No. of people obtaining fuelwood from a forest

Monetization: eg. avoided costs for water purification, recreational value

Source: based on TEEB Interim Report 2008
The Economics of Ecosystems & Biodiversity

Relationship with Policymaking

- Norms, Regulations & Policies
- Economic Mechanisms
- Markets

Regional Plans
- Recognizing value
- Legislations
- Certification
- PA Evaluation
- PES
- Capturing value

Recognizing value
Demonstrating value
Filtration plant estimated cost
US$ 6-8 Billion
Plus US$300-500 Million annual running costs

Investment in watershed
US$ 1-1.5 Billion
Leuser Ecosystem, Indonesia

- 2.5 Mio ha with species rich forest providing multiple services (water provision, erosion control, etc.)
- Deforestation and resulting erosion is a major challenge – also for agriculture
The benefits from ecosystem services

NPV in million US$ (over 30 years, 4% discount rate)

- Deforestation
- Conservation
- Selective use

Source: adapted from van Beukering et al. 2003
Benefits over time

Scenarios 2000 to 2030, discount rate 0% (Beukering et al. 2002)
Who is benefiting?

NPV in billion US$ (over 30 years at 4% discount rate)

Local community “best option”

Logging industry “best option”

Source: adapted from van Beukering et al. 2003
Usefulness of economic valuation

- Monetary valuations with low reliability and of doubtful pertinence
- Increasing system complexity

Commodity-type values

Ethical / cultural convictions

Value plurality

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• Next Steps/ Recommendations
1. National Studies
   - Brazil, India, Germany, Netherlands, Norway, and others

2. Sectoral Studies
   - Water and wetlands
   - Oceans
   - Agriculture

3. Network/Outreach
   - TEEB database
   - TEEB case studies
   - TEEB news updates
TEEB Lessons

• High-level government commitments

• Open Architecture

• Independence

• Targeted to specific end-users

• Robust Communications and Outreach Strategy
**TEEB “Game Changer” Recommendations**

- Understand and recognize the value of nature
- Develop new national measurements for growth and prosperity
- Develop new private sector disclosure requirements
- Shift consumption patterns
Look deep into nature, and then you will understand everything better.

-Albert Einstein

www.teebweb.org