SDGs and Biodiversity
Tradeoffs and Synergies between conservation and human development

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“Biological diversity means the variability among living organisms from all sources including, inter alia, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within species, between species and of ecosystems.” (CBD)
The Sustainable Development Wedding Cake

An intact biosphere is the condition for an intact economy – not the other way around

Stockholm Resilience Centre
There are multiple threats for Biodiversity including overharvesting (logging) and Agriculture (cropping) based on a study looking at IUCN Redlist Species

Maxwell et al 2016
Figure 2.1: Transformation of the biosphere over 8000 years: Adapted from, Based on.
Ecosystem Service Change

- Infectious disease mediation
- Crop production
- Forest production
- Preserving habitats and biodiversity
- Carbon sequestration
- Water quality regulation
- Water flow regulation
- Regional climate and air quality regulation

Variations:
- Natural ecosystem
- Intensive cropland
- Cropland with restored ecosystem services

Foley et al. 2005
Land Sharing or Land Sparing?

- Biodiversity (species richness)
- Ecosystem services
- Connectivity
- Livelihoods

**WHICH FOCUS?**
- Biodiversity (species composition)
- Forest structure and function
- Connectivity

**WHICH FOREST TYPES?**
- "Productive" forest for achieving human needs
- Reforestation with native trees
- Silviculture
- Agroforestry
- Mixed species plantations
- Commercial monoculture plantations

**"Conservation" forest based on similarity with the reference ecosystem**
- Assisted natural regeneration
- Reforestation with native trees
- Passive restoration

**WHICH INTERVENTION AND WHERE?**
- Remaining forest extent
- Previous land uses
- Landscape matrix
- Land availability
- Social context
- Opportunities for land use intensification
- Markets
- Legislation
- Functional groups

OUTCOMES DEPEND ON?

LAND SHARING
- Markets
- Legislation
- Functional groups

LAND SPARING
- Remaining forest extent
- Previous land uses
- Landscape matrix

Meli et al 2019
Take-Home Messages

- Biodiversity is important to humanity as it is the basis for all ecosystem services, human well-being and sustainable development.
- Despite this knowledge, unsustainable human development has led to the loss of biodiversity and land use change.
- This has caused the reduction of many ecosystem services, in particular regulating and supporting, and benefited provisioning services (Trade-offs).
- Synergies between biodiversity conservation and human development can be maximized through integrated land use (land sharing) or through setting aside land for biodiversity conservation (land sparing).
- Which approach is more feasible depends on contextual factors.