SUFACHAIN
Sustainable Forest and Agroforestry Value Chains

Sustainable agroforestry value chains for climate change adaptation in Central Asia

GEWEX Workshop - Osh, 30th April 2024

Dr. Jannike van Bruggen, Philip Schierning

An Initiative of the Federal Ministry of Education and Research
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Sustainable Food Systems

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Challenges ahead in Central Asia

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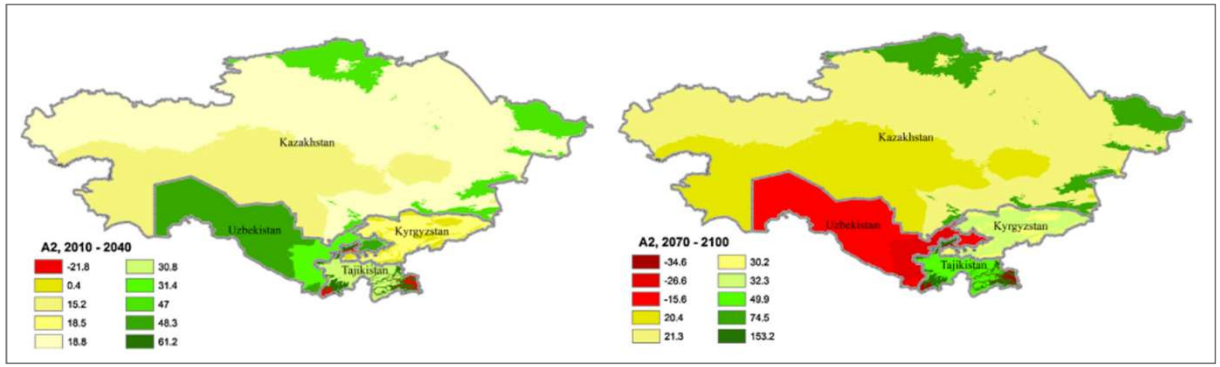
Farmer income scenario 2010-2040, 2070-2100



Bobojonova & Aw-Hassan (2014)

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Agroforestry systems (AFS)

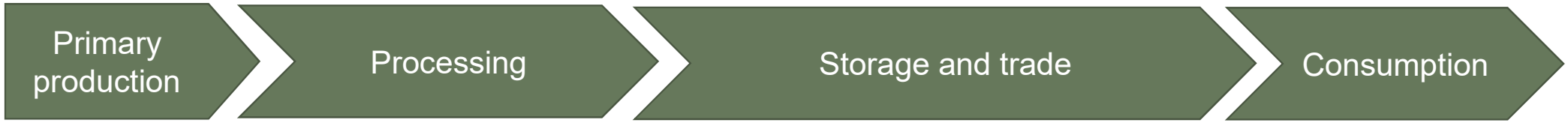
Benefits:

- help mitigating negative environmental impacts (erosion, soil degradation, etc.)
- great potential for sustainable production of high-quality food
- **contribute to climate change adaptation (heat, water stress, pests**

SUFACHAIN at a glance

- **‘Promoting sustainable land management through product, process and SME development in forest and agroforestry value chains in Central Asia’**
- Through:
  - Analysis and integration of (apricot and walnut) agroforestry systems into local land use
  - Development of products and technologies to contribute to sustainable resource use and local value creation
- **Project duration**: Nov 2022 – Nov 2025
- **Regional focus**: Kyrgyzstan, Tajikistan, Uzbekistan
- 26 Project partners from research, SME and international development/ civil society
- **Total budget** ~1.8 Mio EUR

SUFACHAIN at a glance



Work packages	Develop sustainable agroforestry (AF) systems	Enhance product quality and processing technologies	Use of waste streams	Supply chain management & transparency	Monetization of ecosystem services	Culinary tourism development
Outcomes	▪ Manuals on improved AFS	▪ Optimized fruit drying process; ▪ Product standard and prototypes developed	▪ Treatment protocol established ▪ Business case for pilot level	• Integrity platform established and implemented	▪ Feasibility study ▪ Business case for voluntary certification	▪ Brochure on culinary tourism ▪ Thematic maps ▪ Coop. agreements signed

Improve market information, link local AF producers
and processors to international markets, and provide policy advice

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How to set up resilient AFS?

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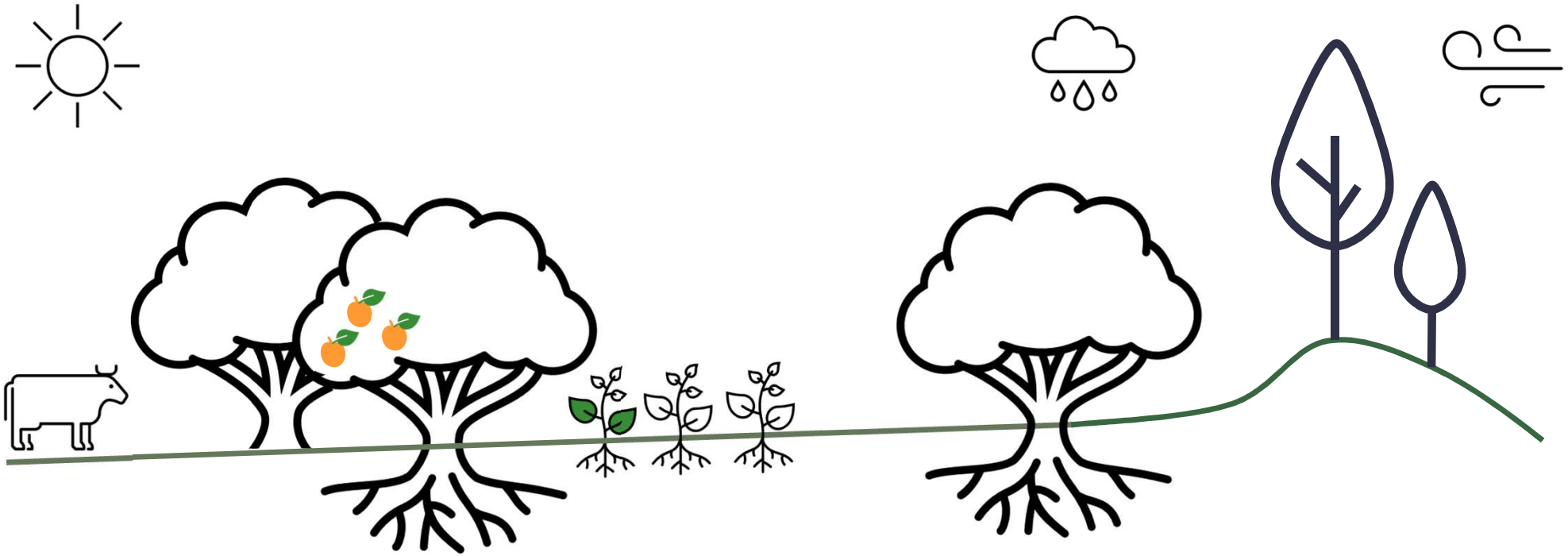
A systems approach



Management | Carbon | Nutrients | Water

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A systems approach

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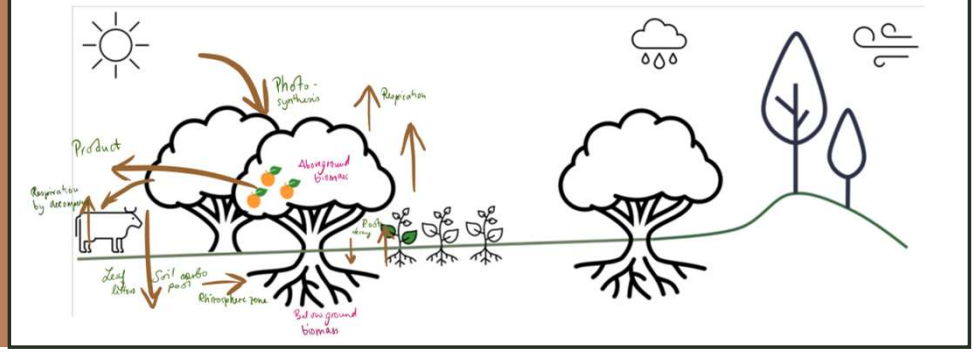
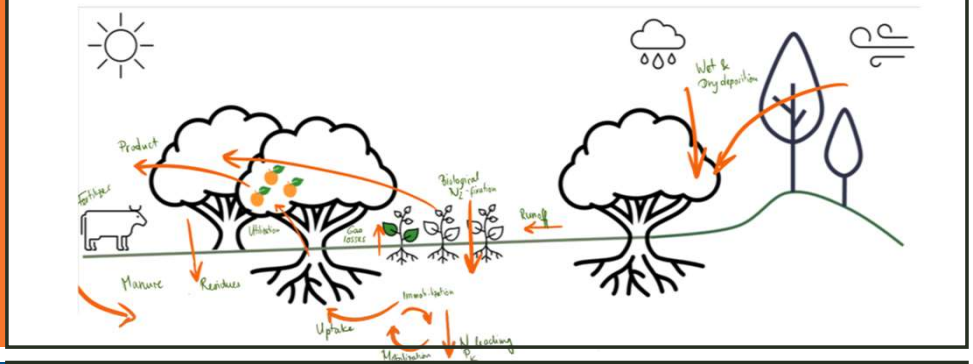
Matter flows & management

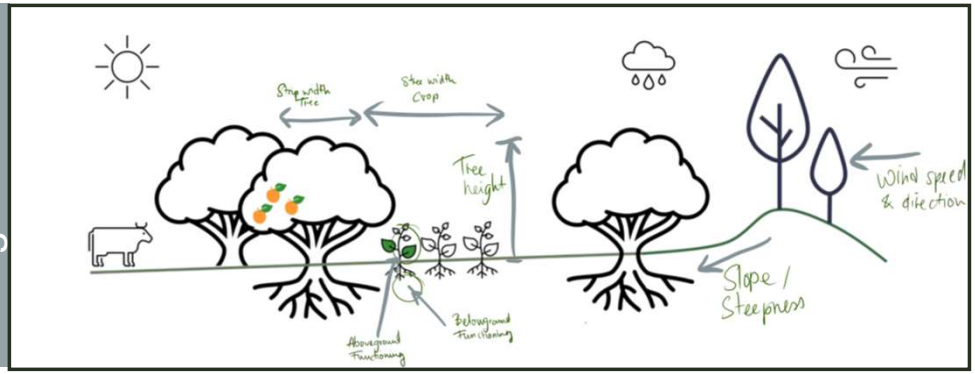
Carbon



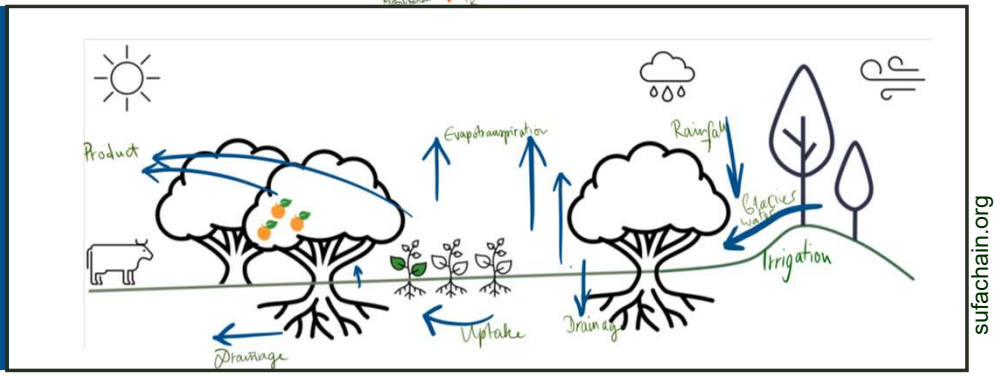
Nutrients



Management



Water



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Research tasks

A deductive approach

- 1. **Overview of present AFS** in Central Asia [*online survey tool*]
- 2. **Apricot & walnut** production as AFS

  → **Types & management** practices

  in Batken & Jalal-Abad, KGZ [*household survey*]
- 3. **Stocks & flows of C, N, P, K, water** within specific AFS

  → Sustainability assessment via mass flow modelling

  on field-level [*based on soil & crop data collection*]

3 Farmer technical handbooks

- Advantages AFS (general)
- Recommended management in apricots AFS
- Recommended management in walnuts

Irrigated apricot agroforestry under climate change

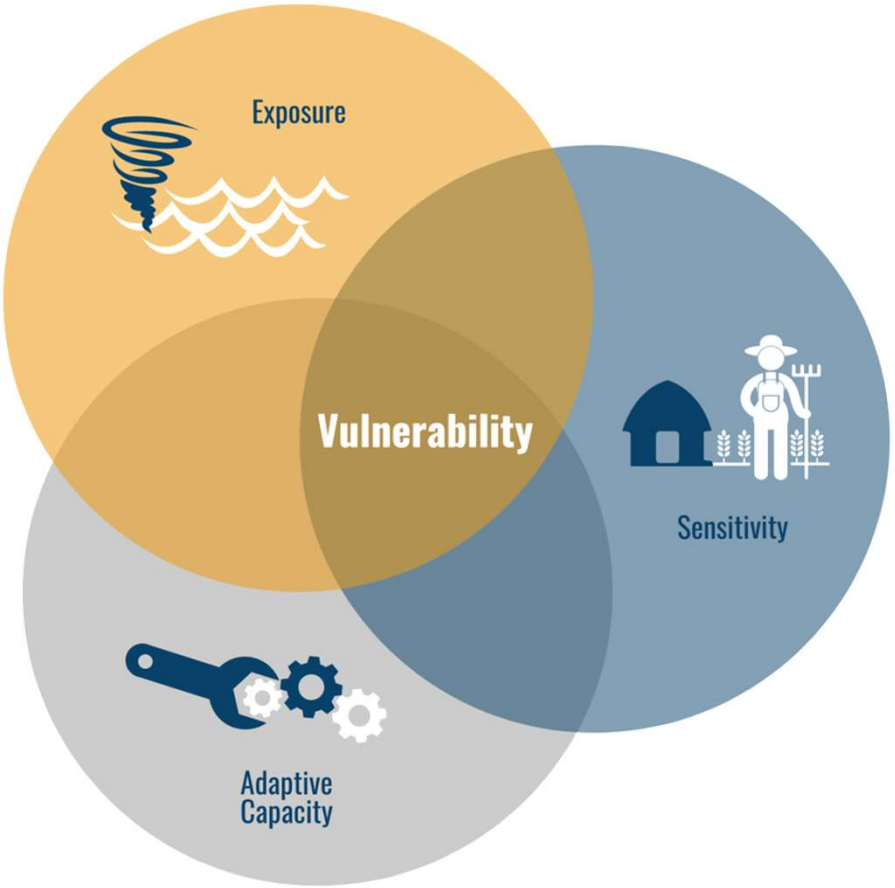
Hydrological changes
Macro level (catchment level):

Rainfall and snow variability
Runoff variability

How much water will be available for irrigation in the future?

Adaptive capacity
Micro to macro level:

Which options do farmers have themselves to influence their irrigation activities? At which levels are interventions suitable?



Water productivity
Micro level (field level):

Crop water requirements
Field water use

How much water is currently used? What are options to improve water use while maintaining the systems productivity?

Nawrotzki et al. (2023), J. Environ. Sci. Stud.
Brooks (2003)

Data requirements

- Meteorological data for Batken & Jalal-Abad region
  (daily values for precipitation, temperature, moisture)

- Up to date soil classification, more detailed then *FAO/UNESCO Soil Map of the World*
  or soilgrids.org/

- Model approaches for water flows
- Hydrological data at catchment level
- Hydrological predictions under different climate change scenarios (Isfara catchment/ Batken oblast)

Contact us

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