

# Localized Anthropocene: potential pathways for critical remote sensing in analyzing land conflicts



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1. Definition of Anthropocene
2. Ontologies of Nature and Society
3. Critical Remote Sensing
4. Case Example





# Anthropocene

- Entire surface of the planet covered by traces of human economic activities
  - Popularised in the 2000s by atmospheric chemist Paul Crutzen

**Markers of human activity** that future geologists could detect:

- **Undegradable material:** plastics, concrete, aluminum...
- **Radioactive isotopes** from nuclear testing
- **75% of Earth's land surface** significantly altered (agriculture, urbanization, deforestation)
- **“Sixth Mass Extinction”:** Biodiversity loss driven by humans (habitat destruction, invasive species, pollution...)



# Anthropocene

- Not accepted by many, including the International Union of Geological Sciences
  - Overemphasize the Human
    - Other forces determine the geological time – volcanism, tectonics, solar cycle...
  - Timescale standards: evidence is too recent
  - Lack of consensus

## **When did Anthropocene began?**

- Early agriculture (+-10,000 years ago)
- Colonial Navigations (1600s, marked by species transfers).
- Industrial Revolution (+-1750)
- “Great Acceleration” (+-1950s, nuclear power, plastics, globalization)



# Anthropocene

- Concept as a Political tool
- Variations of the concept propose different culprits:
  - Capitalocene (Brenner, 2020), Plantationocene (Harraway, 2015), Technocene (Lopez-Corona 2020)



# Ontology

- Ontological question of Nature X Society
- How the way we think about Nature impact the outcomes/framework of our research?
- Existence of pristine nature? Can we know Nature?

# Ontological Dualism - Modernity

## Nature

- Follows laws that exist objectively and independently from human existence and activities
- Pristine and unaccessible
- Antropomorphised nature (revenge)

## Society

- Defined by human capacity to dominate and transform nature
- The realization of freedom is through the mastery and control of external nature





# Ontological Dualism - Crisis of Modernity

Latour, 1998

## First Paradox

- **Nature** is not human construction. It **surpasses our grasp**
- Society is a human construction immanent to our actions

## Second Paradox

- **Nature** is an artificial construction. **Known through laboratory**
- Society transcend our control. It's not our free construction

‘Modern’ institutions aim to maintain a complete separation between Nature and Society.

Avoid the hybridity of nature-society



Global climate crisis: inevitable, unprecedented and irreversible





# Ontological Monism - Social constructivism

Latour, 1998

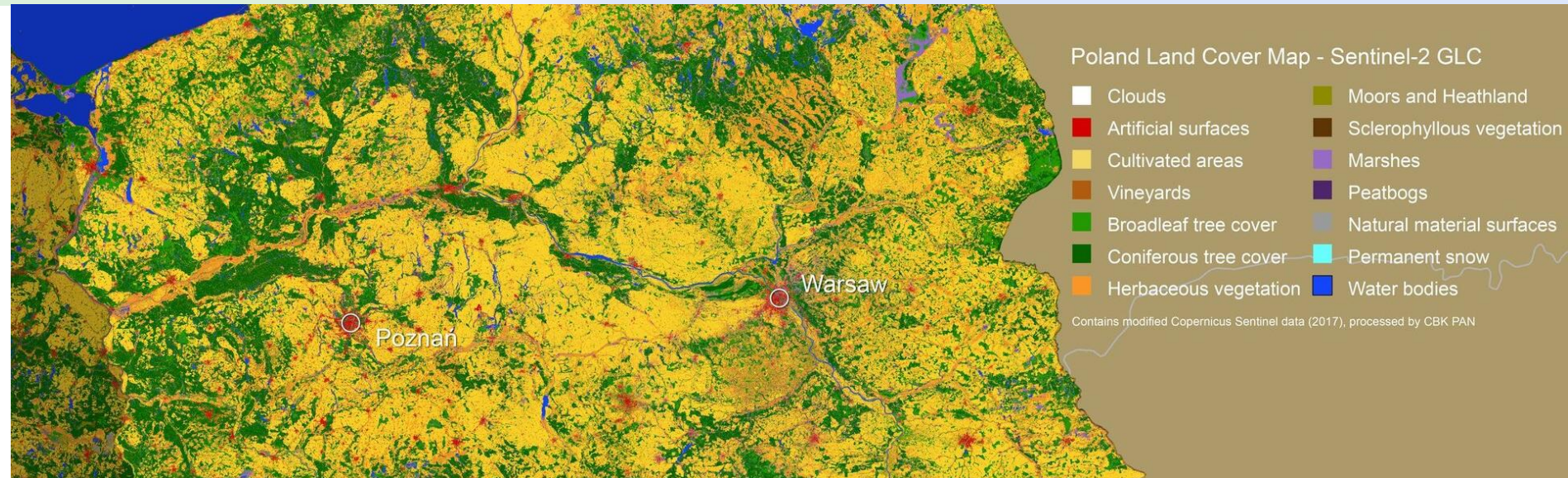
## Nature

- Nature is not directly accessible in itself
- It becomes meaningful only through human mediation (e.g., language, culture, science)

## Society

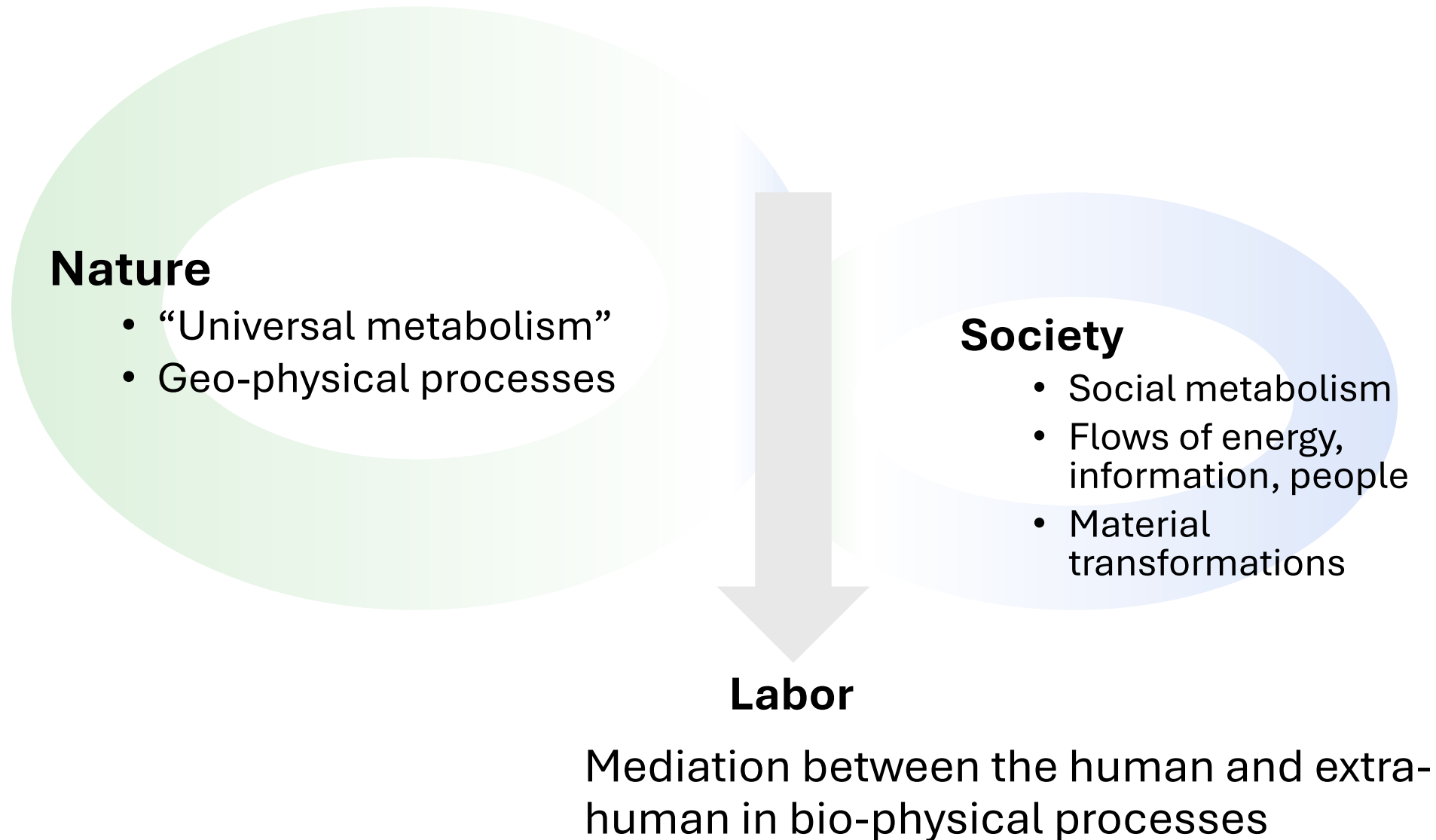
- Provides the frameworks (language, norms, practices) that shape how we understand nature
- Reality is socially constructed rather than objectively given

In social constructivism, the boundary between nature and society dissolves, as both are **mediated through human meaning-making**.



# Ontological Dualism - Metabolism

Saito, 2022

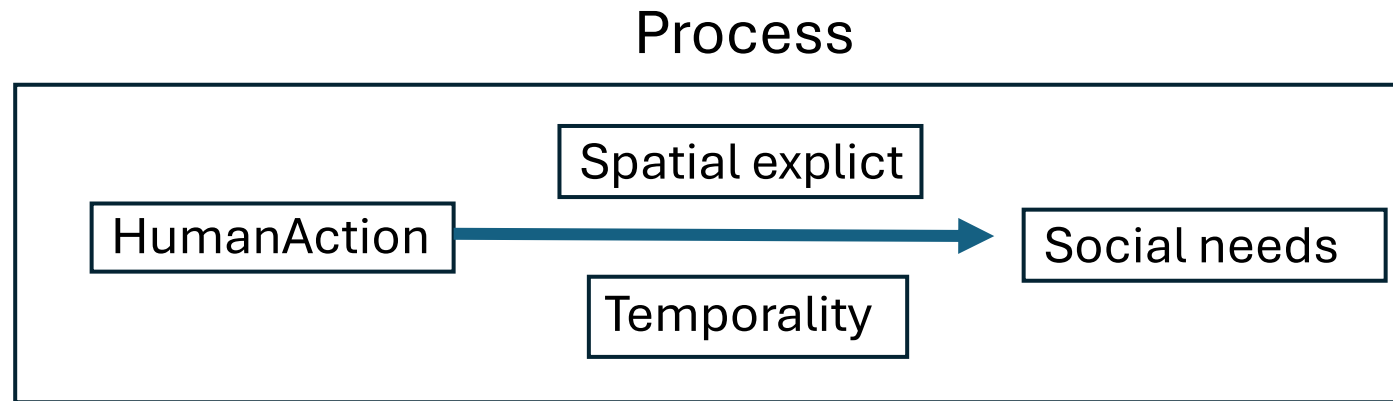


# (Critical) Remote Sensing

- How to **observe labor** in landscape changes?

Labor: **Human activity** that mediates the **metabolism** between society and nature — **transforming nature** to meet human needs, while simultaneously shaping social relations.

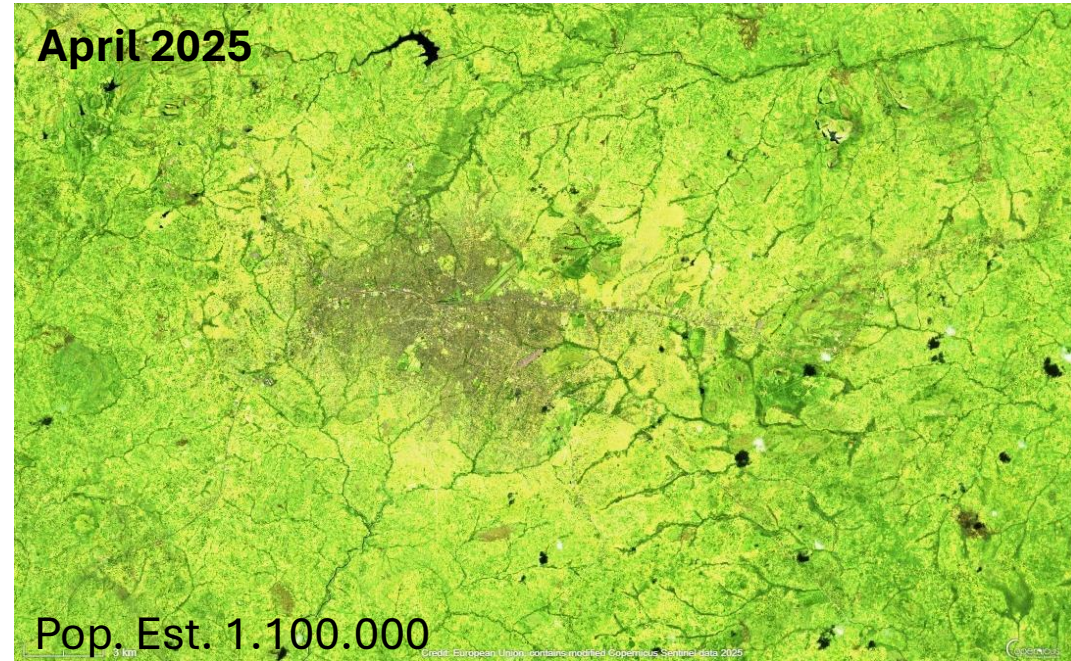
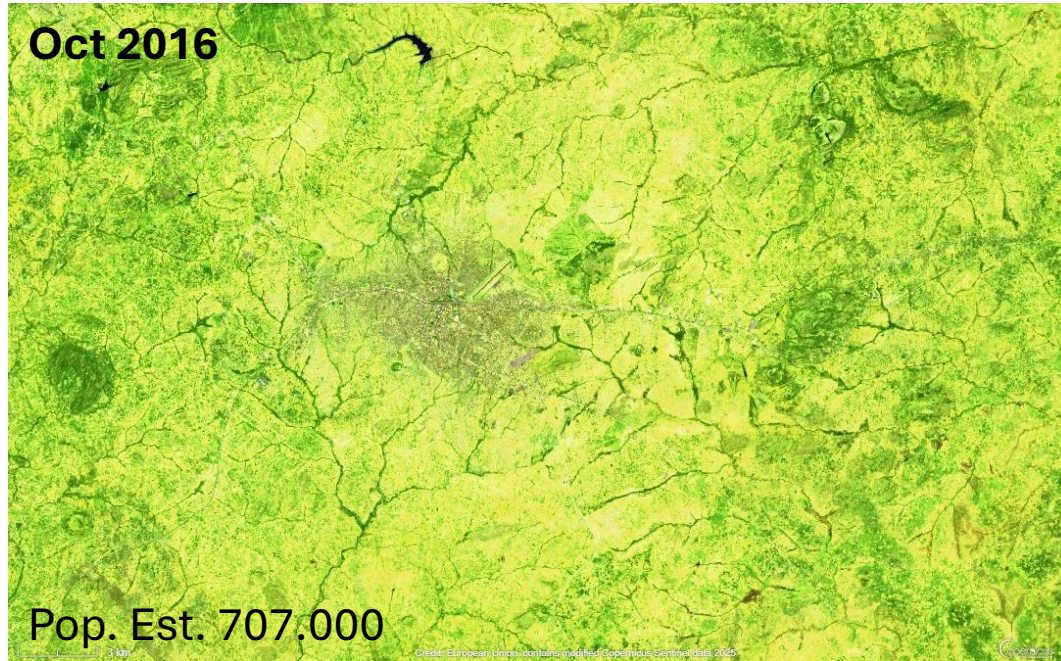
is the **site of metabolic interaction** that can either sustain or disrupt the balance between humanity and nature (Saito, 2022)





# Case study

Nampula, Mozambique



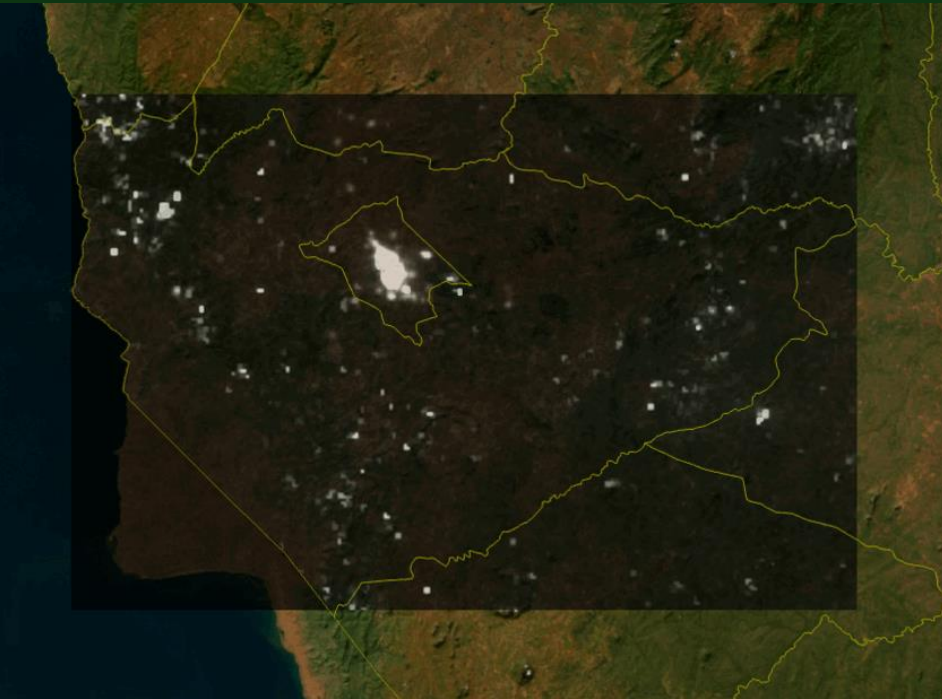
- Pop. 64% increase
- New demands for commodities
- New social-spatial relations

Source: EO Browser. Sentinel 2  
False color Urban B12-B11-B04  
[worldpopulationreview.com/](https://worldpopulationreview.com/)

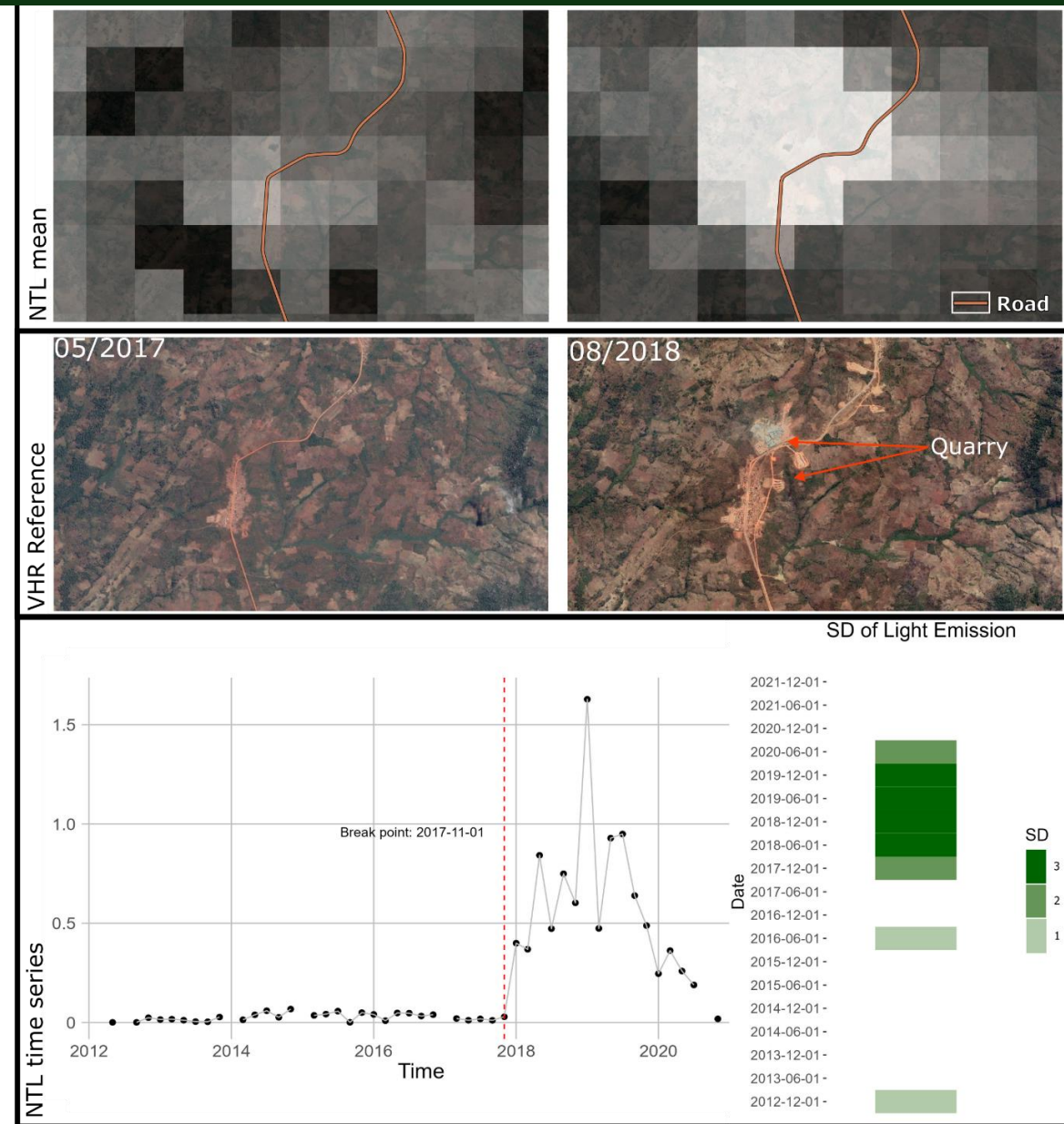


# Case study

Nampula, Mozambique



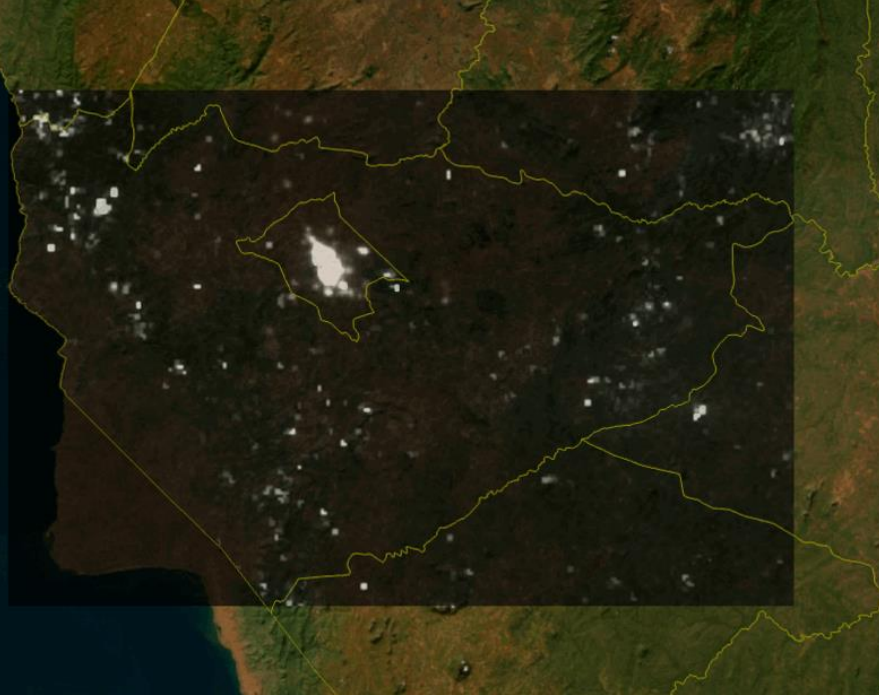
- Nighttime Lights indicating processes linked to extractivism





# Case study

Nampula, Mozambique



## Human Activity and Extractivism

Practices, technologies, value-chains

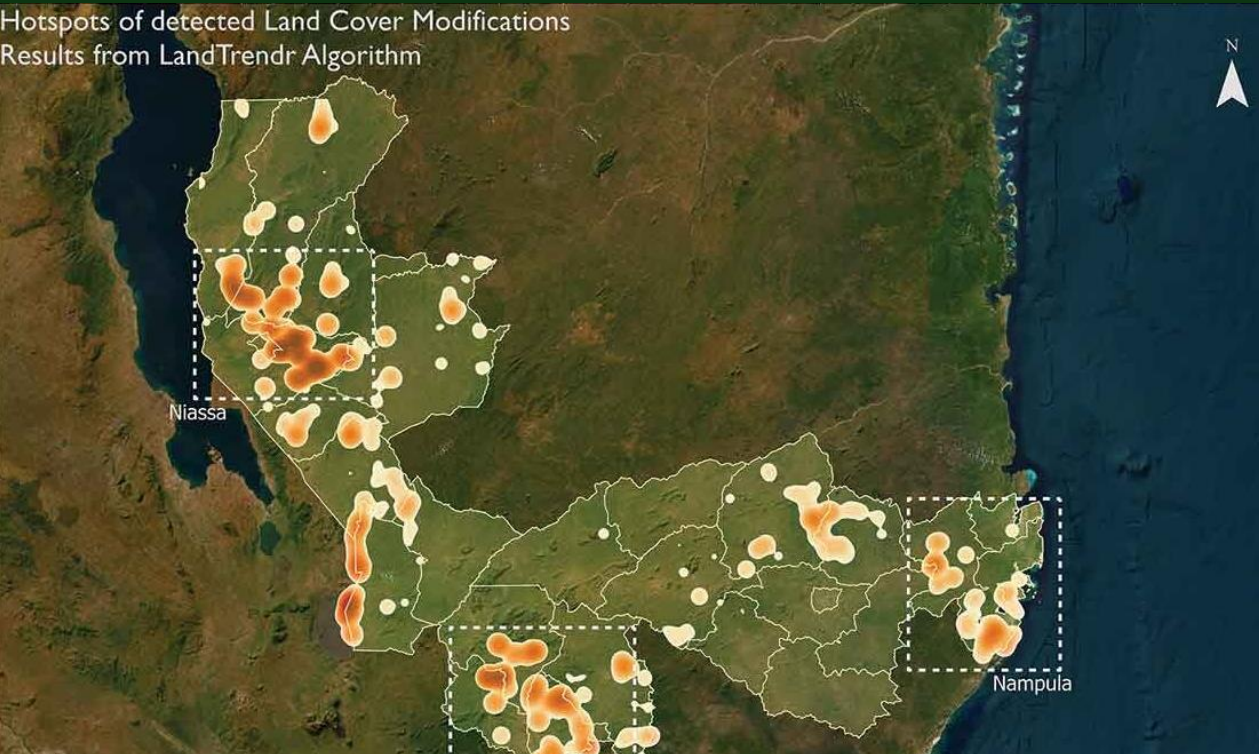




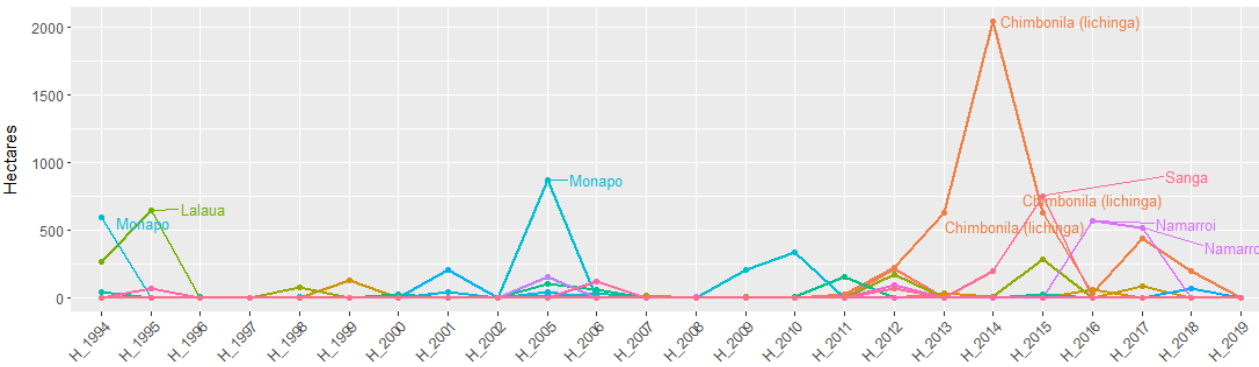
# Case study

Nampula, Mozambique

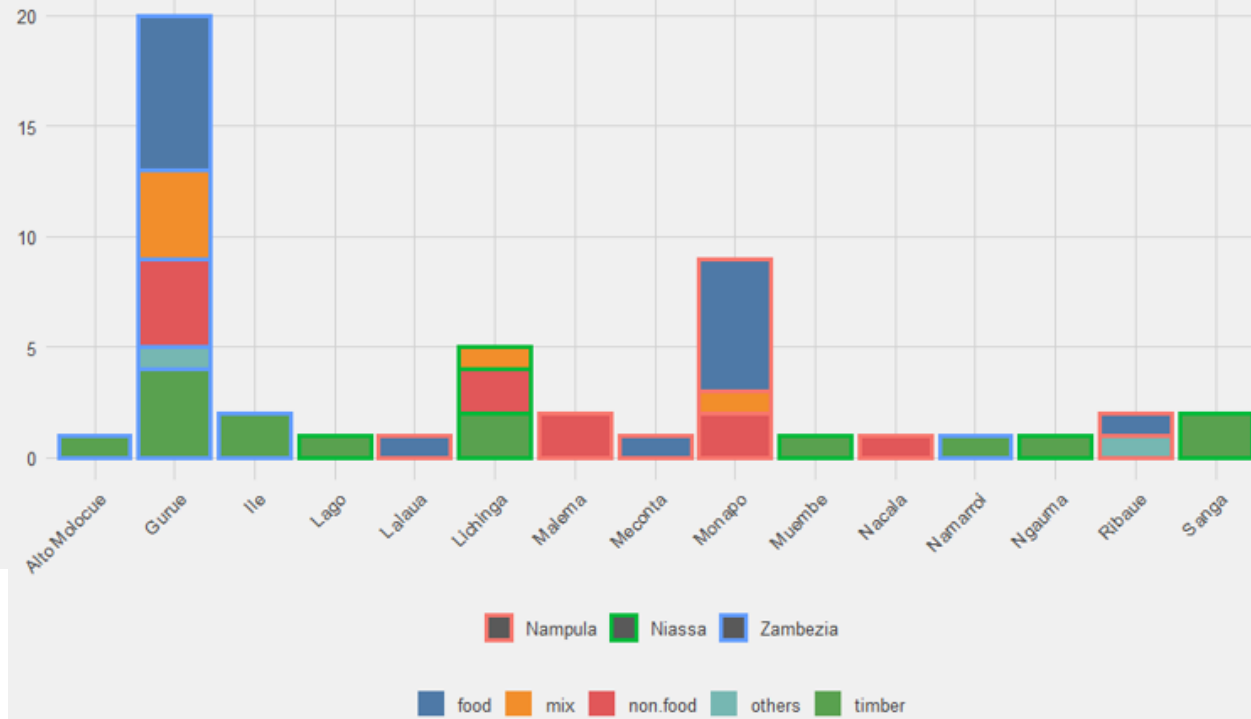
Hotspots of detected Land Cover Modifications  
Results from LandTrendr Algorithm



Detected areas



Reported crop types



- Reported industrial agriculture
  - Construction material – timber

- Identification of massive land cover changes (<200ha)

# Considerations

1. Our ontological principle determine the research methods and solutions to the Anthropocenic crisis
2. From a critical ontology, the focus **shifts from “absolute”** land cover changes **to “relative”** processes
3. Applying the “metabolism” idea in RS brings up meaningful responses as:
  - There is no external nature that must be kept under control –but **co-dependency** between metabolic processes



# Thank you



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Paris, R. Rienow, A. (2024). Shedding light on local development: Unveiling spatial dynamics from infrastructure implementation through NTL



Paris, R. Rienow, A. (2023). Detecting massive land deals using remote sensing and land conflicts database



## Special thanks:

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Disclaimer: Photo credits to the author, 2023  
Every participant gave consent to be part in the research







# Crisis

- We define an assemblage here as the coming-together of human and non-human ‘things’ that take on an emergent agency (Page, [2020](#)). By agency, we mean the ability to do something, to affect and be affected.
- **Using ethnography and assemblage theory in political geography**
- [Pooya Ghoddousi](#), [Sam Page](#)