

# TEEB AgriFood

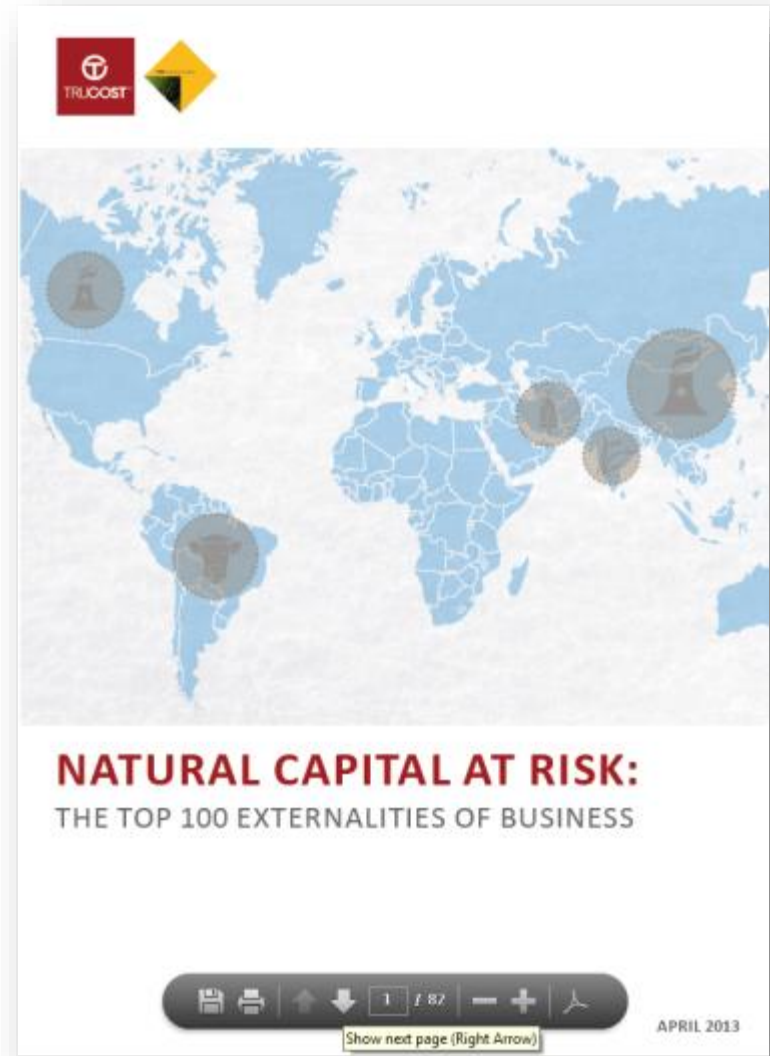
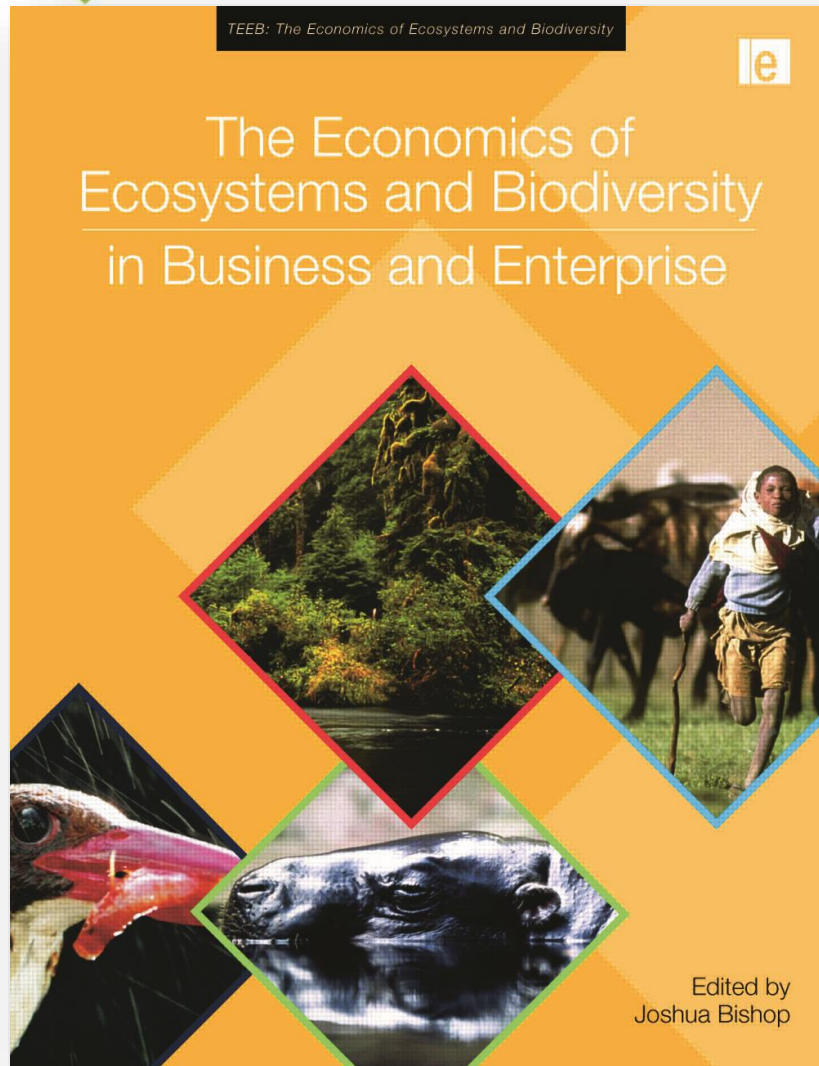
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## TEEB for Business





## 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 (excludes water and land use)	EASTERN EUROPE	72.6	371.6	0.2
20	NATURAL GAS POWER GENERATION	NORTHERN AMERICA	69.4	122.7	1.0



## Summary statement

The **TEEBAgriFood** 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’

- **Eighty per cent 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<sub>2</sub>-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 per cent 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

## AGRICULTURE & FOOD SYSTEMS



# The visible and invisible flows of agricultural production

## HUMAN SYSTEMS

## AGRICULTURE & FOOD SYSTEMS



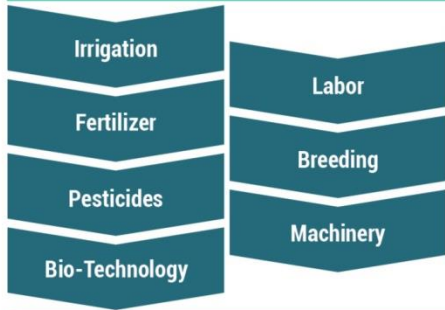
## BIODIVERSITY & ECOSYSTEMS

■ Inputs   ■ Outputs   ■ Invisible positive flows   ■ Invisible negative flows



# The visible and invisible flows of agricultural production

## HUMAN SYSTEMS



## AGRICULTURE & FOOD SYSTEMS



## BIODIVERSITY & ECOSYSTEMS



# The visible and invisible flows of agricultural production

## HUMAN SYSTEMS



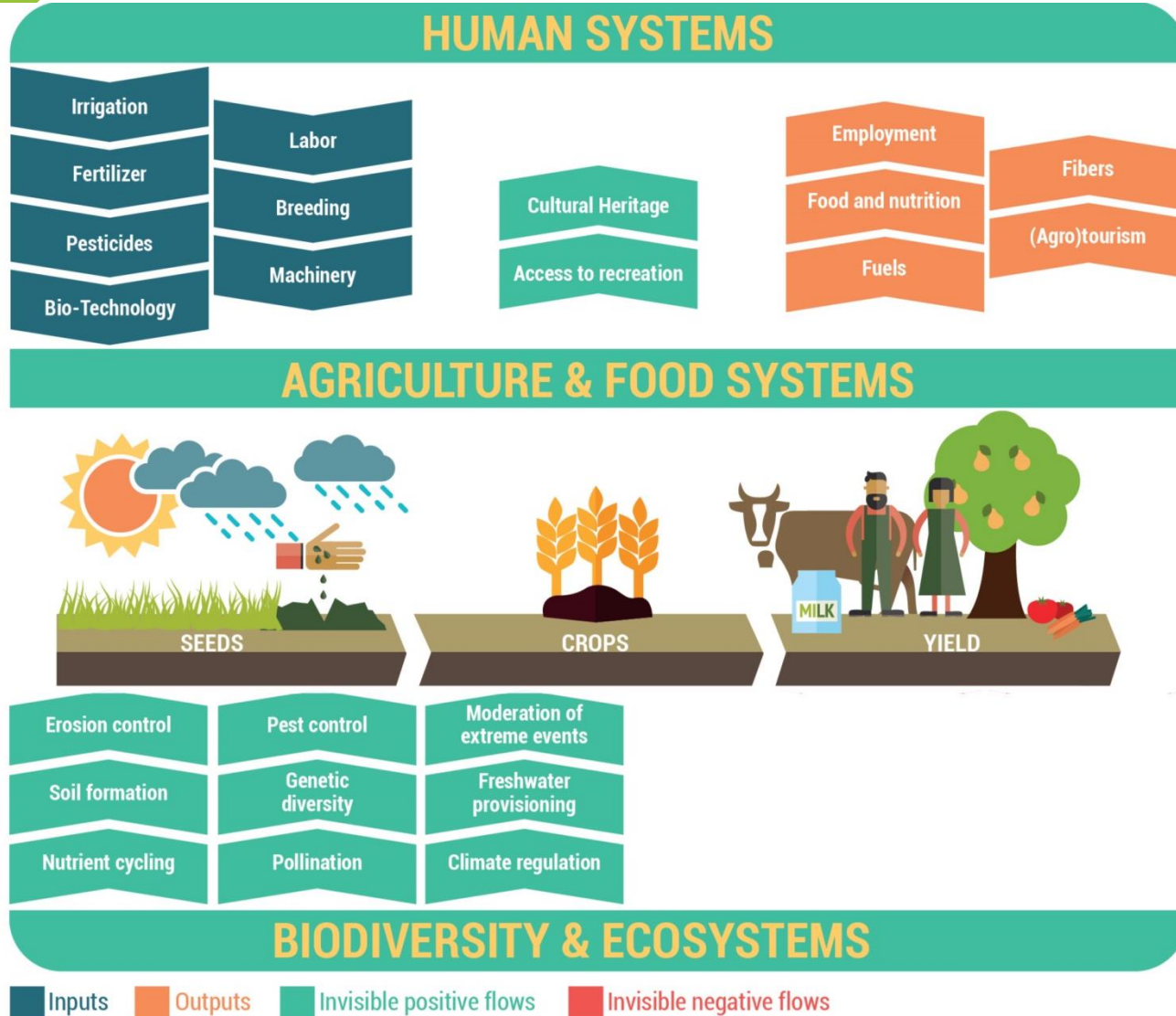
## AGRICULTURE & FOOD SYSTEMS



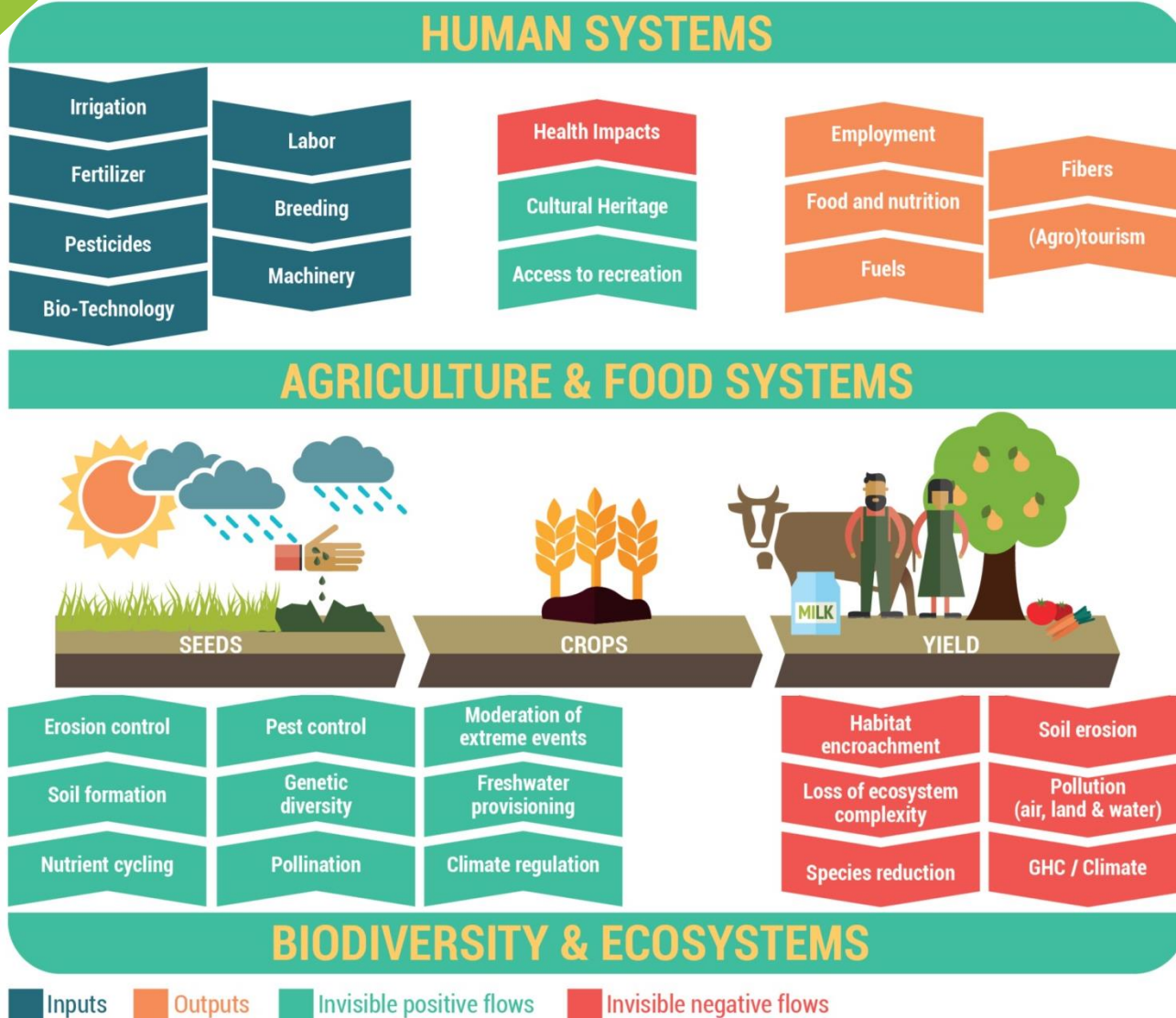
## BIODIVERSITY & ECOSYSTEMS



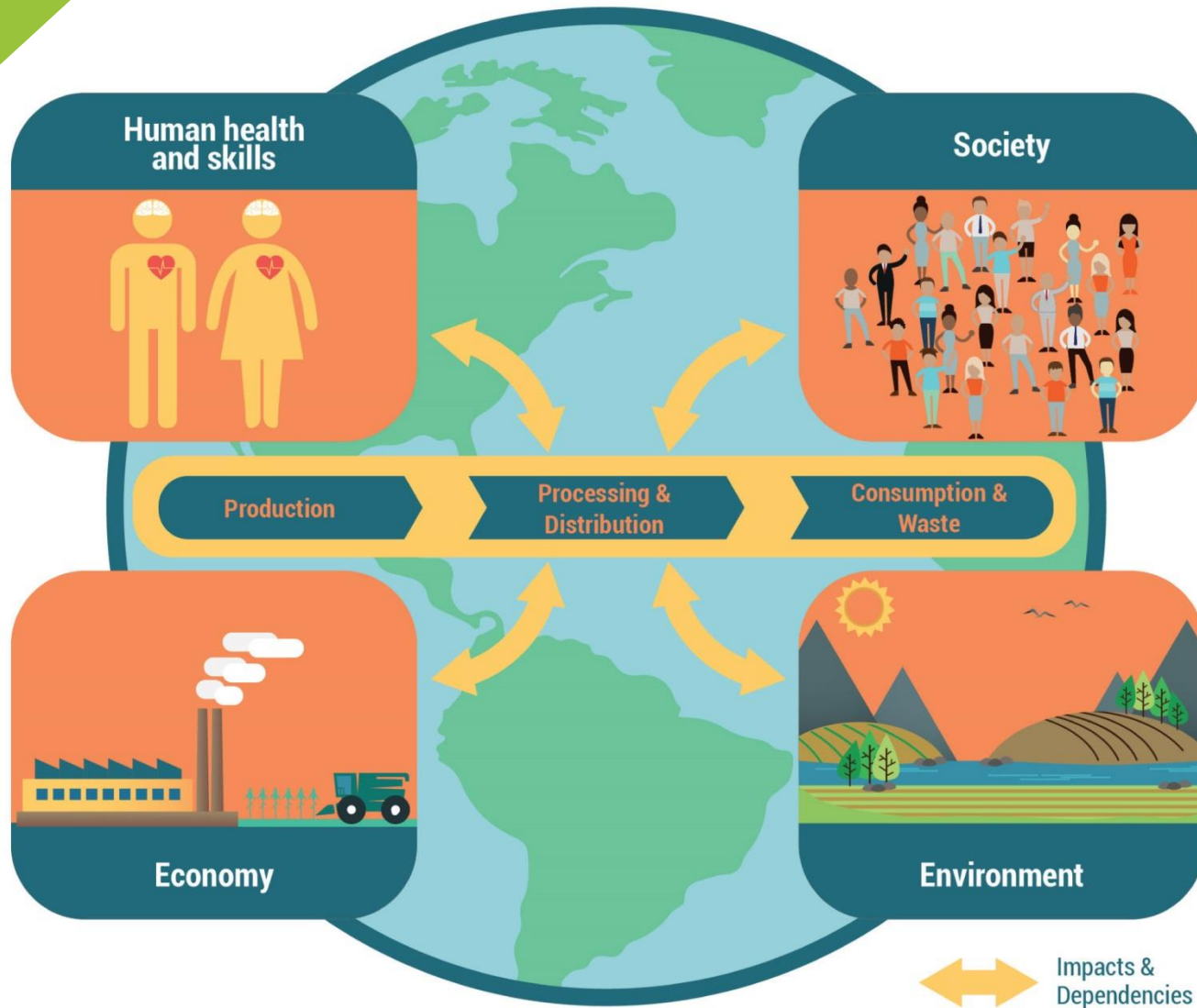
# The visible and invisible flows of agricultural production



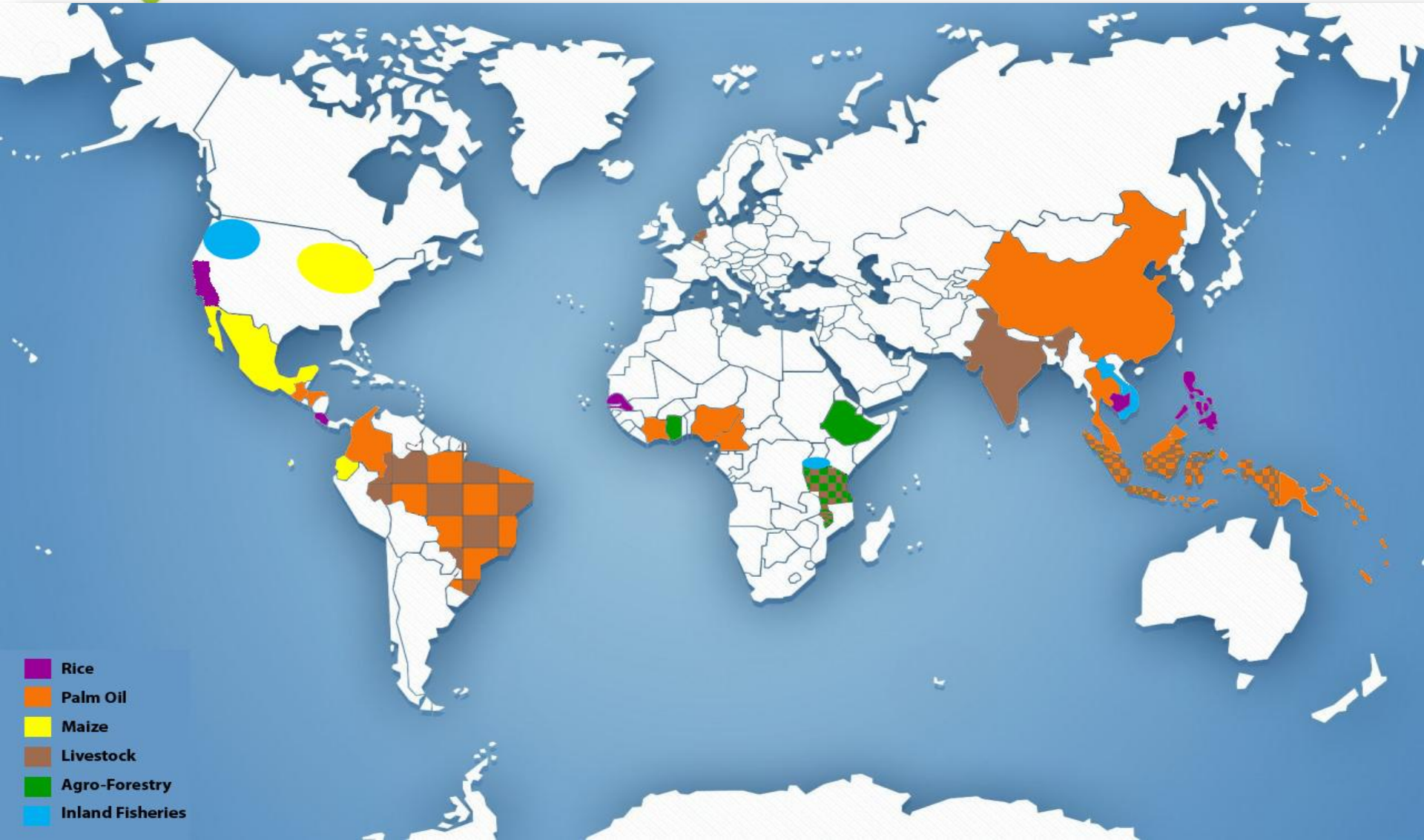
# The visible and invisible flows of agricultural production



# Eco-agri-food systems complex – impacts and dependencies



# Feeder Studies



- Rice
- Palm Oil
- Maize
- Livestock
- Agro-Forestry
- Inland Fisheries



## Trucost valuation approach to Eutrophication I

**TRUCOST**

**Eutrophication**

Valuation Methodology

March 2015

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**TRUCOST** Eutrophication VALUATION METHODOLOGY

1. OVERVIEW

GENERAL PROCESS

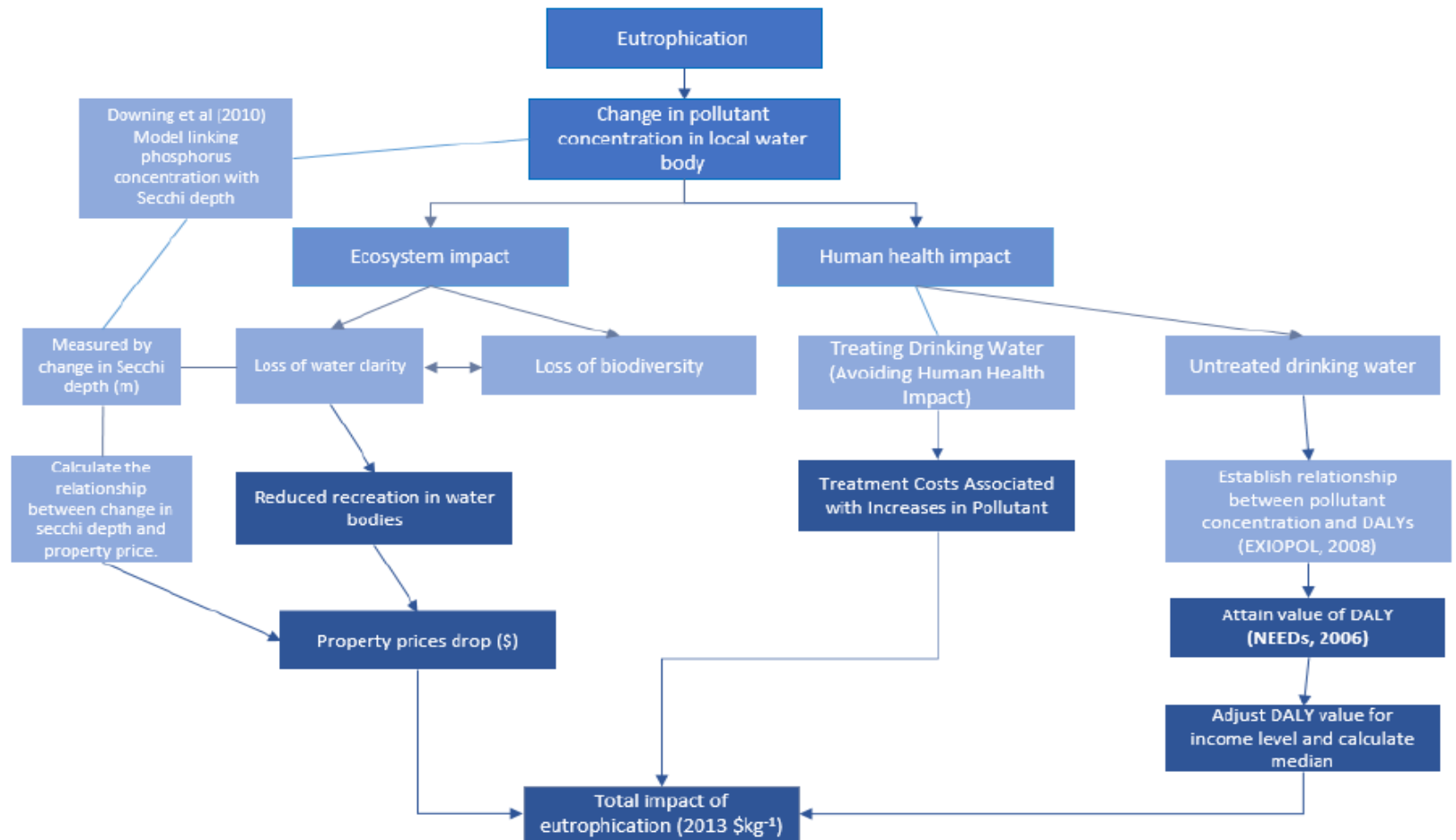
FIGURE 1: GENERAL OVERVIEW OF TRUCOST VALUATION PROCESS

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# 1. OVERVIEW

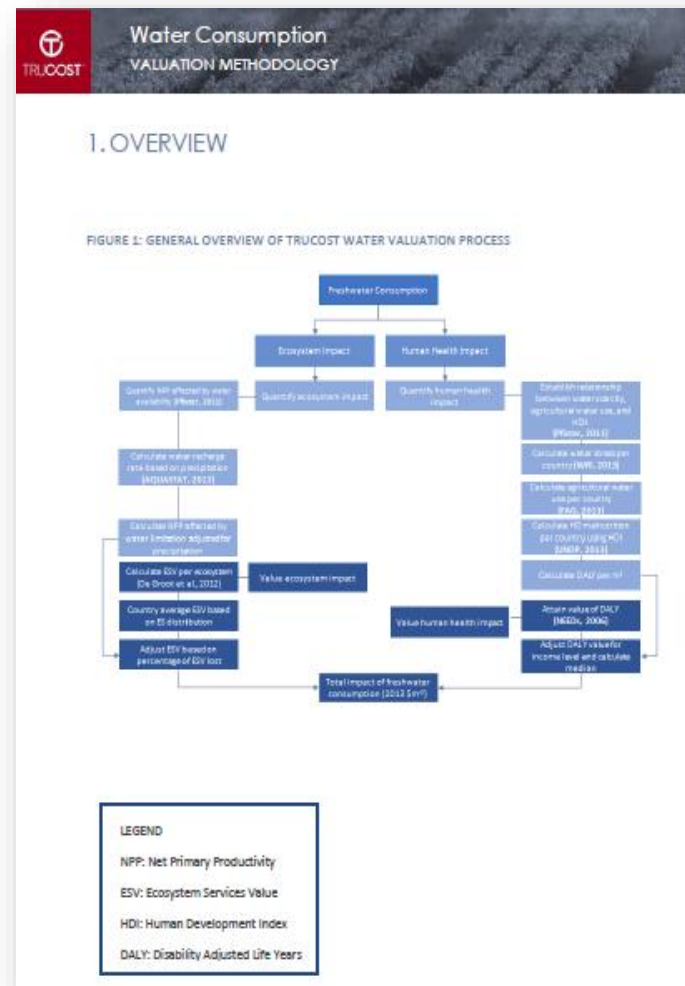
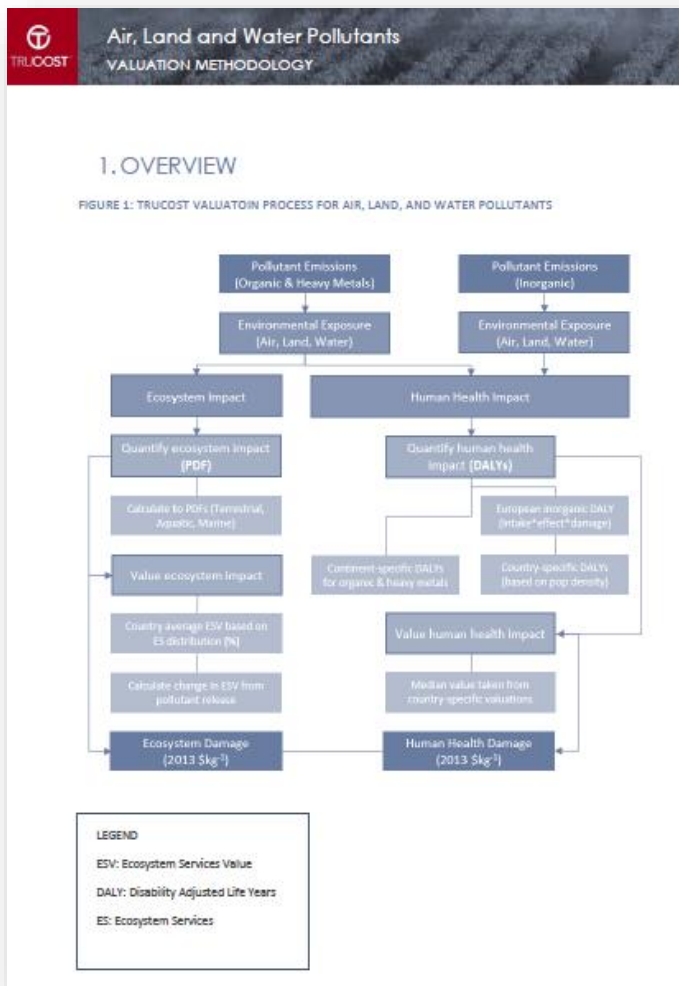
## GENERAL PROCESS

FIGURE 1: GENERAL OVERVIEW OF TRUCOST VALUATION PROCESS





## Further Trucost valuation methodologies





## Interim Report Launch





# Rice Study

- Worldwide, about 80 million hectares of irrigated lowland rice provide 75% of the world's rice production
- This predominant type of rice system receives about **40% of the world's total irrigation water** and **30% of the world's developed freshwater resources**





# Rice Study

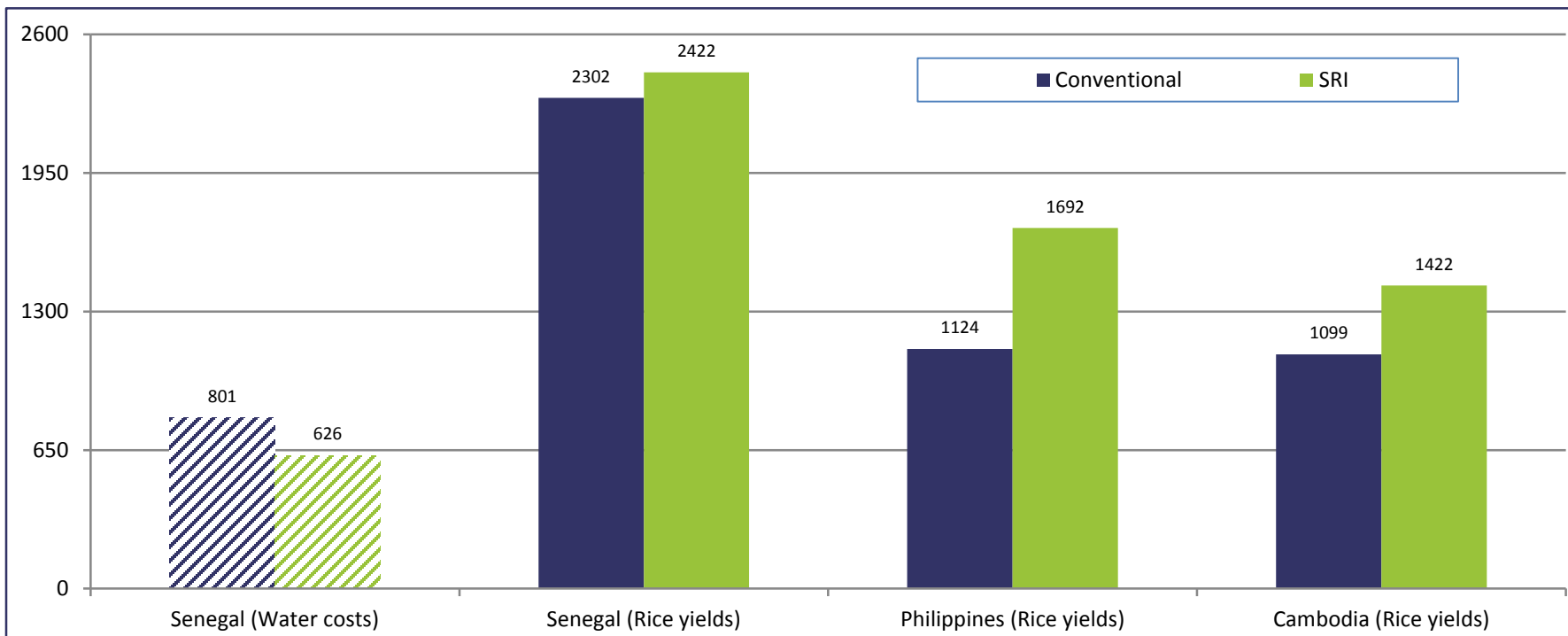
## Conventional vs SRI production

- The System of Rice Intensification (SRI) includes **intermittent flooding** as part of the production package.
- SRI advises **transplanting** of young (eight to ten days old) single rice seedlings, with care and spacing, and applying **intermittent irrigation and drainage** to maintain soil aeration.
- In addition, the use of a mechanical rotary hoe or weeder to **aerate the soil and control weeds** is encouraged.





## Increasing rice yields, Reducing water consumption





# 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
<b>Beef</b>	Honey and beeswax	Tourism in National Parks	Carbon storage	Subsistence hunting
<b>Cow milk</b>	Gum			Recreational hunting
<b>Goat meat and milk</b>	Medicinal plants			Blood from cattle
<b>Maize</b>	Charcoal, firewood, thatch and poles			Water cycle regulation
<b>Beans</b>	Wild herbs and vegetables			
<b>Animal skins and hides</b>	Drinking water			





# Maasai Steppe - Results

## ❖ Year 0 per hectare

Farmland (crop production) 73 USD/ha

National parks 52 USD/ha

Pastoralist rangelands 18 USD/ha

## ❖ Change in ranking over time for locally-realised ecosystem benefits

## ❖ Carbon stocks change:

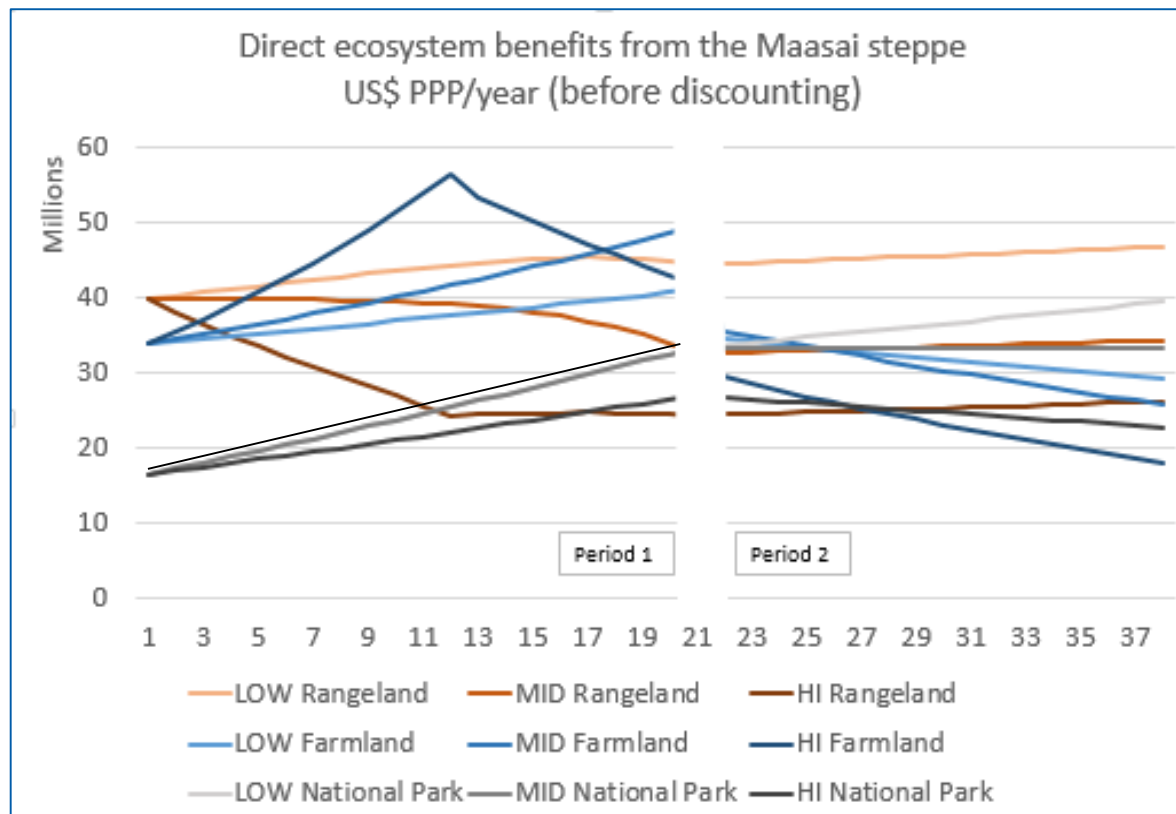
23 billion USD (HI); 15 Billion USD (LOW)

comparing Y0 and Y20





## Maasai Steppe – Results (totals)





# TEEB

## Three different levels of action:

- 1. Recognizing value** – identifying the wide range of benefits in ecosystems, landscapes and biodiversity, such as provisioning, regulating, habitat/supporting and cultural services
- 2. Demonstrating value** – using economic tools and methods to make nature's services economically visible in order to support decision-makers wishing to assess the full costs and benefits of land-use change
- 3. Capturing value** – incorporating ecosystem and biodiversity benefits into decision-making through incentives and price signals



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