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CROSSROADS

Cataloguing and Rating of Side-lined Species for the Restoration of Agriculturally Degraded Soils in Sub-Saharan Africa

ABERDEEN 2040

Exploring the Potential of Underutilised Plants to Improve Soil Health in Sub-Saharan Africa

Dr. Grant Campbell

Manchester, 2025

UK International Development

Partnership | Progress | Prosperity

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The Problem

- **Soil erosion/degradation**
  - Significant loss of fertile land
  - Reduced agricultural productivity
- **Water Scarcity**
  - Exacerbated by climate change and population growth
  - Inadequate infrastructure

The Problem

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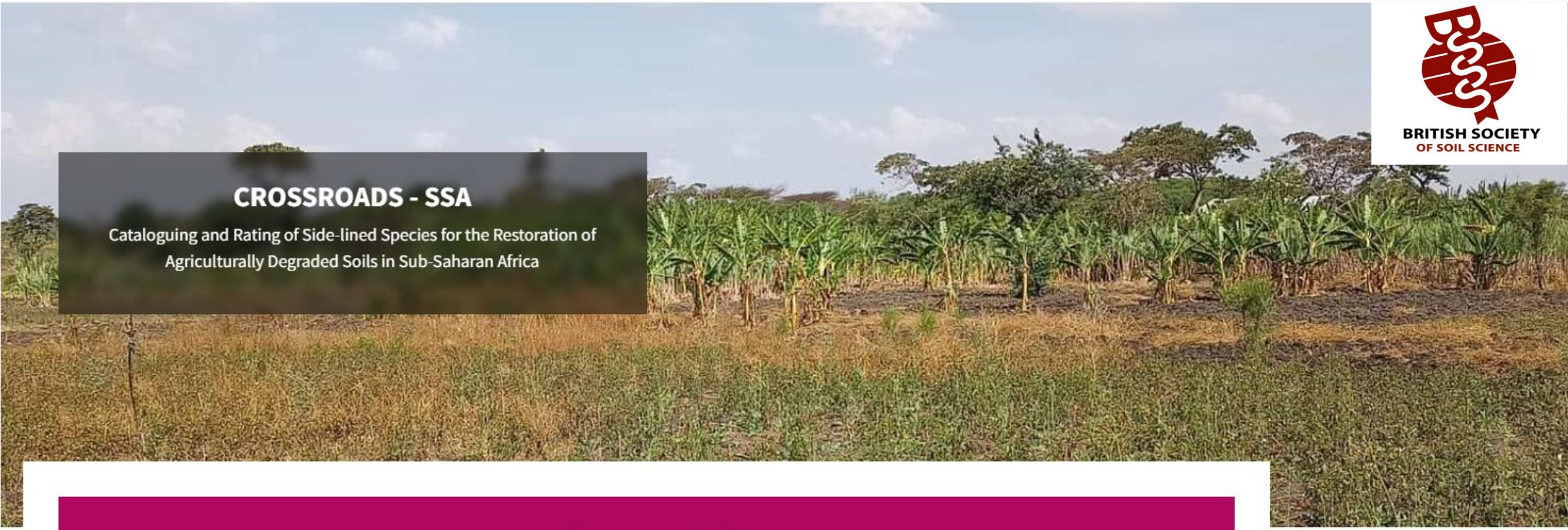
- **Biodiversity Loss**
  - Threats to ecosystem services – pivotal for food security and livelihoods
  - Driven by habitat destruction and unsustainable practices
- **Climate Change**
  - More frequent and severe extreme weather events e.g. floods, droughts.



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CROSSROADS - SSA

Cataloguing and Rating of Side-lined Species for the Restoration of Agriculturally Degraded Soils in Sub-Saharan Africa

Project Description

*The **CROSSROADS - SSA** project will document and test the use of "side-lined" or "underutilised" native plants to restore degraded soils in Ethiopia, characterising impacts on biodiversity, poverty alleviation, and climate adaptation and mitigation.*

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Why are we interested in underutilised plants?

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- Restoring degraded land – captures more carbon soils = mitigation of climate change.
- Increases infiltration and retention of water = improving resilience to erosion, limiting droughts and floods.

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Why are we interested in underutilised plants?

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- IMPROVED SOIL HEALTH
  - IMPROVED LIVELIHOODS
  - IMPROVED CLIMATE RESILIENCE
- INCREASING BIODIVERSITY

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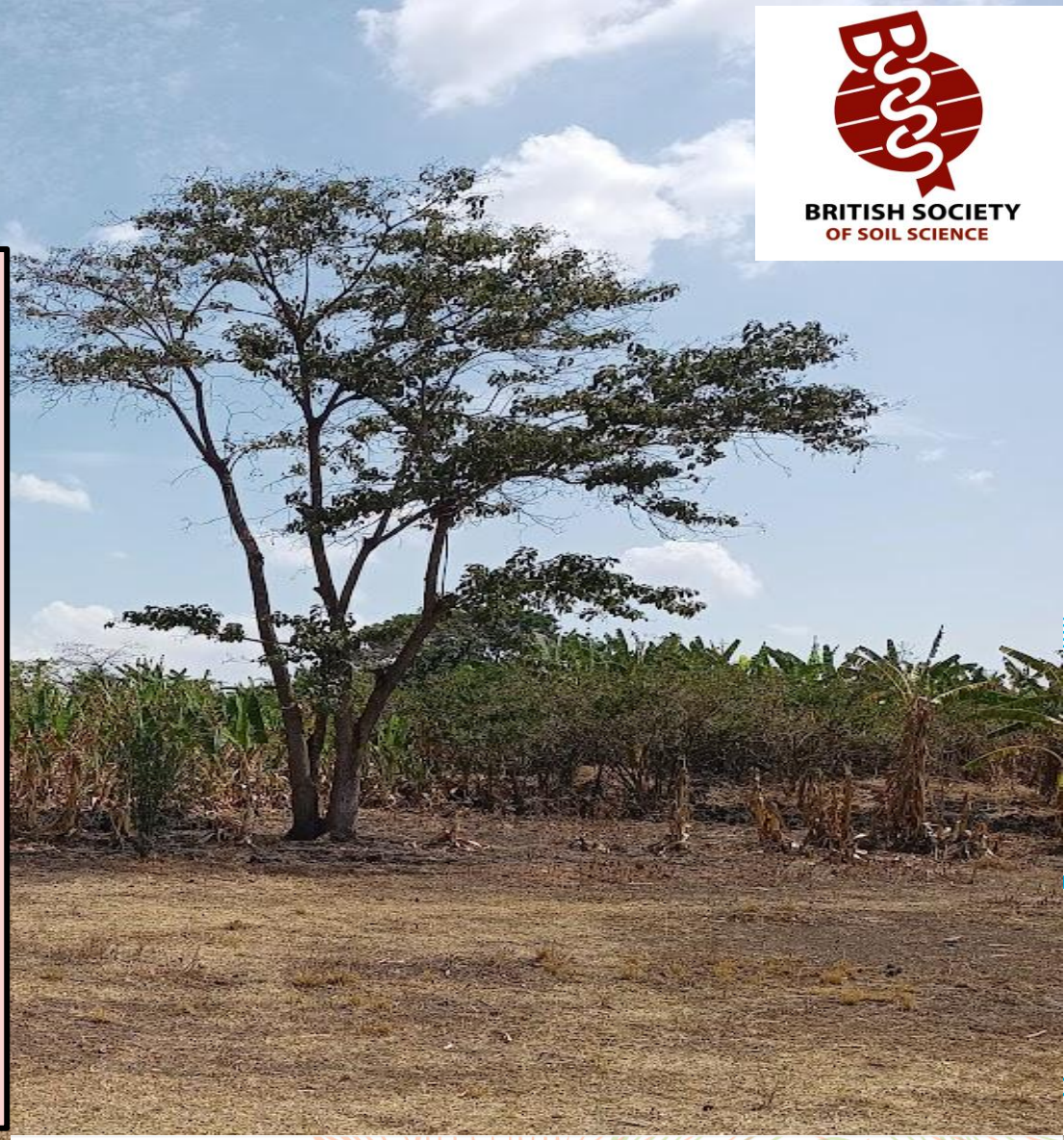
(1) Improve climate resilience
(2) Improve livelihoods
(3) Protect biodiversity

Kev Outcome: Dissemination of paper-based and electronic tools that will inform farmers and policy makers of benefits and dis-benefits of using plants to improve soil health in different locations

How will we do this?

- Characterising impacts these plants have on:
  - Biodiversity
  - Poverty alleviation
  - Improving soil health
- By using underutilised plant species:
  - Both above and below-ground biodiversity will be improved.
  - Improve fertility and reinforce unstable soils



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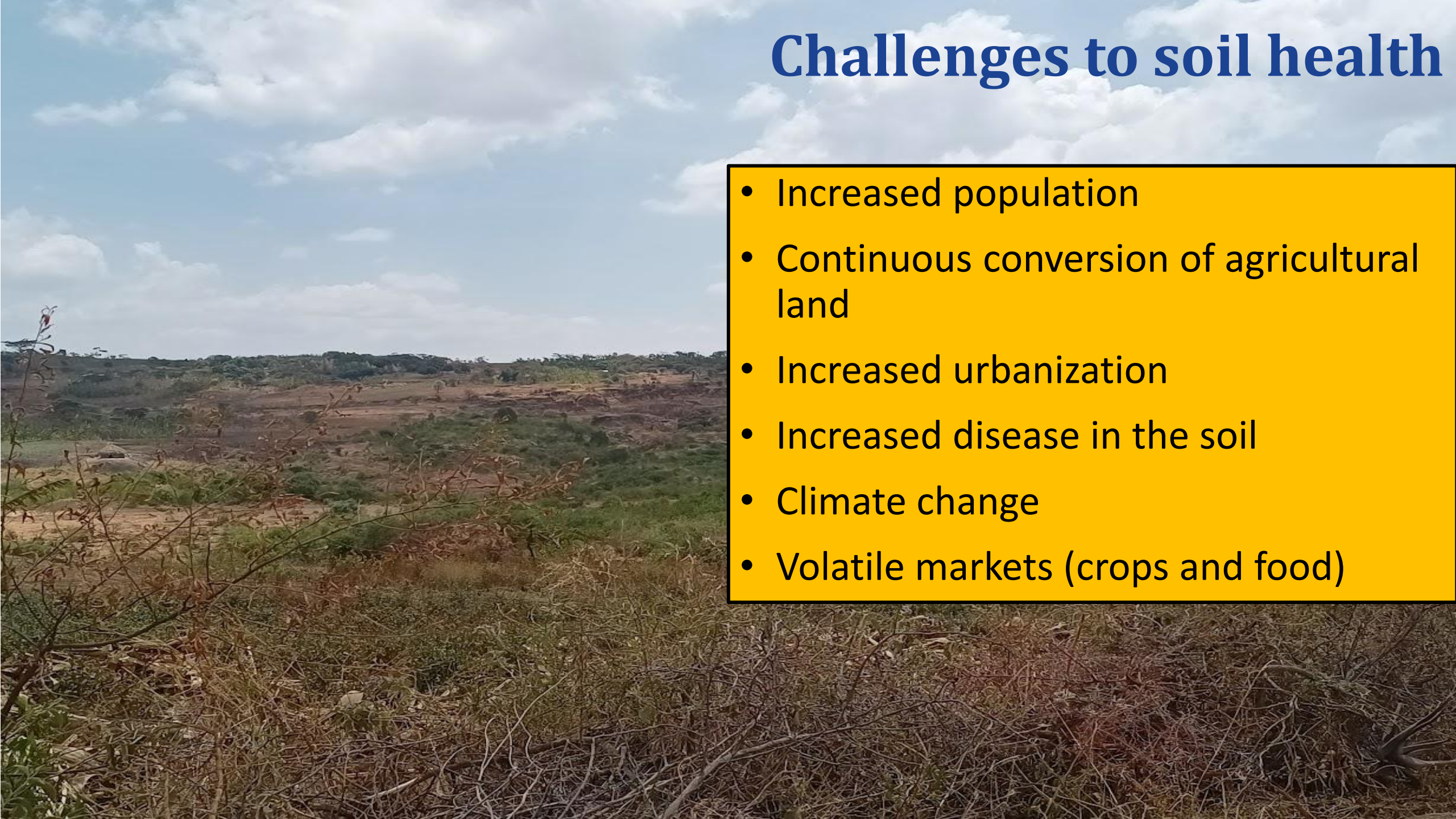
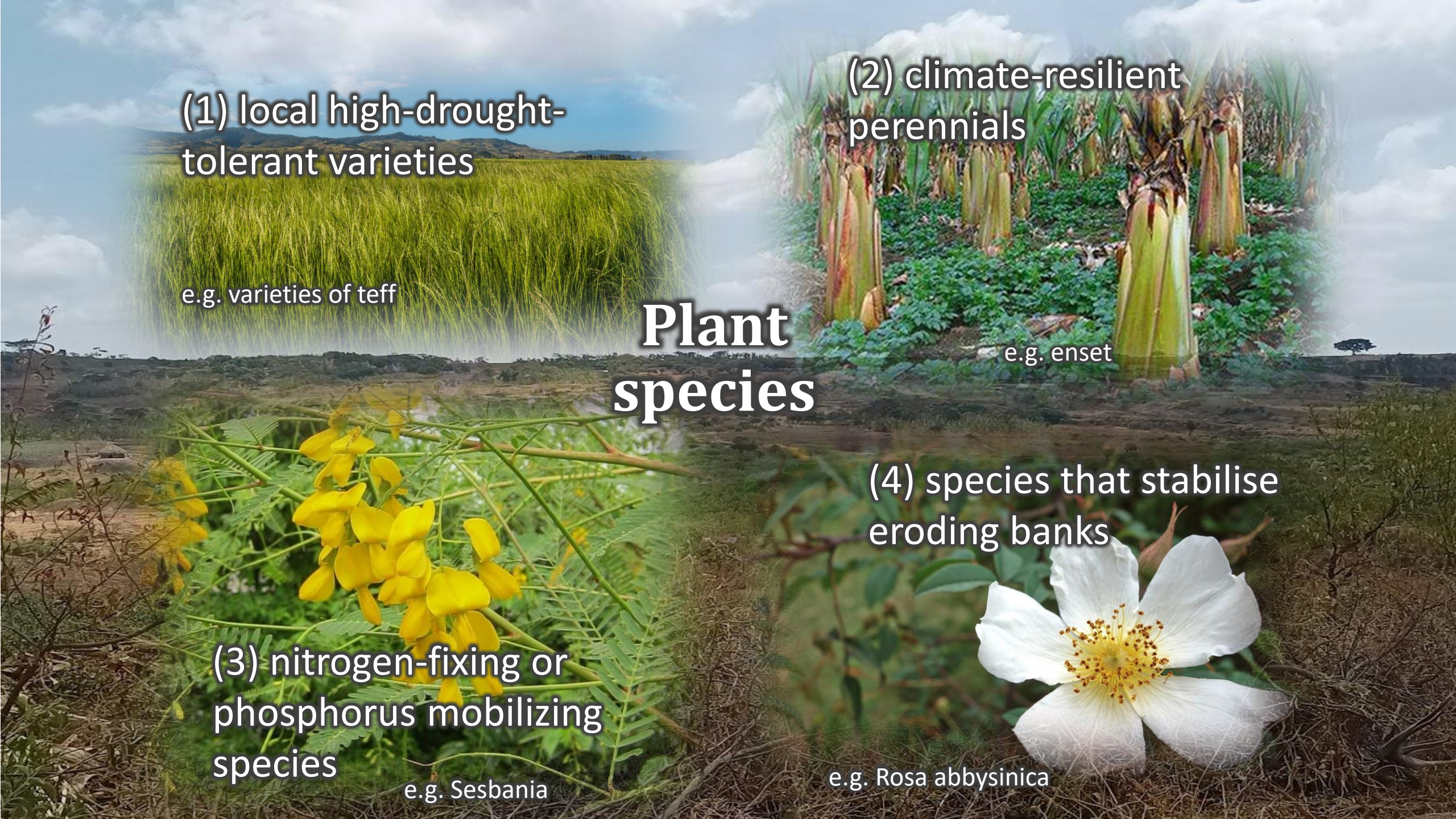
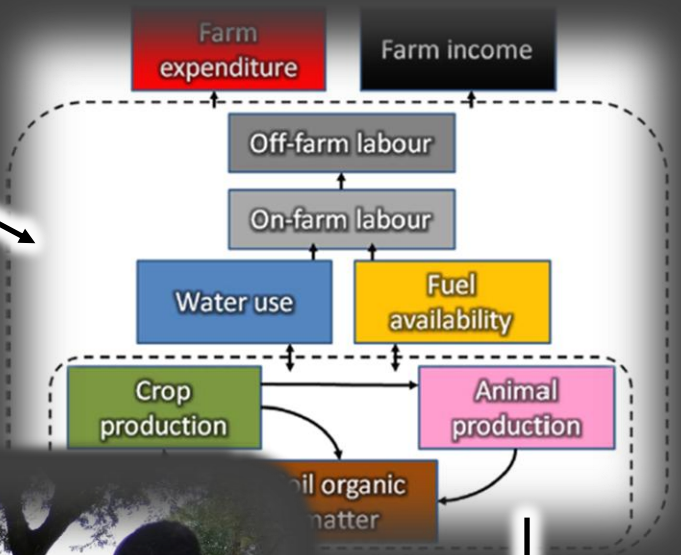
Challenges to soil health



- Increased population
- Continuous conversion of agricultural land
- Increased urbanization
- Increased disease in the soil
- Climate change
- Volatile markets (crops and food)


(1) local high-drought-tolerant varieties
e.g. varieties of teff
(2) climate-resilient perennials
e.g. enset
Plant species
(3) nitrogen-fixing or phosphorus mobilizing species
e.g. Sesbania
(4) species that stabilise eroding banks
e.g. Rosa abbysinica

Wider Approach

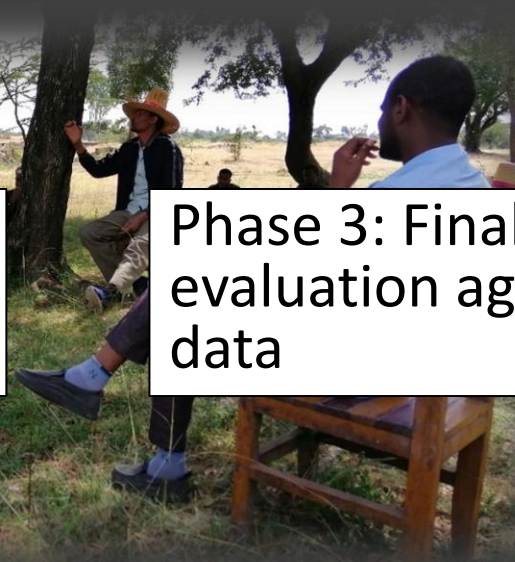


WP1 Catalogue species

- 1.1. Systematic review, machine learning and systems modelling
- 1.2. Community engagement
- 1.3. Catalogue and rate & select species for further study

Phase 1: Selection of candidate species

Phase 2: Evaluation against early data



Phase 3: Final evaluation against data

Wider Approach

WP2 New measurements

- 2.1. Soil health
- 2.2. Soil & water conservation
- 2.3. Food and feed
- 2.4. Biodiversity
- 2.5. Livelihoods
- 2.6. Climate resilience

Wider Approach

WP3 Develop tools

- 3.1. Papers
- 3.2. Electronic formats
- 3.3. Hard formats

Wider Approach

WP4 Develop dissemination methods

- 4.1. On-the-ground demonstrations
- 4.2. Farmer field days and events
- 4.3. International actions
- 4.4. Web materials

Thank you for your attention!