



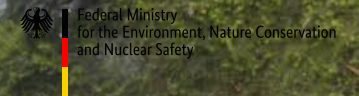
The Economics of Ecosystems & Biodiversity

NILE BASIN DEVELOPMENT FORUM

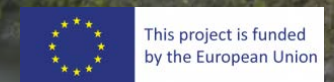
Economic Valuation of Wetland Ecosystem Services Webinar



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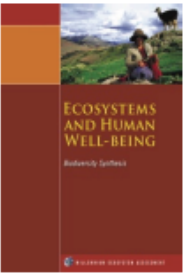
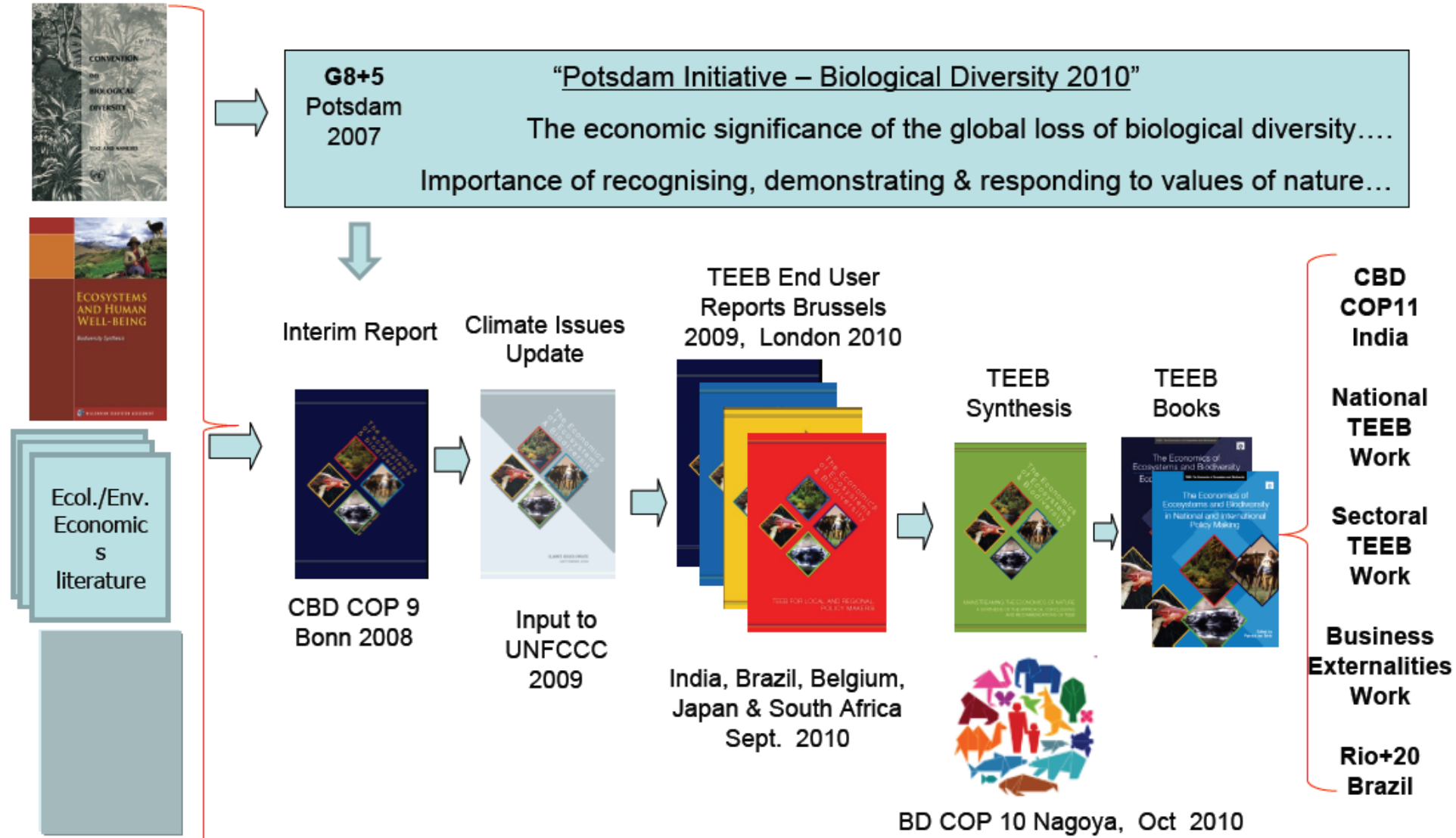


based on a decision of the German Bundestag



I ORIGINS OF TEEB

TEEB initiative (2008-2012)



**G8+5
Potsdam
2007**

"Potsdam Initiative – Biological Diversity 2010"

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

Importance of recognising, demonstrating & responding to values of nature...

Interim Report



CBD COP 9
Bonn 2008

Climate Issues
Update



Input to
UNFCCC
2009

TEEB End User
Reports Brussels
2009, London 2010



India, Brazil, Belgium,
Japan & South Africa
Sept. 2010

TEEB
Synthesis



BD COP 10 Nagoya, Oct 2010

TEEB
Books



- CBD
COP11
India
- National
TEEB
Work
- Sectoral
TEEB
Work
- Business
Externalities
Work
- Rio+20
Brazil

TEEB 6 step approach

STEP 1: Refine the objectives of a TEEB country study by specifying and agreeing on the key policy issues with stakeholders

STEP 2: Identify the most relevant ecosystem services

STEP 3: Define information needs and select appropriate methods

STEP 4: Assess and value ecosystem services

STEP 5: Identify and outline the pros and cons of policy options, including distributional impacts

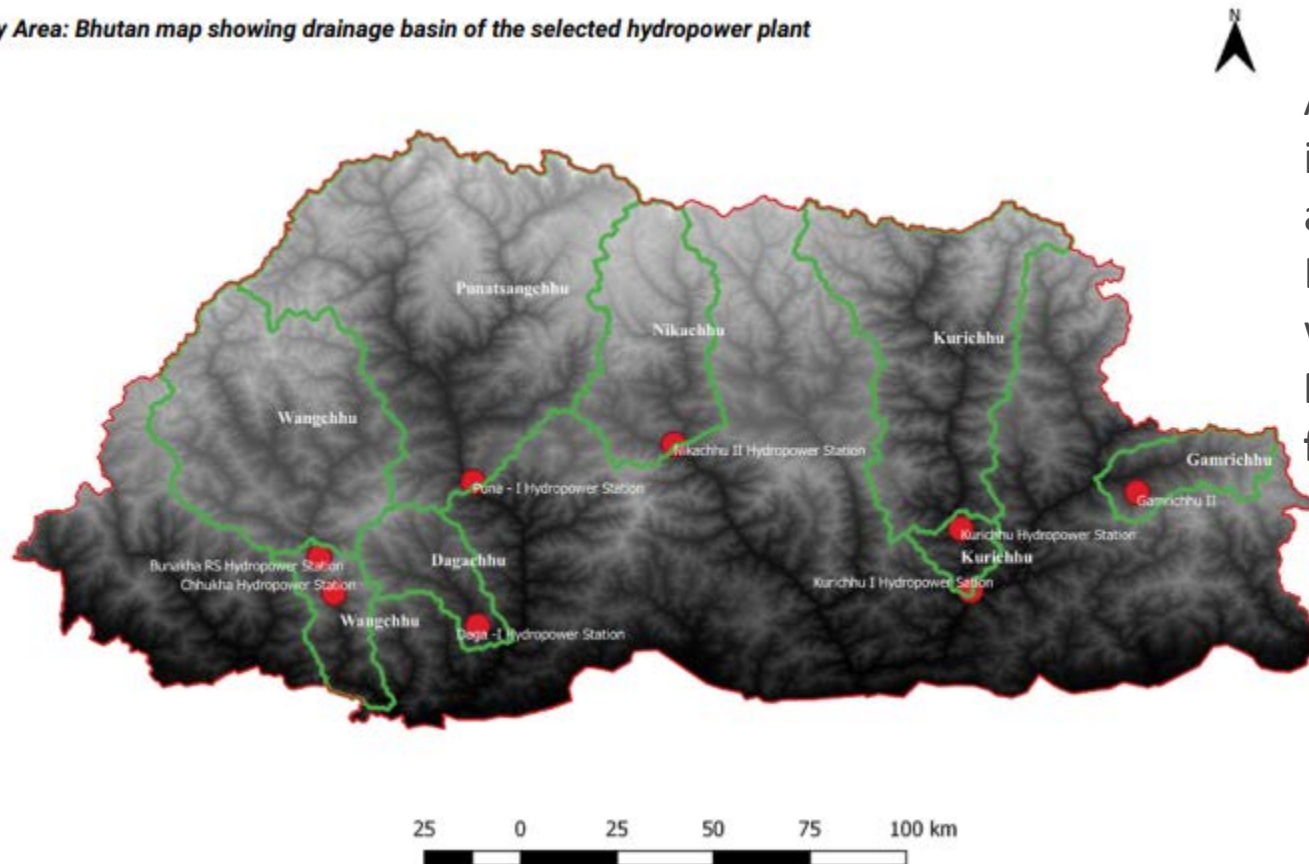
STEP 6: Review, refine and report

TEEB COUNTRY Studies linked to water management

TEEB Bhutan – Informing Hydropower development by watershed

The TEEB Bhutan study assessed changes in ecosystem services provisioning under hydropower development, with a focus on watershed services. It informed the Sustainable Hydropower Development Policy of 2008 and the Alternative Renewable Energy Policy of 2013, both of which have called for a diversification of Bhutan's energy sources.

Study Area: Bhutan map showing drainage basin of the selected hydropower plant



Any expansion in hydropower capacity will have direct and indirect impacts on the provisioning of ecosystem services and on biodiversity, affecting in turn the livelihoods of Bhutanese communities. The following ecosystem services were evaluated:

Provision of freshwater (quality and quantity), Provision of food/fuel wood and Habitat for species

TEEB Philippines – Impact on protected area of development plan

The TEEB Philippines study assesses the potential impact of land reclamation and coastal development plans in Las Piñas-Paranaque Critical Habitat and Ecotourism Area (LPPCHEA) in Manila Ba. Study results are intended to inform environmental compliance process.

TEEB Liberia – Impact on coastal mangroves

The TEEB Liberia study assessed the pressures and threats on coastal mangroves by making a case for integrating the value of biodiversity and ecosystem services into coastal and marine planning policies. The project provided evidence of the benefits of community-based coastal and marine management, the introduction of alternative livelihood options, and the establishment of marine protected areas.

The study compares alternative scenarios for coastal mangrove management in Liberia and the resulting differences in the provisioning of ecosystem services (e.g. provisioning of food, regulation of extreme events, and cultural values) and biodiversity impacts, with a focus on vulnerable coastal population groups. The study consists of five study sites:

- 1.Lake Piso Multiple Nature Reserve (Ramsar site)
- 2.Marshall Wetland (Ramsar site)
- 3.Montserrado Wetland (Ramsar site)
- 4.Baculi, Grand Bassa County (sea turtle nesting site)
- 5.Bafo Bay, Sinoe County (fishing ground and sea turtle nesting site)

The degradation of mangroves has both direct and indirect impacts on the provisioning of ecosystem services and biodiversity, which in turn affects the livelihoods of Liberian communities.

The following ecosystem services were evaluated:

Provision of food, Regulation of extreme events and Cultural Values

TEEBAgriFood

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Why select the Agriculture sector?

7.1.2 THE GLOBAL 20 REGION-SECTORS

Ranking of the 20 region-sectors with the greatest total impact across the 6 EKPIs when measured in monetary terms.

| RANK | SECTOR | REGION | NATURAL CAPITAL COST, US\$ BN | REVENUE, US\$ BN | IMPACT RATIO |
|------|--|--------------------|-------------------------------|------------------|--------------|
| 1 | COAL POWER GENERATION | EASTERN ASIA | 452.8 | 443.1 | 1.0 |
| 2 | CATTLE RANCHING AND FARMING | SOUTH AMERICA | 353.8 | 16.6 | 18.8 |
| 3 | COAL POWER GENERATION | NORTHERN AMERICA | 316.8 | 246.7 | 1.3 |
| 4 | WHEAT FARMING | SOUTHERN ASIA | 266.6 | 31.8 | 8.4 |
| 5 | RICE FARMING | SOUTHERN ASIA | 235.6 | 65.8 | 3.6 |
| 6 | IRON AND STEEL MILLS | EASTERN ASIA | 225.6 | 604.7 | 0.4 |
| 7 | CATTLE RANCHING AND FARMING | SOUTHERN ASIA | 163.0 | 174.0 | 0.8 |
| 8 | CEMENT MANUFACTURING | EASTERN ASIA | 147.0 | 5.8 | 23.0 |
| 9 | WATER SUPPLY | SOUTHERN ASIA | 111.7 | 14.1 | 7.9 |
| 10 | WHEAT FARMING | NORTHERN AFRICA | 100.1 | 7.4 | 13.6 |
| 11 | RICE FARMING | EASTERN ASIA | 99.3 | 91.2 | 1.1 |
| 12 | WATER SUPPLY | WESTERN ASIA | 86.7 | 18.4 | 4.7 |
| 13 | FISHING | GLOBAL | 86.1 | 136.0 | 0.6 |
| 14 | RICE FARMING | NORTHERN AFRICA | 84.2 | 1.2 | 69.6 |
| 15 | CORN FARMING | NORTHERN AFRICA | 80.4 | 1.7 | 47.8 |
| 16 | RICE FARMING | SOUTH-EASTERN ASIA | 79.7 | 41.0 | 1.9 |
| 17 | WATER SUPPLY | NORTHERN AFRICA | 76.4 | 3.4 | 22.2 |
| 18 | SUGARCANE | SOUTHERN ASIA | 75.6 | 6.0 | 12.5 |
| 19 | PETROLEUM AND NATURAL GAS EXTRACTION <i>(excludes water and land use)</i> | EASTERN EUROPE | 72.6 | 371.6 | 0.2 |
| 20 | NATURAL GAS POWER GENERATION | NORTHERN AMERICA | 69.4 | 122.7 | 1.0 |

Objectives of TEEB for Agriculture and Food

The **TEEBAgriFood** aims to:

1. provide a comprehensive economic evaluation of the *'eco-agri-food systems' complex*
2. demonstrate that the economic environment in which farmers operate is distorted by *significant externalities*, both negative and positive, and a lack of *awareness of dependency on natural and social capital*



THE VISIBLE AND INVISIBLE FLOWS OF AGRICULTURAL PRODUCTION

Fix food metrics

For sustainable, equitable nutrition we must count the true global costs and benefits of food production.

***Nature* (2016) Pavan Sukhdev, Peter May and Alexander Muller**

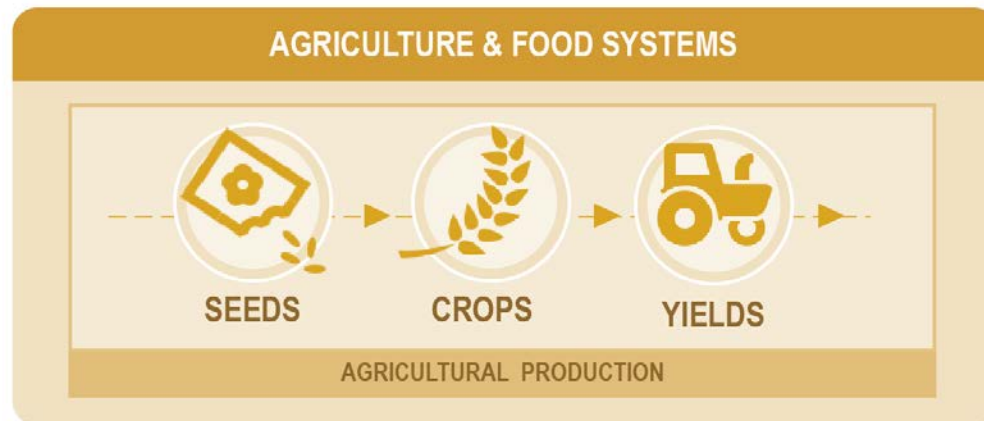
ZAKIR HOSSAIN CHOWDHURY/ANADOLU AGENCY/GETTY



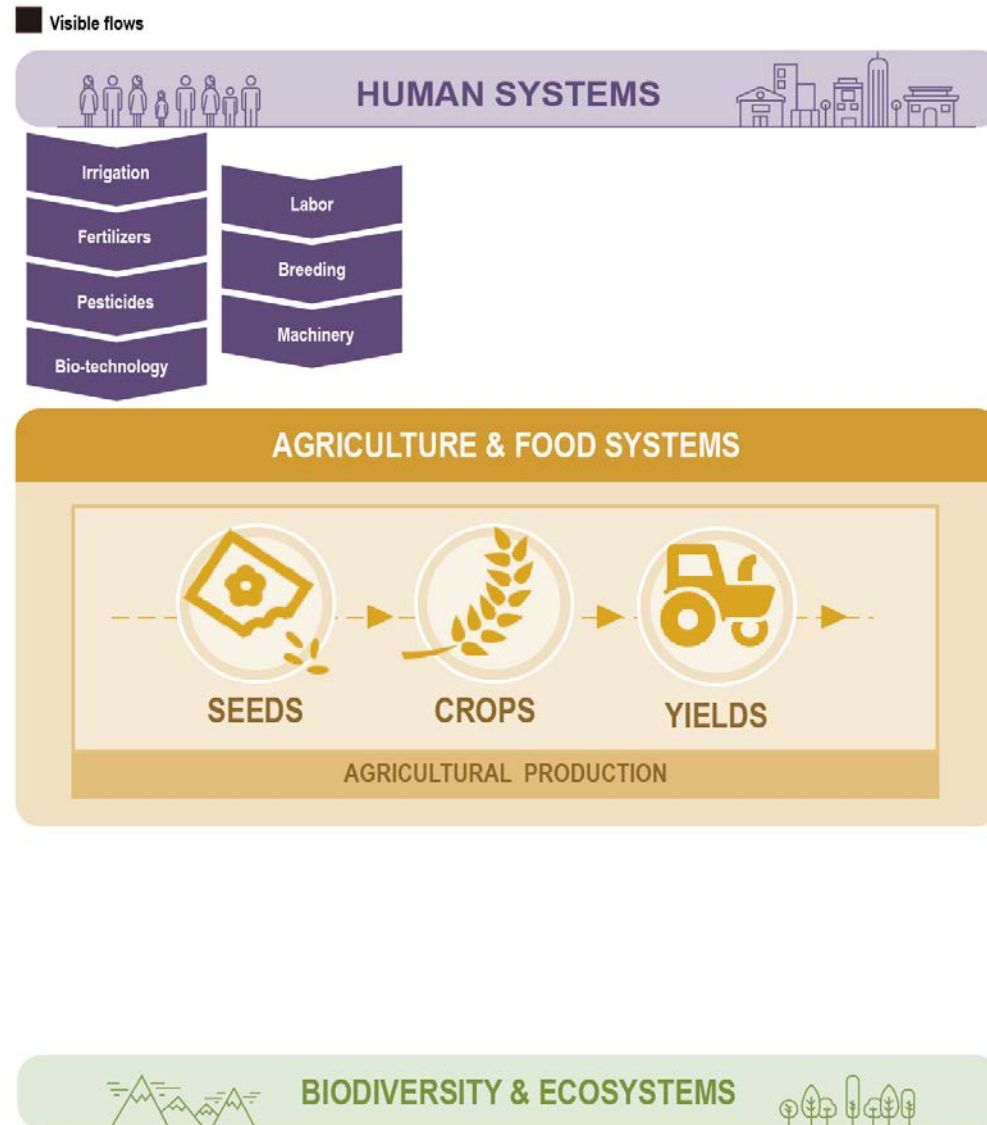
THE VISIBLE AND INVISIBLE FLOWS OF AGRICULTURAL PRODUCTION



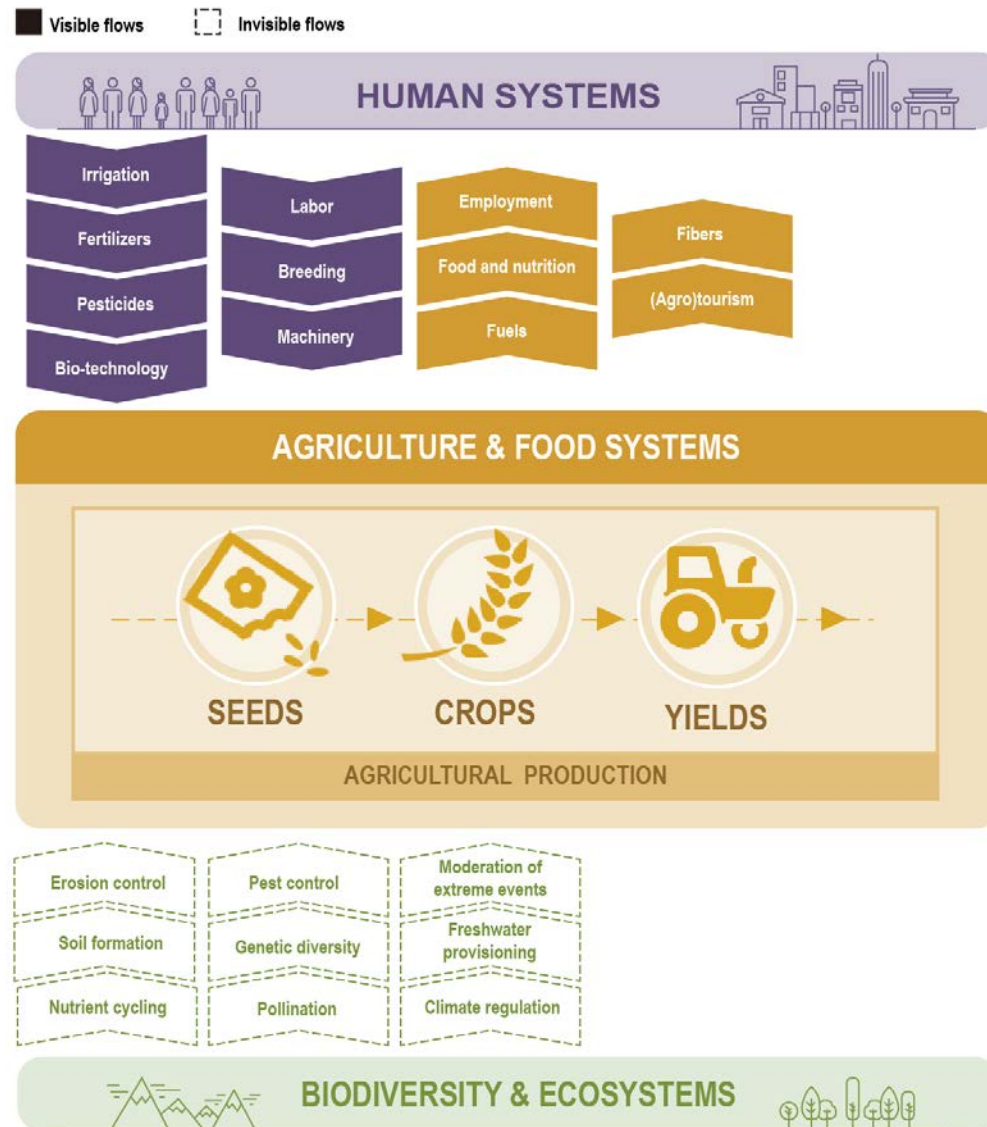
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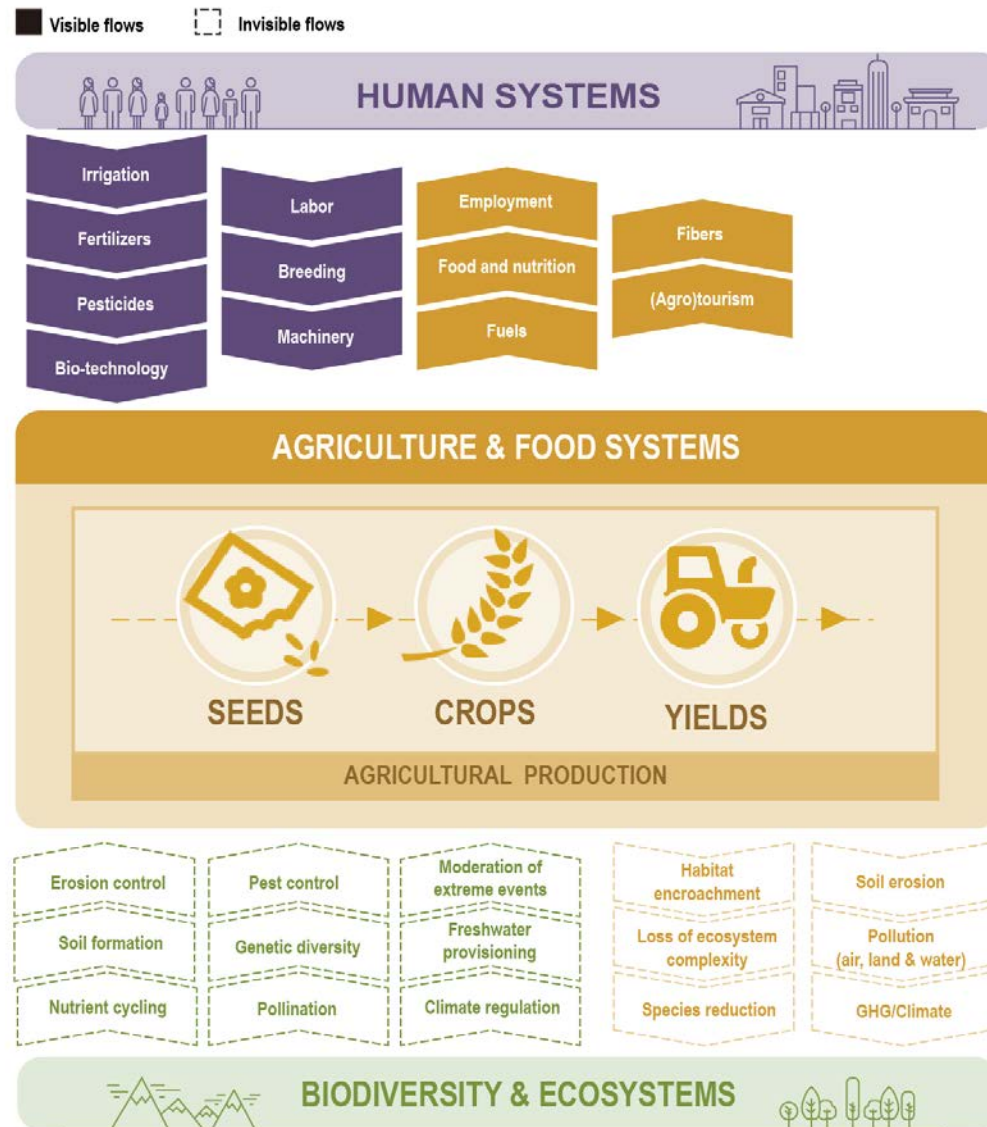
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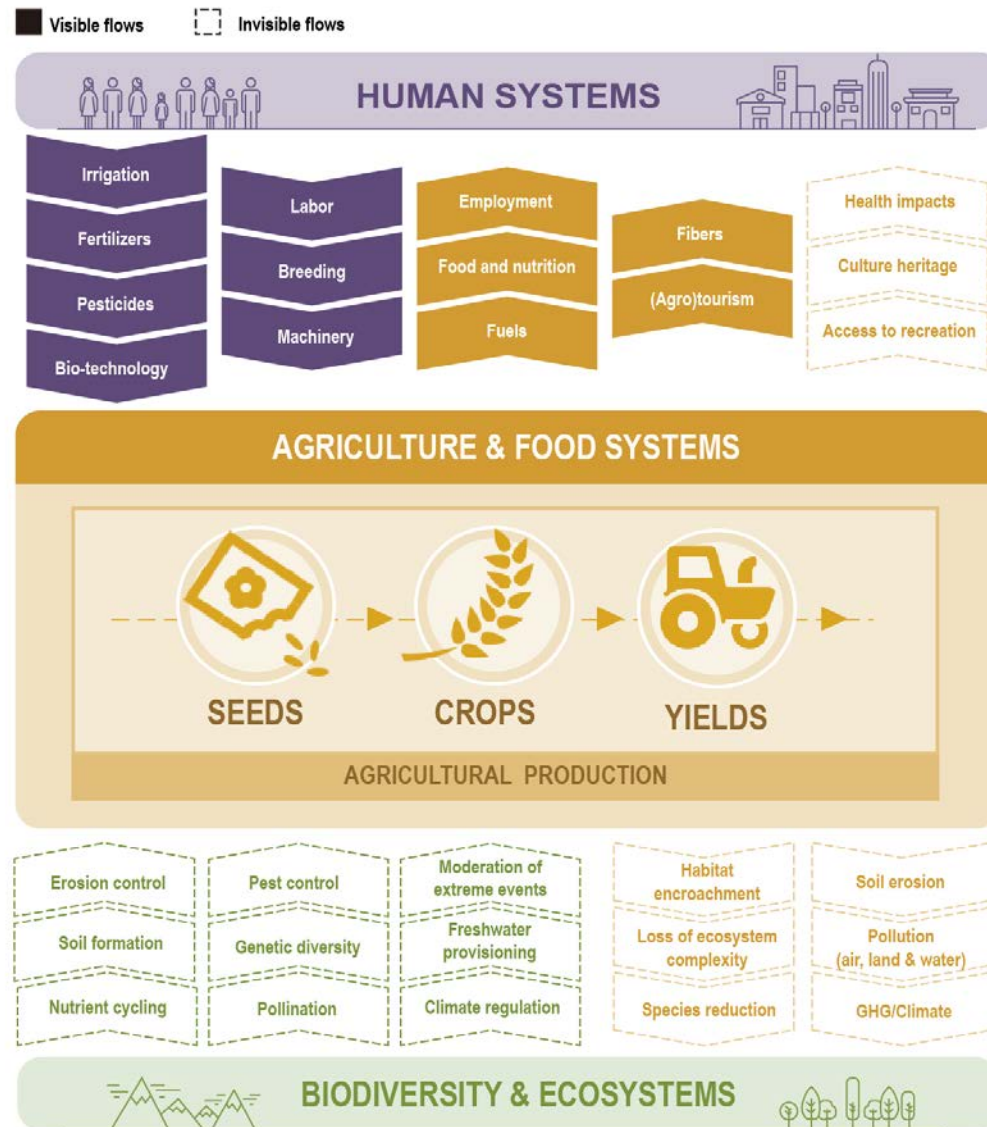
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THE VISIBLE AND INVISIBLE FLOWS OF AGRICULTURAL PRODUCTION

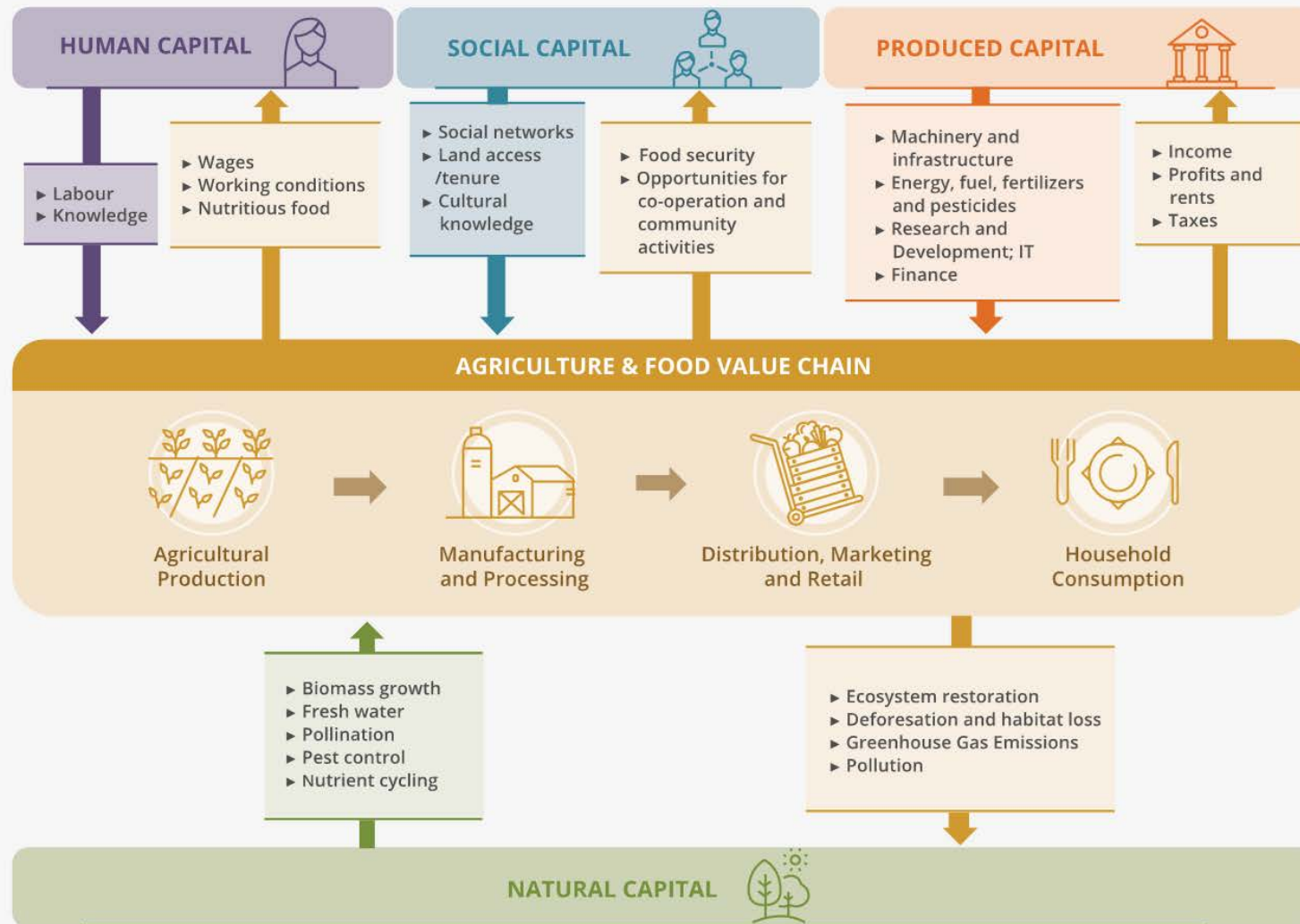


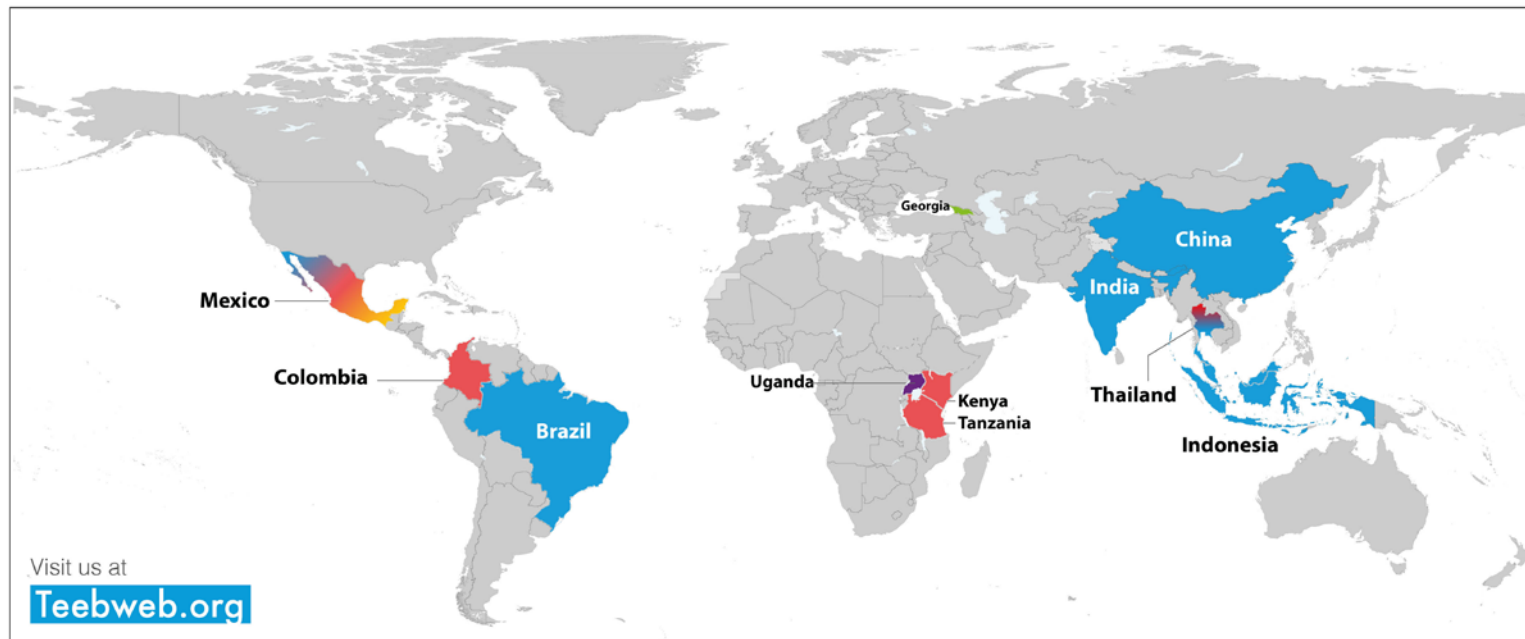
THE VISIBLE AND INVISIBLE FLOWS OF AGRICULTURAL PRODUCTION



THE VISIBLE AND INVISIBLE FLOWS OF AGRICULTURAL PRODUCTION

Figure 2.1 Capital stocks and value flows in eco-agri-food systems (Source: Hussain and Vause 2018)





The designations employed and the presentation of material including on any map in this work do not imply the expression of any opinion whatsoever on the part of the United Nations concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries.

● EU-PI

Brazil i) Degraded Pasture Land Restoration ii) Urban and Periurban Agriculture
China Green Food Production
India Organic Farming and Agroforestry
Indonesia Cacao Agroforestry Production
Mexico Agroforestry Coffee
Thailand Organic Rice Production
Malaysia TBD

● IKI

Colombia Land Use Change
Kenya Cereals and Medicinal Plants
Tanzania Land Use Change; Water Quality & Food Security
Thailand Organic Rice Production
Mexico Conventional & Traditional Maize

Other sources of funding

● GEF

Georgia Sustainable Land Management Practices

● GIZ

Mexico Conventional & Traditional Maize

● NORAD

Uganda Sustainable food systems



THANK YOU FOR LISTENING

For more information, please visit www.teebweb.org or feel free to ask any questions during our Q&A at the end of the presentation.

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Biodiversity and Land Branch, Ecosystems
Division, UN Environment Programme (UNEP)



Supported by:



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