TEEB Phase III: Implementation

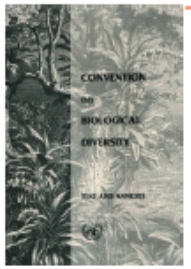
EC-funded Project Workshop:

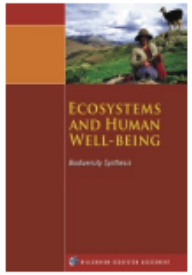
5-7 December 2016, Cancun

Dr Salman Hussain

UNEP TEEB Office

TEEB initiative (2008-2012)





Ecol./Env. Economics literature

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

TEEB Books

BD COP 10 Nagoya, Oct 2010

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

TEEB ADVISORY BOARD

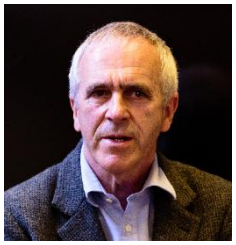
Inger Andersen

Edward Barbier

Hans Bruyninckx

Guillermo Castilleja

Braulio Dias



Patrick Holden

Julia Marton-Lefevre

Peter May

Jacqueline McGlade

Ladislav Miko

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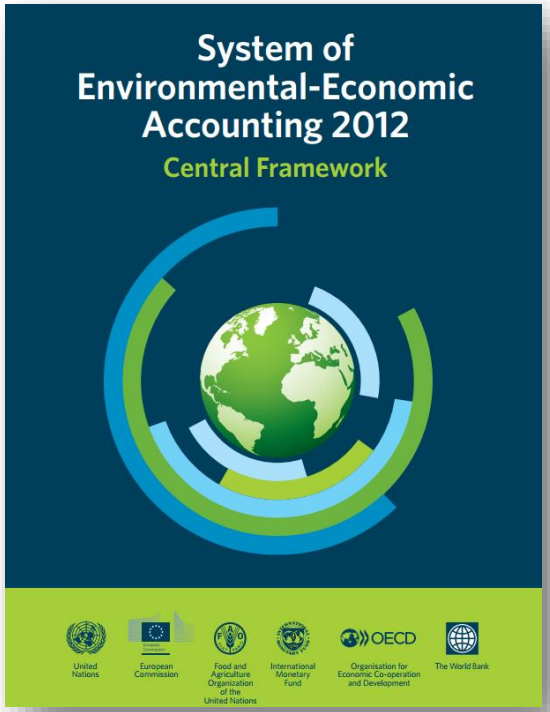
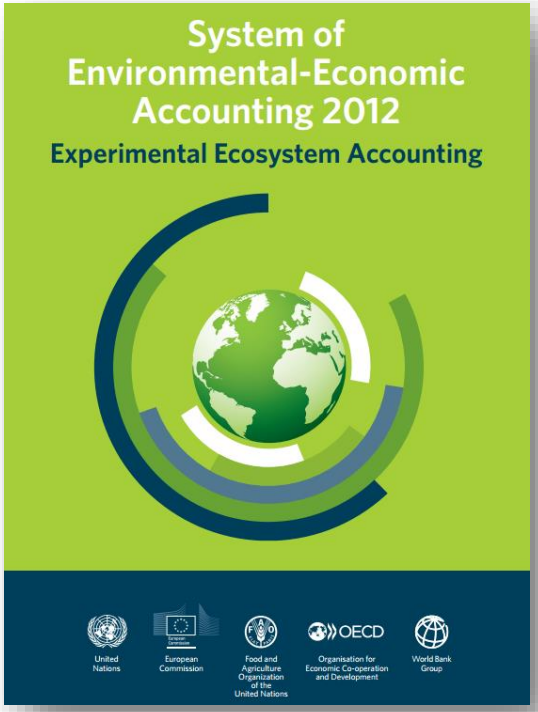
Alexander Müller

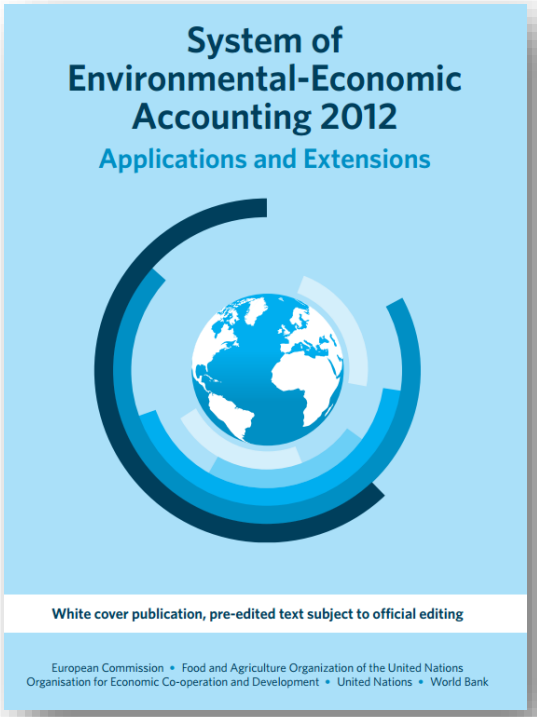
Erik Solheim

Pavan Sukhdev

The System of Environmental-Economic Accounting (SEEA)







UNEP-TEEB/UNSD/sCBD Activities

SEEA-EEA

- NORAD-funded project [Advancing Natural Capital Accounting – ANCA]

I. A 5 year Global Strategy for advancing the testing and research agenda of the SEEA Experimental Ecosystem Accounting;

II. Guidelines on testing

III. Training material

IV. Communication and outreach material for SEEA

V. Country plans for seven pilot countries

UNEP

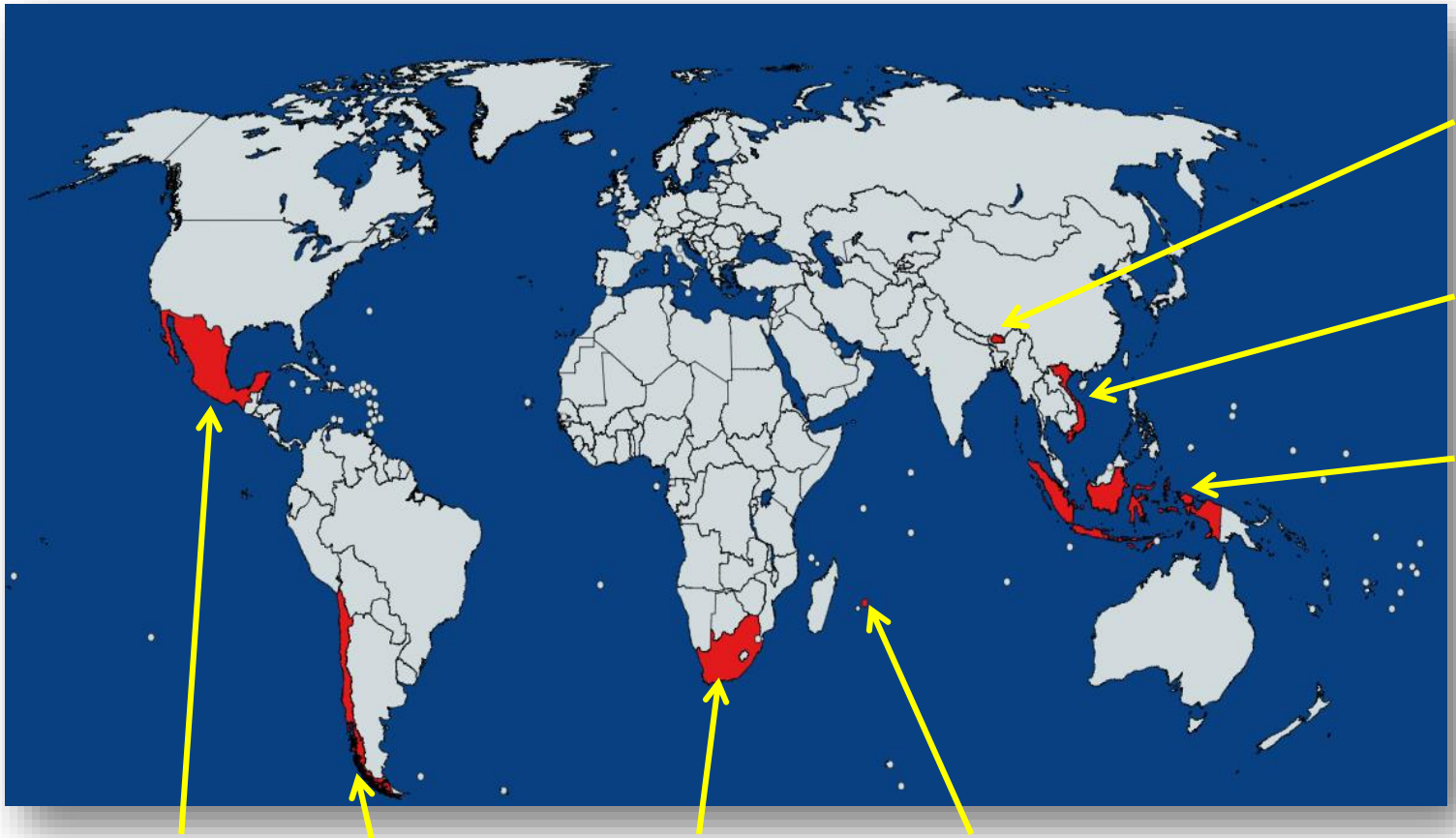
The Economics of Ecosystems & Biodiversity

UNITED NATIONS STATISTICS DIVISION

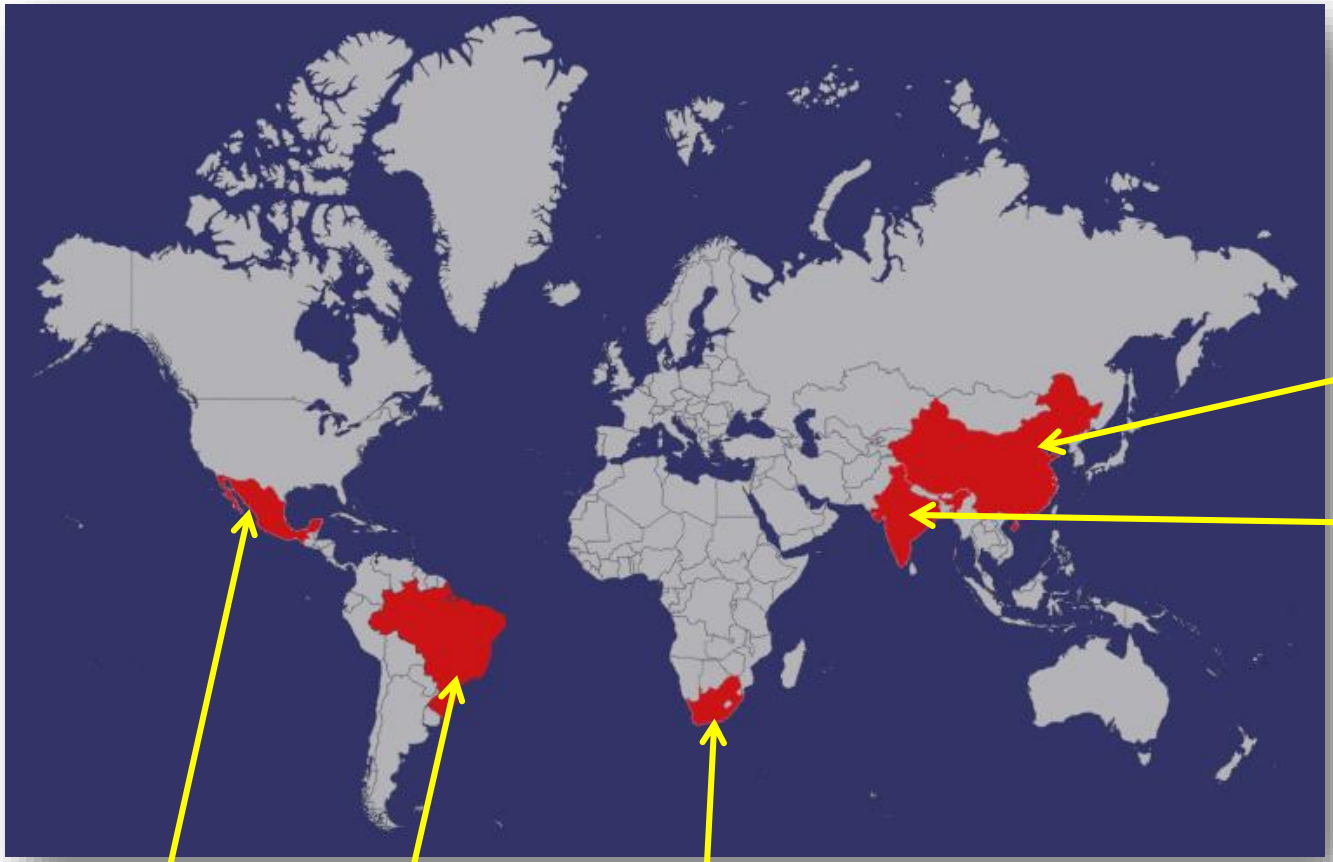
Convention on Biological Diversity

Norad

ANCA Pilot Countries



ECPI Instrument Partner Countries



China

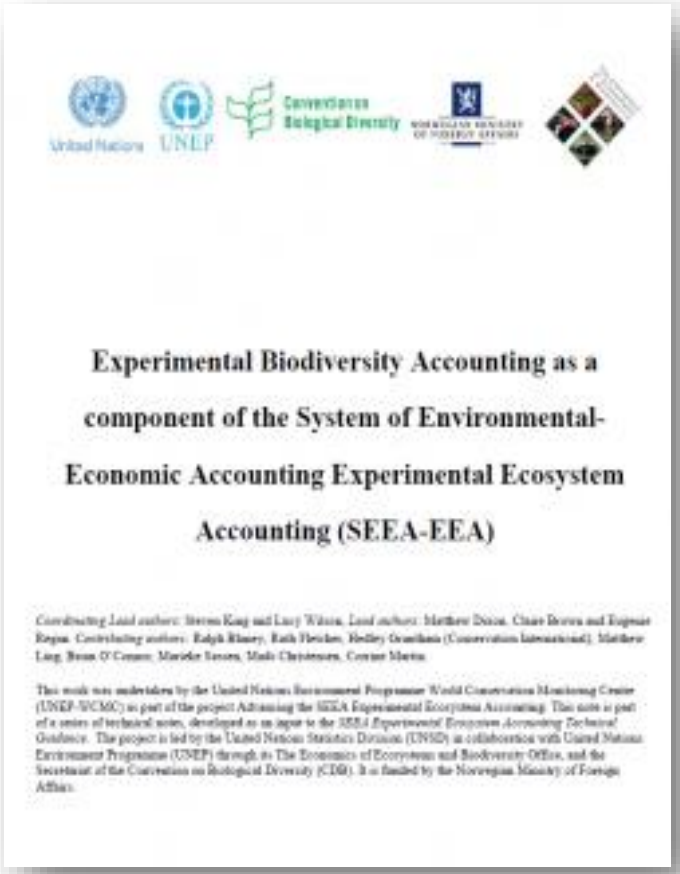
India

Mexico

Brazil

South Africa

Experimental Biodiversity Accounting – Technical Guidance



The **Technical Guidance:**

1. Sets out the *data mobilization process* for national scale data
2. Considers the use of *global datasets and models* to inform Biodiversity Accounts and other accounts in the SEEA-EEA framework, such as Ecosystem Condition Accounts.
3. Presents *experimental Biodiversity Accounts* drawing on case studies from around the world.

Summary statement

The **TEEBAgFood** study is designed 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 Good’

+ Agriculture employs 1 in 3 of the world’s economically active labour force, or about 1.3 billion people. For the 70 per cent of the world's poor living in rural areas, agriculture is the main source of income and employment.

+ Smallholder farms (i.e. less than 2 hectares) represent over 475 million of the world’s 570 million farms and, in much of the developing world, they produce over 80 per cent of the food consumed.

+ Food production systems produce approximately 2,800 calories per person per day which is enough to feed the world population.

‘The Bad’

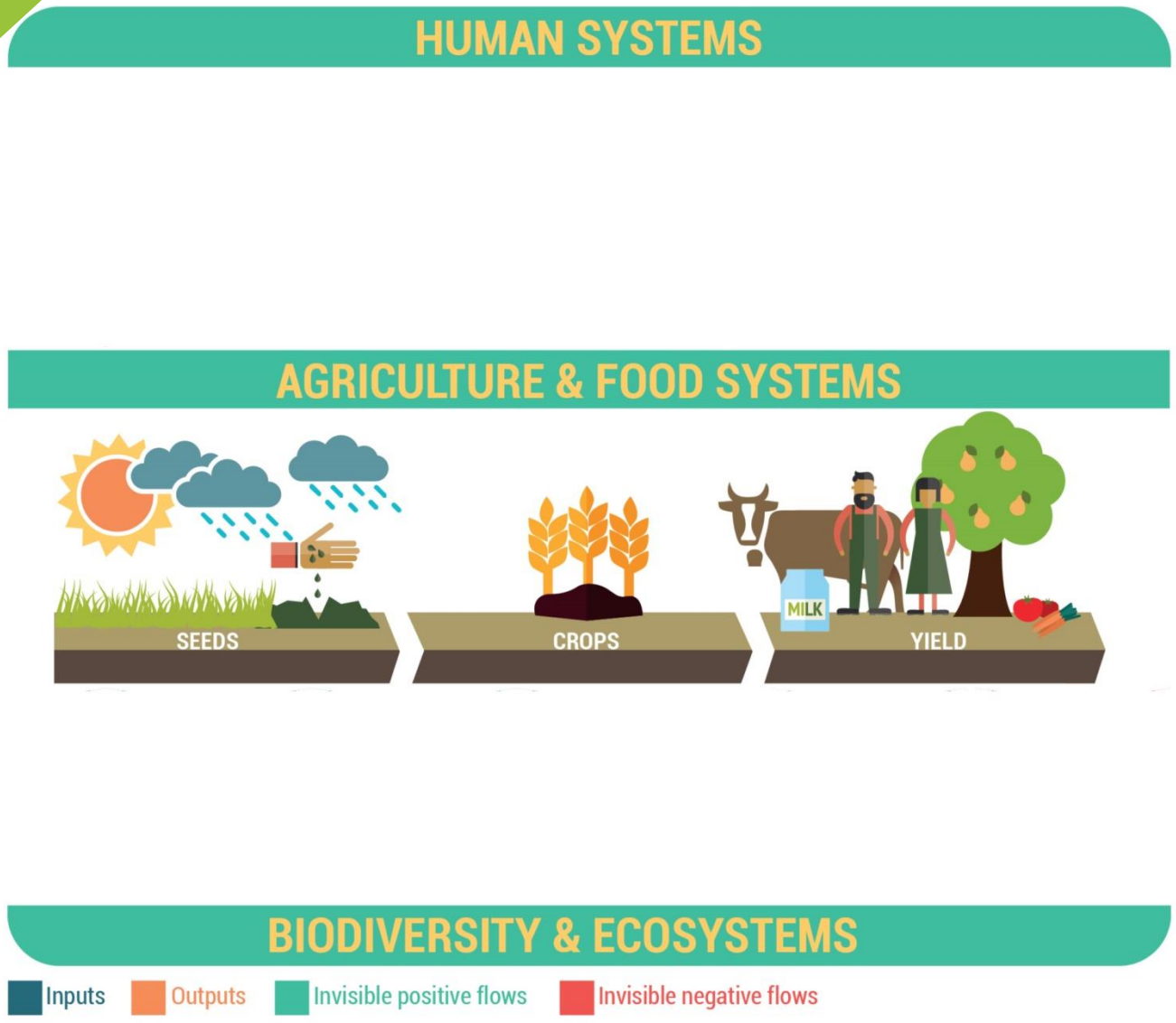
- 80% of new agricultural land has replaced tropical forests since the 1980s, a trend resulting in significant biodiversity loss and ecosystem degradation.

- Crop and livestock farming produce between five and six billion tons of CO_2-equivalent in greenhouse gas (GHG) emissions each year, mostly in developing countries where the agricultural sector has expanded in recent years.

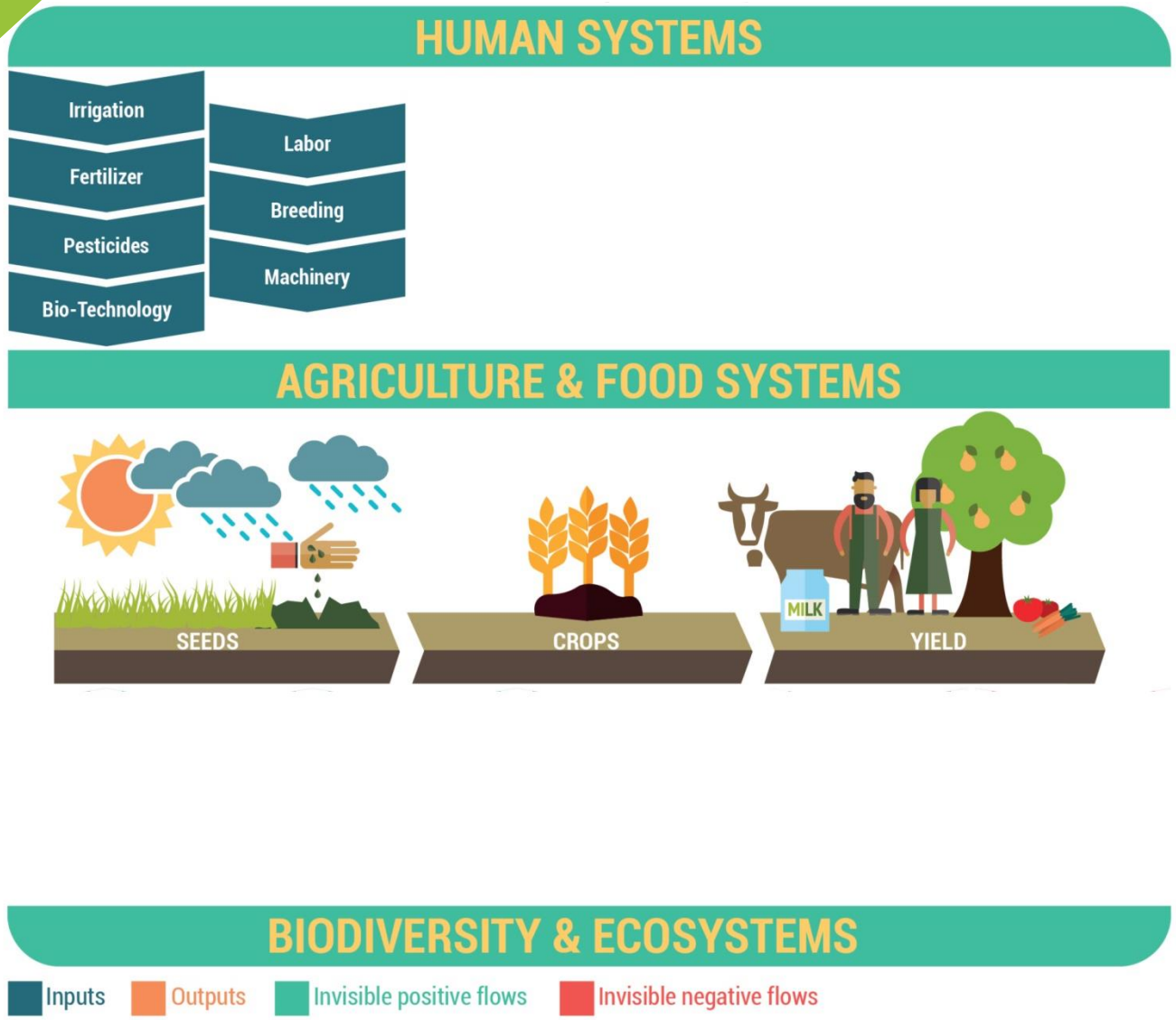
- The agricultural sector utilizes 70% of the water resources we withdraw from rivers, lakes and aquifers, raising serious concerns in terms of sustainability and security.

The visible and invisible flows of agricultural production

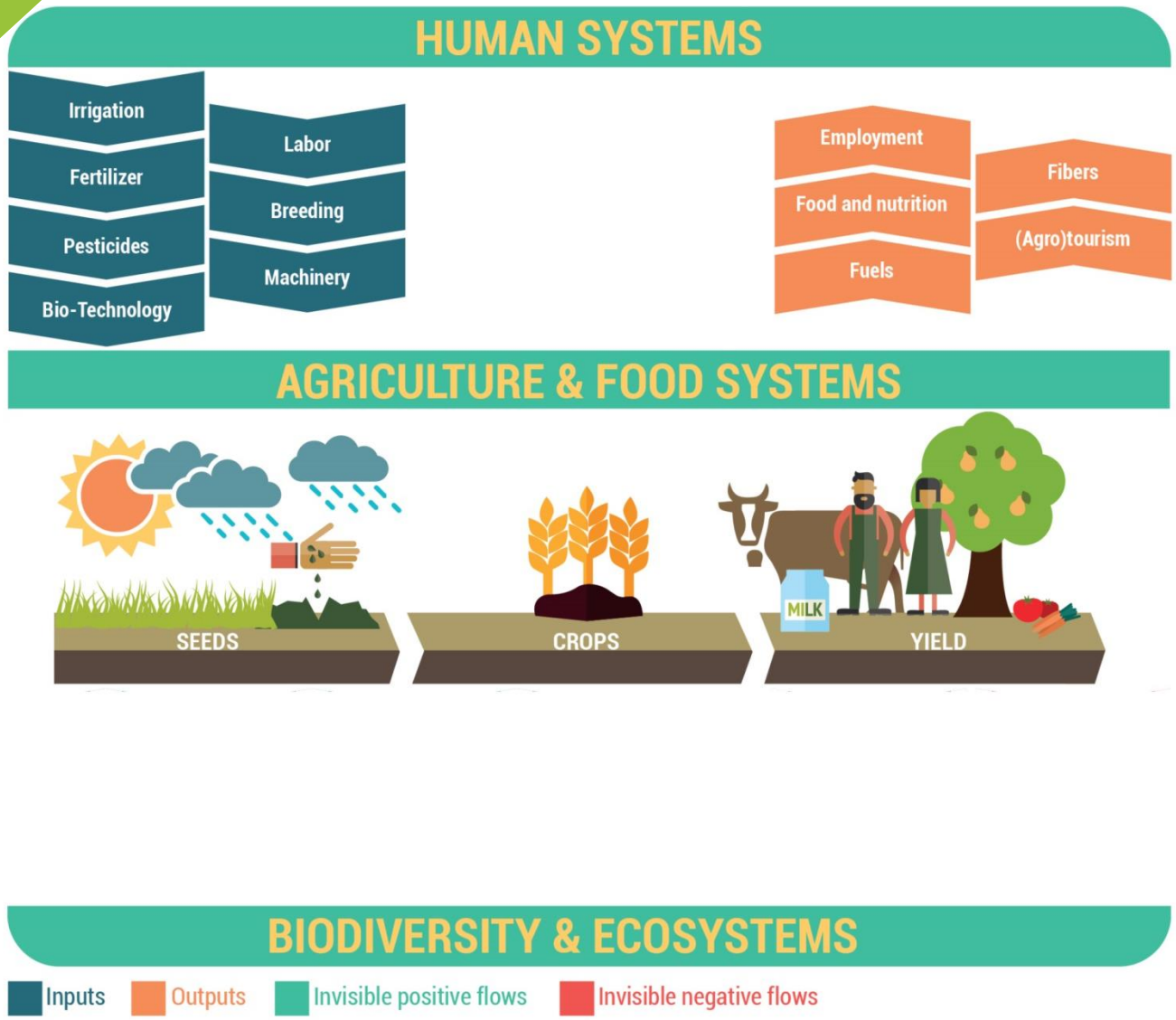
The visible and invisible flows of agricultural production



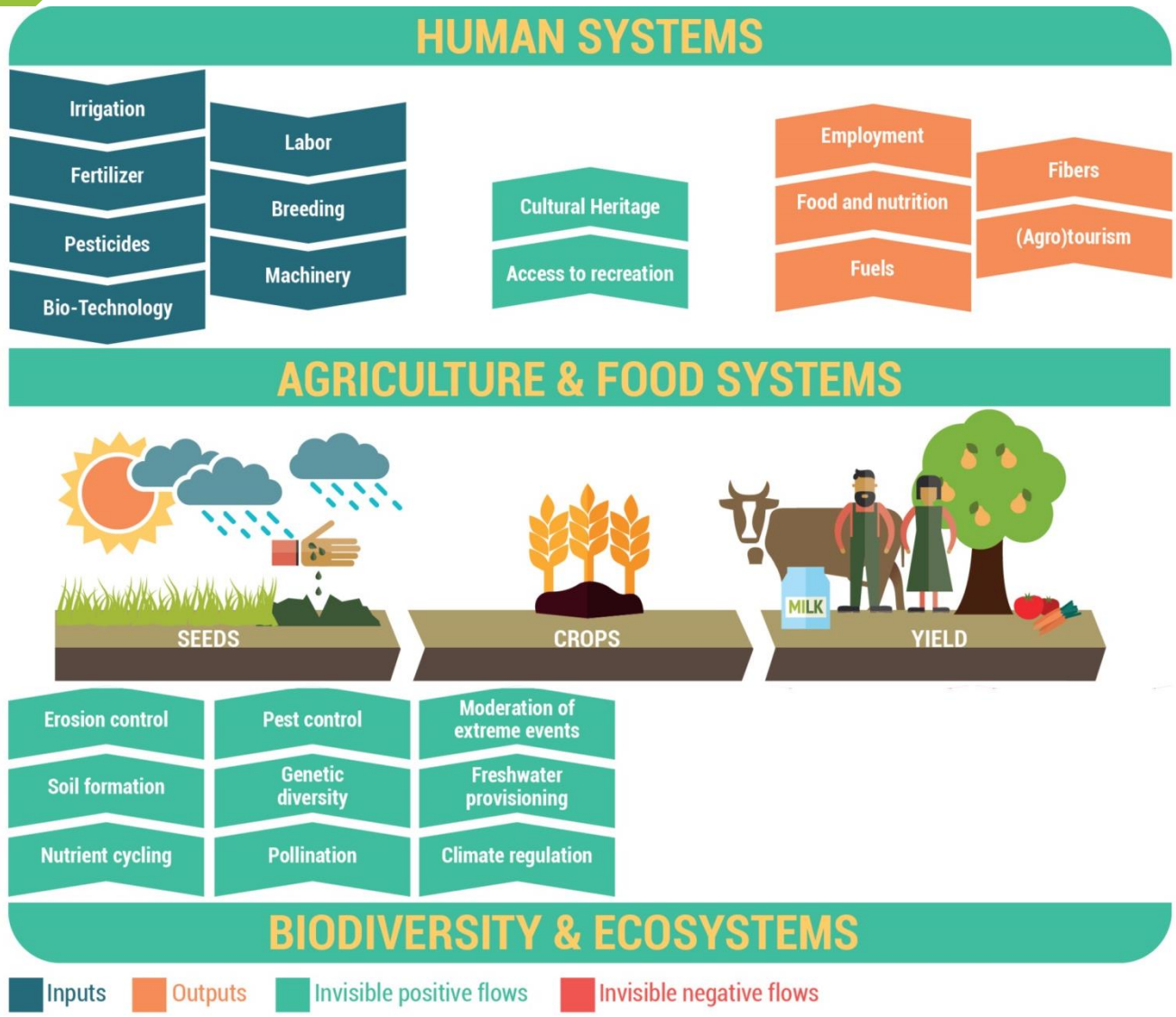
The visible and invisible flows of agricultural production



The visible and invisible flows of agricultural production



The visible and invisible flows of agricultural production



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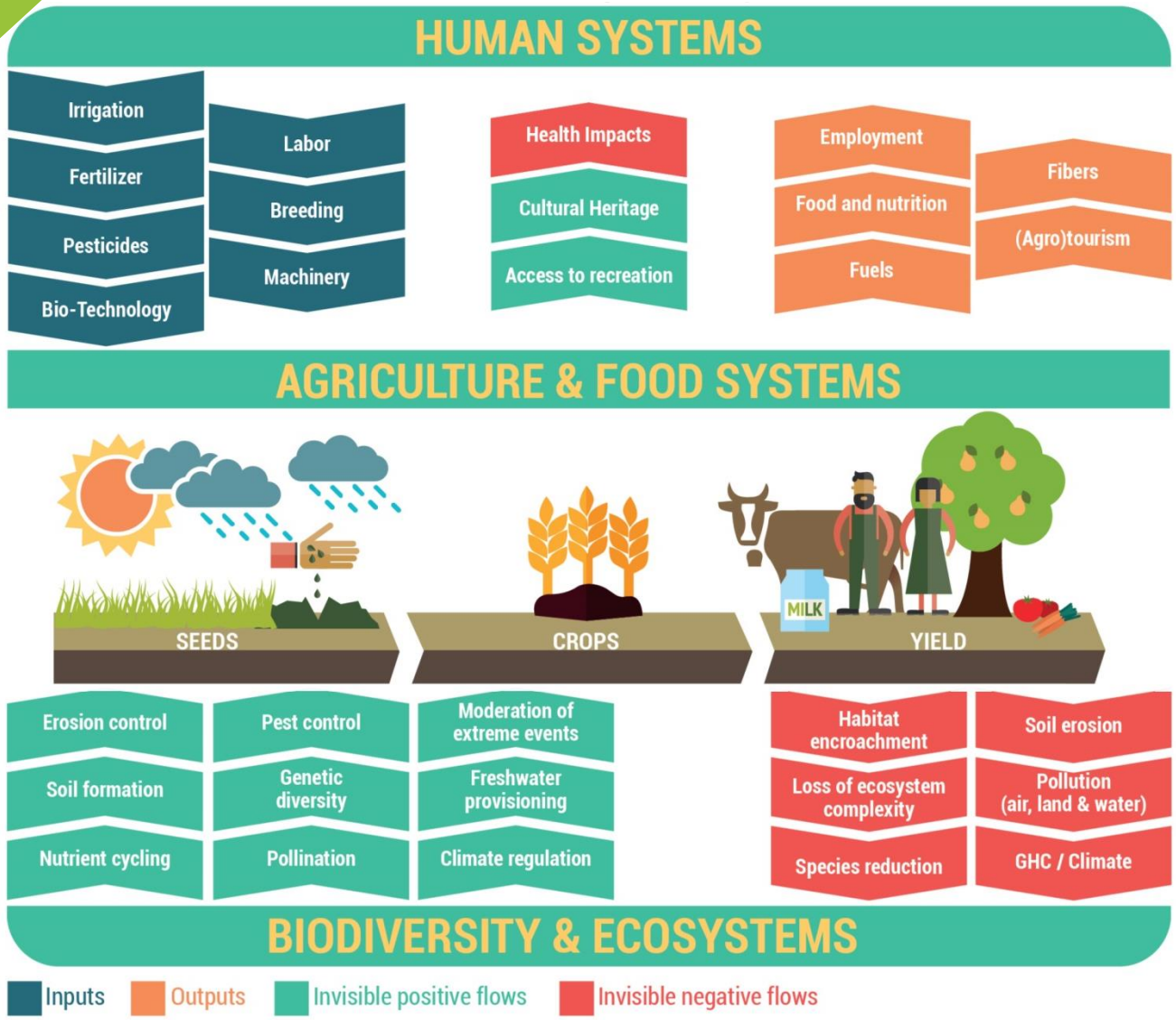
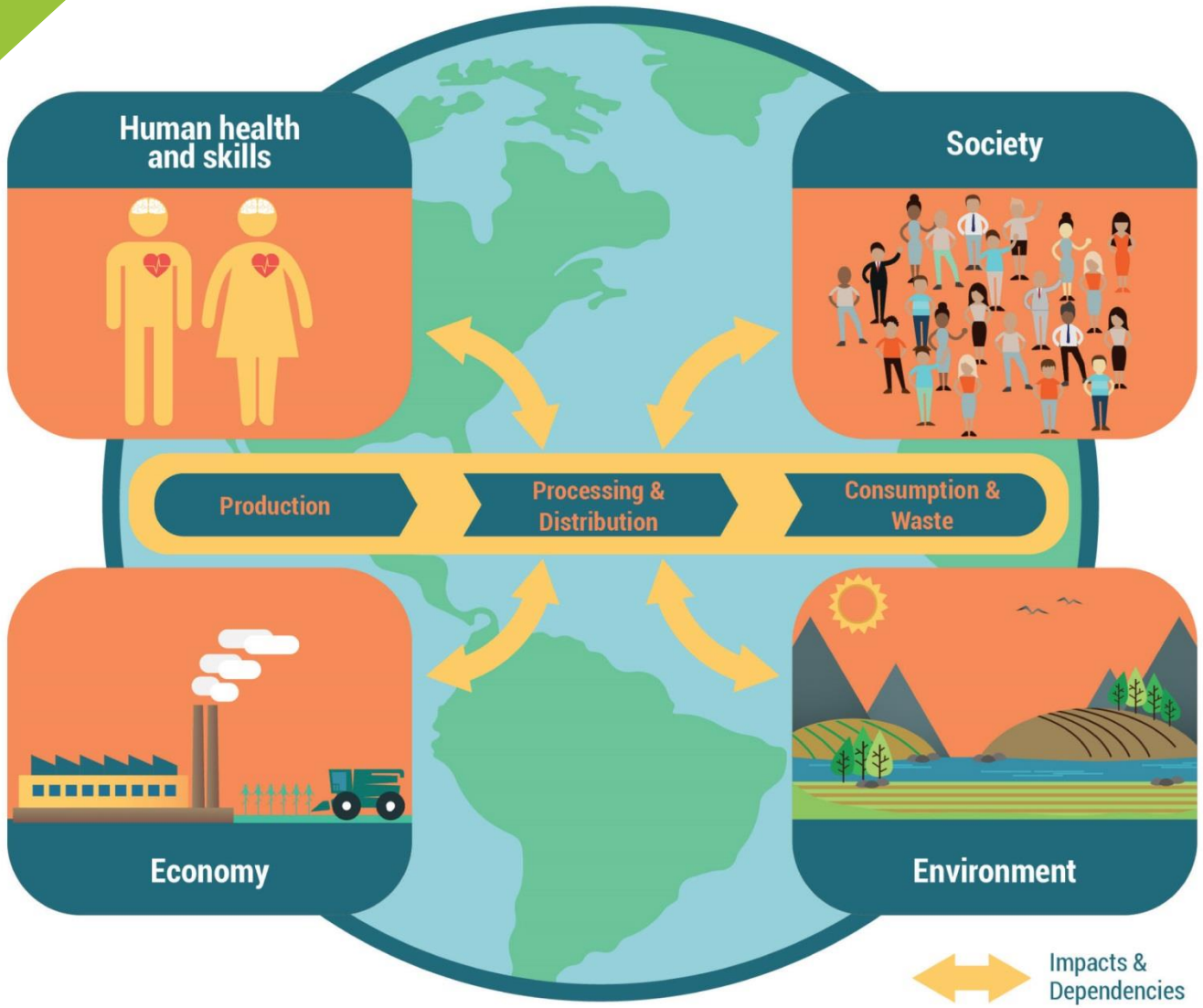
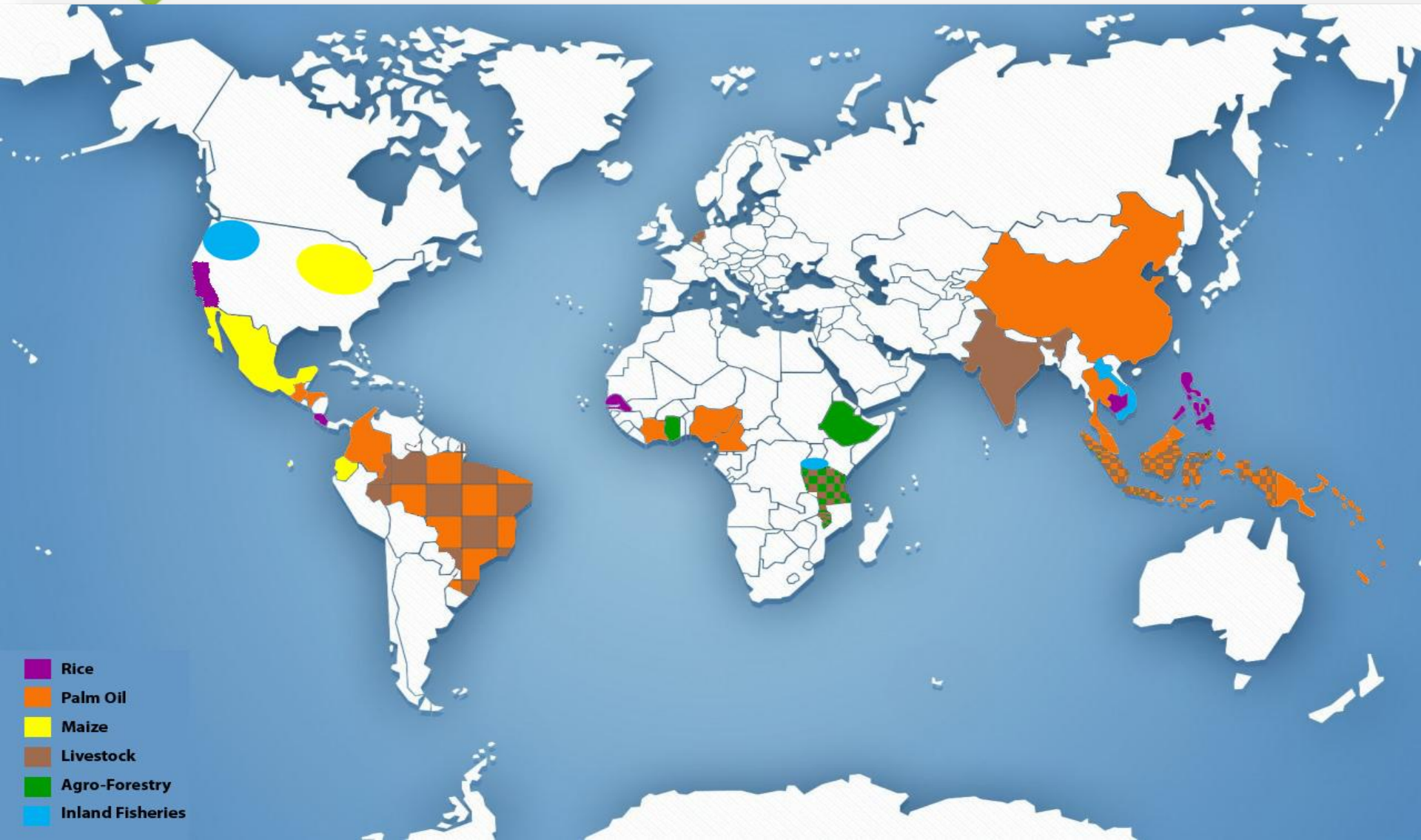


Eco-agri-food systems complex – impacts and dependencies



Feeder Studies



Maasai Steppe

Three scenarios:

1. **Business as usual expansion of agriculture**, leading to the conversion of all land available for farming within 10 years [HI scenario]
2. **Expansion of agriculture at half the speed of business as usual** [MID scenario]
3. **Lower land conversion rate with further conversion being halted within 20 years**, below critical thresholds for ecosystem functioning [LOW scenario]

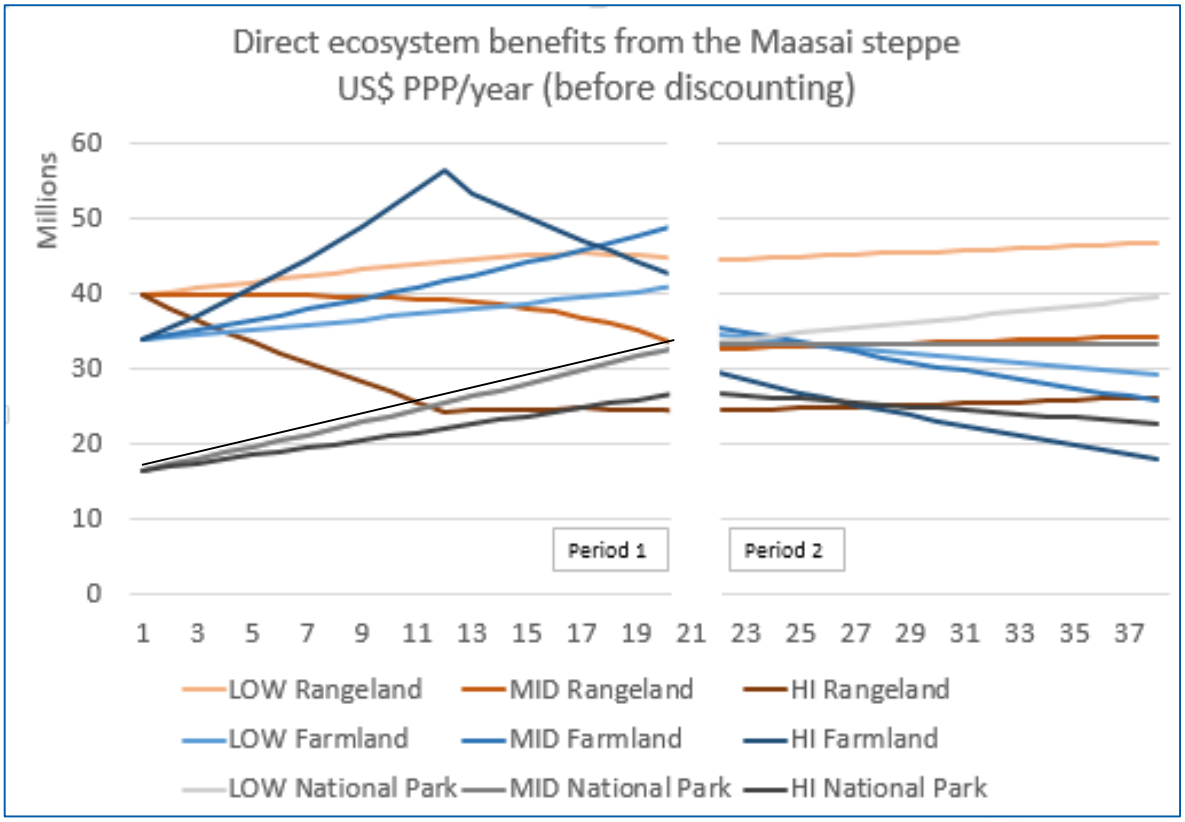
Impacts and Externalities scope

Crops and livestock	Traded and subsistence products	Recreation	External benefits	Out of scope
Beef	Honey and beeswax	Tourism in National Parks	Carbon storage	Subsistence hunting
Cow milk	Gum			Recreational hunting
Goat meat and milk	Medicinal plants			Blood from cattle
Maize	Charcoal, firewood, thatch and poles			Water cycle regulation
Beans	Wild herbs and vegetables			
Animal skins and hides	Drinking water			

Maasai Steppe - Results

- **Year 0 per hectare**
  - Farmland (crop production) 73 USD/ha
  - National parks 52 USD/ha
  - Pastoralist rangelands18 USD/ha
- **Change in ranking over time for locally-realised ecosystem benefits**
- **Carbon stocks change:**
  - 23 billion USD (HI); 15 Billion USD (LOW) comparing Y0 and Y20

Maasai Steppe – Results (totals)



TEEB Country Studies

TEEB 6 step approach

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

STEP 2: Identify the most relevant ecosystem services

STEP 3: Define information needs & 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: Produce an answer to each of the questions

Provisioning services

Food: Ecosystems provide the conditions for growing food. Food comes principally from managed agro-ecosystems but marine and freshwater systems or forests also provide food for human consumption. Wild foods from forests are often underestimated.

Raw Materials: Ecosystems provide a great diversity of materials for construction and fuel including wood, biofuels and plant oils that are directly derived from wild and cultivated plant species.

Fresh water: Ecosystems play a vital role in the global hydrological cycle, as they regulate the flow and purification of water. Vegetation and forests influence the quantity of water available locally.

Medicinal resources: Ecosystems and biodiversity provide many plants used as traditional medicines as well as providing the raw materials for the pharmaceutical industry. All ecosystems are a potential source of medicinal resources.

Regulating services

Local climate and air quality: Trees provide shade whilst forests influence rainfall and water availability both locally and regionally. Trees or other plants also play an important role in regulating air quality by removing pollutants from the atmosphere.

Carbon sequestration and storage: Ecosystems regulate the global climate by storing and sequestering greenhouse gases. As trees and plants grow, they remove carbon dioxide from the atmosphere and effectively lock it away in their tissues. In this way forest ecosystems are carbon stores. Biodiversity also plays an important role by improving the capacity of ecosystems to adapt to the effects of climate change.

Moderation of extreme events: Extreme weather events or natural hazards include floods, storms, tsunamis, avalanches and landslides. Ecosystems and living organisms create buffers against natural disasters, thereby preventing possible damage. For example, wetlands can soak up flood water.

Waste-water treatment: Ecosystems such as wetlands filter both human and animal waste and act as a natural buffer to the surrounding environment. Through the biological activity of microorganisms in the soil, most waste is broken down. Thereby pathogens (disease causing microbes) are eliminated, and the level of nutrients and pollution is reduced.

Erosion prevention and maintenance of soil fertility: Soil erosion is a key factor in the process of land degradation and desertification. Vegetation cover provides a vital regulating service by preventing soil erosion. Soil fertility is essential for plant growth and agriculture. etc

Pollination: Insects and wind pollinate plants and trees which is essential for the development of fruits, vegetables and seeds. Animal pollination is an ecosystem service mainly provided by insects but also by some birds and bats. Some 87 out of the 115 leading global food crops depend upon animal pollination including important cash crops such as cocoa and coffee (Klein et al. 2007).

Biological control: Ecosystems are important for regulating pests and vector borne diseases that attack plants, animals and people. Ecosystems regulate pests and diseases through the activities of predators and parasites. Birds, bats, flies, wasps, frogs and fungi all act as natural controls.

Habitat or supporting services

Habitats for species: Habitats provide everything that an individual plant or animal needs to survive: food; water; and shelter. Each ecosystem provides different habitats that can be essential for a species' lifecycle. Migratory species including birds, fish, mammals and insects all depend upon different ecosystems during their movements.

Maintenance of genetic diversity: Genetic diversity is the variety of genes between and within species populations. Genetic diversity distinguishes different breeds or races from each other thus providing the basis for locally well-adapted cultivars and a gene pool for further developing commercial crops and livestock.

Cultural Services

Recreation and mental and physical health: Walking and playing sports in green space is not only a good form of physical exercise but also lets people relax. The role that green space plays in maintaining mental and physical health is increasingly being recognized, despite difficulties of measurement.

Tourism: Ecosystems and biodiversity play an important role for many kinds of tourism which in turn provides considerable economic benefits and is a vital source of income for many countries. In 2008 global earnings from tourism summed up to US$ 944 billion.

Aesthetic appreciation and inspiration for culture, art and design: Language, knowledge and the natural environment have been intimately related throughout human history. Biodiversity, ecosystems and natural landscapes have been the source of inspiration for much of our art, culture and increasingly for science..

Spiritual experience and sense of place: In many parts of the world natural features such as specific forests, caves or mountains are considered sacred or have a religious meaning. Nature is a common element of all major religions and traditional knowledge, and associated customs are important for creating a sense of belonging.

Policy Identification: Over-arching questions

What policy issues are critical to the host country?

1. What will the policy act *upon*?
   - Single biome; multiple biomes; single sector; cross-sectoral
2. How *valuable* is/are the biome(s)/sector(s) to the economy?
3. What is the *incremental change* brought about by the policy?
4. Who are the *key stakeholders* and governance bodies (sub-national and national)?
5. On-going research

What is the *incremental change* brought about by the policy?

- **Current policies (BAU):**
  - What is the current policy?
  - Is it enforced? Resourcing for monitoring and enforcement?
  - Is there adequate governance? Are roles and responsibilities well defined?
  - If BAU is extractive, contra-conservation, *might an assessment of ecosystem benefits change the policy landscape?*

Who are the *key stakeholders* and governance bodies

- **Policy 'on' versus BAU**
  - National and sub-national governance
  - Affected stakeholder groups – spatial location, gender issues
  - Are the costs and benefits applying to the same stakeholders?
  - Distributional issues

Thank You!

Dr Salman Hussain
salman.hussain@unep.org
UNEP TEEB Office