Biodiversity under Stress: Global Climate Change & Human Development

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Reasons for Biodiversity Loss are manifold and connected!

Deforestation
Since 1990 ~1000 football fields/hour

Pollution
250,000 tons plastic in the oceans

Fragmentation
>600,000 fragments

Climate Change
15-37% species threatened by extinction till 20
The Earth is shattered in > 600,000 Pieces

>50% of the pieces are <1km²

Ibisch et al. 2016: Size of Global Roadless Areas
Multiple Threats have caused Biodiversity Loss beyond safe limits!

Global Biodiversity
Barthlott et al. 2005

Human Impact
Ibisch et al. 2017

Species Population Loss

Biodiversity beyond safe limits at ~65% of the area
Newbold et al. 2016

Global Biodiversity

Human Impact

Species Population Loss

Biodiversity beyond safe limits at ~65% of the area
Newbold et al. 2016
Existing Threats are reinforced by Climate Change

Barthlott et al. 2005

Sommer et al. 2010

IPCC 2013

Sommer et al. 2010

+4°C – Scenario (2100)
Climate Change affects Biodiversity on multiple Levels

- Individuals, Populations & Habitats
- Interactions between species
- Ecosystems
- Ecosystem Services
It is all connected!

- Biodiversity
- Climate Change
- Ecosystem Services
- Human Development
Human development leads to increased resource consumption – but elsewhere

Human Development causes increased Consumption (Ecological Footprint)
But not necessarily Environmental Degradation (Human Footprint Index)

Human Development causes biodiversity loss, but not at the same place!
Environmental Costs are being externalized!

Freudenberger et al. 2010
How to conserve biodiversity, safe the climate & enable human development?
1. Use less resources more efficiently

Project Water-Energy-Food-Nexus: Increasing Resource Use Efficiency under Growing Natural Resource Scarcity

Project Improved application strategies for entomopathogenic fungi (EPF) as biological control agents in integrated pest management (IPM)

Biber-Freudenberger et al. 2016
2. Find Win-Win Situations

Project STRIVE: Identify bioeconomy strategies that provide benefits for sustainable development?

Climate Smart Conservation: Conserve the most resilient and functional ecosystems

@ German Bioeconomy Council

Freudenberger et al. 2012
3. Build Capacities to Adapt & Mitigate

Example Project WASCAL:
Create capacities through academic education and collaborative research on climate change impacts

Example Project WABES:
Strengthen Policy Advise through academic education and exchange on Biodiversity and Ecosystem Services for IPBES
Thank you for your attention!