**Pitch**

**Title**

**Mapping the influence of accessibility to cities on the compositional biodiversity globally**

**Bla bla in conflict?**

Accessibility and biodiversity

Human developments impact on biodiversity

Human dev vs biodiversity – a farce of a fight?

Connectivity - essential for humans, extinctive for animals?

Presence of humans

**The hook (what we know)**

Human alterations to the biosphere are seeing unprecedented extents. Urban centres play a major role in both the alteration of the environment but also as a place of access to opportunities and wellbeing aspects such as education, health services and financial institutions. Advancing accessibility globally predicate the equity agenda of the UN and the pursuit of the Sustainable Development Goals. On the other side, accessibility often comes with habitat change, which is one of the biggest impairments on biodiversity. The present global decline in biodiversity can lead to degradation of ecosystem functions globally.

Assessing the impact of human development, as here in the form of accessibility, on biodiversity metrics is essential for the efficient allocation of limited resources.

Theory of BD – intermittent disturbance etc?

Accessibility map article:

Advancing accessibility worldwide underpins the equity agenda of leaving no one behind established by the SDG of UN.

Metrics for accessibility -> inform decision making

Access to urban centres stratifies the economic, educational and health status of humanity.

Fine grained quantification of accessibility world wide; inclusion of minor roads -> what’s new through tech

Accessibility as precondition for many developmental targets

Based on 15 as year of SDGs implementation

Relationship between national wealth and accessibility ambigiuous

Going beyond urban vs rural land cover

To highlight development gaps

Contributing to natural science research, conservation efforts and formulation of environmental policy

Illustrate relationship between travel time and socioeconomic outcomes encompassed within the SDGs

Methods:

Accessibility map showing time travel to urban centres, as cities are proxies for access to many goods and services that affect human wellbeing

Importance BD ecosystem services? Biodiversity declining rapidly. Land use change one of main issues. Urbanisation share. Different theories BD: intermittent disturbance theory etc. How is BD affected by humans worldwide?

Growing population

Habitat loss as main driver

Alteration vs loss BD

Unknown species

Importance of accessibility

Can be used to identify places which have both gaps in accessibility and BD?

**Knowledge gap**

The accessibility map has only been published 2015.

**Are current “development” practices contributing to biodiversity changes and losses?**

With presence of remote sensing techniques it is possibly to scale biodiversity and accessibility globally and observe trends resulting from that. Depending on scales?

Accessibility opposing to urbanisation etc (accessibility important, because schools, medical care etc)

Scale of biodiversity changes – not known at global scale?

**(Study motivation)**

**Methods**

I aggregate data for change of terrestrial compositional biodiversity from the BioTime biodiversity dataset and map global trends from 2005-2015 in ??sized cells /and match the scale to that of the accessibility map. From the accessibility data set I can obtain an accessibility score. Then, I can do a linear model about how accessibility is affecting the homogeneity of communities globally. A PCA allows to cluster groups of responses.

**Hypothesis, Research questions and Predictions**

* **How has biodiversity changed globally over the past few years?**
* **Compare different biomes?**
* **Does accessibility lead to biodiversity homogenisation**
* **Compare different biodiversity metrics?**
* **Case studies of extremes?**

1. How does accessibility affect biodiversity?
2. Does accessibility to cities have a negative effect on biodiversity
   1. Hypothesis: Accessibility is linked to land use change. Land use change reduces biodiversity.
      1. Prediction: The higher the accessibility score the lower the biodiversity index.
3. How does population density influence the results
4. How does accessibility affect the homogeneity of communities?
5. How does accessibility relate to species richness and species evenness
6. By time travel interval?

**Results**

**Take home message**

Open questions:

* What kind of biodiversity – compositional vs richness etc
* Trend over what time frame (for BD)
* What species?
* How to exclude the different biomes and their suitability for human use? Eg low biodiversity areas might not be inhabitable -> have low accessisbility index
* How to include time aspect in title? Measuring BD over time
* How to include biodiversity gradient in it?

