

Assessing the Biodiversity Footprint of Global Oil Crops Cultivation: Increased Species Extinction Risks from 1995 to 2020

Shuntian Wang^{1,2,*}, Stephan Pfister^{1,2}

¹ Department of Civil, Environmental and Geomatic Engineering, Institute of Environmental Engineering, Ecological Systems Design (ESD), ETH Zurich;

² Department of Humanities, Social, and Political Sciences, Institute of Science, Technology, and Policy (ISTP), ETH Zurich.

* shuntian.wang@ifu.baug.ethz.ch



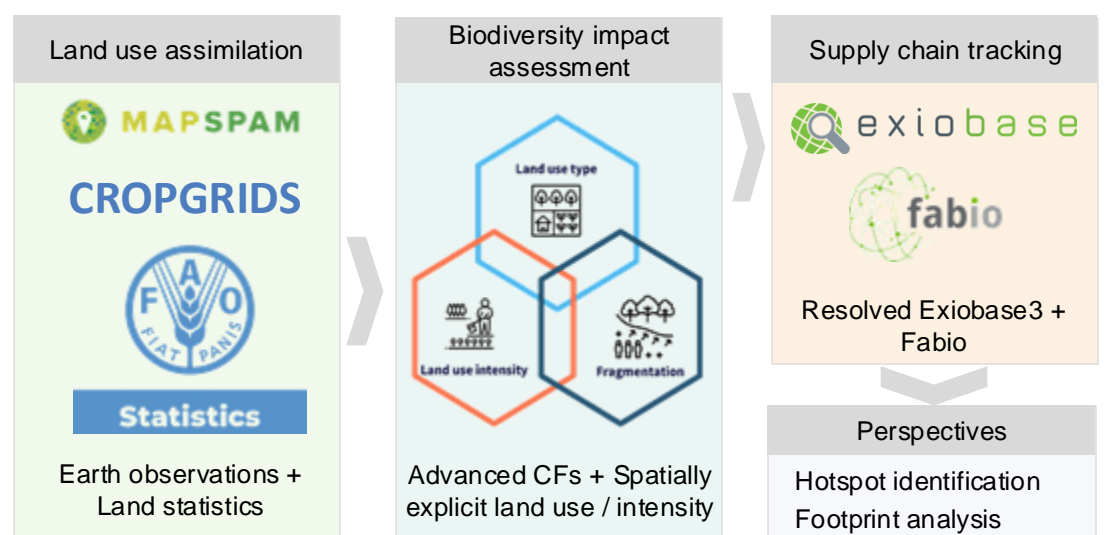
In 2020, the global cultivation of oil crops posed a potential extinction to 1.61% of global species. From 1995 to 2020, the impact increased by approximately 68%, primarily located in the Global South and mainly driven by consumption in the Global North.

Background & Methods

The rapid expansion of agricultural land use for oil crops such as oil palm and soybean, **driven by tele-connected demand** has significantly increased concerns about biodiversity loss.

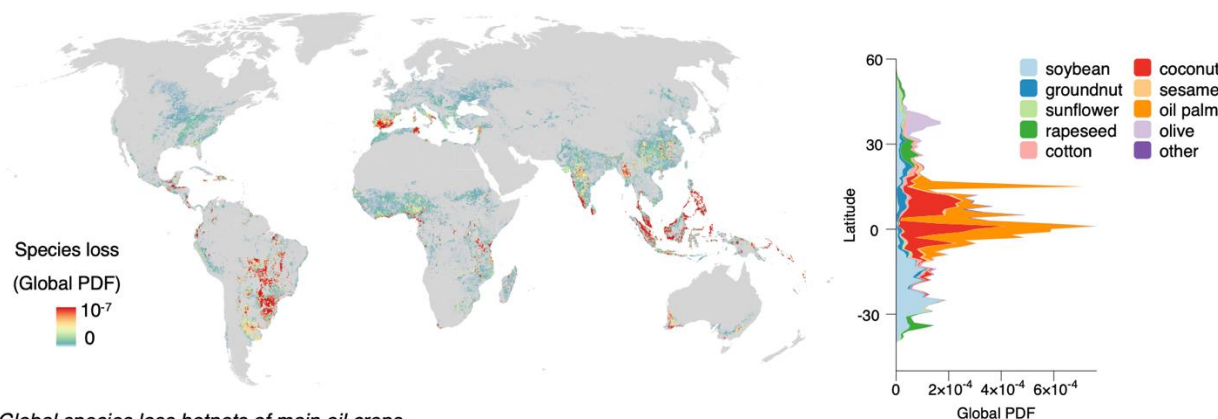
Enhanced methods have been applied to analyze the biodiversity footprint of global oil crop cultivation from 1995 to 2020:

- Harmonized crop land use and land use intensity maps
- Advanced extinction risk characterization factors (CFs)
- Hybridized multi-regional input-output (MRIO) tables

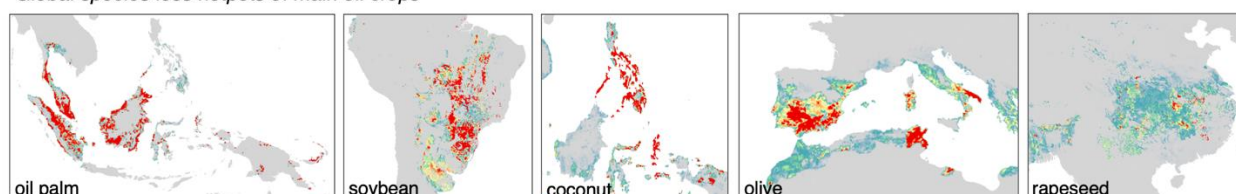


Results

Biodiversity impact of global oil crops cultivation



Global species loss hotspots of main oil crops



Harvested area: In 2020, the harvested area of oil crops accounted for ~22% of the global cropland area.

Biodiversity impact: The global species loss of oil crops land use is ~0.0161 global PDF.

Hotspots: Tropical regions account for only 43% of the global oil crop total harvested area, but they are responsible for 77% of the total global species loss.

Disparity: e.g., the per-hectare average potential global species loss caused by soybeans harvested in the US is only about 1/8 of that in Brazil.

Trends: The biodiversity impact has increased by 68% between 1995 and 2020.

Hotspots: Oil palm and soybean cultivation contribute to around 62% of the increased impact. ~90% of the increased impact is located in the Global South.

Footprint: ~75% of these impacts are driven by tele-connected consumption in the Global North, including a rapid increase in demand for vegetable oils and the non-food chemical and energy sectors.

Outlook: enhanced MRIO analysis (target-sector-region), SDA

