FINEPRINT

Geospatial assessments of the environmental impacts of global resource extraction

Institute for Ecological Economics, WU Vienna

01.03.2019

Structure of special session

- Four presentations à 15 minutes – plus 5 minutes questions:
  - **Stefan Giljum**: Moving material flow analysis from the national to the spatially explicit level
  - **Victor Maus**: Using global crop maps to improve the estimation of impacts associated with biomass production
  - **Mirko Lieber**: Creating global extraction maps for non-renewable resources
  - **Stephan Lutter**: Assessing water inputs of global mining activities

Structure of special session

- 30 minutes plenary discussion on the use of FINEPRINT results and data:
  - Which data sets / results produced by FINEPRINT are relevant for you?
  - For which research questions would you use the data?
  - Are there additional aspects that you would like to see covered?
  - Which other relevant data sets are you aware of (e.g. on social aspects)?

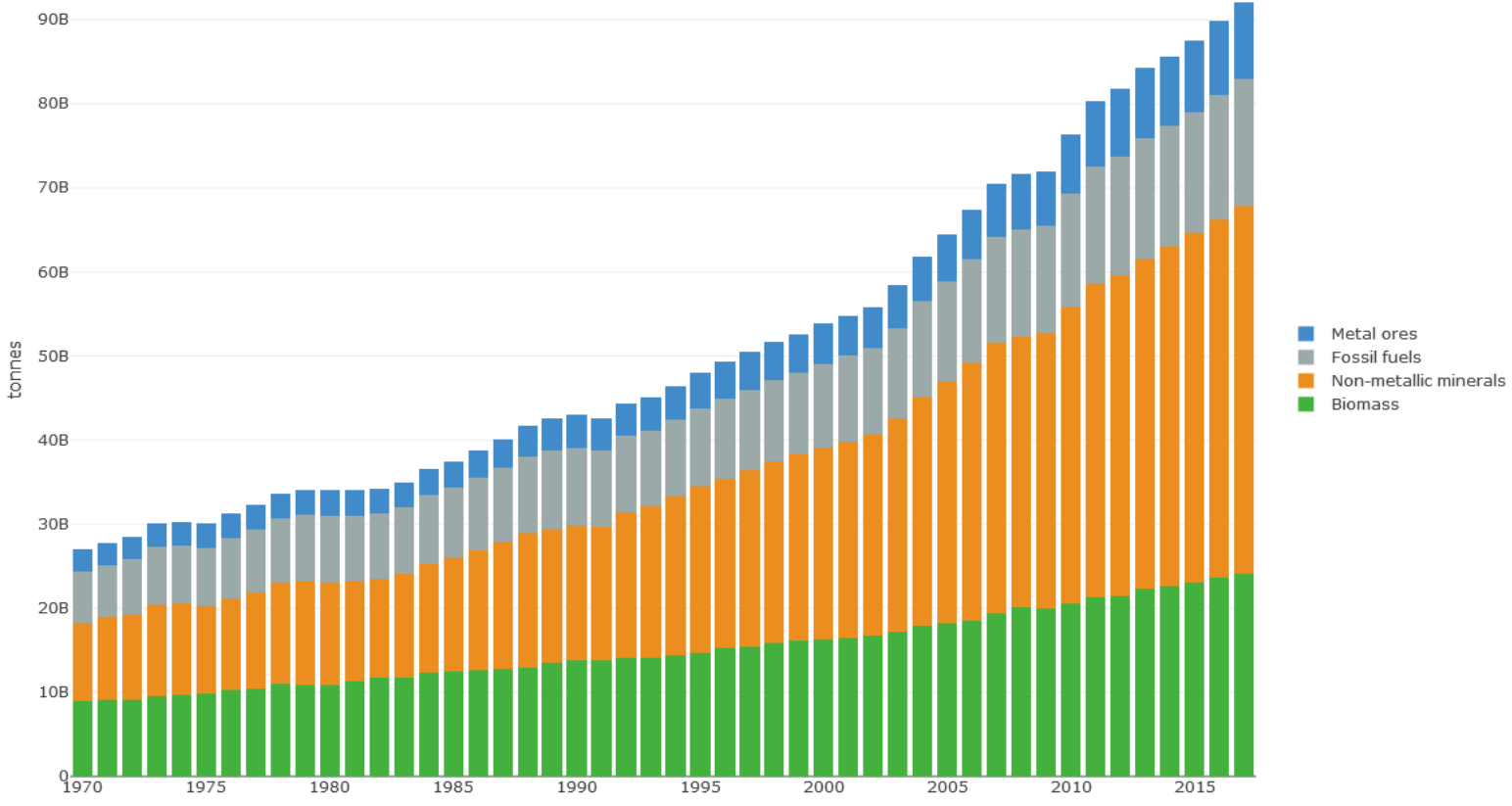
Moving material flow analysis from the national to the spatially explicit level

Stefan Giljum / Institute for Ecological Economics, WU Vienna
01.03.2019

Rapidly increasing global material consumption

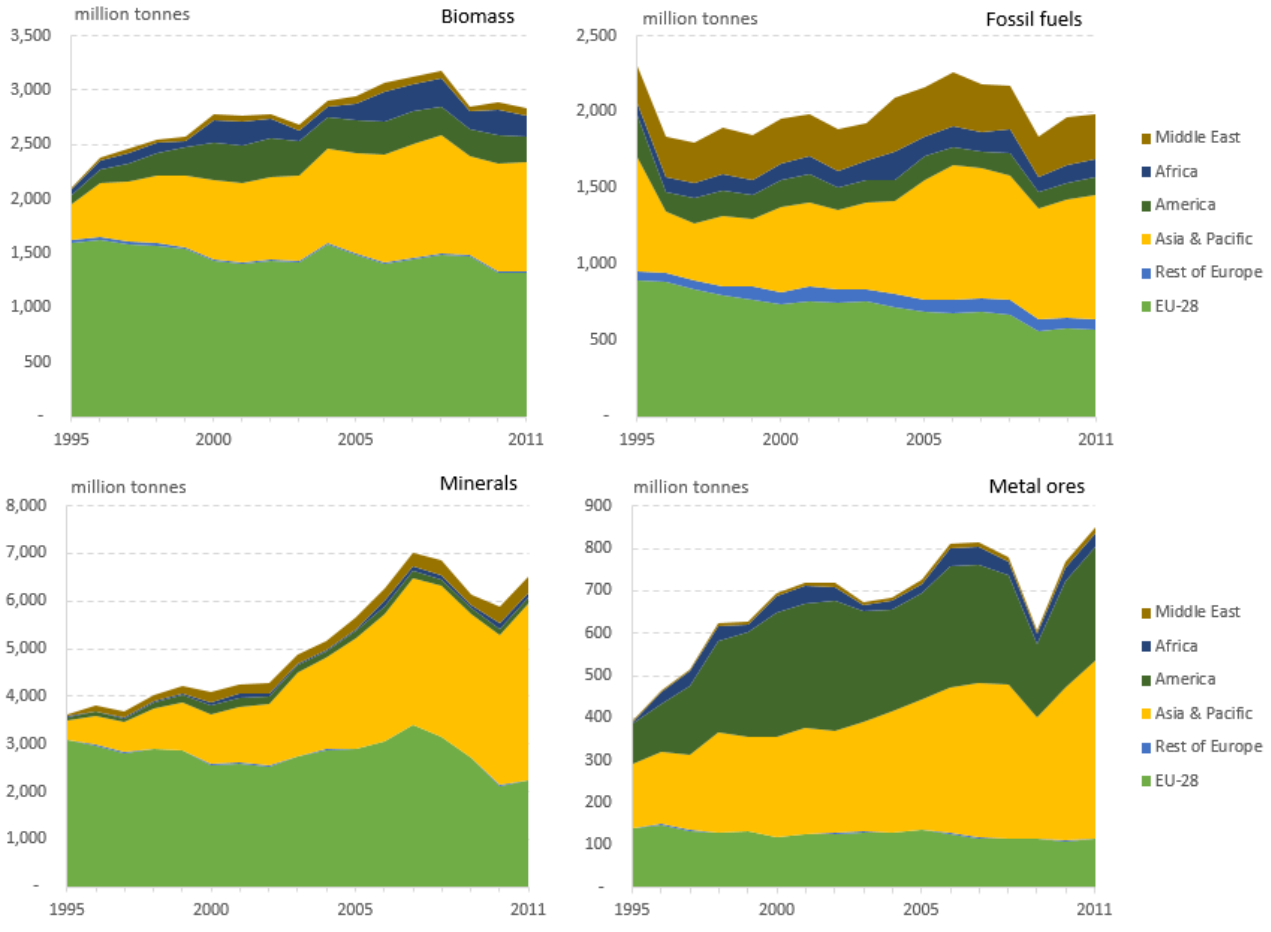
1970: 27 billion tonnes

2017: 92 billion tonnes



Source: UN IRP, 2018 / www.materialflows.net

Geographical origin of EU-28 material footprint



Source: Giljum et al., 2016

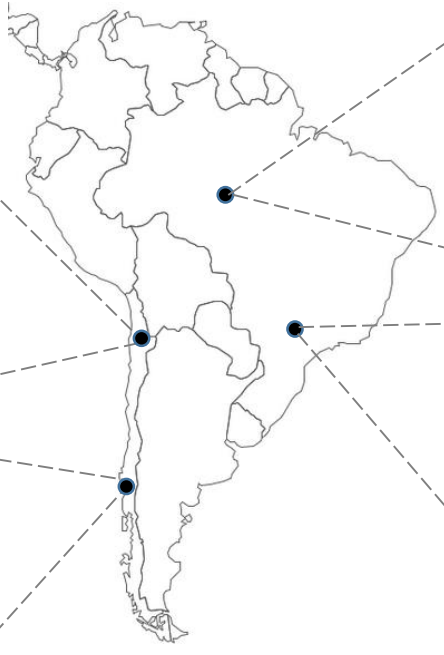
Global impacts of EU's material footprint

- Difficult to assess the impacts related to our (material, water, land) footprint on the aggregated national level
- Environmental and social conditions within raw material extraction countries vary considerably
- → Need to analyse environmental pressures and impacts in a consistent assessment framework of high spatial resolution

Impacts depend on specific location

Brazil:
Soybean production

Chile:
Copper mining



Source: own illustration

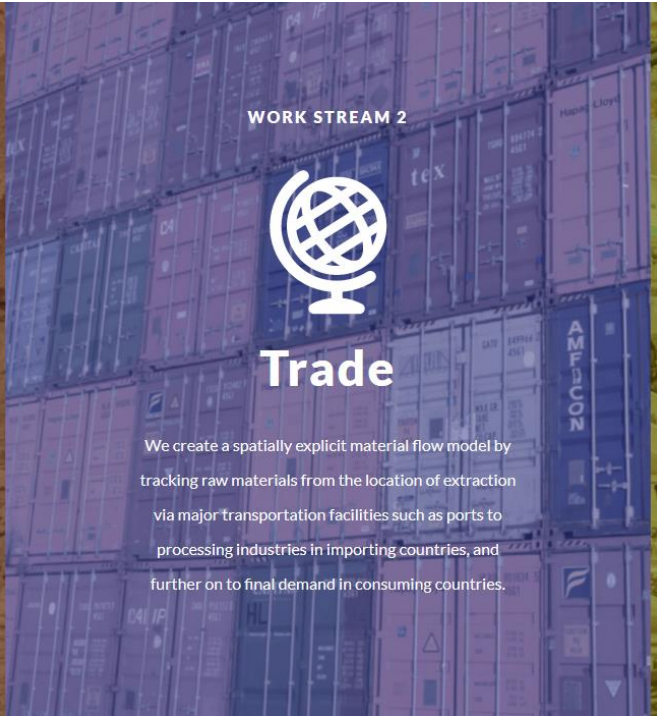
ERC Consolidator Grant project

- Spatially explicit material footprints: fine-scale assessment of Europe's global environmental and social impacts
- July 2017 – June 2022
- Team of ~10 researchers
- Budget of 2 million Euro

Objectives of FINEPRINT

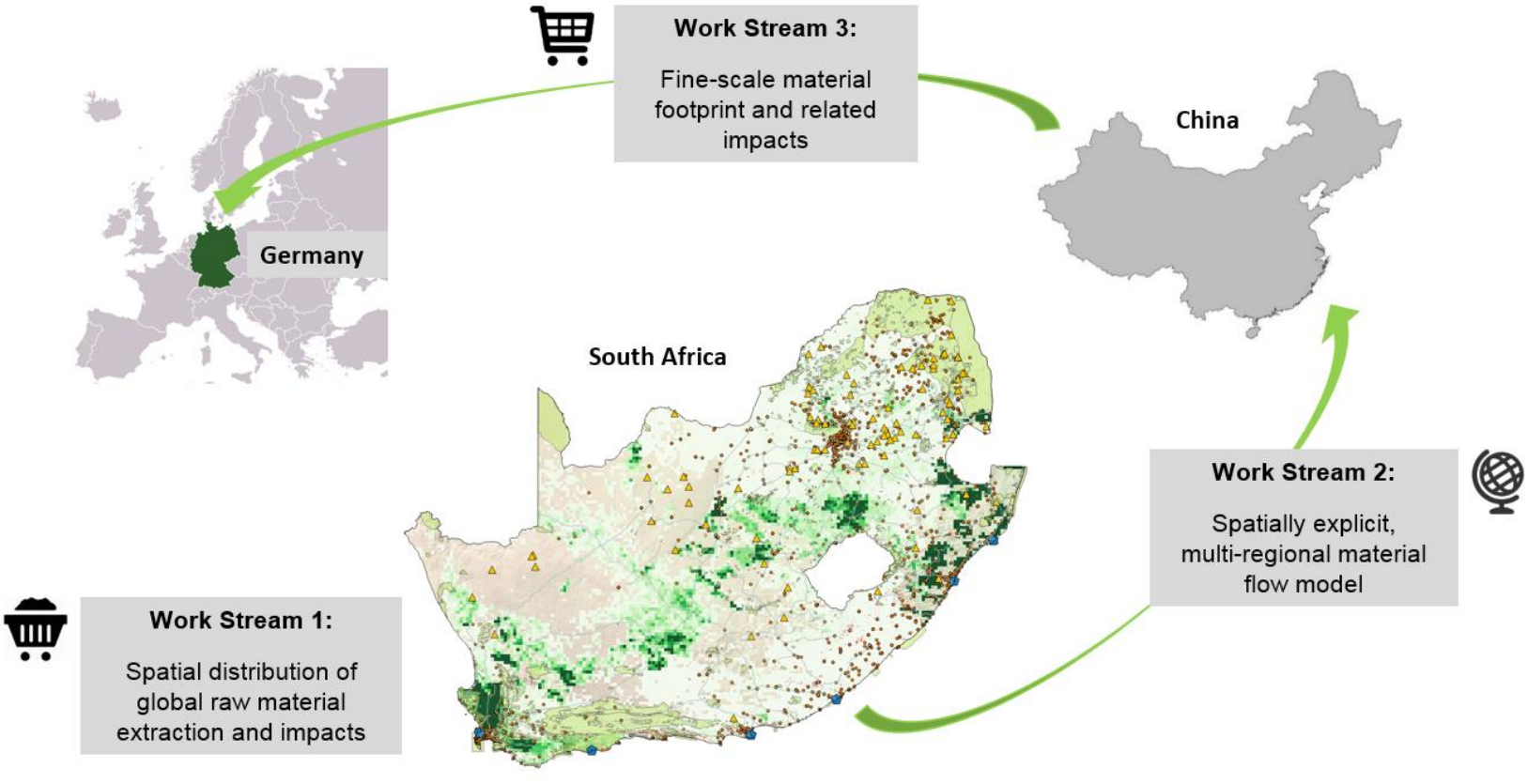
- **Develop new method for assessing global material flows and related impacts using high spatial resolution**
- Linking spatially-explicit data on raw material extraction and related impacts to models of global supply-chains
- Identifying the – often geographically distant – socio-economic drivers (economic sectors/products, consumption areas) of local changes in ecosystems and communities; already investigated in a large number of case studies

Implementation of FINEPRINT (1)



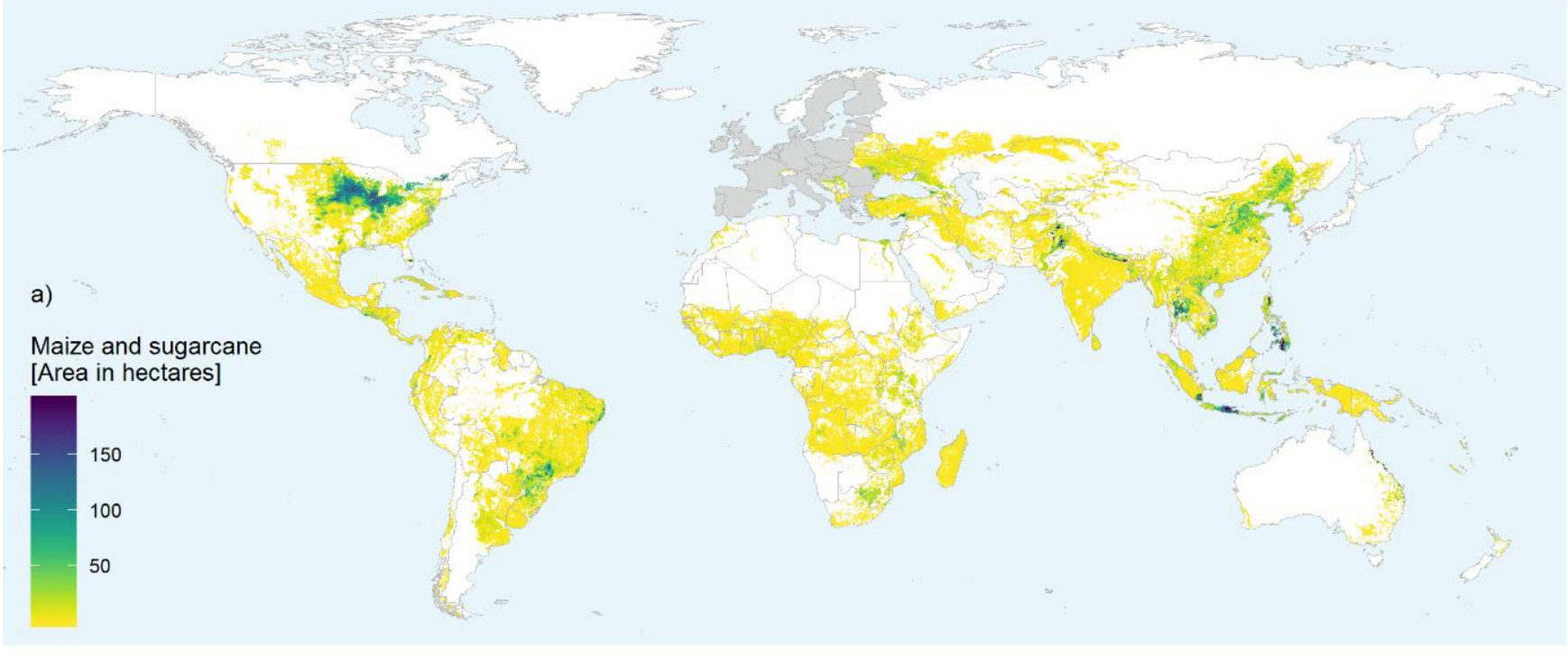
Source: www.fineprint.global

Implementation of FINEPRINT (2)



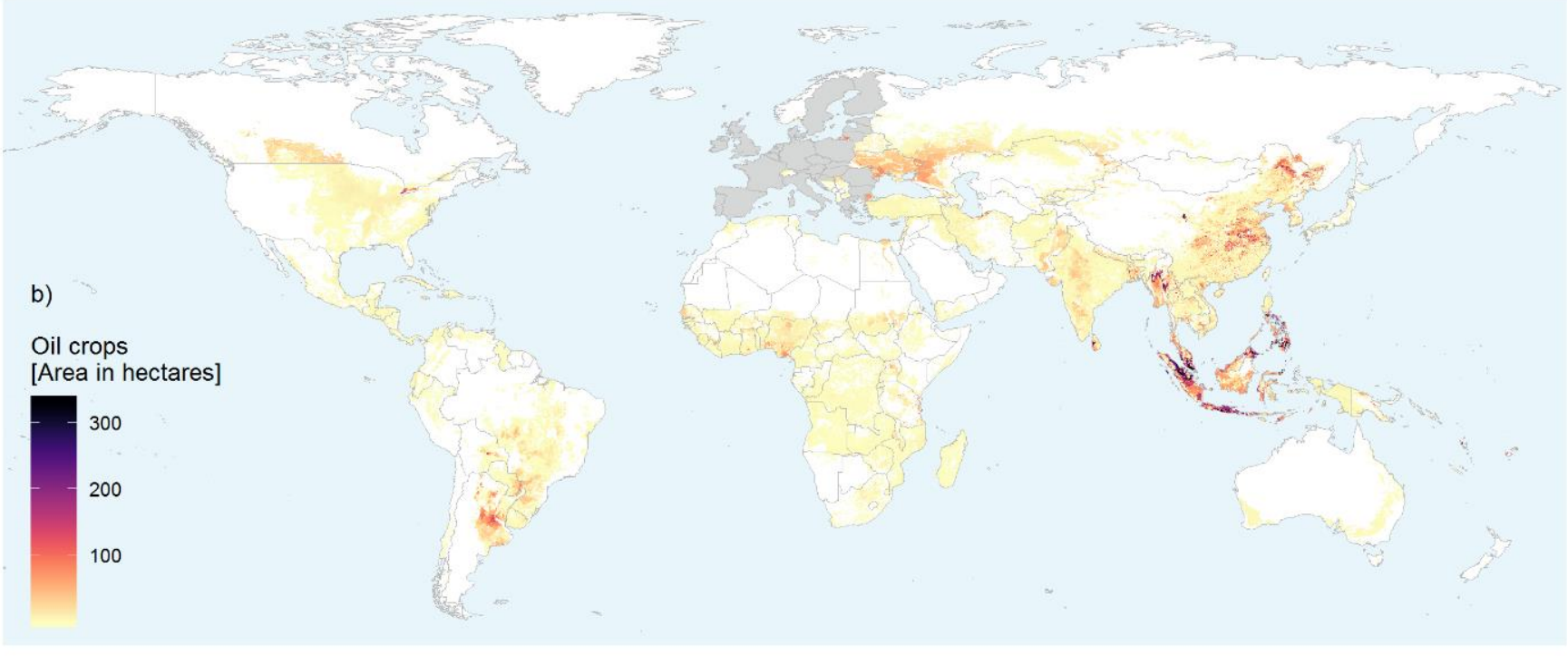
Source: www.fineprint.global

Land footprint of EU non-food bioeconomy



Source: Bruckner et al., 2019

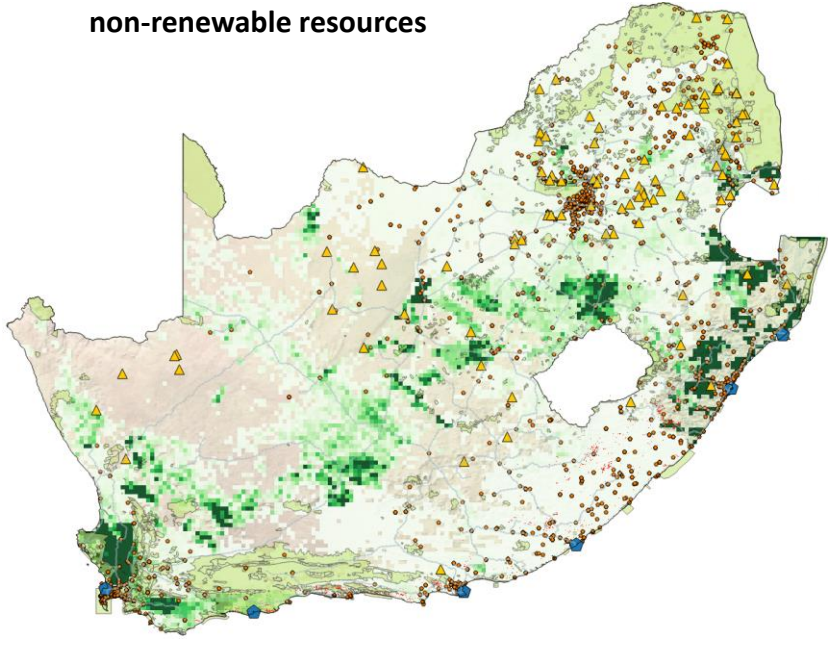
Land footprint of EU non-food bioeconomy



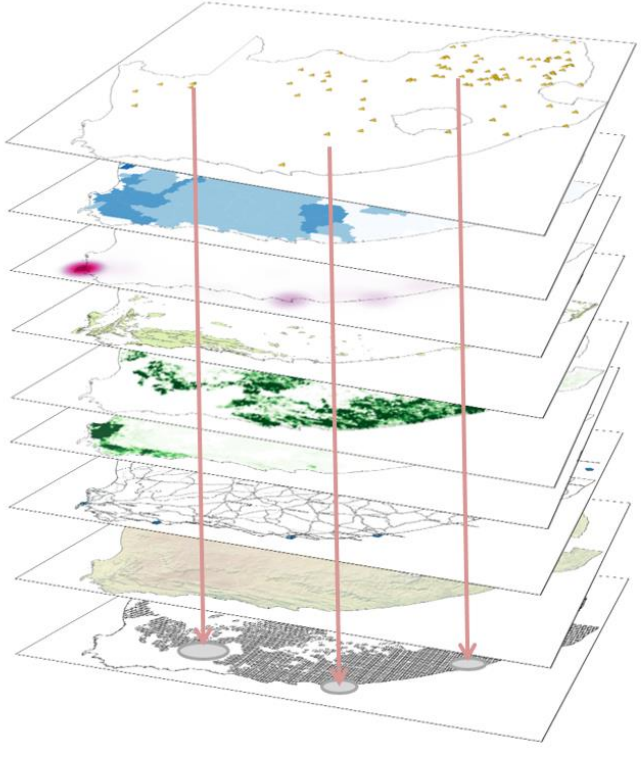
Source: Bruckner et al., 2019

Global mapping of extraction & impacts

Mapping the extraction of biomass & non-renewable resources



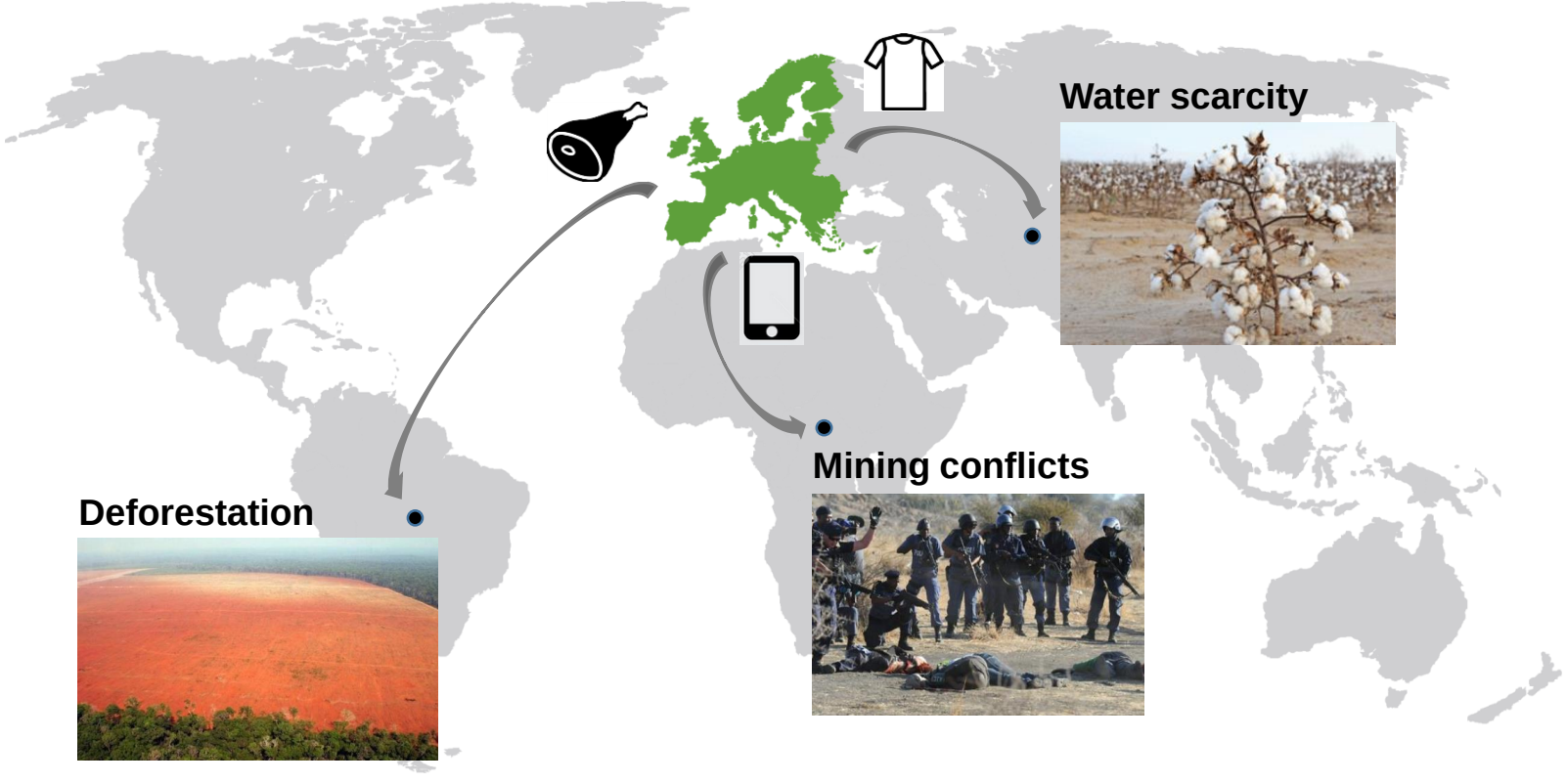
Multi-layer, time series analysis of environmental and social impacts related to raw material extraction and their underlying drivers



Potential impacts to be investigated

Impact category	Name of data set	Institution
Water scarcity	AWARE	WULCA / UN Life Cycle Initiative
Biodiversity	Species occurrence	Global Biodiversity Information Facility
	Red List of Threatened Species	IUCN
Protected natural areas	World Database on Protected Areas	IUCN and UNEP
Deforestation	Global Forest Change	University of Maryland
Pollution / contamination	mapx	UN Environment, World Bank, GRID-Geneva
Environmental and social conflicts	Environmental Justice Atlas	Environmental Justice Organisation
	ACLED Version 6	Armed Conflict Location and Event Data Project (ACLED)
Children malnutrition	Global Subnational Prevalence of Child Malnutrition	Socioeconomic Data and Applications Center (SEDAC)
Land grabbing	LAND MATRIX	Land Matrix Observatory
	LandMark	IBC, WAIPT, Liz Alden Wily and WRI

Fine-scale footprints and related impacts



Source: own illustration

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www.fineprint.global

github.com/fineprint-global

researchgate.net/project/FINEPRINT

Contact: Stefan Giljum
stefan.giljum@wu.ac.at
+43 1 31336 5755