Economic Costs of Biodiversity Loss and Ecosystem Degradation for Agriculture Sectors: Valuing Biodiversity as the Basis of Production

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Outline

1. Biodiversity loss and ecosystem degradation
2. Valuing biodiversity
3. Transitions to sustainable path
Biodiversity loss and ecosystem degradation
Biodiversity and ecosystem decline

- **Biodiversity is deteriorating at an unprecedented rate**
  - FAO reports that biodiversity and genetic resources for food and agriculture are declining
  - Around **one million** animal and plant species are now threatened with extinction, many within decades (IPBES, 2021)
  - The current rate of extinction is **tens to hundreds of times higher** than the average over the past 10 million years (IPBES, 2019)

- **Biodiversity loss** is one of the top five risks perceived by CEOs, which therefore undermines development gains and jeopardizes progress towards the SDGs (World Economic Forum, 2020)

Source: The Economics of Biodiversity: The Dasgupta Review
It’s estimated that the worth of biodiversity is at US$33 trillion per year—close to the GDP of the United States and China combined (Bos, G. 2017)

---land degradation costs more than 10% of annual global GDP in lost ecosystem services (IPBES 2018)

Between 1992 and 2014, produced capital per person doubled, and human capital per person increased by about 13% globally; but the stock of natural capital per person declined by nearly 40%
Valuing biodiversity
Six sources of biodiversity value

Biodiversity enables Nature to be productive, resilient and adaptable.

- Agrobiodiversity as the foundation of food systems.

---Biodiversity is essential to ensure the provision of ecosystem services and to maintain a high and stable agricultural production (Dainese et al., 2019)

Source: Our Biodiversity, Our Food, Our Health | CIAT (cgiar.org)

Source: The Economics of Biodiversity: The Dasgupta Review

A woman from Agoo, Philippines, showing a dish of diverse local food. Credit: Allan Jay Quesada
Biodiversity benefits crop production

- Agricultural fields with greater biodiversity are better protected from harmful insects, promote pollination and produce higher yields.

- Up to 50% of the negative effects of landscape simplification on ecosystem services was due to richness losses of service-providing organisms, with negative consequences for crop yields.

- Maintaining the biodiversity of ecosystem service providers is vital to sustain the flow of key agroecosystem benefits to society (Dainese et al., 2019).

- Halting and reversing current trends of land degradation could generate up to USD 1.4 trillion per year of economic benefits (IPBES 2018).

Biodiversity for food and nutrition

- The future capacity of agriculture to nourish us depends directly on the agrobiodiversity that is present in the production systems and its linkages with the market.
- There is also enough evidence to show that diverse production systems are more resilient to climate pressures and help reduce crop losses caused by pests and diseases, as well as the costs to control them.

Source: Innovation: Biodiversity for food and nutrition, CGIAR
Transitions to sustainable path
Seven Strategic Transitions

**Technological Innovations**: Reprioritize agricultural R&D for multiple-win technological innovations—yield, nutrition, sustainability and resilience

**Repurposing Subsidies**: Reform agricultural subsidies and innovate fiscal policy, by taxing unhealthy and unsustainable foods and supporting the supply chain development of healthy and sustainable foods

**Investment in New Infrastructure**: Increase investment in rural information and communication technology

**Institutional Innovations**: Facilitate institutional innovations to build efficient and inclusive food value chains by reforming property rights, empowering women and establishing productive safety nets

**Respect for Nature**: Respect nature and protect wildlife habitats by introducing laws and regulation

**Open and Resilient Trade**: Maintain free trade and enhance agrifood systems resilience

**Behavioral Change**: Guide residents' behavior change for a win-win for human and planetary health
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