UNIVERSITY OF CENTRAL ASIA

GRADUATE SCHOOL OF DEVELOPMENT

Mountain Societies Research Institute

Mountain Societies Research Institute

GEWEX workshop, Tashkent 2023

University of Central Asia

UCA UNIVERSITY OF CENTRAL ASIA

A private, not-for-profit, secular university, UCA was founded in 2000 through an International Treaty signed by the Presidents of Tajikistan, the Kyrgyz Republic, and Kazakhstan, and His Highness the Aga Khan, ratified by their respective parliaments and registered with the United Nations.

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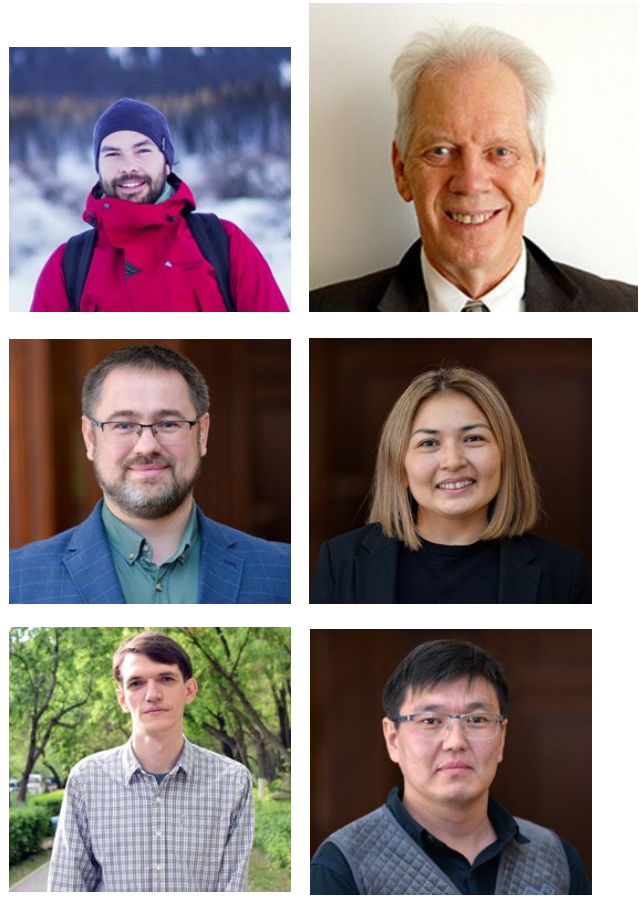
Mountain Societies Research Institute

MSRI studies complex earth surface and environmental processes and interactions that affect mountain societies. Based in Khorog, Tajikistan and Bishkek, Kyrgyzstan.

- interdisciplinary research,
- improving mountain livelihoods,
- sustainable management of natural resources,
- mitigating the effects of natural hazards and climate change,
- building community resilience.



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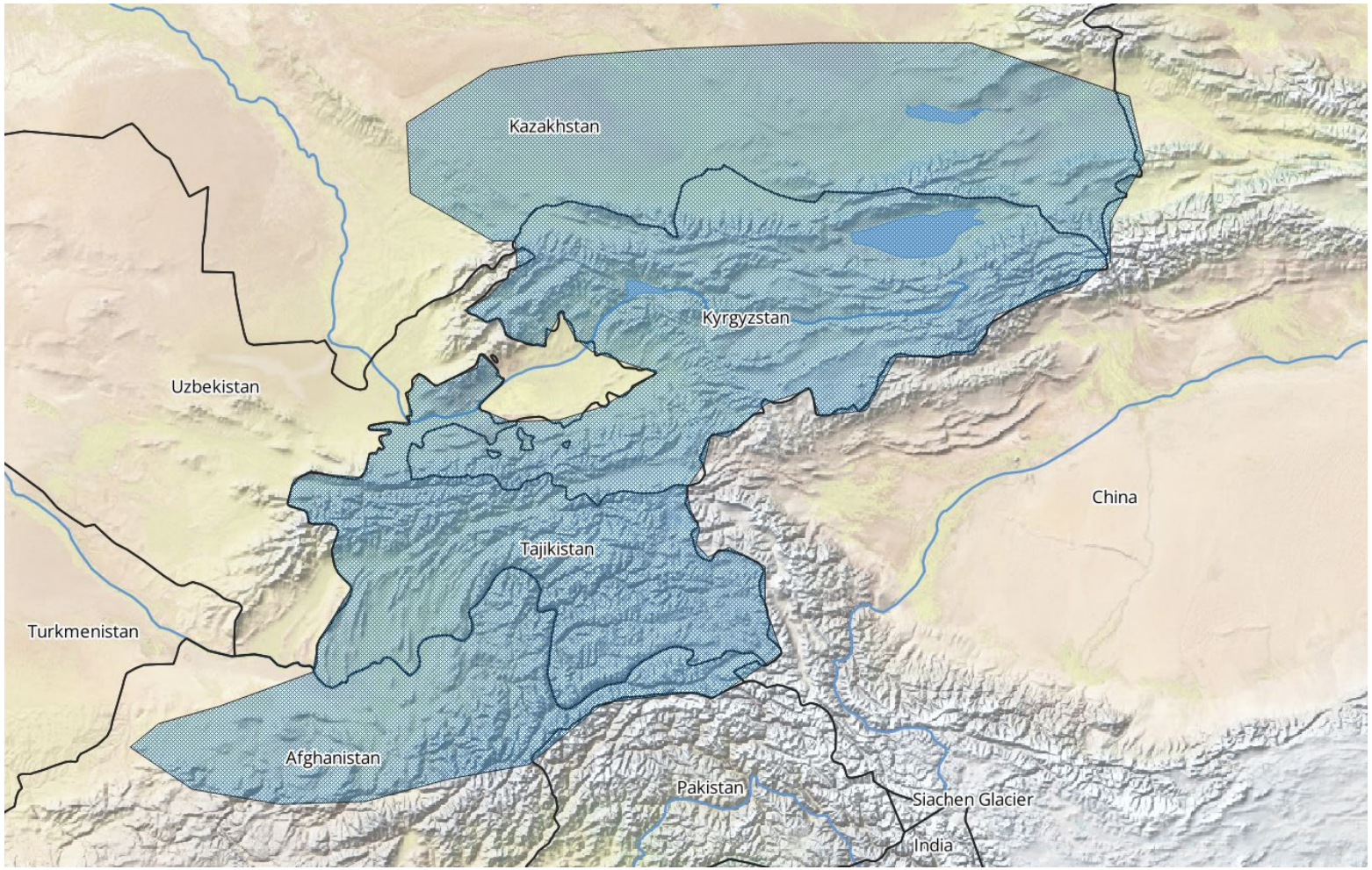
Geographic footprint of MSRI projects

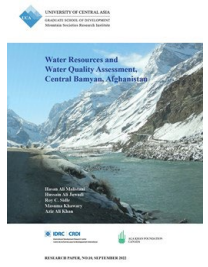


Key activities

1. Research
   - Transdisciplinary and integrated, but founded on solid science
   - Communicated locally, regionally and internationally

2. Education and Training
   - Certificate programs through the Graduate School of Development
   - Summer schools, short courses etc.
   - Supporting the Earth and Environmental Sciences Department at UCA in Khorog

3. Research Dissemination and Outreach
   - Journal articles, MSRI publications
   - Workshops and field training with users
   - Media releases



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Vision for MSRI

- Natural resources management & food security
- Natural hazards, disaster mitigation
- Social dynamics
- Mountain livelihoods
- Water sources and supplies
- Land degradation

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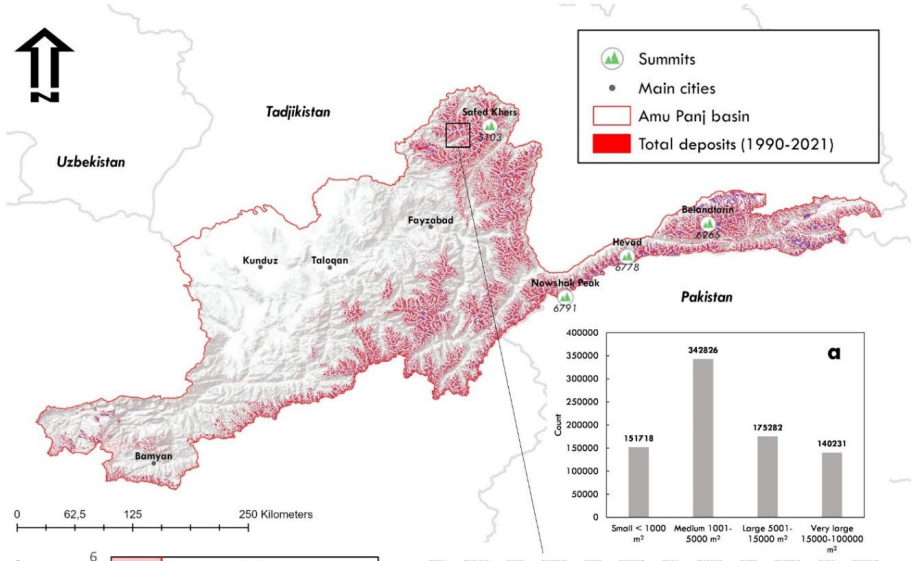
Innovation in snow avalanches monitoring in remote high mountains of Central Asia

To improve roads, power lines and villages resilience to snow avalanches, based on high level research.

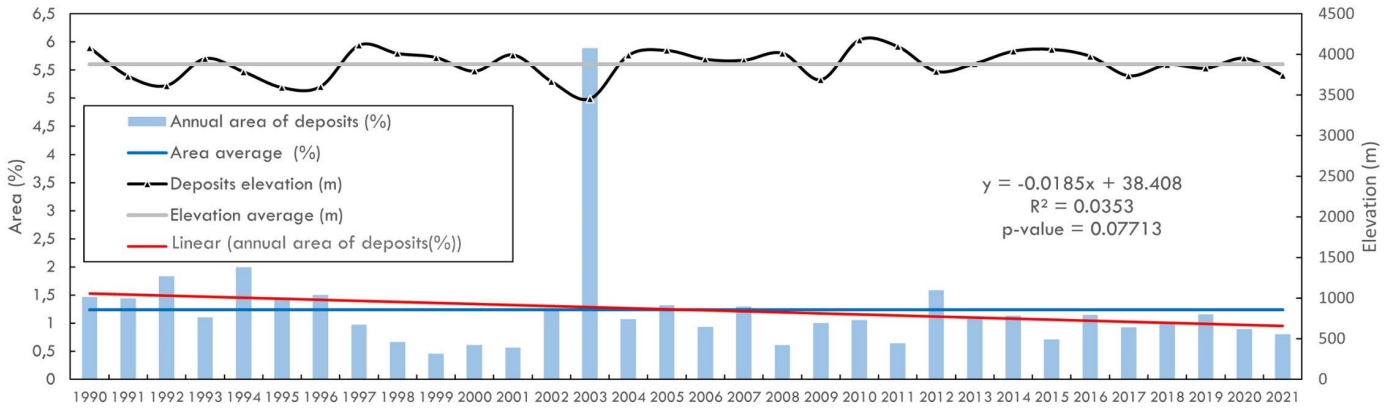
Objective 1: *Mapping the risks*
Objective 2: *Forecasting*
Objective 3: *Mitigate*

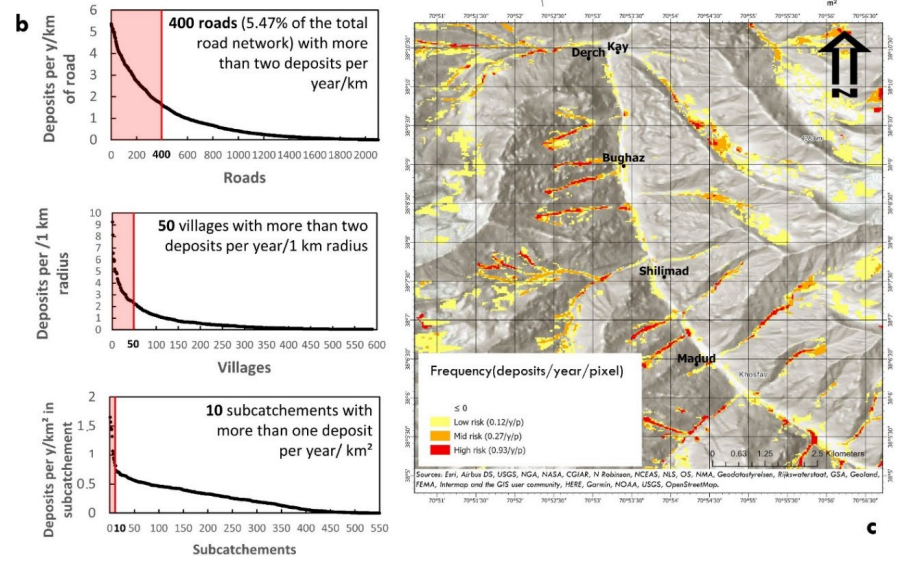
Geoscope: *Tajikistan*

Partners: *WFP, WB*



Evolution of avalanches during the last 32-years





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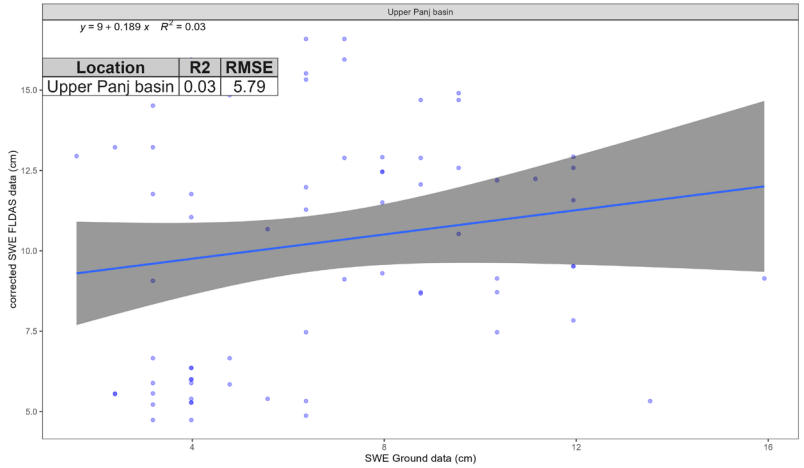
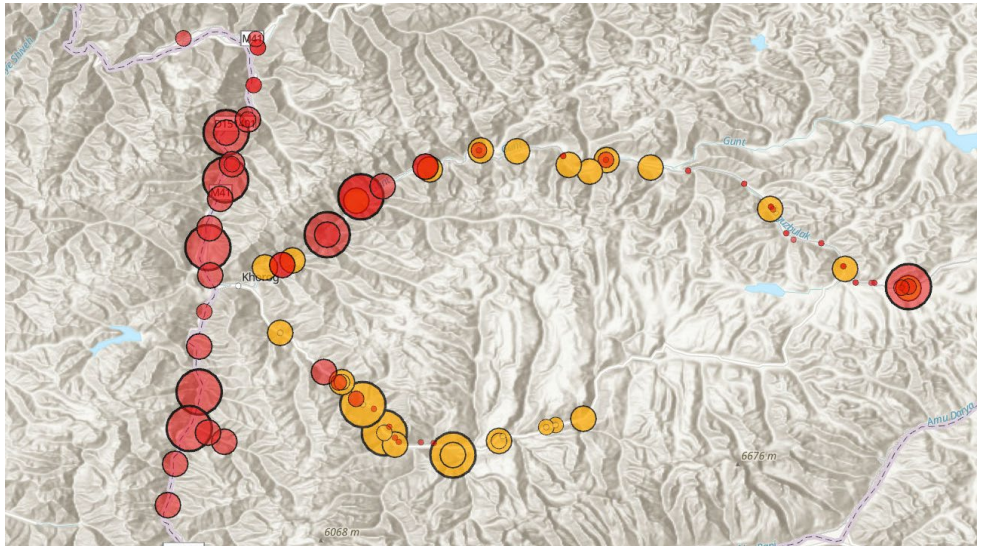
Our sites: Snow Water Equivalent

- **Objective**: available water from snow
- **Ground data**: SWE (Mount Rose)
- **Remote sensing**: calibration of FLDAS products
- **Locations**: Panj, Gunt, Shordara profiles
- **Frequency**: every winter since 2021





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THRIVE project

Capacity building

- Partner institutions staff were trained and mentored in research design, implementation, analysis, etc.

Research training and mentorship

- Research Methods Trainings for PBI, PARC and KBG organized
- Subject-specific workshops for researchers
- *In situ* training through collaborative work

Global expertise

- Integration of international institutional support
- Support and expertise for local Institutes by international scholars

Data collection and research publication

- Field based research
- Environmental conditions, agricultural practices, household socioeconomics, decision-making
- Peer-review and publications of three research studies

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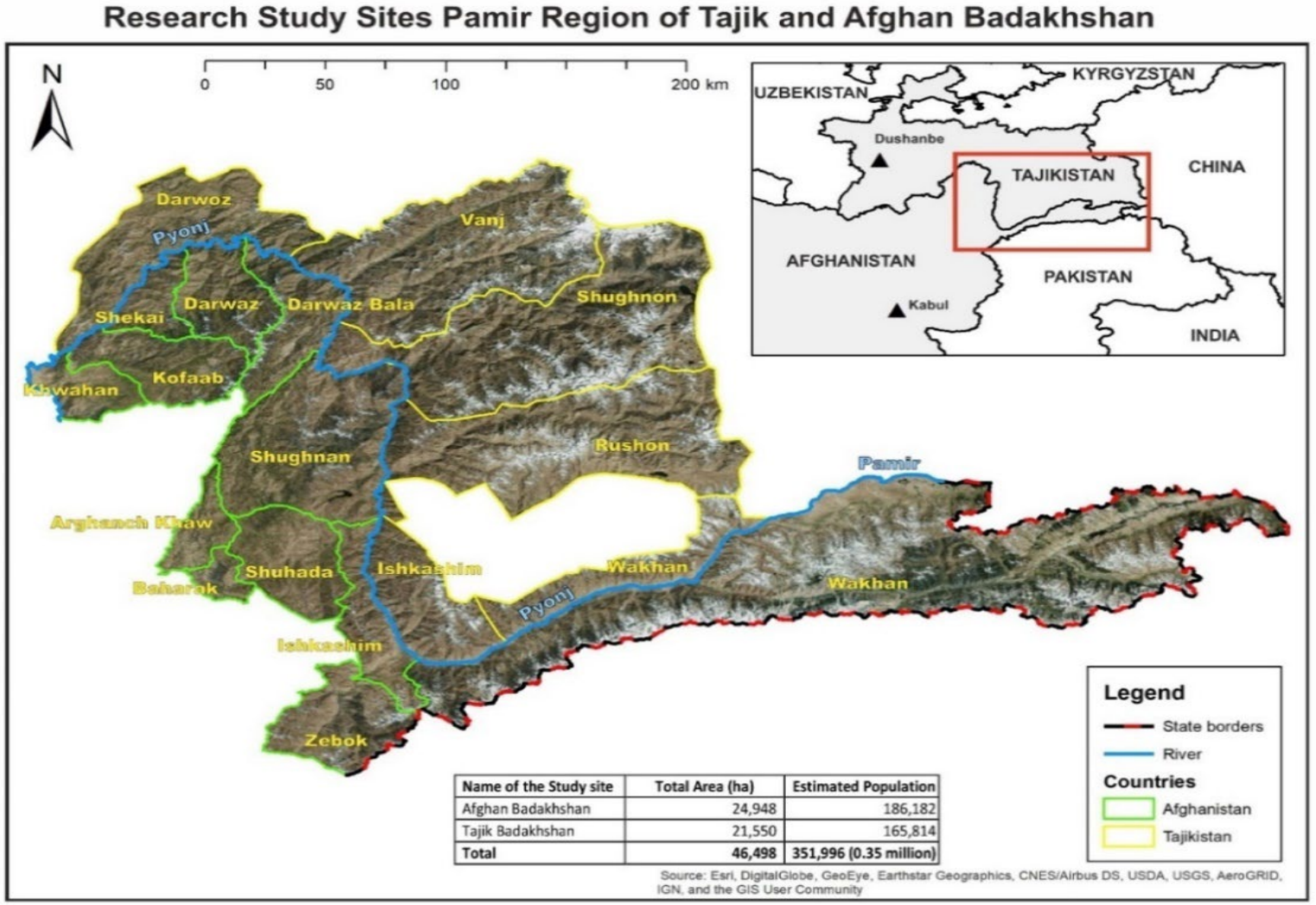
Impacts of Climate Change on Food Security and Health

- Investigate how mountain communities use medicinal and aromatic plants (MAPs) for sustenance and healthcare
- Explore and document the impacts of climate change on MAPs and therefore the food security of mountain communities in the Pamirs



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Results of interviews

- 200 respondents both Afghan and Tajik Pamirs revealed that the population heavily rely on plants to meet their daily livelihood needs, particularly for herbal remedies and food.
- The result of the study shows that 128 different plant species belonging to 63 families and 81 genera are used for food/ nourishment and health-related purposes.

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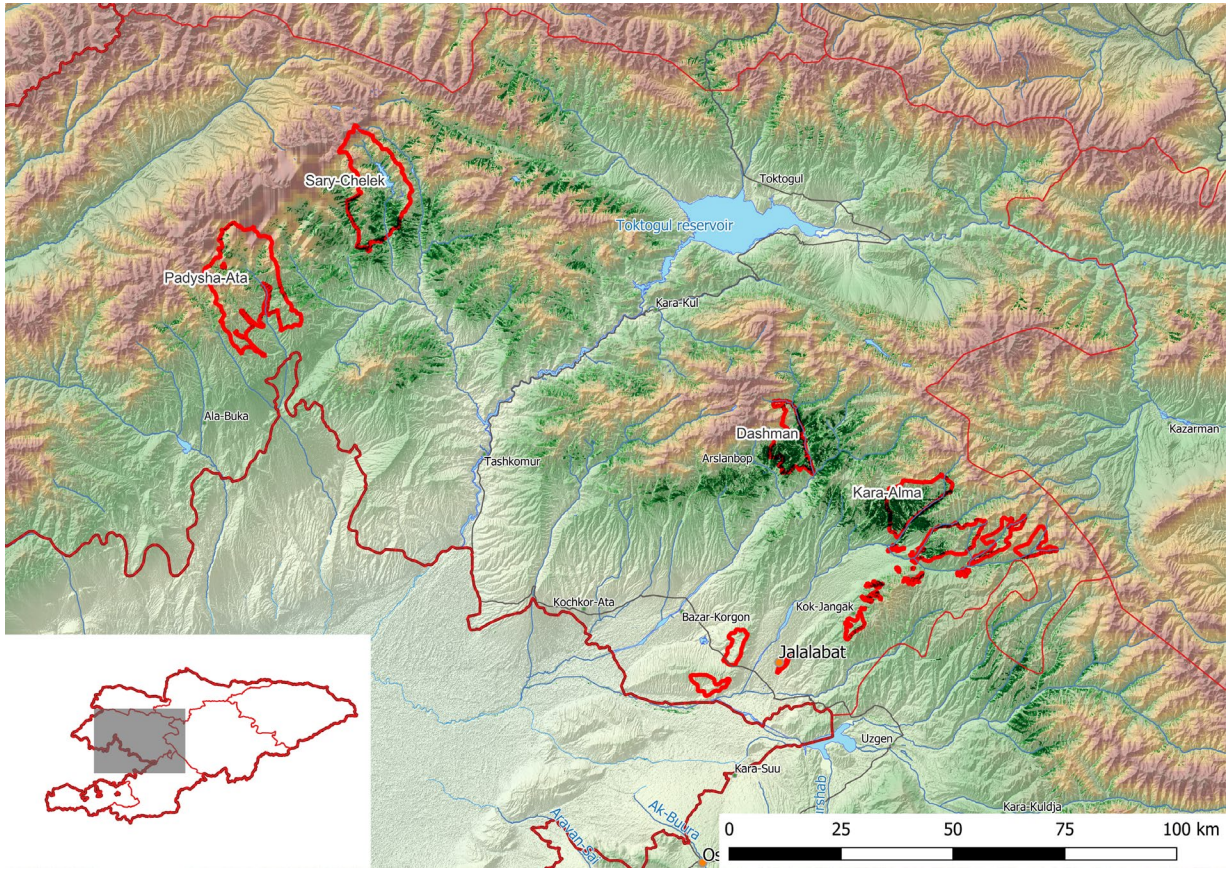
High-resolution Forest Mapping

Remote sensing with UAV

Collection of environmental data



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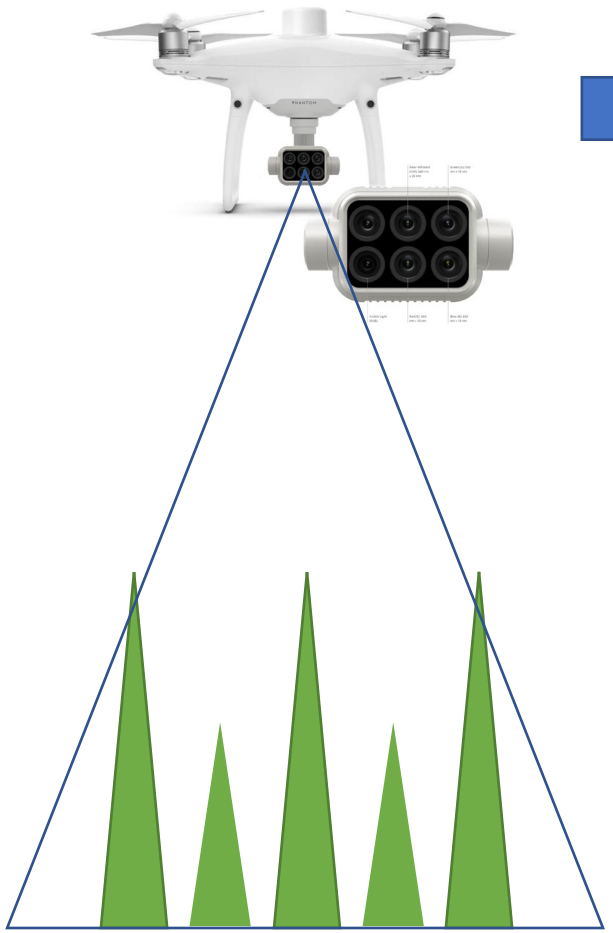
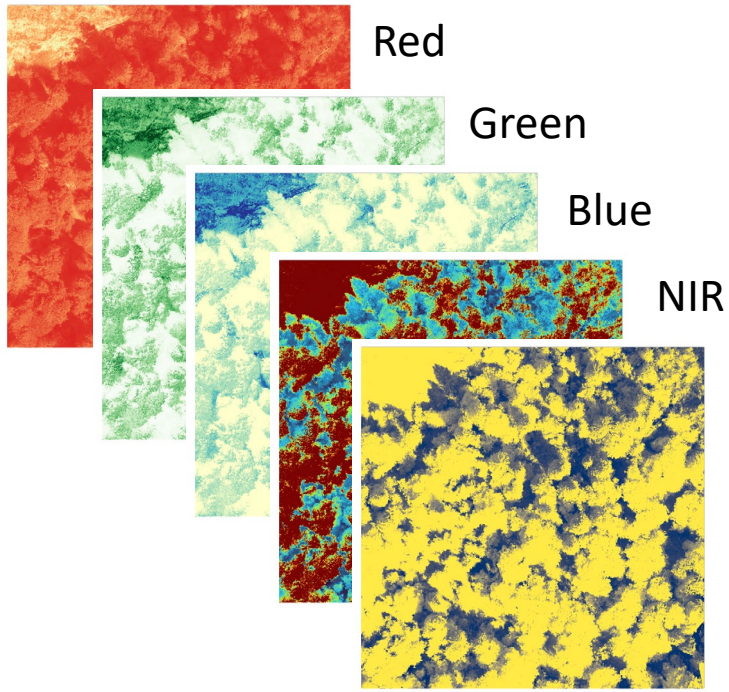
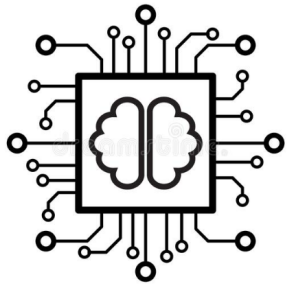
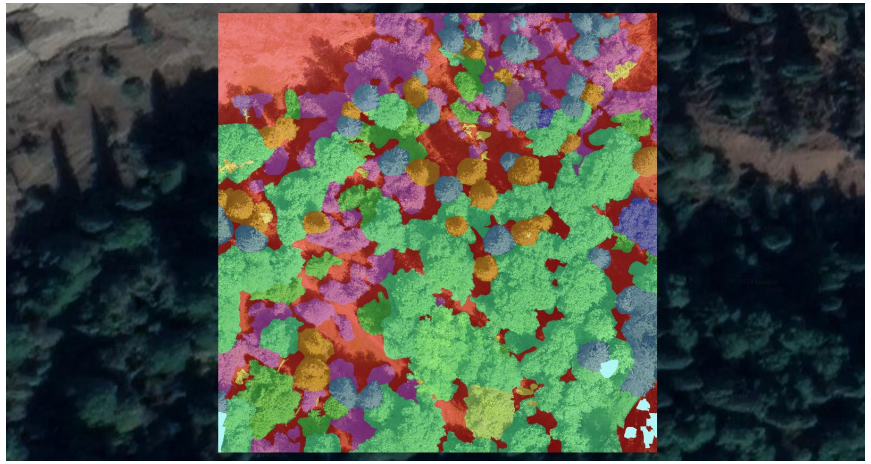
Multispectral RS + AI









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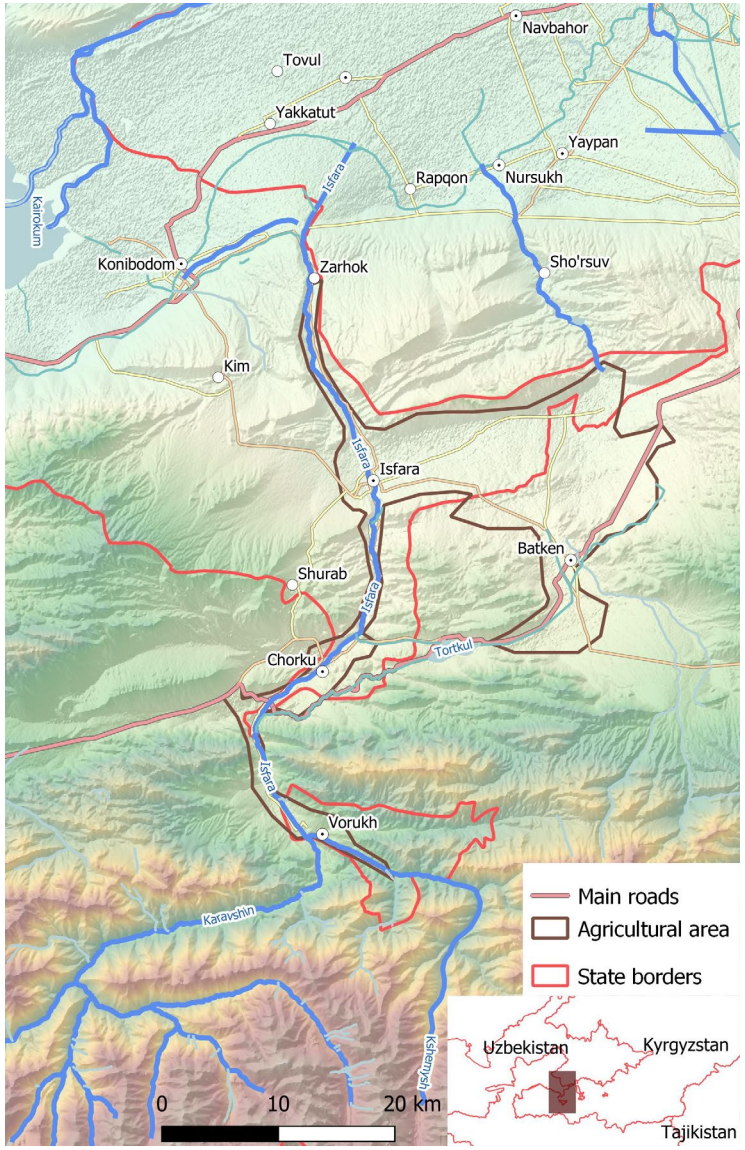
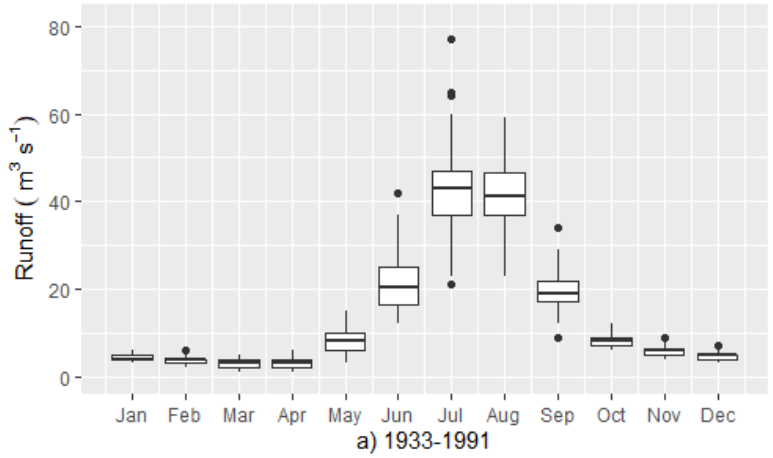
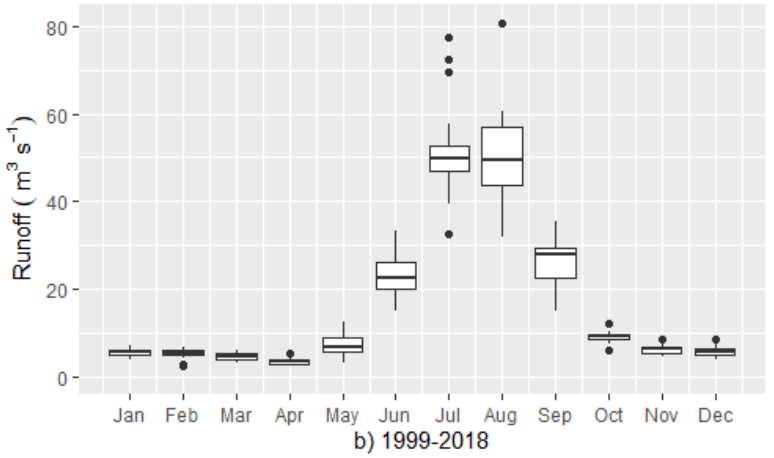
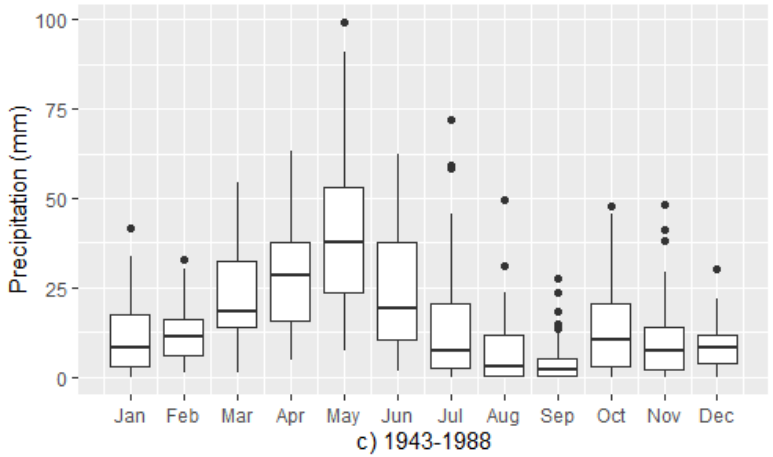
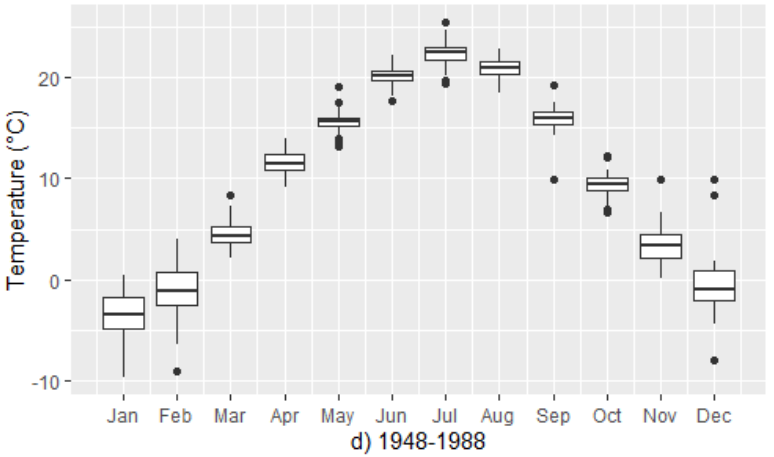
Vegetation and Climate in Isfara/Ak-Suu











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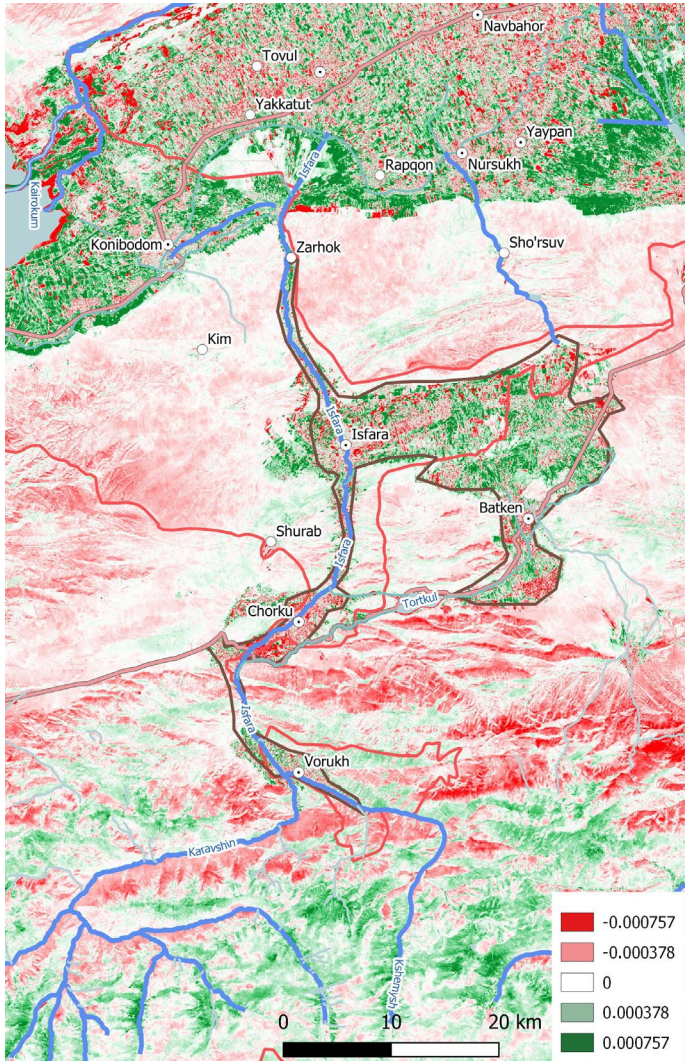
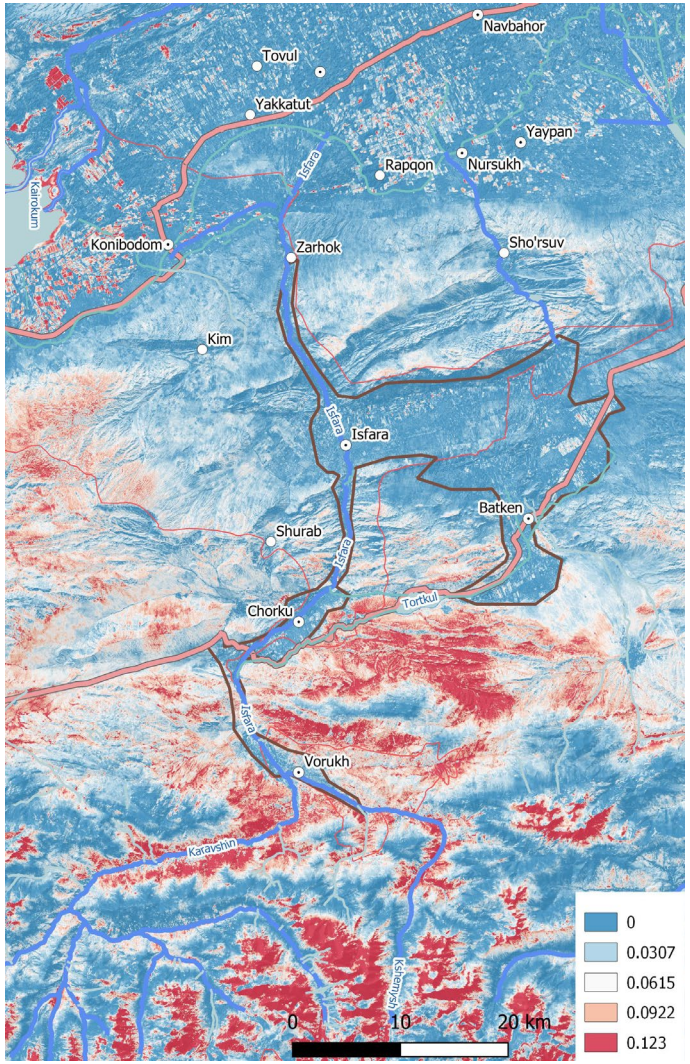
Results of NDVI and climate regression

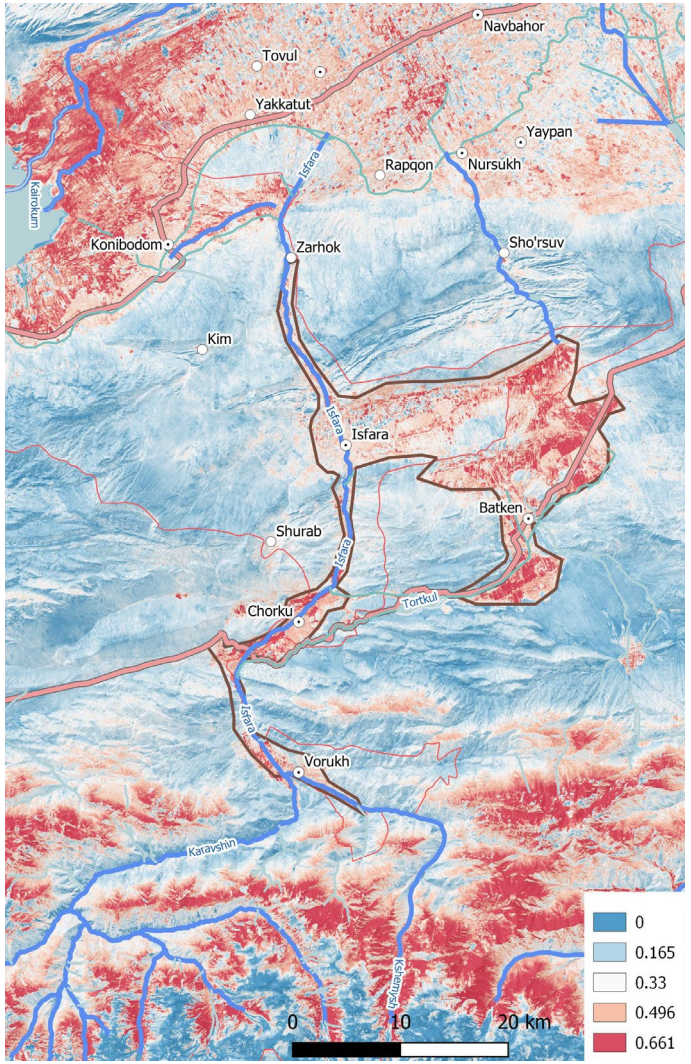
NDVI trend



NDVI~Precipitation R^2



NDVI~Discharge R^2



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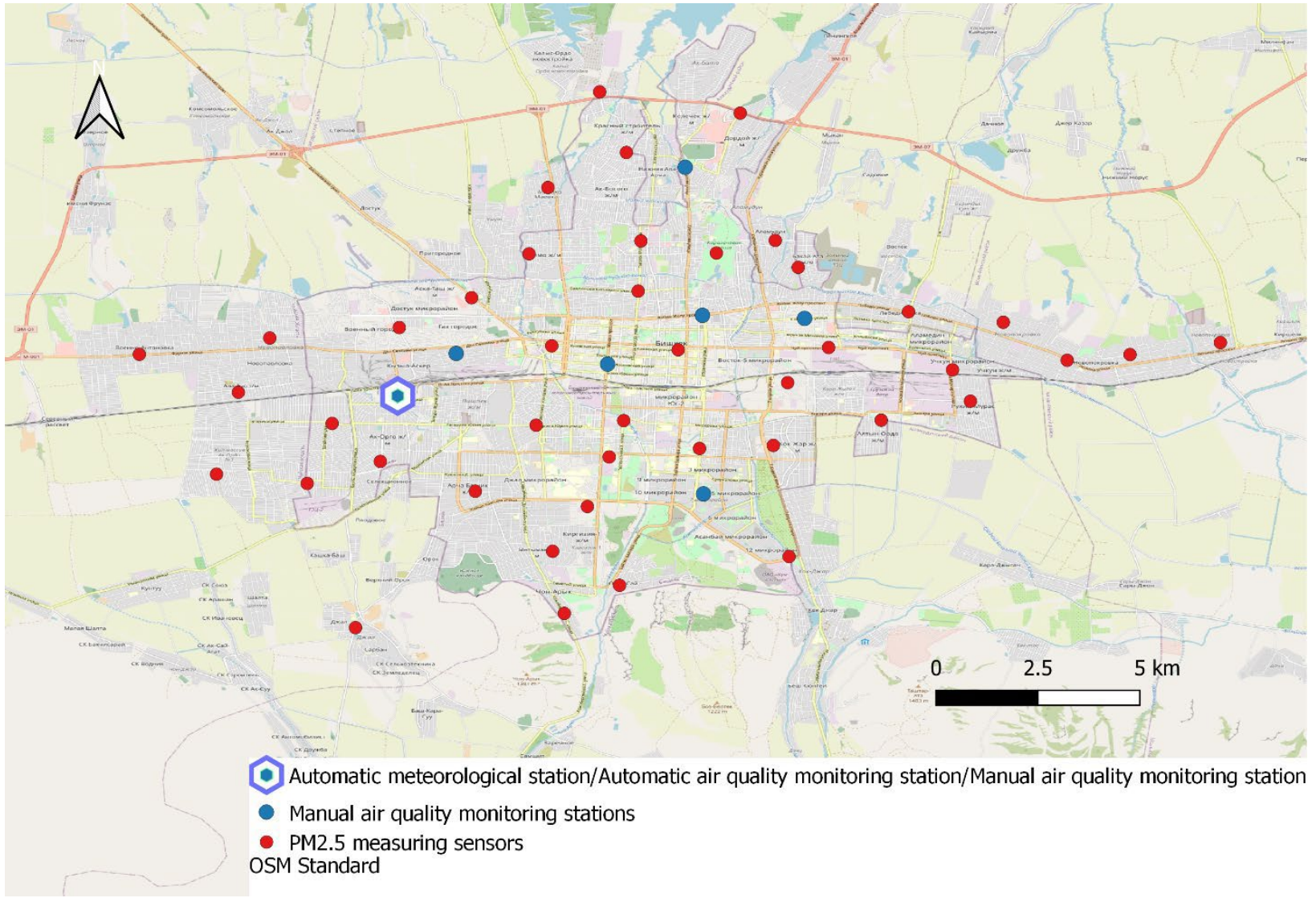
Air pollution in Bishkek

- Compare the levels of pollutants in Bishkek during lockdown 2020 with the same periods in 2016 – 2019
- These measurements included NO, NO_2, SO_2, HCOH, and NH_3



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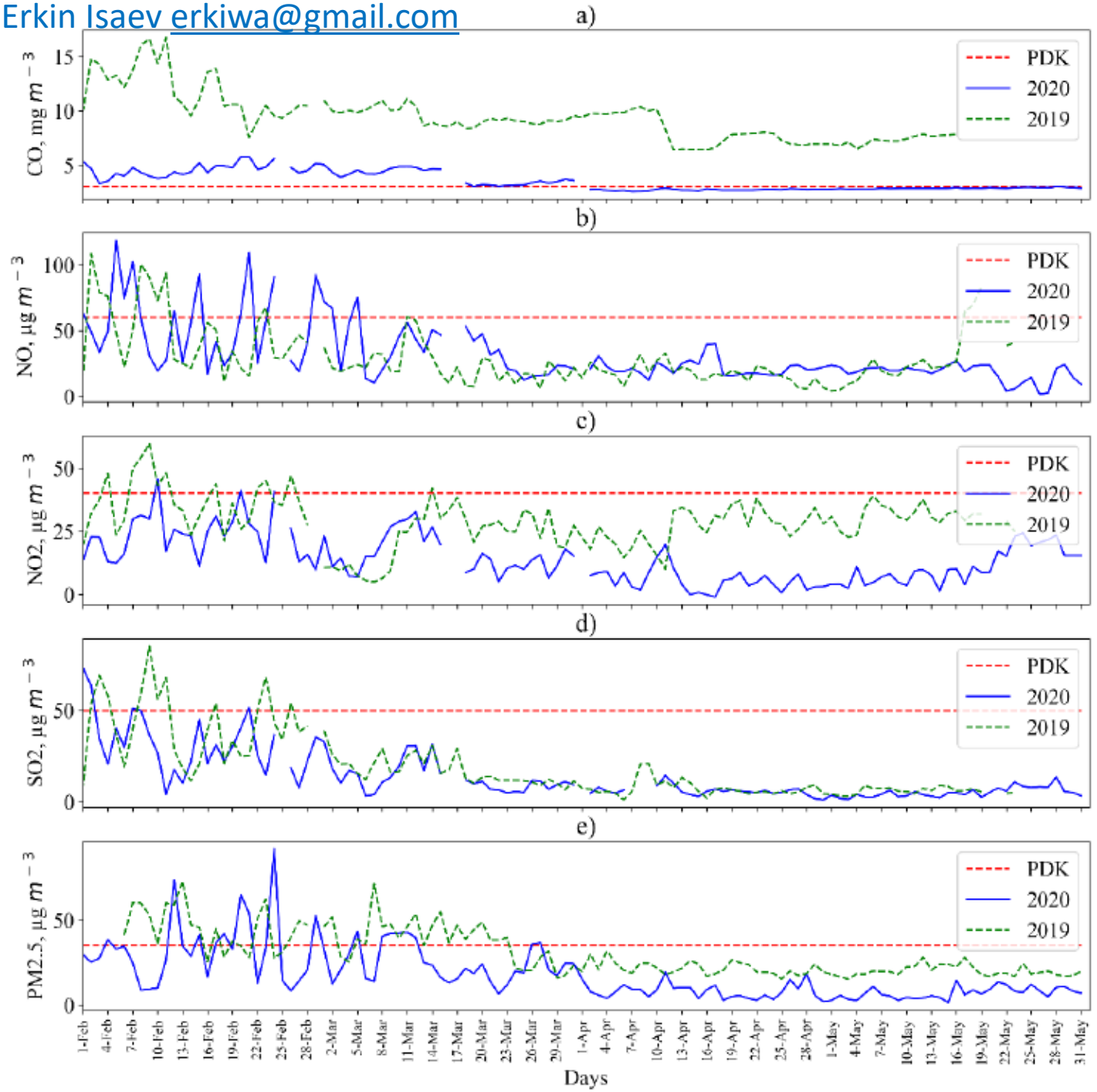

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Average daily concentrations of air pollutants

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Agrarian change and labor migration in rural Kyrgyzstan

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- Objectives: The research pillar seeks to understand a range of economic, institutional, cultural and agro-ecological factors that mediate the outflow of labor from rural areas; explain how demographic changes feed back into reshaping rural transformation in these places; and challenge our thinking on what are the best policy and practice approaches to governing migration in these contexts.

- Partners: SOAS, University of Birmingham, IWMI.

AGRUMIG
MIGRATION GOVERNANCE & AGRICULTURAL AND RURAL CHANGE

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Impact

The key contribution of the research is the identification of strategies that promote safer and more regular migration through supporting change in sending regions – establishing, in effect, a “positive migration” philosophy. AGRUMIG outline longer term and more evidence-based governance solutions, supported by comparative analysis and tangible indicators that are sensitive to the position and role of migration within larger agro-livelihood systems.

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Thank you!

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