Economics of Climate Adaptation

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UNITED NATIONS UNIVERSITY

UNU-EHS

Institute for Environment and Human Security

# From Climate Risk Data to Climate Finance

The Economics of Climate Adaptation (ECA) in Ethiopia

## UN-SPIDER Bonn International Conference

18.11.2021

A project implemented on behalf

InsuResilience Solutions Fund

managed by

Frankfurt School of Finance & Management

funded by

KFW

on behalf

Federal Ministry for Economic Cooperation and Development

In cooperation

ETH zürich

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# Questions from Decision Makers

## What is the risk exposure of different assets?

> vulnerable people, livestock, natural resources…)

## What measures can be done to reduce the exposure?

> 26 measures considered (green, grey, monitoring)

## How to finance these measures, which one are cost-efficient?

> strong stakeholder involvement, KFW, community, academia

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# Economics of Climate Adaptation

initiated by

first „real life“ project by

Recent ECA Studies

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ADB ASIAN DEVELOPMENT BANK

ECA offers a

# UNIQUE FRAMEWORK

**for the flexible identification of cost-effective climate adaptation measures**

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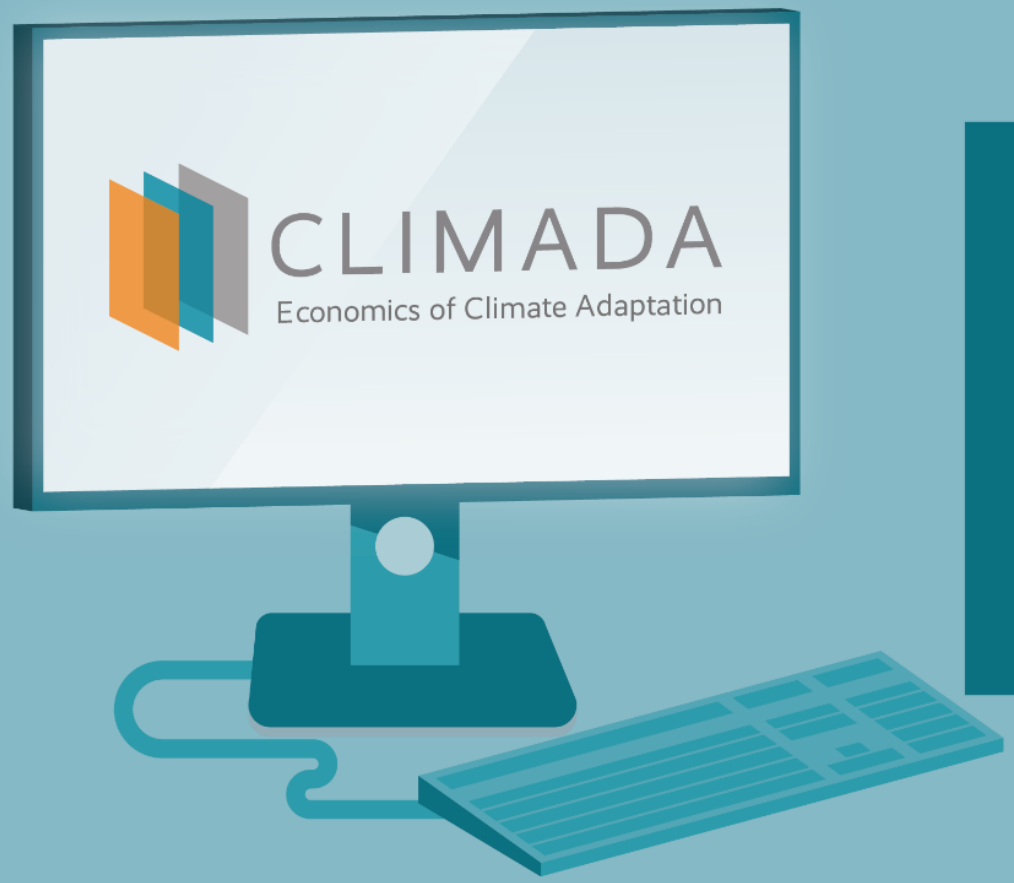


Powered by **CLIMADA**, the ECA framework links hazards, vulnerable assets and potential damages, quantifying them into monetary values.

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**ECA systematically evaluates and offers an optimal climate adaptation measures portfolio**

# FOR DECISION MAKERS.

ECA builds a smart-mix portfolio of different adaptation measures, weighting costs and benefits of the different options to enable synergies and leverage local conditions.

Ecosystem-based adaptation

Infrastructure

Community-based adaptation

Risk transfer

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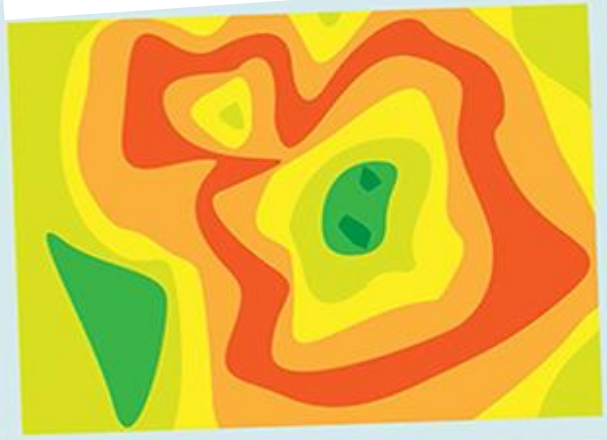
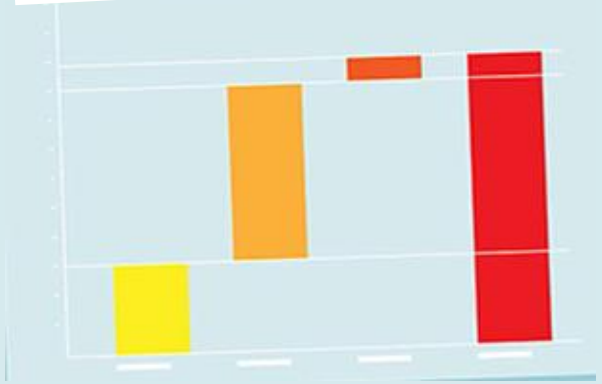
Adap

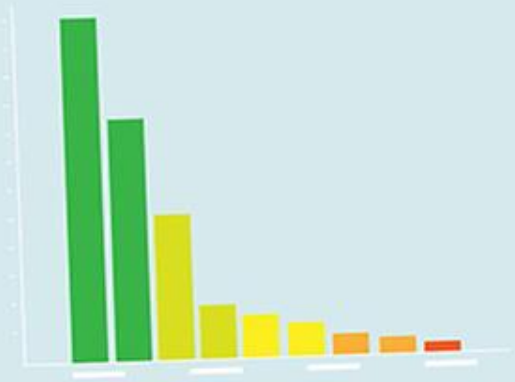
Hazard footprint and risk model



Expected economic and human losses under current and future scenarios



Cost-benefit analysis of adaptation measures



The outcomes of ECA inform
climate adaptation strategies and policies,

# UNLOCKING CLIMATE FINANCE.


National adaptation plans
Local adaptation strategies


International cooperation
Development banks
Global funds

ECA outcomes inform local and national adaptation strategies. The quantification of climate risk and the ranking of potential benefits align with the requirements of international funding agencies and other investors.

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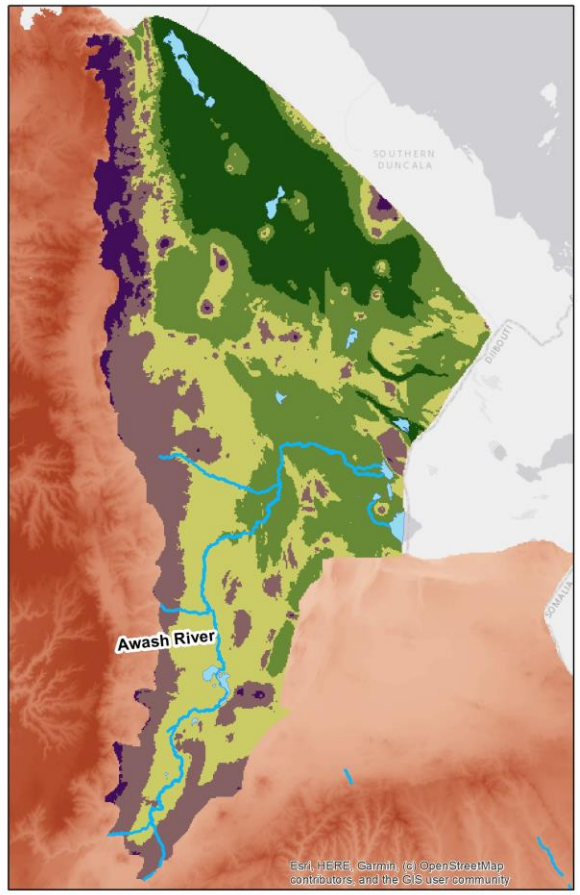
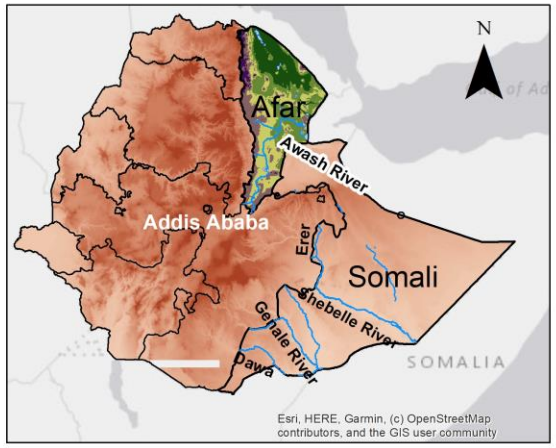
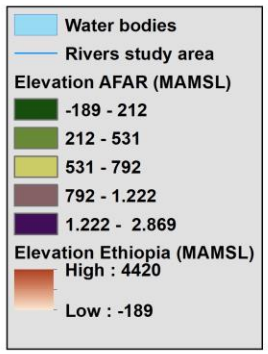
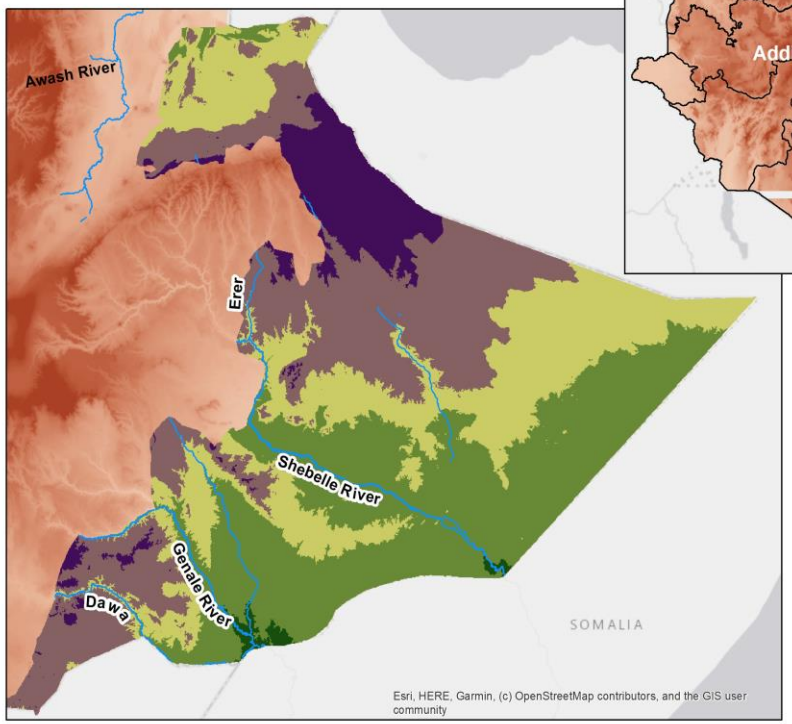
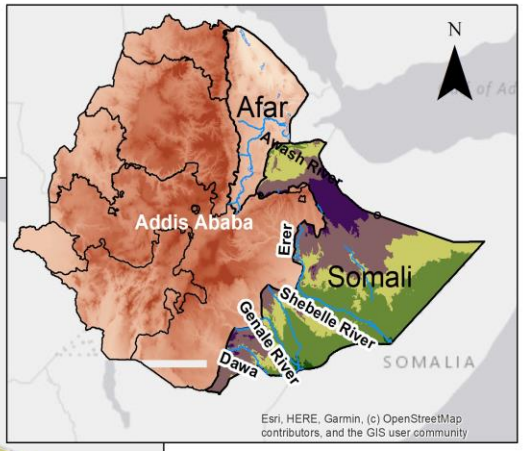
# Drought Risk in Afar and Somalia, Ethiopia

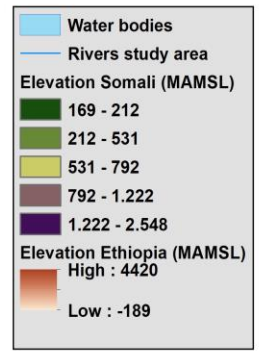


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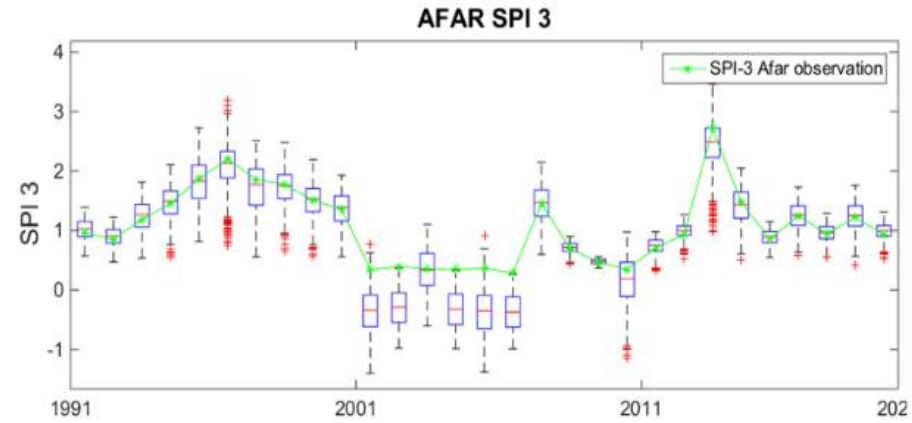
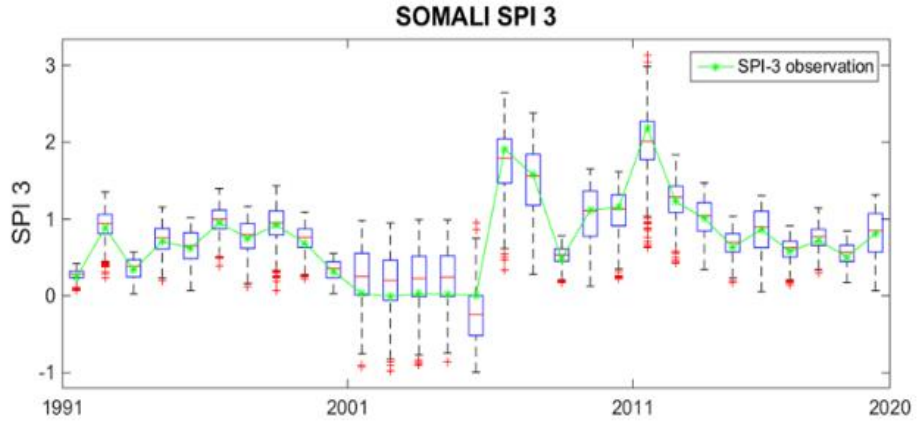
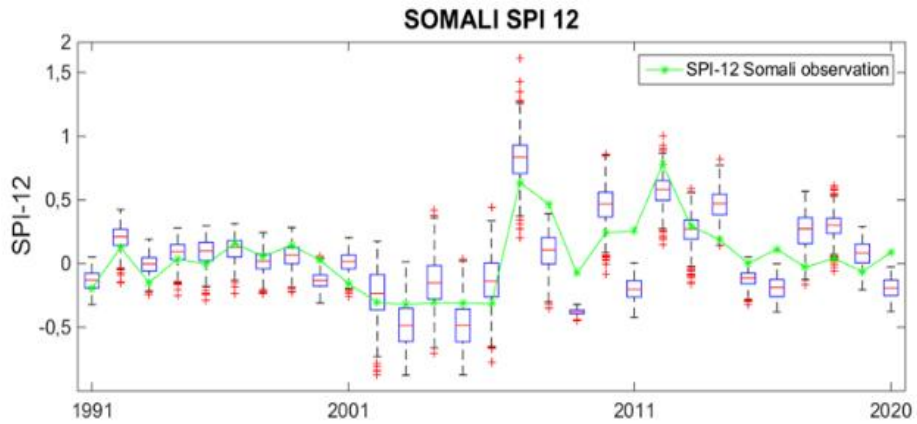
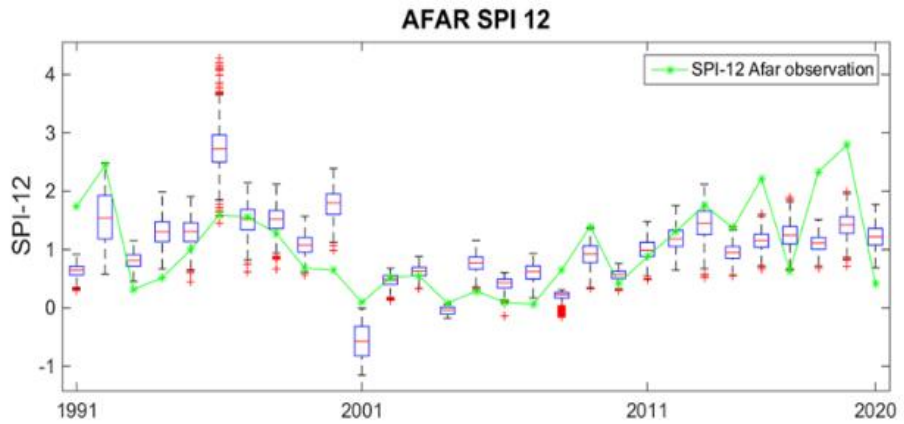
# Drought Model - Validation

- 1951-91 used for probability density function
- 1 000 simulations for 1991-2020 used for validation of SPI



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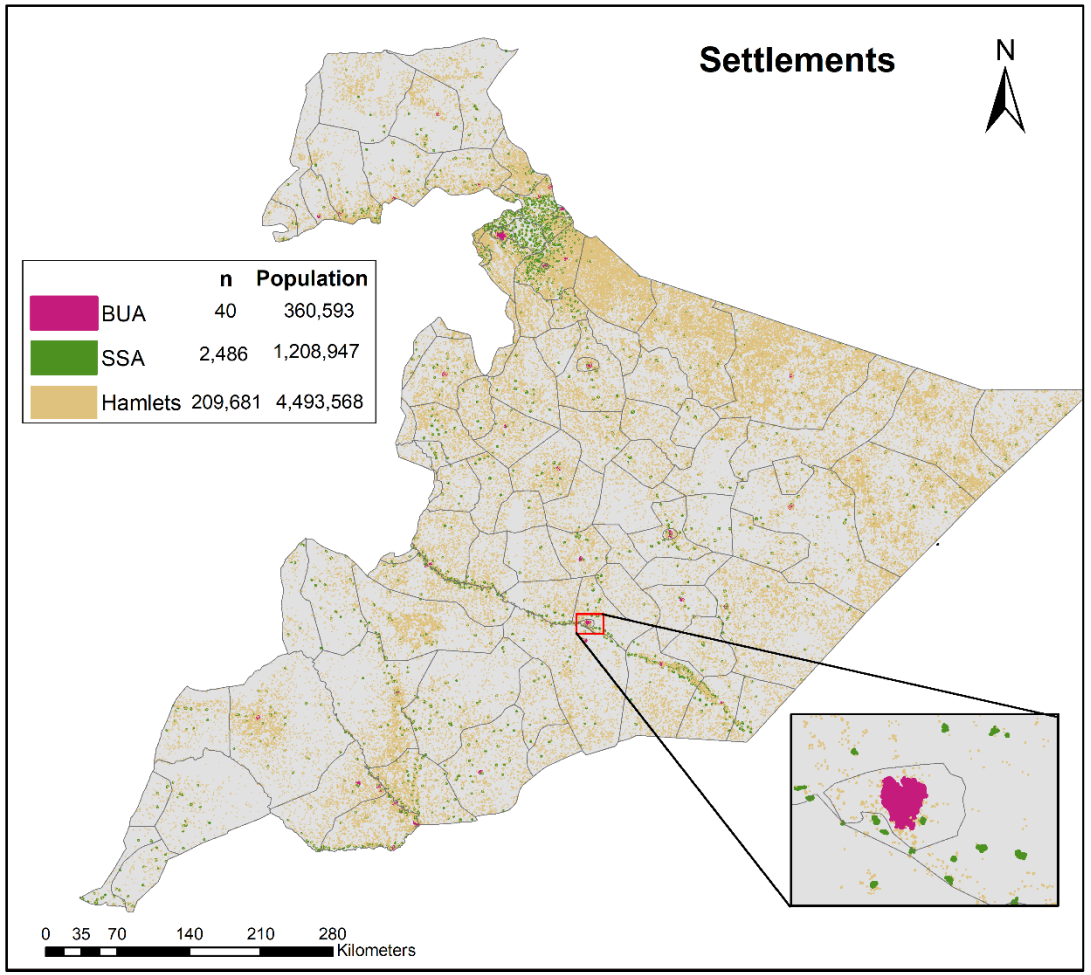
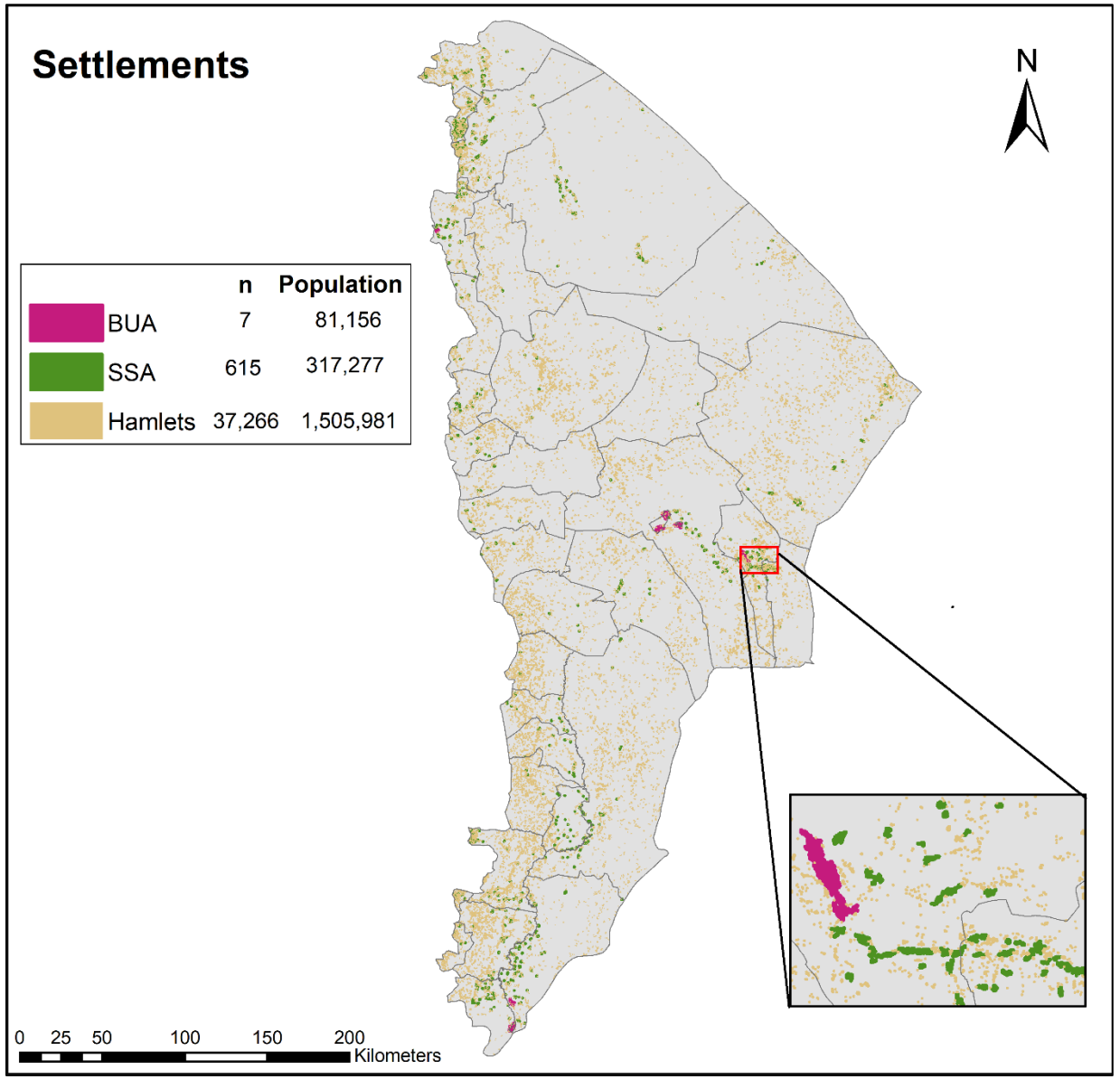
# Assets

## No monetary value for people



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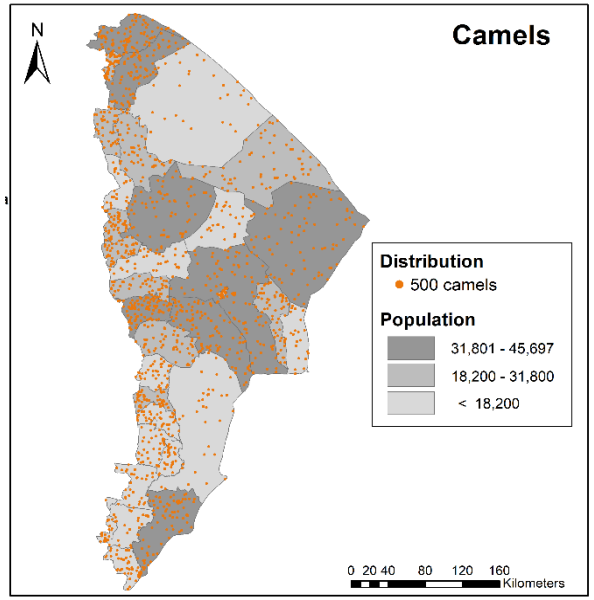


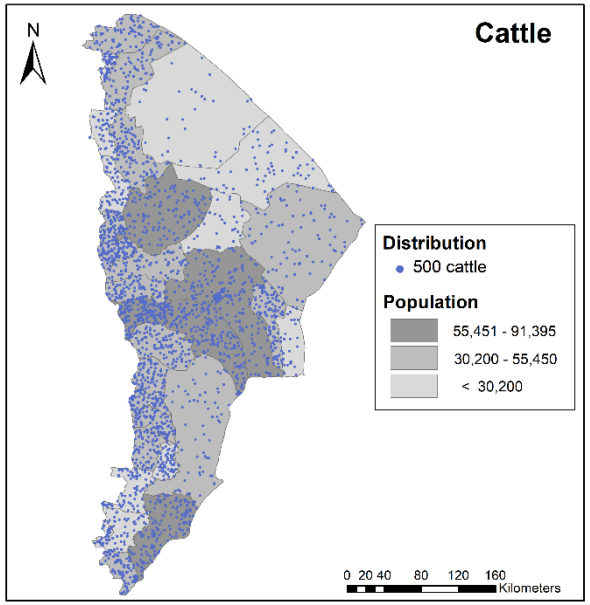


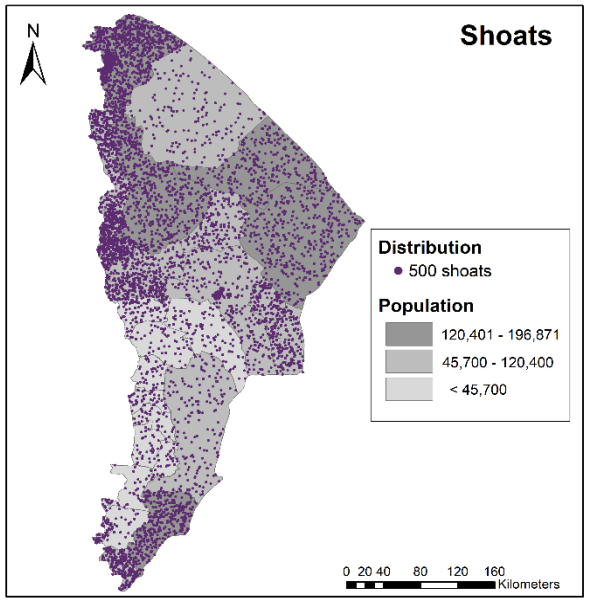


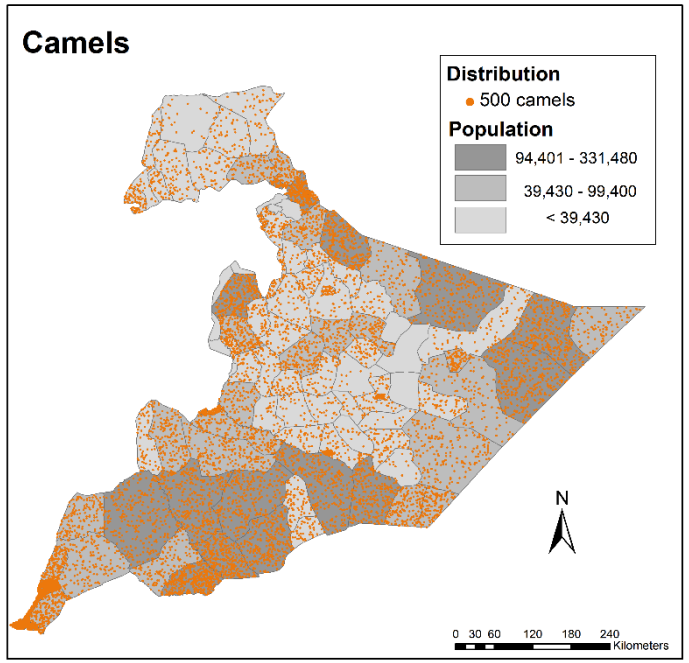


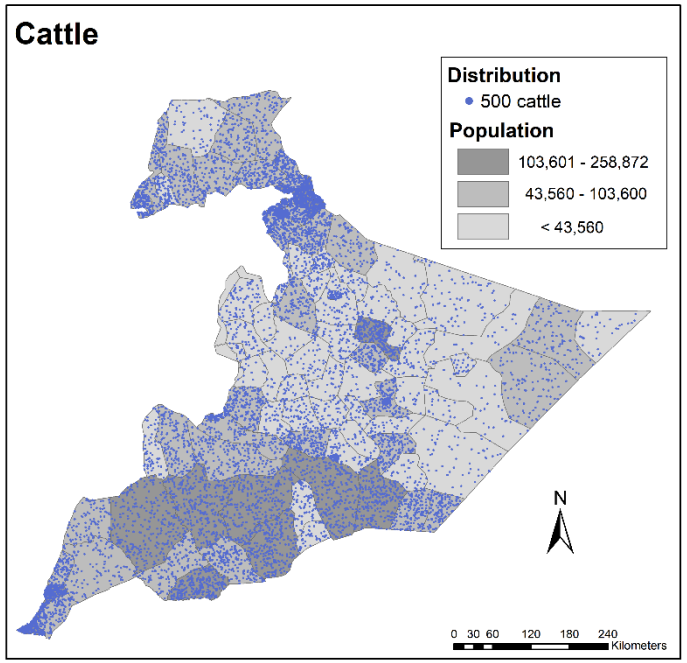


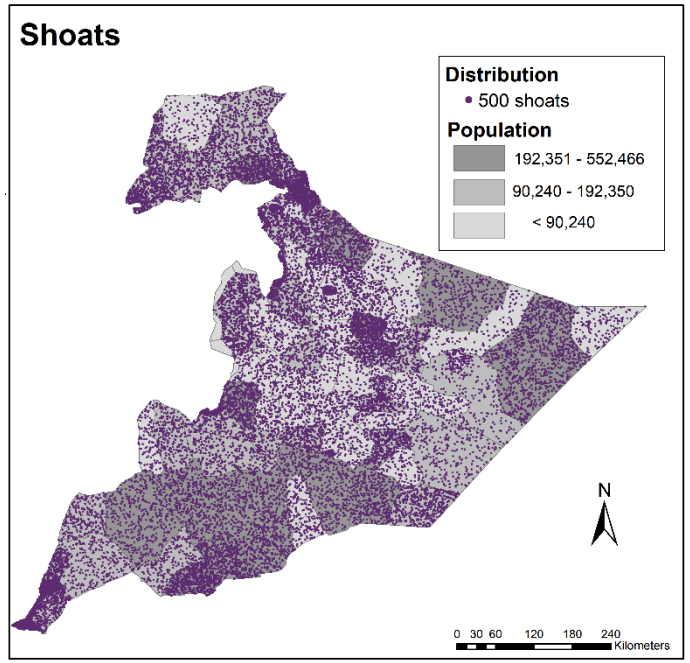

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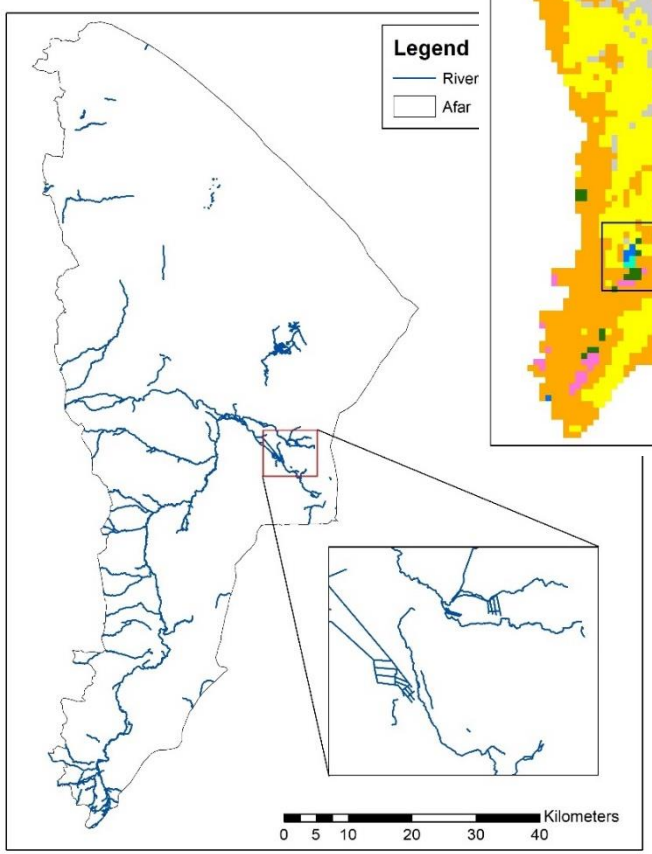


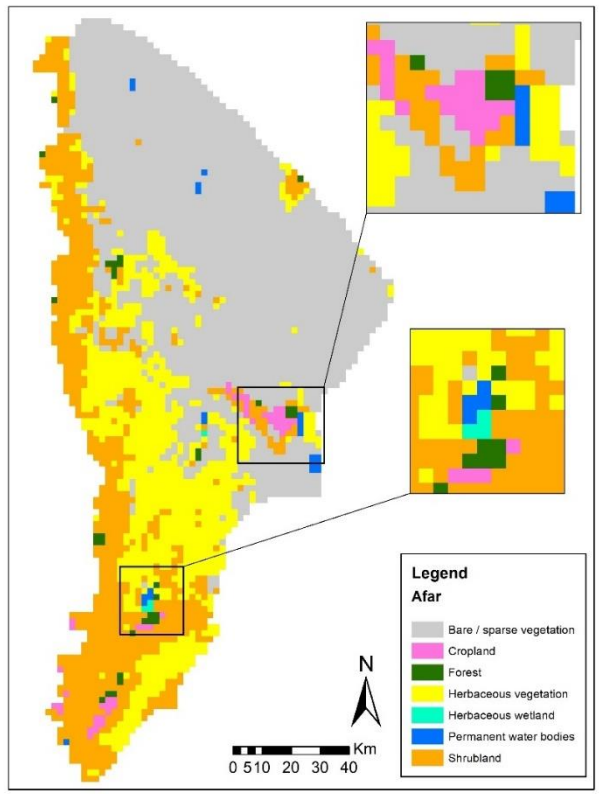


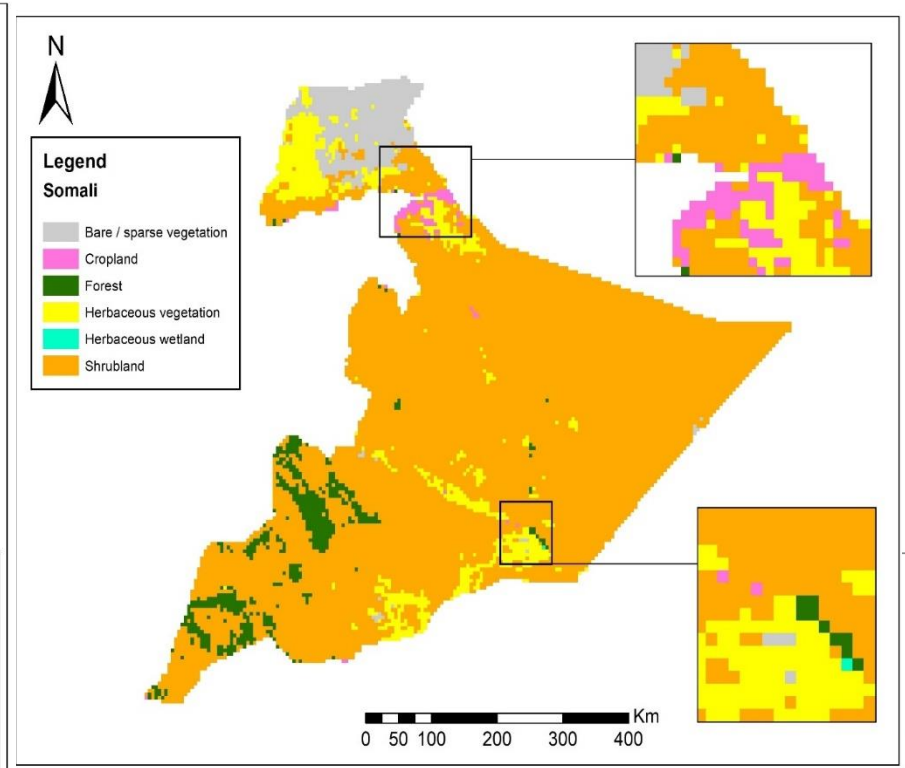


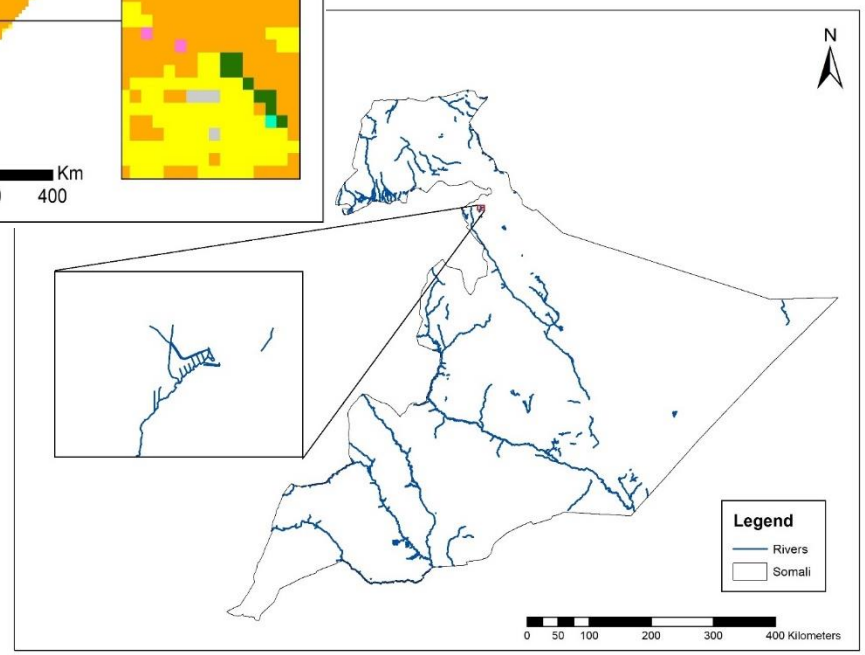

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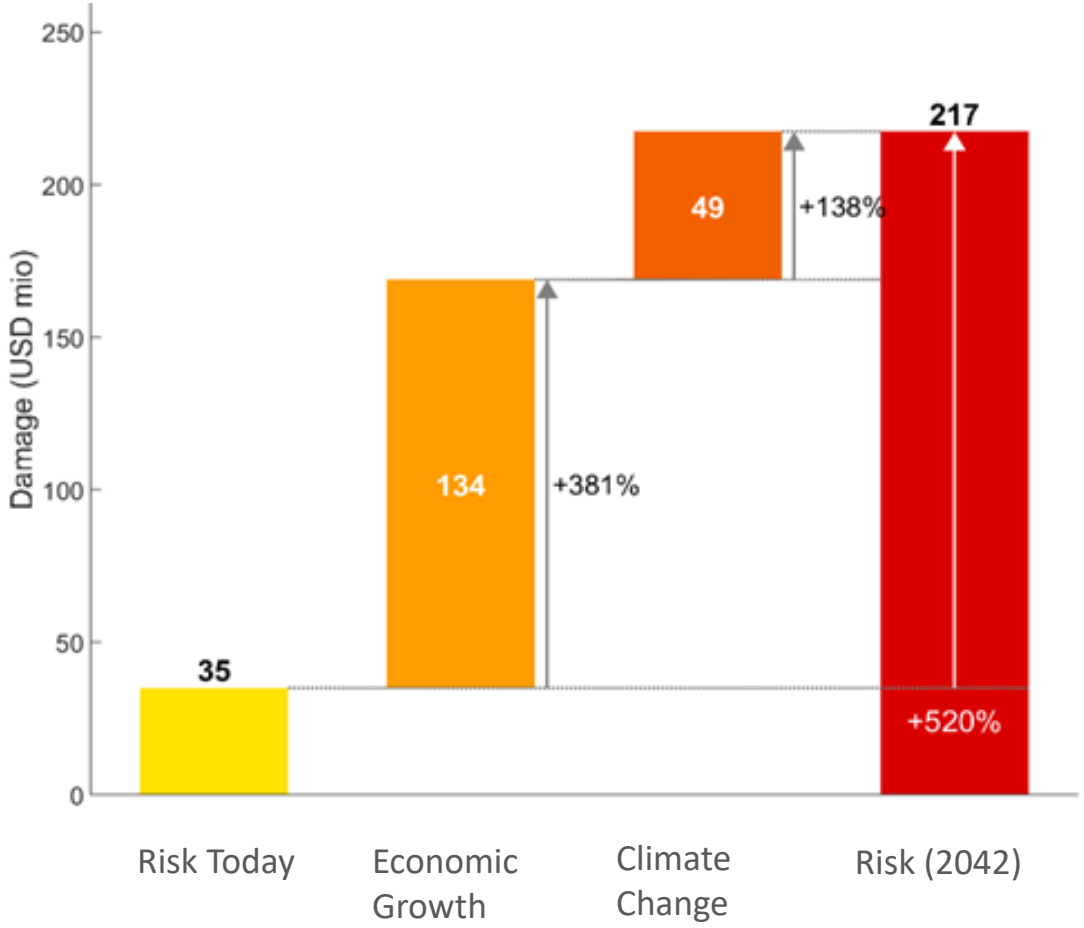
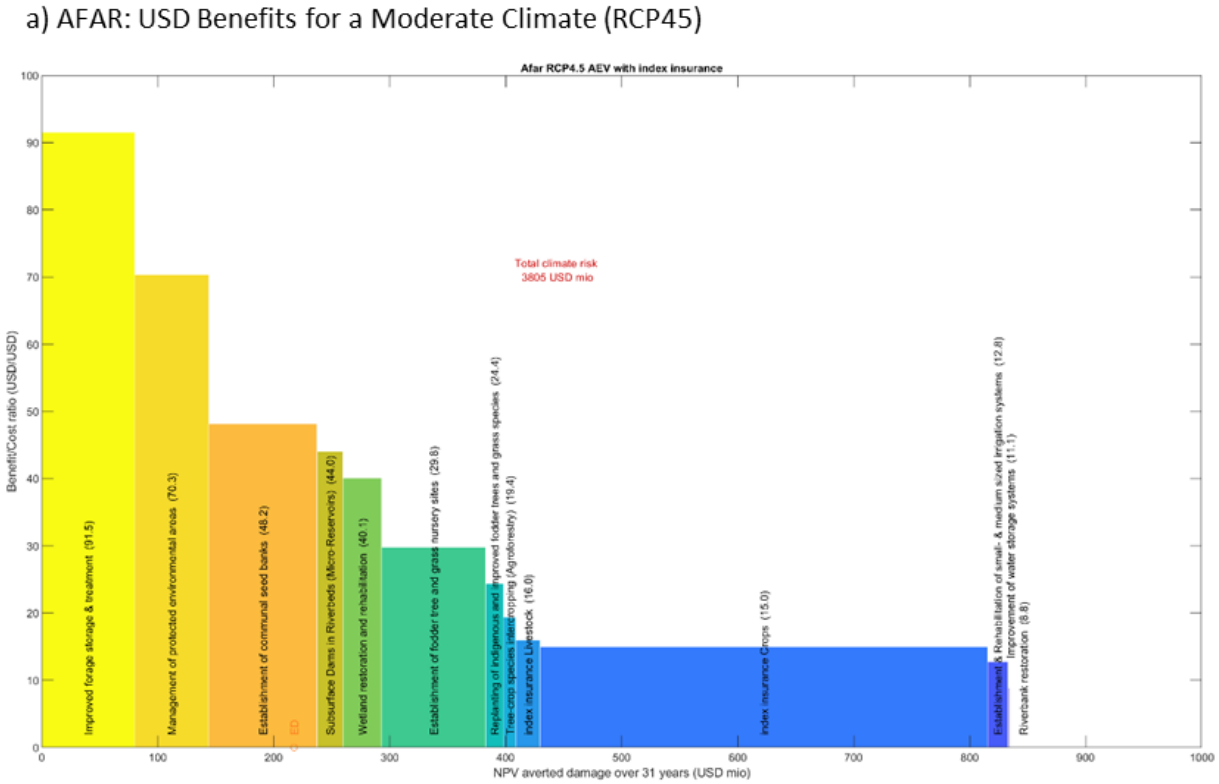
# Drought Risk in Afar and Somalia, Ethiopia

## ***Annual Expected Damage*** *(AFAR) in 2050 (USD m)*




## ***Most Effective Measures*** *(AFAR)*



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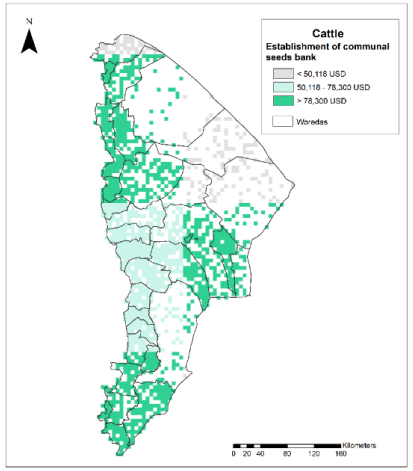
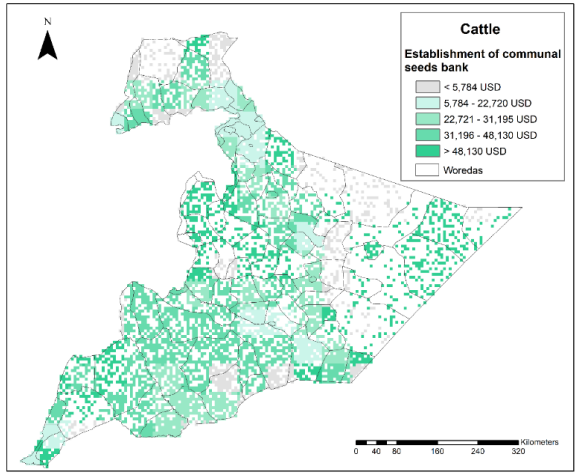
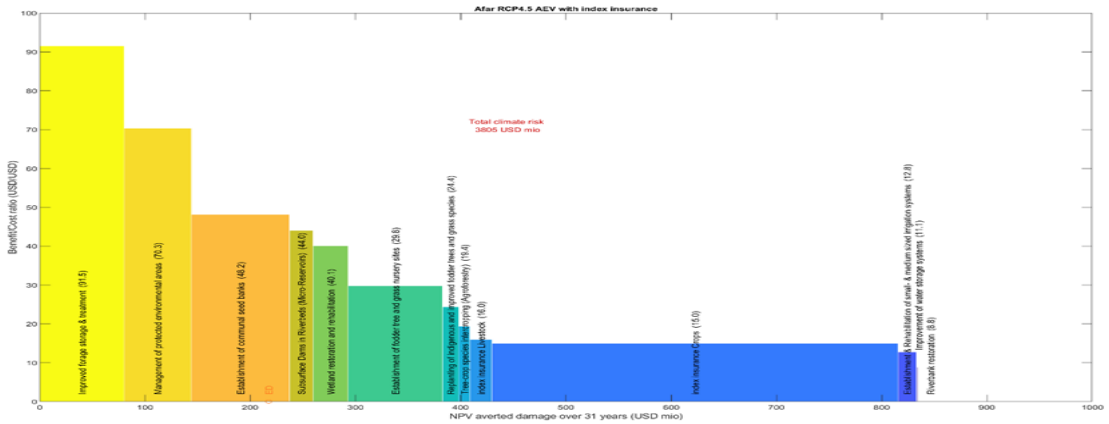
# Drought Risk in Afar and Somalia, Ethiopia

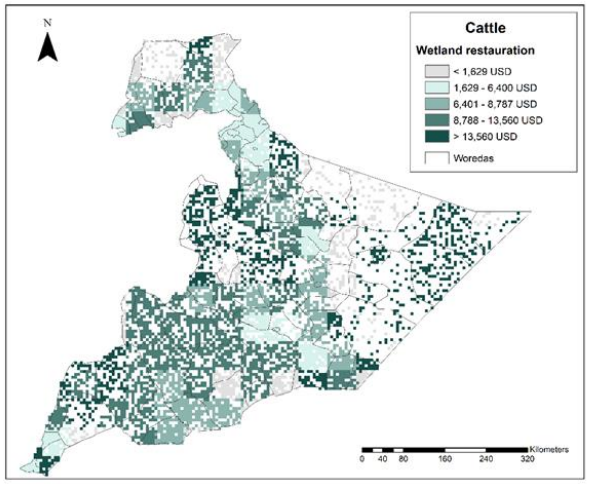
## Benefits of “Establishment of Communal Seed Banks”

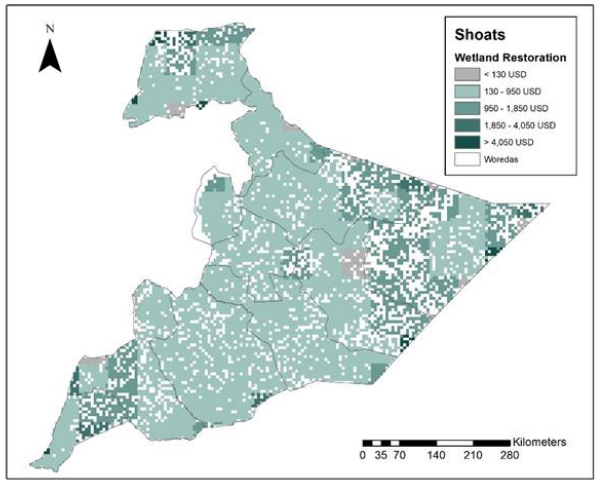


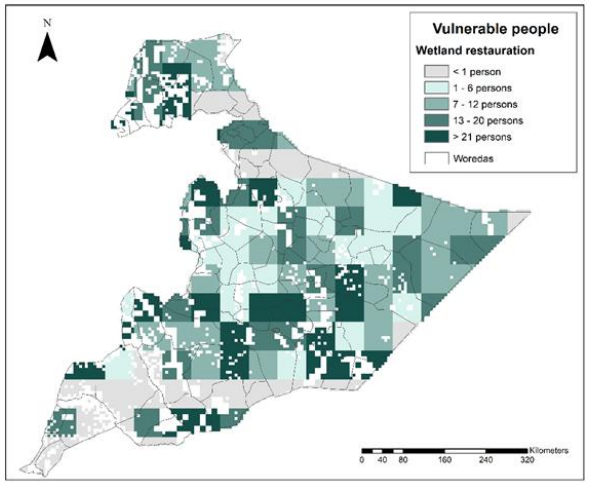




## Benefits of “Wetland restauration”



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# Challenges and Outlook

- Drought modelling with limited data availability (few records and decentralized data storage)
- Overestimation of Rainfall in certain cases
- Few data for valuation of Ecosystem (low resolution)
- No return periods simulations readily available

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# Thank You!


## Contact

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