

# Deutsches Hochschul- und Wissenschaftsforum Zentralasien



# Posterbeiträge (Conference Poster Proceedings)

Halle (Saale), 23.–25.02.2026

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# Alternative fiber crops – examples of cooperation projects for their (re)introduction in Central Asia

H.-J. Gusovius, B. Selge, M. Angulu, A. Hernandez

Central Asia is one of the most important cotton-growing regions in the world. Cotton cultivation has contributed significantly to the scarcity of water resources. In addition, the consequences of climate change are already affecting established land use systems. The associated changes in landscape structure and their natural, health, and socioeconomic impacts must be counteracted by developing alternative land management systems. The associated structural changes and demographic trends must take into account future value creation, particularly in rural areas.

Therefore, international teams from Germany and Central Asian countries have worked closely with local stakeholders in joint projects to develop exemplary solutions for these issues, including the cultivation, processing and use of alternative fiber crops.

## Linseed – a huge untapped fibre source

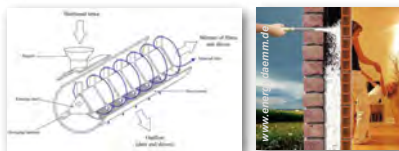
- Worldwide million tonnes of linseed straw remain unused on field, and cause environmental and process technological problems, in particular in Kazakhstan.



- The Kazakh-German cooperation project **“LinoKas”** enabled extensive field trials to determine the growth, yield and quality of linseed straw of regional compared to West European varieties at Barajew-Institute, Shortandy, Akmola region (KAZ). This revealed a potentially attractive fiber yield that can significantly exceed that of cotton.



- Furthermore, selected process technologies and value chains have been developed enabling the exploitation of linseed straw as well as its processing in fibres which can be used as sustainable insulation material.

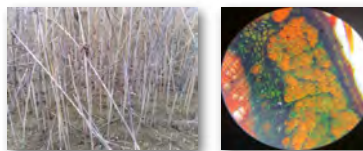


## Textile hemp fibres as alternative to cotton

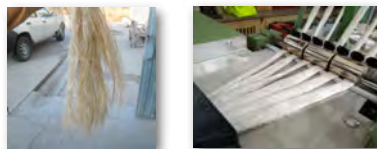
- Central Asian countries are facing big challenges due to decreasing cotton cultivation. Alternatives have to be developed in order to secure both employment and national value added as well as technological knowledge.



- In the cooperation project **“KasHemp”**, agricultural cultivation trials conducted by TOO «KazHemp» (KAZ) under the supervision of CIFOR-ICRAF<sup>1)</sup> (KIZ) have shown that fiber hemp can be successfully cultivated in selected regions of Kazakhstan without irrigation.



- Special emphasis was put on the continental environmental conditions which require a fundamental understanding of metabolic processes during stand retting. Based on this, the added value to textile fiber quality could be illustrated in an exemplary manner.

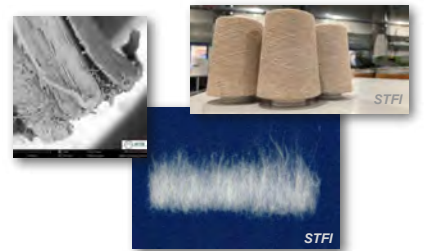


## A new fibre crop for over-salted locations

- Cotton cultivation is followed by huge unusable areas due to over-salination, e.g. in Central Asia. These can be re-cultivated with new management strategies and, so far unexploited crops like Kendyr (Apocynum ssp.).



- It shows the potential to survive and propagate under such barren conditions and is already known from traditional handicraft fibre utilization. The **“KendyrTex”** cooperation project enabled for the first time pot and greenhouse trials for propagation at CIFOR-ICRAF<sup>1)</sup> (KIZ), as well as preliminary experiments on outdoor cultivation at Al-Farabi Kazakh National University, Almaty (KAZ) and IICAS<sup>2)</sup> (UZB).



- A remarkable fiber content of more than 15% have already been determined in plants from wild collections. The fibers can be processed to such an extent that they can be easily blended with cotton fibers into textile quality grade.

<sup>1)</sup> Center for International Forestry Research and World Agroforestry (CIFOR-ICRAF), Bishkek (Kyrgyzstan)  
<sup>2)</sup> International Innovation Center for Aral Sea Basin, Nukus (Uzbekistan)

The world-wide increasing interest in natural fibres requires both, applied and fundamental research and development along the value added chains. Alternative and so far unutilized fibre resources need to be developed in order to strengthen solutions which are not increasing competition for cultivation land. Alternative fibre crops in Central Asia show the potential to supplement or even substitute the comparable unsustainable cotton cultivation. Local or regional value creation can be maintained even if drought or land degradation by pesticides and salinization make conventional land use increasingly difficult.

Such international cooperations should be continued and intensified in the future in order to enable the transfer of the fundamental knowledge gained so far into practice, especially in collaboration with partners in the target regions.

# Betrieb einer permanenten Wolken-, Aerosol- und Klimaforschungsstation in Duschanbe / Tadschikistan

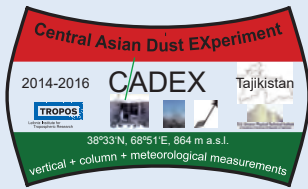


Ronny Engelmann<sup>1</sup>, Sabur F. Abdullaev<sup>2</sup>, Dietrich Althausen<sup>1</sup>, Annett Skupin<sup>1</sup>, Holger Baars<sup>1</sup>, Julian Hofer<sup>1</sup> und viele andere

<sup>1</sup> Leibniz-Institut für Troposphärenforschung (TROPOS), Leipzig, Deutschland  
<sup>2</sup> S. U. Umarov Physikalisch-Technisches Institut (PhTI), Nationale Akademie der Wissenschaften von Tadschikistan (NAST), Duschanbe, Tadschikistan



## Befristetes Projekt CADEX 2014 - 2016, Verträge zur Installation in Duschanbe / Tadschikistan



BMBF - Projekt  
**Leuchtturmprojekt:**  
 - vertikale Partikelprofile  
 - 24/7-Messungen, jahreszeitliche Auswertungen, höhenaufgelöste Partikeleigenschaften  
 - regionale Quellen, innerkontinentaler und interkontinentaler Transport

### MEMORANDUM OF UNDERSTANDING (TROPOS und PhTI)

#### Vertrag 1:

- Import des Systems
- kostenlose Aufstellung
- PhTI beteiligt sich an Betriebskosten
- PhTI unterstützt Visa-Anträge von TROPOS-Kollegen

#### Vertrag 2:

- Installation des Containers
- Reaktivierung des existierenden Transformators
- Kostenübernahme durch TROPOS

#### Vertrag 3:

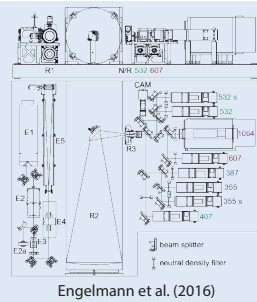
- Central Asian DUst Conference
- Staub => sehr wichtiges Thema in Zentralasien => Internationale Forschungszusammenarbeit ist erforderlich (vgl. separates Poster)

## Finanzierung der Hardware: Projekt PoLiCyTa (Fona-Programm)

### -2016 Antrag an BMBF

- o 2 Container (für Installation in Tadschikistan und in Zypern) mit Messgeräten für höhenaufgelöste Aerosol-Fernmessungen
- o ca. 1.2 Mio €

### -2019 Fertigstellung



Engelmann et al. (2016)



TROPOS-Team für PoLiCyTa



Abtransport 19.5.2019: LKW und Fahrer aus Belarus

## Aufbau und feierliche Inbetriebnahme

- auspacken
- Stromanschluss
- Kolloquium in der Nationalen Akademie der Wissenschaften Tadschikistans
- gemeinsames Drücken des „roten“ Knopfes durch Entscheidungsträger und Repräsentanten



Gemeinsames Einschalten des neuen PollyNet-Messgeräts in Duschanbe (v.l.n.r.): Dr. Jochen Elberskirch (DLR Projekträger), Deutscher Botschafter Neithart Höfer-Wissing, Prof. Farhod Rahimi (Präsident Nationale Akademie der Wissenschaften von Tadschikistan), Prof. Khikmat Muminov (Stell. Präsident Nationale Akademie der Wissenschaften von Tadschikistan), Prof. Farhod Shokir (Direktor PhTI)



## Einbettung in ACTRIS-Struktur => National Facility

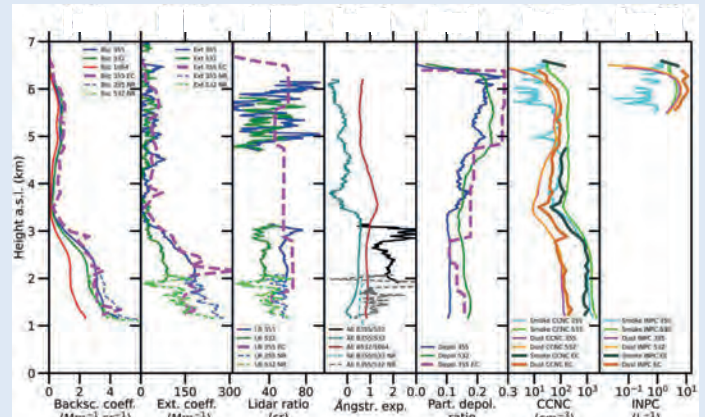


<https://www.actris.eu/facilities/national-facilities>

+ Capacity building  
 => Stipendienvertrag  
 TROPOS mit  
 Mitarbeiterin des PhTI

regelmäßige Wartung  
 => Finanzierung von  
 o Ersatzteilen  
 o Verbrauchsmaterial  
 o Wartungsreisen  
 regelmäßige Qualitätschecks  
 o systeminterne Tests  
 o Tests zum Systemergebnis bei bestimmten atmosphärischen Bedingungen  
 o Querchecks mit anderen Messungen (Sonnenphotometer etc.)

## Beispielmessung vom 12.09.25, Vergleich mit EarthCare



Hofer et al., TROPOS Zweijahresbericht, 2026





# Bridging Research & Practice: UfU Central Asia as a Think Tank for Regenerative Agricultural Futures

## UFU CENTRAL ASIA

A newly founded independent **Think Tank**, located in Astana, Kazakhstan.

**Aim:** to establish a scientifically sound, reliable long-term cooperation platform between Germany and Kazakhstan in the fields of environment, climate and sustainability

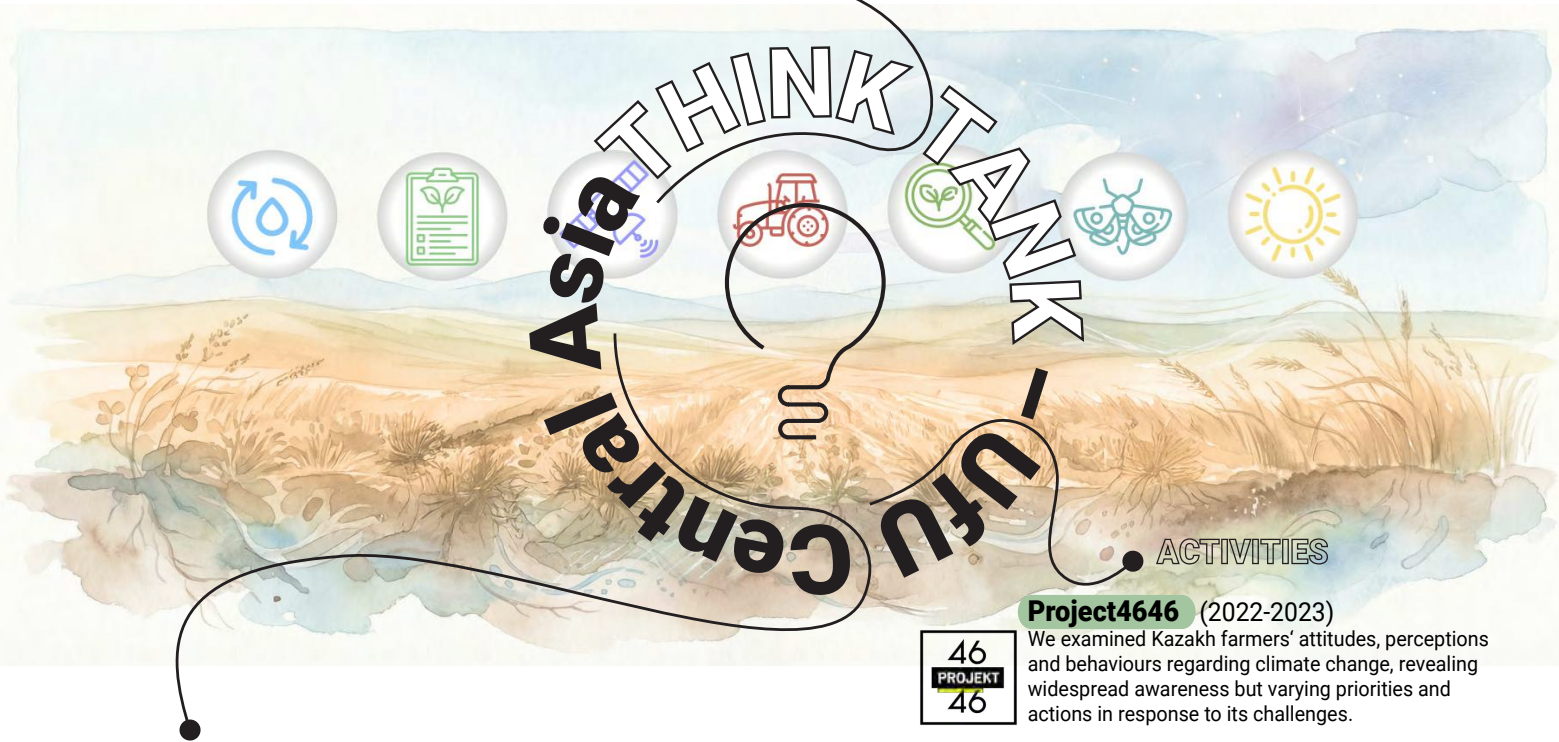
**Approach:** UfU Central Asia acts as a bridge-builder between **science, policy and practice**, fostering dialogue and knowledge transfer to develop regionally tailored, sustainable solutions in Central Asia.

## THEMATIC FOCI

**Climate Change:** Holistic climate impact analysis, cross-sectoral risk assessment and adaptation strategy evaluation to inform evidence-based policy in agriculture, water and economic stability

**Soil, Water, and Sustainable Agriculture:** Scientific assessment of soil, land use dynamics and water management to guide evidence-based agricultural and resource decisions.

**Regenerative and Nature-Based Solutions:** Evaluating regenerative practices, ecosystem services and policy compatibility to enhance ecosystem function and adaptability in the diverse context of Kazakhstan's ecological regions.



## ACTIVITIES

### Project4646 (2022-2023)



We examined Kazakh farmers' attitudes, perceptions and behaviours regarding climate change, revealing widespread awareness but varying priorities and actions in response to its challenges.

### SaltySoil Project – Sustainable Solutions for Soil Salinization in Southern Kazakhstan (currently in development)

By combining innovative soil analysis, field-based biochar application, and capacity development, we aim to address the accumulation of salts in topsoil and the subsequent degradation, with impacts on soil fertility, crop productivity, and the long-term sustainability of rural livelihoods.

### Carbon Farming in Kazakhstan

as an Exemplary Project for Mitigating and Adapting to Climate Change (2024 – 2026)  
This project evaluates the feasibility of carbon farming in Kazakhstan by analysing soil carbon sequestration potential, biodiversity impacts, and economic opportunities for farmers through carbon credit generation and trading. A dedicated research component focuses on assessing soil organic carbon in croplands of Northern Kazakhstan using an integrated methodology that combines remote sensing, environmental covariates, field sampling, and machine learning to produce robust field-scale SOC stock estimates.

## PARTNERSHIPS

### Ministries

- Ministry of Agriculture of the Republic of Kazakhstan
- Ministry of Ecology and natural resources of the Republic of Kazakhstan
- Ministry of Water Resources and Irrigation of the Republic of Kazakhstan
- Ministry of Water Resources, Agriculture and Processing Industries of the Kyrgyz Republic



### State agencies / specialized institutes

- JSC Zhasyl Damu
- Information-Analytical Centre for Water Resources (IACWR)
- Kazakh Scientific Research Institute of Water Economy (KazSRIWE)



### Universities / higher education institutions

- Nazarbayev University
- M. Kozybayev North Kazakhstan University
- North Carolina Agricultural and Technical State University
- Kyrgyz National Agrarian University (KNAU)
- SDU University
- Narxoz University



### Think tanks / academies / research centers

- Center for Regional and Local Development (RealDev)
- National Academy of Agrarian Sciences (HAAH)
- TALAP Center for Applied Research



Sami Çeltikoglu<sup>1,2,3</sup>, Arne Reck<sup>1</sup>, Charlotte Schifer<sup>1</sup>, Michael Zschiesche<sup>1</sup>  
<sup>1</sup> Unabhängiges Institut für Umweltfragen (UfU), Berlin, Deutschland  
<sup>2</sup> Leibniz Institute of Agricultural Development in Transition Economies (IAMO), Halle (Saale), Germany  
<sup>3</sup> Geography Department, Humboldt-Universität zu Berlin



Schafft Wissen. Seit 1502.

MARTIN-LUTHER-UNIVERSITÄT HALLE-WITTENBERG



# Building Research Capacity through International Cooperation: MLU Halle-Wittenberg and Urgench State University

Franz Schulze<sup>1</sup>, Michael Zierdt<sup>1</sup>, Murodjon Sultanov<sup>2</sup>, Oybek Egamberdiev<sup>2</sup>, Temur Matqurbanov<sup>2</sup>, Christopher Conrad<sup>1</sup>

## Cooperation Agreement

The Faculty of Natural Sciences III of MLU Halle-Wittenberg and the Faculty of Natural Sciences of Urgench State University (UrSU, Uzbekistan) have entered 2020 into an Agreement for Academic and Cultural Cooperation. The Agreement establishes a collaborative framework covering:

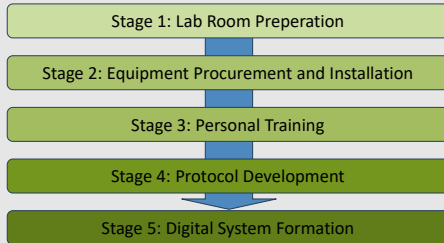
- Joint research projects
- Exchange of faculty and academic staff
- Research literature exchange
- Organization of academic conferences
- Organization of cultural activities.

## Building a DiSA - Lab (Digital Soil & Agrochemical Laboratory)

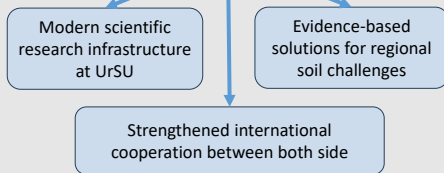
As a current example UrSU and the Department of Geography of the MLU are planning to upgrade the soil laboratory for comprehensive soil analytics.

- Joint assessment of existing lab facilities across Agronomy, Biology, Chemistry & Geography departments
- Shared analysis of regional soil problems in the Khorezm region (salinity, irrigation, fertility)
- Collaborative selection of priority lab equipment and development of the DiSA-Lab concept

### Implementation Stages



### Expected Outcomes



Ion Chromatography (IC) – Determination of anions and cations



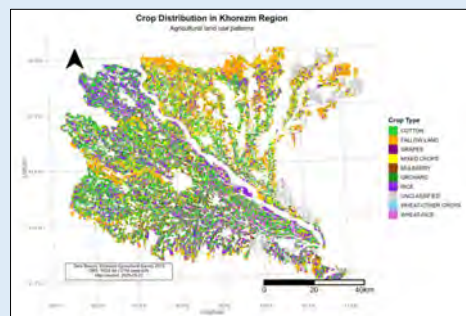
UV - Vis Spectrophotometer - Nutrition and NPK analysis

Additionally, the collaboration encompasses the joint development of a seminar for master's students on remote sensing methods within the local agricultural context of Khorezm, which was held for the first time in 2025.



## Monitoring Trends & Changes in the Agricultural Landscape

PhD candidate Franz Schulze (MLU), together with Dr. Murodjon Sultanov (UrSU) and local partners, is developing a remote-sensing-based monitoring system to track agricultural changes after the introduction of water-saving technologies.

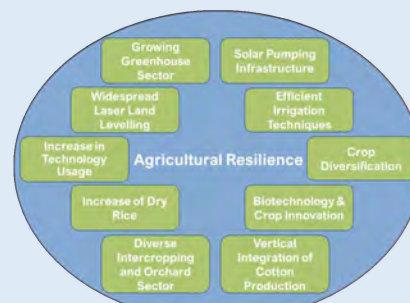


Agricultural structure

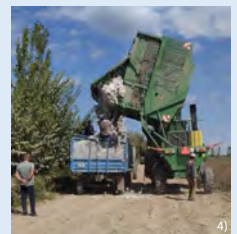


Cotton production monitoring

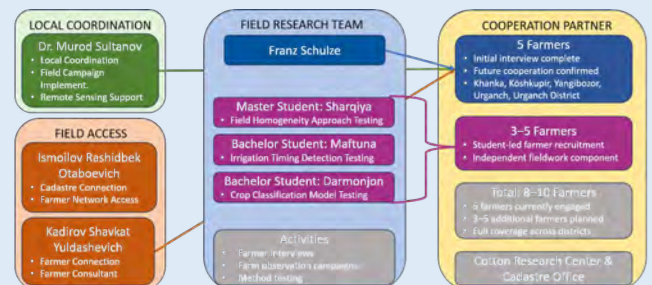
In the Khorezm region of the Lower Amu Darya Delta—where water scarcity and soil salinization are increasing—measures such as laser land leveling, improved irrigation, and crop diversification have been widely introduced, but their impacts remain poorly documented. This project combines multi-temporal satellite data with field validation at representative farms to assess effects on irrigation patterns, crop performance, and overall agricultural resilience.



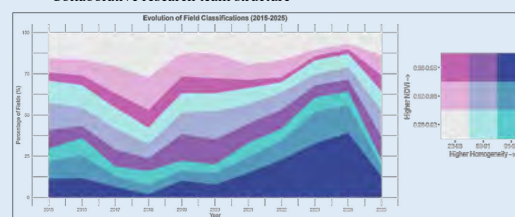
Current changes in agronomic sector in Khorezm



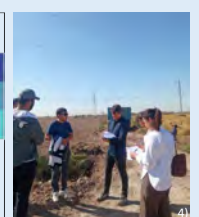
Cotton harvest



Collaborative research team structure



Homogeneity Analyses for cotton fields in Khorezm

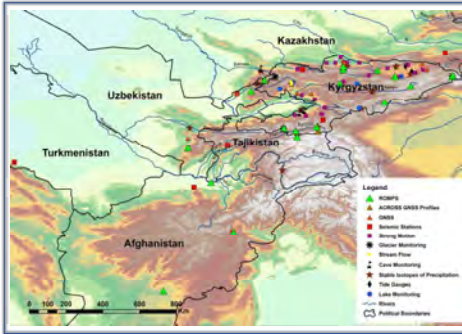


Collaborative fieldwork

# GFZ Global Change Observatory Central Asia Strengthening Long-term Regional Research Networks in Central Asia



O. Bens, A. Gafurov, S. Metzger, J. Mingram, S. Pinkerneil, S. Roessner, B. Schröder, T. Schöne, A. Strollo



The GFZ Global Change Observatory Central Asia (GCOCA) was established 20 years ago and ever since has been efficiently collaborating with local, national and international partners. **Our comprehensive approach includes geophysics, geology, hydrology, paleoclimate, geodesy and remote sensing to eventually assess the impact of natural and human-induced processes on societal and political developments.**

**GCOCA consists of 18 ROMPS hydrometeorological stations, 10 seismic broadband stations, 35 GNSS stations, 11 stable isotope precipitation sites, 23 strong-motion sites, 1 lake monitoring site, 4 cave monitoring locations, 5 tide gauges (Issyk Kul), 4 glacier monitoring sites with cameras, and 2 GNSS profiles.**



### Remotely Operated Multi-Parameter Stations

**Meteorological sensors**

- ✓ Air temperature
- ✓ Relative humidity
- ✓ Air pressure
- ✓ Wind speed & direction
- ✓ Precipitation
- ✓ Insolation
- ✓ Soil temperature

**Hydrological sensors**

- ✓ River discharge
- ✓ River water level
- ✓ Snow depth
- ✓ Snow density
- ✓ Snow water equivalent
- ✓ Soil water content

**Additional sensors**

- ✓ High-precision GNSS
- ✓ Cameras
- ✓ Seismometer

In cooperation with CAIAG and other partners in Central Asia we operate a network of automated climate stations in Central Asia and Afghanistan. The data is important to understand weather and climate change, but network also monitors glaciers, GLOFs, river discharge, or earthquakes.

### Open-data, open science and FAIR culture

Our research relies on a broad range of long-term monitoring infrastructures, such as hydro-meteorological and climate monitoring stations, GNSS antennas, broadband and strong-motion seismic stations, stable-isotope precipitation sites, lake and cave monitoring sites, tide gauges, glacier cameras and ablation stakes. The majority of these settings are continuously operated by GFZ and our partners in Central Asia. In our projects we pursue an open-data policy, promote open science and FAIR principle. Our data is disseminated through the [GFZ Data Portal](#), [GEOFON](#), [SDSS](#), [PANGAEA](#), [VARDA](#), [MODSNOW](#) and the [International Soil Moisture Network](#) repositories.

### Lake Issyk Kul Radar Altimetry Calibration Site

In cooperation with CAIAG the Issyk Kul Radar Altimeter Calibration Site is developed since 2016. Future plans are the extension with gravimetric surveys for GRACE-C/NGGM.

Our 5 tide gauges measuring the water level. All gauges are connected to either continuous or campaign GNSS-sites by leveling. With two ROMPS installations, we monitor several environmental parameters.

Since 2017 we perform regular surveys for establishing and validating ground truth-data. Currently missions, such as Sentinel-3A/B, Sentinel-6A/B and SWOT are monitored.

### Paleo-climate: a guidebook for today's climate change

**Scientific Questions / Methods**

**Reconstruction of past climate change:** dynamics of climate change (e.g., seasonality of precipitation in warm periods / tipping points / landscape change (e.g., open vs closed system, major landslides))

**Combination of different terrestrial archives – lakes, caves:** long proxy records with seasonal resolution of paleoclimate information + **recent monitoring** (lakes, caves, stable isotopes of precipitation)

**For a mechanistic understanding and calibration of paleoclimate proxy data** => monitoring and modelling is important for future implementations

### Our Framework

**Prospects and opportunities through transboundary cooperation**

In close cooperation with Partner Institutions in Central Asia we engage on:

- improvement of transboundary disaster and climate risk management,
- improvement of regional water management,
- improvement of framework conditions for integrative land use approaches,
- development of shared monitoring and spatial data infrastructures,
- capacity building, knowledge transfer and information exchange.

**Contributions to national, regional and international agreements**

- UNFCCC & Paris Agreement
- International Environment Instruments (UN, UNECE)
- EU Strategy Central Asia, 2019
- Sustainable Development Goals
- Aral Sea Basin Program ASBP-4
- Regional Environment Action Plans
- National Strategies and Adaptation plans of Central Asian countries

### Continental Collision in the Pamir-Hindu Kush

- At the Hindu Kush and Pamir, the Indian and Eurasian continent collide.
- The region hosts intense seismicity with decadal M6-7 earthquakes and frequent smaller ones.
- Deep earthquakes illuminate key geodynamic processes like continental subduction, lithosphere delamination & the (geologically) rare event of an ongoing slab break-off.
- The crustal deformation gradients observed at the surface belong to the highest worldwide observed on continents. Some faults move at up to 2 cm/yr.
- The W-Pamir collapses westwards to the lower lying Tajik Basin, while the E-Pamir is pushed northwards.
- The Pamir frontal Thrust marks the boundary between the Pamir and the South Tian Shan.

### Remote Sensing for Landslide Analysis

Under conditions of ongoing climate change, landslides pose an increasing threat to Central Asia. Improved process understanding is needed to identify predisposing and triggering factors, such as seismicity, increasing precipitation, land use changes and growing human impact influencing landslide hazard and risk.

Results of automated landslide detection for landslide-prone region in Southern Kyrgyzstan – color corresponds to time of failure

The inventories of past landslides support the dynamic hazard and risk analysis, and allow effective risk mitigation by developing early-warning systems and evaluating future scenarios.

Time series analysis of optical remote sensing data allows:

- Automated multi-temporal detection of landslide objects
- Retrospective landslide mapping using archived satellite data
- Derivation of spatial and temporal landslide activity patterns
- Improved dynamic hazard and risk assessment based on multi-temporal landslide inventories

### Glacier and GLOF Monitoring

Glaciers are important indicators of climate change. In Central Asia, glaciers are a vital source of freshwater, with glacier melt providing the main supply in summer. Under global warming, therefore, the negative mass balance of Central Asian glaciers threatens water security. Starting with monitoring the Inylchek Glacier (Kyrgyzstan) in 2005 at the Merzbacher Observatory, Abramov (2011), and Golubin Glacier (2013), and the Pakhtakor Glacier (2023), GCO provides important information for international glacier monitoring program of the WGMS.

Hydrological year - Glacier Mass Balance (m.w.e. yr<sup>-1</sup>)

Glacier monitoring with the University of Fibourg (Swiss) using automated cameras.

The number of glacier lakes is increasing due to ongoing glacier retreat. Many of these lakes have poorly compacted dams and are therefore susceptible to glacier lake outburst floods (GLOFs). These lakes are monitored with remote sensing technologies, but also with some in situ installations. At the Merzbacher Lake (Inylchek), GCOCA operates one of its monitoring sites.

### Water Resource Monitoring from Space

The water shortage in Central Asia is evident, not least due to the shrinking Aral Sea. Most of the region's water originates in the high mountains of Kyrgyzstan and Tajikistan, where it comes from snow and glacier melt. Kazakhstan, Uzbekistan and Turkmenistan depend on this water for agriculture.

Over the past few decades, the in situ water monitoring network declined, leading to a lack of regional and cross-boundary information and the need for new sources of information. Radar altimetry can generate such information. Within the GCOCA, we routinely provide surface water table and volume information and disseminate the data through the SDSS.



# GreenAgro – Aufbau eines internationalen Forschungsnetzwerks für nachhaltige Landwirtschaft

## AUTHORS

Dr. Julia Schneider, Dr. Sabine Zikeli  
Zentrum Ökologischer Landbau

## PROJEKTIDEE

**GreenAgro** ist ein internationales Kooperationsprojekt zur Identifikation von Voraussetzungen und Potenzialen für eine langfristige Zusammenarbeit zwischen Hochschulen in **Deutschland, Armenien und Kasachstan**. Im Mittelpunkt stehen die großen Herausforderungen **Klimawandel, Biodiversität und nachhaltige Landwirtschaft**. Ziel ist es, gemeinsame Forschungs- und Innovationsansätze zu entwickeln, die zur grünen Transformation des Agrarsektors beitragen.

## PROJEKTZIELE

- Aufbau eines internationalen Forschungsnetzwerks im Bereich nachhaltige Landwirtschaft
- Identifikation gemeinsamer Forschungs- und Lehrpotentiale
- Stärkung wissenschaftlicher Zusammenarbeit zwischen den Partnerhochschulen
- Vorbereitung gemeinsamer Anträge für Folgeprojekten

## PROJEKTSTRUKTUR

- **Online-Phase**  
Austausch von Expertise und Erfahrungen  
Entwicklung gemeinsamer Schwerpunkte
- **Vor-Ort-Phase**  
Exploration lokaler Potenziale in D, ARM, KZ  
Vernetzung mit relevanten Akteuren aus Wissenschaft und Praxis
- **Abschluss-Workshop (Stuttgart)**  
Ausarbeitung Folgeantrag

## PROJEKTPARTNER

### DEUTSCHLAND



Universität Hohenheim (Stuttgart)

Zentrum Ökologischer Landbau

FG Gesellschaftliche Transformation und Landwirtschaft

FG Landschaftsökologie und Vegetationskunde

Landesanstalt für Agrartechnik und Bioenergie

FG Kommunikation und Beratung in Ländlichen Räumen

Logo e.V.

### ARMENIEN



American University of Armenia, Acopian Center for the Environment  
(Yerevan)

### KASACHSTAN



S. Seifullin Kazakh Agrotechnical Research University (Astana)

Sh. Ualikhanov Kokshetau State University (Kokshetau)

A. Baitursynuly Kostanay Regional University (Kostanay)

M. Kozybaev North Kazakhstan University (Petropalovsk)

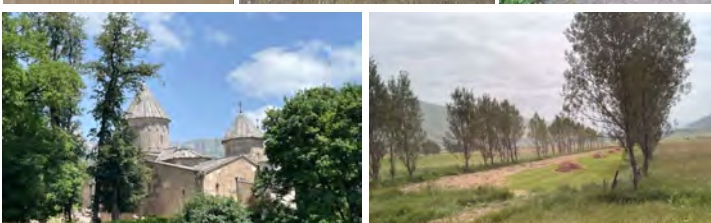
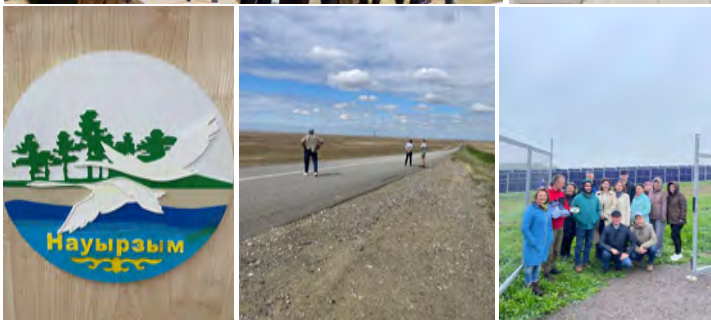


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## ERGEBNISSE

- Deinition der Forschungsziele und thematische Prioritäten
- Klare Rollenverteilung innerhalb des Netzwerks

### FOLGEANTRAG GREENAGRO+



### CONTACT

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Fruwirthstr. 14-16, 70599 Stuttgart, Germany  
Julia.schneider@uni-hohenheim.de

# Central Asian DUST Conferences (CADUC) I & II

Dietrich Althausen<sup>1</sup>, Sabur F. Abdullaev<sup>2</sup>, Julian Hofer<sup>1</sup>, Shakhimardan Shaniyaziov<sup>3</sup>, Christian Opp<sup>4</sup>, Bakhriddin Nishonov<sup>5</sup>, Akhmed Reymov<sup>3</sup>, Ronny Engelmann<sup>1</sup>

- 1 Leibniz Institute for Tropospheric Research (TROPOS), Leipzig, Germany
- 2 National Academy of Sciences of Tajikistan (NAST), Dushanbe, Tajikistan
- 3 Karakalpak State University (KSU), Nukus, Uzbekistan
- 4 Philipp-Universität Marburg, Germany
- 5 Hydrometeorology Scientific Research Institute (NIGMI), Tashkent, Uzbekistan



## Dust belt and locations of conferences



Adapted from Hofer et al., 2017, <https://doi.org/10.5194/acp-17-14559-2017>



## Benefits for Central Asia (CA)

- **Recognition:** Central Asia main dust source, sink, intensively impacted by dust
- **Improvement of knowledge => CA dust is different from dust** at other areas, **is distributed** regionally, continentally, **intercontinentally**
- Education/training of young scientists and technicians, administrative staff (**capacity building**)
- **Scopus indexed** papers (proceedings)

**Approvals by the governments / presidential offices were necessary!**

## CADUC I, Dushanbe, Tajikistan, 8 - 12 April 2019



**4 sessions: dust**  
sources, at transport, sinks, impacts  
**80 participants from 17 countries**

### Funding => saves time in organization



- TROPOS project funded by Volkswagenstiftung => **budget**
- **actions were possible two years before start of conference**
- website, abstract management system, proofreading, procedure, and creation of conference proceedings
- (straightforward) contracts between suppliers and TROPOS (w/ NAST) regarding advertising, room, internet, bus, hotel etc. in time



## CADUC II, Nukus, Uzbekistan, 15 - 22 April 2024



**7 sessions: dust**  
sources, at transport, sinks, Aral Sea region as source and sink, impacts, early warning systems, success stories in controlling SDS  
**80 participants from 14 countries**

### No funding, complex organization, many last - minute actions

- 3 visits to Uzbekistan
- organizing committee (helped a lot)
- scientific committee (was partly active)
- website, start of abstract managing system (without having the approval by Uzbek government)
- „last-minute“ application for conference to the president
- **presidents approval, but no funds**  
=> **hybrid conference + Uzbek colleagues took over the financial responsibility**
- contracts between suppliers and Karakalpak State University regarding advertising, room, internet, bus, etc.



## CADUC III, Turkistan (?), Kazakhstan, 2028 (?)

=> **would need funding!** => **who would fund a dust conference?**  
=> needs: 3 visits, budget, organizing and scientific committee

**Planned: Steering Committee**  
**Question: institution behind the Steering Committee?**  
=> **World Meteorological Organization?**

## CADUC I & II: Links to conferences + proceedings

**Conferences:** <https://www.e3s-conferences.org/caduc-2019> and <https://www.e3s-conferences.org/caduc-2024>  
**Proceedings:** <https://www.e3s-conferences.org/articles/e3sconf/abs/2019/25/contents/contents.html>  
<https://www.e3s-conferences.org/articles/e3sconf/abs/2024/105/contents/contents.html>

# Climate Change Impact on Water Resources and Cryosphere in Central Asia

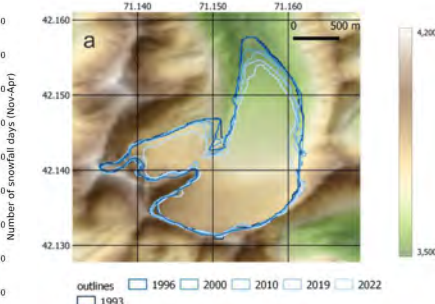
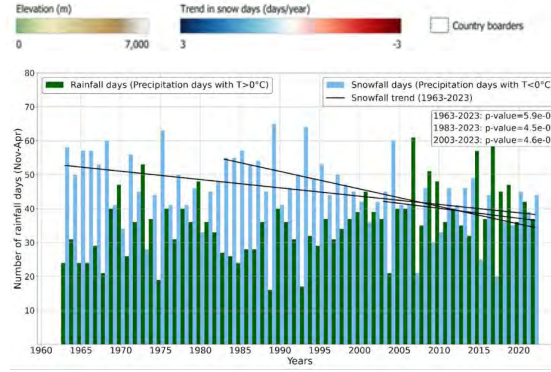
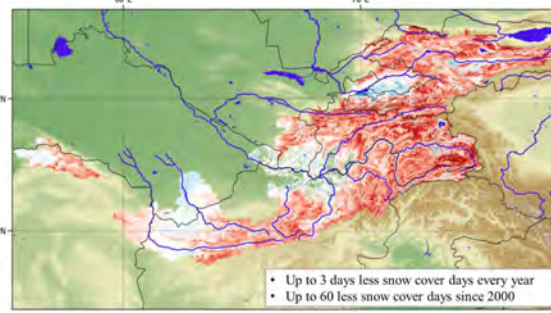
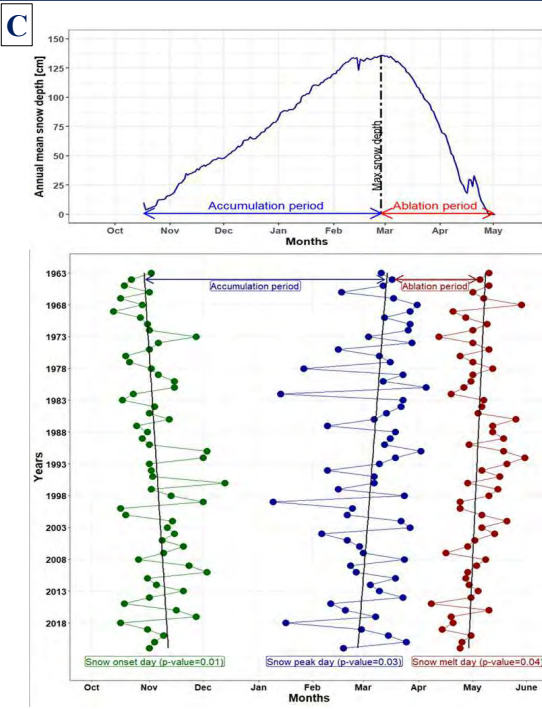
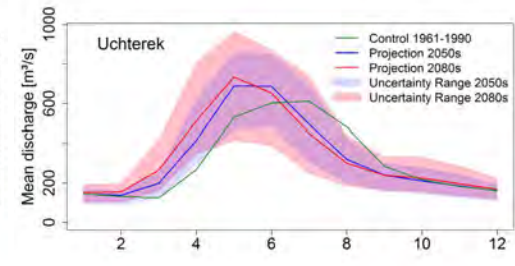
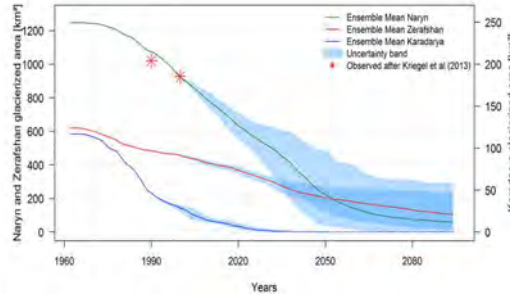
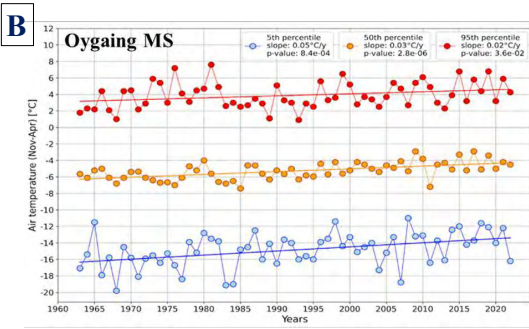
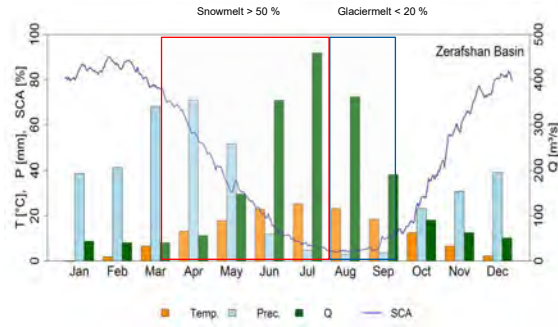
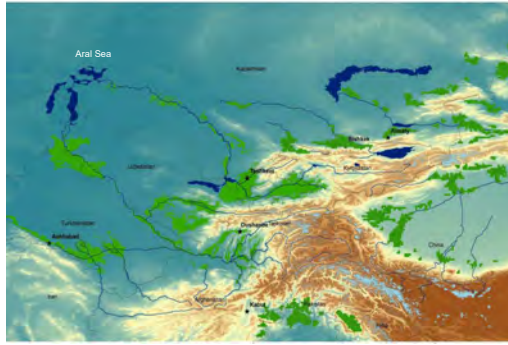
Abror Gafurov<sup>1</sup>, Adkham Mamaraimov<sup>1</sup>, Astrid Krahn<sup>1</sup>, Olga Kalashnikova<sup>2</sup>, Till Weiss<sup>1</sup>, Djafar Niyazov<sup>3</sup>, Tursyn Tillakarim<sup>4</sup>

1- GFZ Helmholtz-Centre for Geosciences, Potsdam, Germany; 2-Central Asian Institute of Applied Geosciences (CAIAG), Bishkek, Kyrgyz Republic; 3-Institute of Water Problems, Hydropower and Ecology, Dushanbe, Tajikistan; 4-National Hydrometeorological Service of Kazakhstan (Kazhydromet), Astana, Kazakhstan

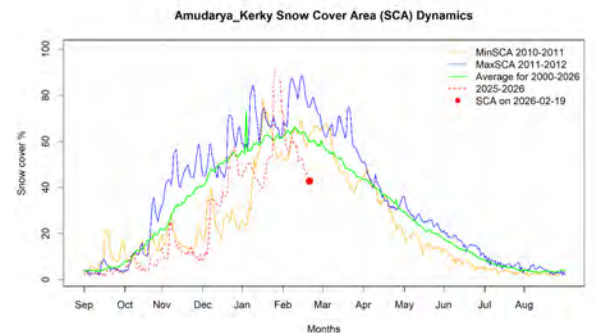
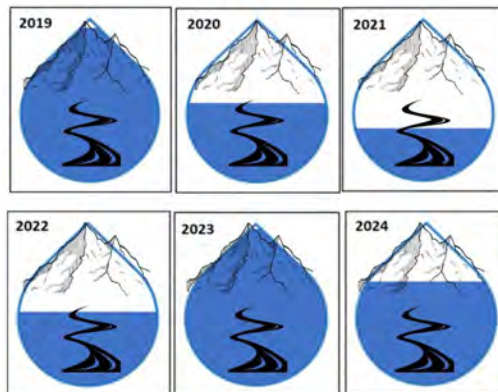
**A** Water resources in Central Asia are mainly used for agricultural production and hydropower generation. The region is highly vulnerable to the impacts of ongoing climate change.

Glacier and snow in the mountains of Pamir and Tian Shan, which are the main hydrological components of water formation, are melting with unexpected speed that can lead to severe water shortages in the near future.

Climate change is also affecting the frequency of natural hazards such as floods or droughts. This requires adaptation into climate change and establishing early warning systems.



## D Utilizing advanced methods with MODSNOW for climate sensitive water resources management in Central Asia



# Deutsch-Usbekischer Lehrstuhl für Agrarökonomie Zentralasiens an der Internationalen Agraruniversität in Taschkent, Usbekistan

Ihtiyor Bobojonov, Lena Kuhn



## Einführung

- Der Deutsch-Usbekische Lehrstuhl für Agrarökonomie in Zentralasien (GUCAE) wurde 2018 an der TSAU gegründet.
- Anfängliche Finanzierung durch die VolkswagenStiftung
- Anschließende Finanzierung durch die IAU und das usbekische Bildungsministerium
- Plattform für gemeinsame Forschung, Projektanträge, wissenschaftliche Veranstaltungen
- Austausch zwischen IAMO und lokalen Interessengruppen
- Drei Postdoktoranden, fünf Promovierende sowie ein Habilitierender
- Assoziierte Forscher des IAMO
- Gemeinsamer Doktorandenausschuss an der IAU

### Lehrstuhl Personall



### Doktoranden und Habilitierende



### IAMO Wissenschaftler



### Alumni



Abbildung 1: Mitglieder des Lehrstuhls

## Internationale Qualität

- Unterricht in englischer Sprache nach internationalen Standards
- Analyse von Sekundärdaten
- Erhebungen in landwirtschaftlichen Betrieben
- Durchführung Feldversuchen und Verhaltensexperimenten
- Datenanalyse, Peer-Review-Zeitschriftenartikel
- Zusammenarbeit mit internationalen Organisationen (z. B. CGIAR, Weltbank)

## Forschungsthemen

- Auswirkungen des Klimawandels auf Landwirtschaft und Ertragssicherheit
- Wasser- und Bewirtschaftungsmanagement unter Unsicherheit
- Agrar- und Marktstrukturelle Umstellungen in Transformationsökonomien
- Agrar- und Wetter-Versicherungen
- Effizienz der landwirtschaftlichen Produktion
- Ernährungssicherheit & Resilienz ländlicher Haushalte
- Einsatz von Fernerkundung und maschinellem Lernen

## Wissenschaftlicher Transfer und Kontaktstelle

- Enge Zusammenarbeit mit usbekischen Ministerien
- Beteiligung an der Organisation hochrangiger Treffen in Deutschland und Usbekistan
- Umsetzung von Forschungsergebnissen unter realen Bedingungen
- Information über Bedarfe auf nationaler Ebene

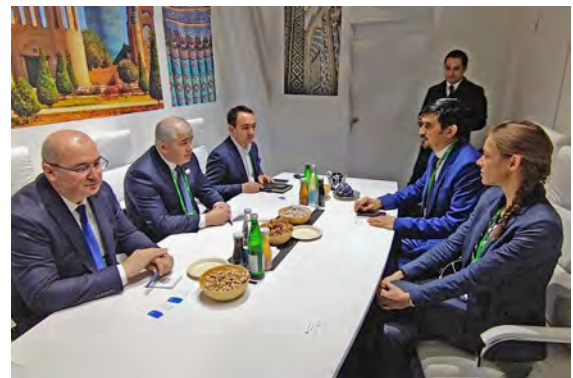


Abbildung 2: Treffen von Ihtiyor Bobojonov und Lena Kuhn mit stellvertretendem Landwirtschaftsminister Akmaljon Kosimov

## Ausgewählte Publikationen

Bobojonov, I., Kuhn, L., Egamberdiev, B., Glaben, T., Lambrecht, I., & Akramov, K. (2026). Consequences of increased farm resilience on food security in Tajikistan. *Food Security* [in press].

Djuraeva, Mukhayyo; Bobojonov, Ihtiyor; Kuhn, Lena (2026) To specialize or not to specialize?—A technical efficiency analysis in three transition economies. *European Review of Agricultural Economics* 53 (1): 177-213.

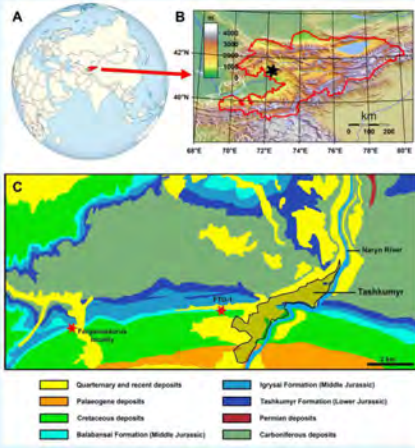
Egamberdiev, Bekhzod; Bobojonov, Ihtiyor; Kuhn, Lena; Glaben, Thomas; Akramov, Kamiljon T. (2024) Household resilience and coping strategies to food insecurity: An empirical analysis from Tajikistan. *Applied Economic Perspectives and Policy* 46 (4): 1646-1661.

## Vor Ort - Finanzierung aus Usbekistan - Internationale Forschung

# Dinosaurier in Kirgisistan

## Die ideale Verbindung zwischen Europa und Ostasien

Tom Hübner, Oliver Rauhut, Oliver Wings, Jakob Stubenrauch, Thomas Voigt, Richard Butler, Susannah Maidment, Aizek Bakirov, Zhanyi Namazbekova



A: Lage Kirgistan in Zentralasien; B: Fundregion innerhalb des Landes; C: Wichtige, bereits bekannte Fundpunkte von Dinosauriern in der Balabansai Formation



Das Team zu Beginn der zweiten Expedition an einem Denkmal des Nationalhelden Kirgistan, Atake Batyr, nördlich der Kleinstadt Tashkumyr im April 2025

### Die Partner 2025:

- 1: Institute of Geology n.a. M.M. Adyshev, National Academy of Sciences of Kyrgyz Republic, Bishkek
- 2: Friedenstein Stiftung Gotha
- 3: Friedrich-Schiller-Universität Jena
- 4: Bayerische Staatssammlungen für Paläontologie und Geologie
- 5: Naturkundemuseum Bamberg
- 6: University of Birmingham
- 7: Natural History Museum London

### Das Projekt

- Titel** → Investigation of the dinosaur fauna of the Middle Jurassic Balabansai Formation of Kyrgyzstan and insights into the evolutionary radiation and biogeography of dinosaurs in central Asia
- Vorhaben** → Entdeckung, Aufbereitung und wissenschaftliche Analyse von Fossilien von etwa 165 Mio. Jahre alten Dinosauriern und anderen Landtieren als Verbindung zwischen den Lebewelten des damaligen Europas und Ostasiens
- Ziele** → 1) Entdeckung neuer Arten von Dinosauriern und anderen Landtieren;  
2) Verkleinerung der Wissenslücken in der Evolution von Landökosystemen in Zentralasien;  
3) Rekonstruktion früherer geografischer Landverbindungen oder Barrieren, die die Evolution in Eurasien beeinflusst
- Bisherige Förderung** → Sachbeihilfe durch die Deutsche Forschungsgemeinschaft (DFG) in Form eines Erkundungsprojekts
- Perspektiven** → 1) Nach erfolgreicher Erkundungsphase werden Förderanträge in Deutschland und Großbritannien gestellt;  
2) Bei Erfolg wird eine kirgisische Wissenschaftlerin an der Ludwig-Maximilians-Universität ein Promotionsstudium absolvieren;  
3) Kirgisische Kollegen sollen in technischer Präparation und konservatorischer Sammlungspflege ausgebildet werden;  
4) Ziel ist die nachhaltige Entwicklung eigenständiger geowissenschaftlicher Grundlagenforschung in Kirgisistan mit wissenschaftlichem Nachwuchs und Infrastruktur



Eingangsbereich des Institute of Geology n.a. M.M. Adyshev, National Academy of Sciences



Präparation, Konservierung, Beschreibung und Dokumentation der Skeletteile des Raubdinosauriers *Alpkarakush* auf dem Hof des Instituts, 2023



Das Team von 2023 inkl. Fahrer und kirgisischer Studentin



Erhaltene Skeletteile von *Alpkarakush* Maßstab = 1m



Wirbeltierfauna aus der 165 Mio. Jahre alten Balabansai Formation. Grafik: Joshua Knüppe



Lebendrekonstruktion von *Alpkarakush* Paleoart: Joshua Knüppe 2024



Impressionen um und aus der Fundstelle von *Alpkarakush*

### Bisherige Ergebnisse:

- 2023 und 2025 Entdeckung mehrerer vielversprechender Fundstellen
- 2023 Gründung einer systematisch geordneten Fossilensammlung im Institute of Geology in Bishkek
- 2024 Veröffentlichung des ersten kirgisischen Groß-Raubdinosauriers: *Alpkarakush kyrgyzicus*
- 2025 Etablierung eines breiten wissenschaftlichen Netzwerks mit Partnern aus Deutschland, Großbritannien und Kirgisistan
- 2026 gestiegenes öffentliches Bewusstsein für das landeseigene naturkundliche Potential sowie steigende Unterstützung aus Regierungskreisen für Förderung und Ausstellung der Forschung



Knochen-Puzzle im Sammlungsraum des Institutes of Geology



Prospektieren im Gelände rund um Tashkumyr



Mehrere neu entdeckte, vielversprechende Fundstellen von Dinosauriern westlich von Tashkumyr



2025 frei gelegter Schwanzwirbel eines Langhals-Dinosauriers

# Droughtmap-ASB: Near Real-Time Monitoring for Environmental Sustainability and Decision Support in Central Asia



## Needs Assessment for a Digital Drought Early Warning System in Central Asia

Vast arable lands & centuries of agricultural experience and knowledge.

Growing interest in water & climate cooperation in the region.

Increased satellite data access and usage for monitoring vegetation, soil moisture & drought monitoring (e.g., CaWA, CAREC).



Satellite-based tools for early drought alerts at the local scale.

Data-driven opportunities for water-efficient irrigation & drought-resistant crop management.

Leverage remote sensing to improve predictions & farmer advisories.



Lack of drought-specific digital tools, in particular for water supply assessment in irrigation.

Fragmented (operative) early drought warning.

Low institutional capacity and financial potential for (analysing digital data in) local drought risk management.



Food insecurity & malnutrition from drought-driven crop failures.

Mass livestock deaths & rural livelihood collapse from pasture/water shortages.

Migration, health crises & local conflicts from prolonged water scarcity & economic distress.



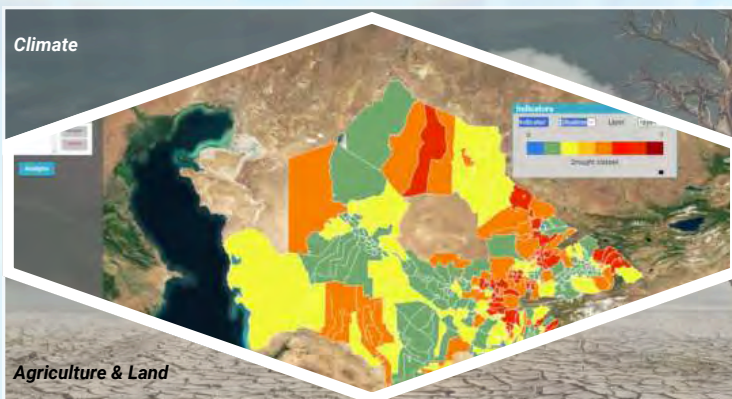
## Information

... is provided via an interactive map and Drought Information Dashboard:

- Indicators showing agricultural and meteorological drought, its occurrence, duration, and severity on a 10-day basis.
- Assessment-ready data at a bi-weekly, monthly, and seasonal scale.

... is also accessible through automated PDF Drought Bulletins

The web-based Droughtmap-ASB integrates satellite data, climate indices, and historical records uses Copernicus (Sentinel-3) and other open-access European geodata, i.e., ERA5.



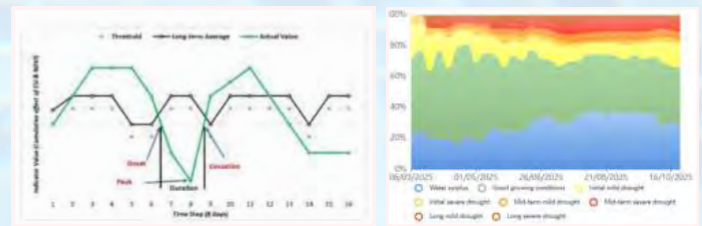
Dashboard of Droughtmap-ASB tool  
(accessible from <https://droughtmap.geo.uni-halle.de/droughtmap>)

## Next steps

- Elaboration of Forecasting and Options for optimized regional water allocation and use (**Integrated Water Management Framework**).
- Drought information will be systematically linked with snow depth, snow cover extent, and reservoir storage dynamics.
- Reservoir release patterns will be analyzed in relation to irrigation water demand.

## The new System ...

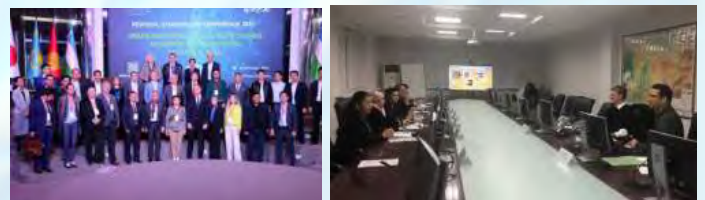
- continuously observes **vegetation status and water consumption** based on satellite data (Earth Observation).
- operates throughout **all ecoregions of Central Asia** and on irrigation systems in the Aral Sea Basin in particular (transboundary information system).
- provides near-real-time information.
- enables **assessments of irrigation water availability and climate-related agricultural stress** (basis for decision making).
- **supports daily operations of hydrometeorological and water supply services** in the Aral Sea Basin and across Central Asia.
- has high potential to **support integrated water resources management (IWRM) and disaster preparedness** in the region.



Calculations and Visualization: Drought Indicators & their visualization in frontend

## Roles, Implementation and Transfer

- All partners are involved in **tool development, capacity building, and policy-science dialogue**.
- Activities are conducted online and in person using an **agile implementation approach**.
- Technical requirements are collected from partner countries.
- MLU and GFZ are implementers.



Development and Transfer: Workshops, Visits and Trainings with partners from Central Asia, Contribution to Conferences in the Green Central Asia Context

## Project Summary

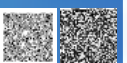
- Funding:** Federal Foreign Office of Germany through GIZ
- Duration:** October 2024 - October 2026 (Current Phase)
- Partners:** MLU, GFZ (Potsdam), GIZ, Hydrometeorological Services of all five CA countries
- Target Group:** Scientists, Hydromets, Basin Water Organizations, Ministries of Water, Agriculture, and Environment, others
- Coordination:** GIZ (Central Asia)

Contact : Dr. Muhammad Usman, Matthias Völkel and Prof. Dr. Christopher Conrad

[muhammad.usman@geo.uni-halle.de](mailto:muhammad.usman@geo.uni-halle.de)

<https://geo.uni-halle.de/en/geoecology/home/>

Department of Geoecology, Martin Luther University Halle-Wittenberg



# EU for a Green Turkmenistan

## Policy Dialogue and Climate Action 2024-2028

More information about the project:



www.greencentralasia.org

### Our aim:

- Establish an effective dialogue and partnerships in the areas of energy, environment and climate policy between the EU and Turkmenistan
- Support the implementation of Turkmenistan's National Climate Strategy
- Promote the implementation and maintenance of international best practices and standards
- Development and implementation of capacity-building programmes for adaptation measures

### Background:

- Turkmenistan is affected by climate change and faces major environmental challenges
- Greenhouse gas and methane emissions intensify atmospheric feedback loops and accelerate global warming
- Turkmenistan acknowledges the global climate crisis and is taking action at international levels by signing the Paris Agreement and joining the Global Methane Pledge
- National climate strategies focus on renewable energy, reducing greenhouse gas emissions and sustainability

### Our approach:



Review project implementation results, discuss and approve future activities among stakeholders from Turkmenistan, the EU and Germany: Third Steering Committee Meeting held in Ashgabat



Delegation trips and study visits to support and strengthen policy dialogue: A Turkmen delegation visits the German Federal Ministry of Research, Technology and Space, the Federal Foreign Office, and the Embassy of Turkmenistan in Berlin



Signing of memoranda to initiate joint educational programmes and research activities: The rector of the State Energy Institute of Turkmenistan signs an MoU with Martin Luther University Halle-Wittenberg in Mary



Facilitating international exchange of expertise: German scientist discuss project evaluation and implementation of photovoltaics with teachers and government officials in Mary



Interactive workshops and practical trainings for teachers: Introduction to the fundamentals of renewable energy and applied software tools at the State Energy Institute



Strengthening cross-regional collaboration between the EU and Central Asia: Turkmen and Uzbek scientists exchange knowledge on algae-based drainage water treatment in Nukus



Pilot project showcasing sustainable solutions to promote energy-efficient technologies and improve water quality in the country's agricultural sector

### Interested?

Join us in realising innovative pilot projects in Turkmenistan, focusing on renewable energy, methane reduction, microalgae and other sustainable solutions.

### Please get in touch:

We support your scientific cooperation in Turkmenistan!



Dr. Moritz Koza  
Department of Geoecology  
Martin Luther University Halle



moritz.koza@geo.uni-halle.de  
www.linkedin.com/in/moritzkoza

# FID Central Asia

Central Asia & Siberia Specialized Information Service



[www.fid-cassib.de](http://www.fid-cassib.de)

Fotos: Johannes Rechel, SUB Göttingen

## Our Regions

Kazakhstan  
Kyrgyzstan  
Uzbekistan  
Turkmenistan  
Siberia  
Mongols  
Sinkiang



## We are specialized in

The acquisition of printed and digital literature on the autochthonous peoples of Central Asia and Siberia

The construction of the "Web Archive Central Asia" in cooperation with the Center for Research Libraries (CRL)



## Our Objectives

Our aim is to collect information from cultural sciences and the humanities on indigenous peoples of Central Asia and Siberia and to offer it central and freely accessible on a supra-regional level. We want to actively support research in and on these regions by developing networks and by offering transparent information.



## Our Challenges

Access to and acquisition of minority literature against the background of political and structural problems of multi-ethnic societies



# IAMO Central Asia Research Group

Coordinators: Ihtiyor Bobojonov, Nodir Djanibekov, Kathleen Hermans, Lena Kuhn, Daniel Müller

30 active members at IAMO, including 15 doctoral researchers



## Motivation

- Ongoing agricultural transformation in post-Soviet Central Asia
- Agriculture is key to income, social stability, and food security
- Rising demand, slowing productivity, and environmental pressures challenge sustainability outcomes
- Climate change increases water demand, yield volatility, and producer risks

## Aim

- Multidisciplinary research and cross-department collaboration
- Policy-relevant science with economic impact
- Regional knowledge transfer and capacity building



Fig. 1: Regional cooperation partners

## Activities and Achievements

- **Publications & Academic Output:** >100 peer-reviewed journal papers (since 2016), 18 finalized PhDs (since 2015)
- **Events & Conferences:** seven organized regional conferences, participation in regional and international conferences, and workshops
- **Capacity Building:** Training of agricultural economists, enhancing academic curricula in Central Asia
- **Policy & Stakeholder Engagement:** Policy Briefs, frequent meetings with ministries, international agencies, and regional stakeholders
- **Research Projects:** >20 third-party funded projects
- **Institutional Development:** German-Uzbek joint Chair, Structured Doctoral Programme, Experimental lab in Uzbekistan
- **Media & Outreach:** Active presence in international, local, and social media
- **Data Science:** Recognition in the data science competition on Water Supply Forecasting (2025), organized by DrivenData and the U.S. Bureau of Reclamation

## Major Research Projects

- **Establishment of a Joint Research Structure for the Conservation of Fruit Genetic Resources in Central Asia with the Potential for the Breeding of Climate-Tolerant Crops (KLINU)**  
BMFTR | 2026-2028
- **Rural Community Resilience in Central Asia (CARE)**  
Volkswagen Foundation: Change! Research Group | 2025 – 2030
- **The Agricultural Policy Trilemma in Post-Soviet Countries: Cultivating Growth amidst Complexity (TRILEMMA)**  
DFG | 2024 – 2028
- **SUSADICA Data Reuse - Data Reuse on Sustainable Agricultural Development in Central Asia**  
Volkswagen Foundation | 2025 – 2026
- **Transcending Boundaries: Navigating Mobility and Persistence in Arid and Degraded Landscapes (TransMoP)**  
Leibniz Association | 2026 – 2031
- **UzFarmBarometer - Better Understanding of the Adoption of Sustainable Agricultural Practices in Uzbekistan**  
BMFTR, Ministry of Higher Education, Science and Innovation of the Republic of Uzbekistan | 2023 – 2026
- **Increasing Climate Resilience via Agricultural Insurance – Innovation Transfer for Sustainable Rural Development in Central Asia (KlimALEZ)**  
BMBF | 2017 – 2024
- **An Innovative Pilot Program on the Re-Integration of Scientists to Central Asia: Research and Capacity Building on Food Chains under Climate Change (IPRES)**  
Volkswagen Foundation | 2018 – 2024
- **Central Asian Water Conflict & Migration Network (CAWAMNET)**  
DAAD | 2023 – 2024

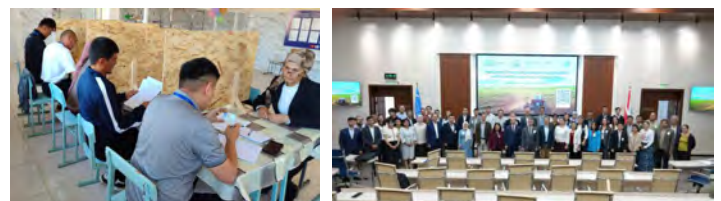


Fig. 2: (from left to right) Lab-in-the-field experiments with smallholders in Kyrgyzstan; Conference Agricultural Sustainability and Rural Development in Central Asia, Tashkent

## Recent key publications

- Bobojonov, I., Kuhn, L., Egamberdiev, B., Glauben, T., Lambrecht, I., & Akramov, K. (2026). Consequences of increased farm resilience on food security in Tajikistan. *Food Security* [in press].
- Hermans, K., Djanibekov, N., Abdullaev, I., Abduvalieva, N., A., Aliya, Blondin, S., Bobojonov, I., Conrad, C., Herzfeld, T. ... (2024). Future research directions for understanding the interconnections between climate change, water scarcity, and mobility in rural Central Asia. *Climate and Development*, 1-10.
- Kurbanov, Z., Tadjiev, A., Djanibekov, N., Akramkhanov, A., & Govind, A. (2024). Farmers' participation in messenger-based social groups and its effects on performance in irrigated areas of Kazakhstan and Uzbekistan. *Agribusiness*.
- Umirbekov, A., Essery, R., Müller, D. (2024). GEMS v1.0: Generalizable Empirical Model of Snow Accumulation and Melt, based on daily snow mass changes in response to climate and topographic drivers. *Geoscientific Model Development* 17.

# Klimasensibles Wasserressourcenmanagement in Zentralasien

Projektlaufzeit: 2023 – 2026

Projektleitung: Prof. Dr. Christopher Conrad & Prof. Dr. Anne-Kathrin Lindau



## HINTERGRUND

Die Länder Zentralasiens sind durch gemeinsame Wasserressourcen miteinander verbunden und ein großer Teil der Bevölkerung ist von der Bewässerungslandwirtschaft abhängig. Gemeinsam stehen diese Länder vor den Herausforderungen begrenzter Wasserressourcen, die sich weiter verstärken durch:

- ❖ Klimaveränderungen
- ❖ steigende Wassernachfrage aufgrund des Bevölkerungswachstums und der sich entwickelnden Volkswirtschaften
- ❖ erhöhtes Risiko von Wasserkonflikten

Daher wird nach Möglichkeiten gesucht, die Nutzung der Wasserressourcen länderübergreifend zu optimieren. Der Umsetzung des IWRM wird dabei eine wichtige Rolle zugeschrieben. Die nationalen Organisationen sind für die Bewirtschaftung und Verteilung der Wasserressourcen auf der Ebene des lokalen Flussgebietes verantwortlich.

Es fehlt jedoch ein klima- und gendersensibles Integriertes Wasserressourcen-Management (IWRM).



IWRM Water Security Framework  
(Quelle: Global Water Partnership, 2026)

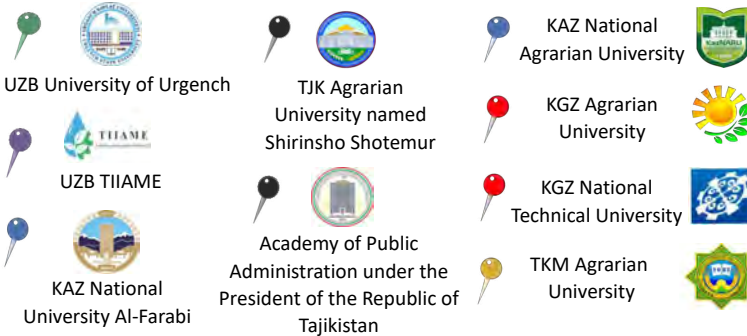
## ZIELE

**Stärkung der Kapazitäten von Fachpersonen der nationalen/regionalen Organisationen von Flusseinzugsgebieten zur Anwendung des praxisorientierten klima- und gendersensiblen IWRM in Zentralasien**

Das Ziel wird erreicht durch folgende Maßnahmen:

- ❖ Entwicklung eines Zertifikatskurses zu IWRM in Zentralasien zur Fortbildung von praxisorientierten Multiplikator\*innen
- ❖ Förderung der transnationalen Kooperation, insbesondere Wissens-, Bildungs- und Forschungstransfer zwischen den beteiligten Akteur\*innen
- ❖ Erweiterung der Kapazitäten der zentralasiatischen Universitäten in den Bereichen Wasserwirtschaft, Methodik und Pädagogik
- ❖ Schulung von ausgewählten Vertreter\*innen der nationalen Organisationen von Flusseinzugsgebieten

## PROJEKTPARTNER



<https://mlu.maps.arcgis.com/apps/mapviewer/index.html>

## AKTIVITÄTEN & ERGEBNISSE

- ❖ Auf zahlreichen Workshops in Deutschland und den Partnerländern abgestimmte Formate zur Wissensvermittlung für IWRM, v. a. im Bereich der länderübergreifenden Einzugsgebiete
- ❖ Ongoing: Gemeinsame Entwicklung eines Zertifikatskurses zu IWRM in Zentralasien für Wassermanager\*innen in Flussgebietsorganisationen, bestehend aus Textbook und Handbook



Textbook

Handbook

Beispielseiten des Handbooks

## HERAUSFORDERUNGEN

- ❖ Einigung auf ein einheitliches fachliches Verständnis
- ❖ Sprachbarriere (Russisch und Englisch als Vermittlungssprachen)
- ❖ Kaum Einbindung von Early Career-Fachkräften, um die langfristige Nutzung des Zertifikatskurses und weiterer Projektergebnisse zu gewährleisten
- ❖ Unterschiedliche Ausgangsbedingungen bei den Hochschulpartnern (Forschung und Lehre zu IWRM)
- ❖ Mangelnde Kommunikation und Kooperation der Hochschulen in die und mit der Praxis
- ❖ Fehlende Erfahrung und teilweise fehlendes Verständnis des Mehrwertes von Partizipationsformaten sowie neuen Impulsen aus Didaktik und Methodik



Bewässerungsanlage von Baumwollfeldern bei Samarkand (UZB)



Research Stay in Halle (2025)



Entwicklung und Testung von Materialien für den Zertifikatskurs



Reflexion von IWRM-Konzepten mithilfe von LEGO® SERIOUS PLAY®



# KoDaNetØst

Collaborative Data Network with Eastern Europe

## OBJECTIVES

- Bringing researchers & institutions together
- Simplifying data exchange
- Visualising existing data
- Discussing standards & challenges

## BACKGROUND

- Lack of sustainable networks between researchers in Western and Eastern Europe
- Difficult conditions for research and data collection in/about/with Eastern Europe
- Different academic standards & cultures
- Different legal requirements & unstable funding

## UNDERLYING PRINCIPLES

- Collaboration at eye level
- Good scientific practice
- FAIR principles
- Interdisciplinary
- Transregional

## CORE TOPICS

- Democratic consolidation
- Human-environment relations & climate change
- Conflict dynamics & protest movements
- Minorities & diversity



# LILA

## Lake Issyk-Kul Laboratory

### The German-Kyrgyz center on sustainable research of Central Asian Lakes

Georgiy Kirillin<sup>1</sup>, Artyom Spirin<sup>2</sup>, Samsaly Alymkulov<sup>3</sup>, Hans-Peter Grossart<sup>1</sup>

<sup>1</sup>Leibniz-Institute of Freshwater Ecology and Inland Fisheries, Berlin, DE

<sup>2</sup>OpenEyes GmbH, Almaty, KZ <sup>3</sup>Kyrgyz State Technical University named after I. Razzakov, Bishkek, KG

### REGIONAL CHALLENGE

Central Asian lakes, the region's "local oceans," face severe pressure from water use and climate change. Despite their global importance, sustained long-term research infrastructure has been lacking.

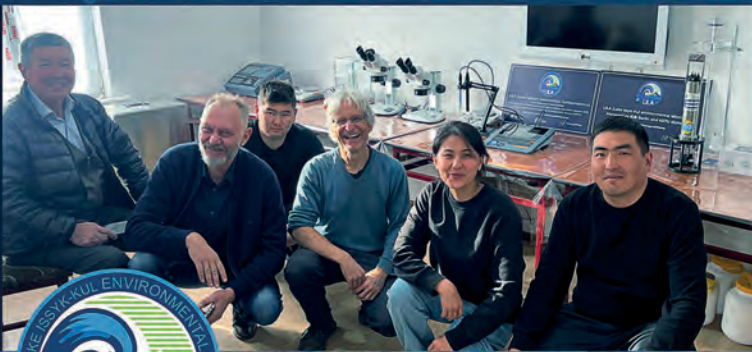


### NEW RESEARCH INFRASTRUCTURE

LILA is the new permanent German-Kyrgyz research facility established to address environmental challenges across Central Asian lakes. It serves as a hub for sustainable research and regular monitoring of major water quality characteristics (operational since 2025).

### FIRST PROJECT AND LAKE EXPEDITION

The DFG-funded project "LakeLink" is LILA's first major research initiative, focusing on the biological productivity of Lake Issyk-Kul. Initial data were successfully collected during the 2025 field expedition, including two research cruises aboard the R/V Moltur, carried out in close collaboration with the Kyrgyz Ministry of Natural Resources.



**LILA LAKESHORE LABORATORY (PERMANENT BASE)**

Sample preparation, documentation, storage, and lab analysis.

Sediment and water samples: handling, archiving, and processing.

**NEARSHORE LONG-TERM BUOY STATION**

Continuous measurements tracking seasonal and interannual variability.

**COASTAL CTD PROFILES AND SEDIMENT SAMPLING**

High-resolution CTD casts in the nearshore zone, paired with targeted sediment sampling to link water-column dynamics with the lakebed record.

**OPEN LAKE TRANSECTS**

Repeated stations across fixed GPS points—CTD casts and water sampling to build a comparable dataset over time.

### STRATEGIC OUTLOOK & SYNERGY

LILA serves as the new regional platform for scientific collaboration and **science diplomacy**. **Key priorities:**

HOSTING INTERNATIONAL RESEARCH & EDUCATIONAL GROUPS

SUPPORTING LARGE-SCALE, INTERDISCIPLINARY FIELD CAMPAIGNS

CAPACITY BUILDING: TRAINING LOCAL STUDENTS IN ENVIRONMENTAL SCIENCES

FACILITATING KNOWLEDGE TRANSFER TO GOVERNMENTAL AGENCIES AND STAKEHOLDERS

2025

# NETSTAN – Networking for Climate, Environmental and Social Smart Cities in Central Asia

Leuchner M<sup>1</sup>, Kretzer M<sup>1</sup>, Gulyamova L<sup>2,6</sup>, Egamberdiev E<sup>2</sup>, Broomandi P<sup>3</sup>, Kim J<sup>3</sup>, Bagheri M<sup>3</sup>, Abdullaev I<sup>4</sup>, Xen A<sup>5</sup>, Fayzullaev K<sup>5</sup>, Muratova N<sup>6</sup>, Tursunov D<sup>7</sup>

<sup>1</sup>Physical Geography and Climatology, RWTH Aachen University, Germany, <sup>2</sup>Tashkent State Technical University, Uzbekistan, <sup>3</sup>Nazarbayev University, Kazakhstan, <sup>4</sup>National University of Uzbekistan, <sup>5</sup>Department of Digital Development, Tashkent City Administration, Uzbekistan, <sup>6</sup>Fulbright Association Uzbekistan, <sup>7</sup>Consulting Business Management LLC, Uzbekistan

## 1 Objectives

- Urban areas are experiencing **more frequent and more intense climatic extremes** and compound events leading to major health and social impacts on the population
- Urban structures **need to adapt** to the new demands of global change
- NETSTAN aims to build **new institutional networks in Central Asia**
- A fact-finding mission and two networking workshops were conducted
- Thematic focus: **climate change adaptation** measures against the **compound risks of heat and air pollution** and other stressors
- Role of **multifunctional green spaces and biodiversity** and their impact on the provision of **ecosystem services**

## 2 Institutional Partners



CONSULTING  
BUSINESS  
MANAGEMENT

## 3 Workshops in Tashkent and Aachen in 2025

### Workshop I: 17–20 March 2025 in Tashkent

- Visit of Tashkent City Khokimiyat, Department of Digital Development
- Field trip to urban hotspots, urban green infrastructures and developing sites
- Involvement of various stakeholders and perspectives during the workshop
- Plenary discussions, World Café, small group breakouts
- Identification of major urban challenges in Central Asia

### Workshop II: 30 September–2 October 2025 in Aachen

- Excursion to research sites and the transforming landscapes of Aachen and the Rhenish mining area
- Plenary discussions, World Café, Round Tables
- Involvement of various stakeholders and perspectives during the workshop
- Learning from each other with each other
- Development of a concrete roadmap for a NETSTAN 2.0 proposal



## 4 Results

- **Strengthened network** between project partners through intensive interaction in workshops, online meetings, field trips and social events
- Expanded network with **several new partner institutions** from Central Asia for cooperation in climate and environmental research, education curricula, and scientific structures
- **Clearly identified urgent topics** towards climate, environmental and social smart cities in Central Asia: integration of **nature-based solutions** contributes significantly to the development of economically, ecologically and socially viable **urban sustainability strategies**
- Target groups are local decision-makers, educators, researchers, students and other local and national stakeholders in the areas of:
  - Urban and Environmental Planning
  - Geography
  - Climate Sciences
  - Landscape Architecture
  - Environmental Protection and Education

## 5 Way Forward: NETSTAN 2.0

- **Institutionalization** of the network for long-term cooperations
- Establishment of the **Central Asian-German Urban Resilience Hub (CENTAUR)**
- **Vision:** Consolidate CENTAUR as a stable **regional center of excellence** that supports research and training cooperation, community engagement, and capacity building in the areas of urban climate, nature-based solutions, ecological and social resilience, health, and governance for **future urban challenges in Central Asia**



Structure of the CENTAUR with the three sub-areas NET, INNO, and KNOW

## Project

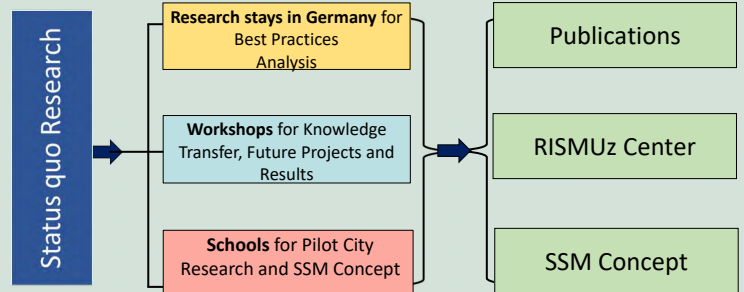
With experience gained during the forerunner of this project, the SUMRICA project, as well as with that of the central project partners, RISMUz is aimed at the **exchange of experience** and transfer of worldwide **best practice knowledge** to and between the partners involved in the sustainable design of urban-rural systems, especially with regard **to the establishment of sustainable mobility** based on analysis of deficits in integrated spatial and transport planning in Uzbekistan.

## Challenges

- high percentage of **unplanned suburbanization** in Uzbekistan as an outcome of development distortions in urban-rural systems in the 1990s;
- **unsustainable** urban and transportation **development** leading to **pollution weakening** of the public transport system;
- the rise of private motorization typical for former USSR leading to **more CO2 emissions**.

## Objectives and Methods

- the **pilot region of Urgench** will be used as an example to gain insights into deficits in integrated spatial and transport planning in Central Asian countries, analyze their causes and **develop strategies for sustainable design – SSM concept**;
- a series of **research stays** by Uzbek partners and **workshops** in Germany as well as **schools and research in Uzbekistan** with the participation of German and Uzbek scientists, employees of local authorities such as city administrations and planning institutions such as planning offices and non-governmental organizations (NGOs);
- establishing a regional research and innovation center (knowledge hub) for sustainable, integrated urban and mobility planning in Uzbekistan – **RISMUz Center**;
- RISMUz targets at **forming international partnerships** through professional exchanges between Uzbek and German experts in **the field of mobility**.



## SSM Concept

aims at:

- expansion and improvement of **smart and public transport in Urgench**;
- reducing **car dominance and dependency**;
- strengthening **active modes** (walking and cycling);
- creating **inclusive and accessible mobility** in metropolitan areas.



## RISMUz Center

is targeted to:

- **contribute to a better level of knowledge** in spatial and transport planning in Uzbekistan and other Central Asian countries;
- **disseminate the acquired knowledge** for future urban and transport planning in Central Asian countries;
- **ensure the continuity** of knowledge and discourse between stakeholders on mobility solutions;
- in a later phase, **to finance itself independently** by acquiring third-party funding and offering consulting and seminars as well as working in cooperation with universities.

#### Kontakt:

Technische Universität Berlin  
Center for Technology and Society  
Research unit „Mobility and Space“  
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Kaiserin-Augusta-Allee 104  
D-10553 Berlin

Tel. +49 30 31425230  
[wulf.holger.amdt@tu-berlin.de](mailto:wulf.holger.amdt@tu-berlin.de)  
<http://www.tu.berlin/ztg/mobility>

**Projektwebsite:**  
<https://www.tu.berlin/ztg/rismuz>

**Projektteam:**  
Dr.-Ing. Wulf-Holger Arndt (Projektleiter)  
Ilyya Sogolov  
Aikena Orolbaeva  
Emre Sevim  
Sofia Sazonova

**Funded by:**  
German Federal Ministry of Education and Research (BMBF)  
and the Ministry of Innovative Development of the Republic of Uzbekistan

**Running time:**  
1.10.2023 – 30.9.2025



*Doctoral students: Jakhongir Babadjanov, Suray Charyyeva, Daniela Peña Guerrero, Barchynai Kimsanova, Zafar Kurbanov, Davron Niyazmetov, Kadyrbek Sultakeev, Abdusame Tadjiev, Atabek Umirbekov*

*Supervisors: Martin Petrick (Project leader) and Nozilakhon Mukhamedova (both University of Giessen)  
Nodir Djanibekov, Thomas Herzfeld, Daniel Müller (all IAMO)  
Insa Theesfeld and Ilkhom Soliev (both University of Halle)*

## Motivation

- Variety of challenges for sustainable agricultural development in Central Asia due to its cross-country diversity
- Lack of integrated view on the complex interrelations between reforms, resource management, and overall economic development
- Widespread Soviet-era management styles in public institutions in agricultural research and education
- New academic environment linking cutting-edge research to graduate education at international standards in the region

## Objectives

- To create a challenging, collaborative research environment for doctoral researchers in Central Asia
- To conduct cutting-edge research on leading issues related to sustainable agricultural development in Central Asia
- Project period: 2018 – 2023

## Recent spin-offs

### Data Reuse Initiative



- Better accessibility of SUSADICA farm survey dataset through preparation, cleaning, documentation and storing
- Development of target group-specific tutoring program in data analysis and evidence-based research

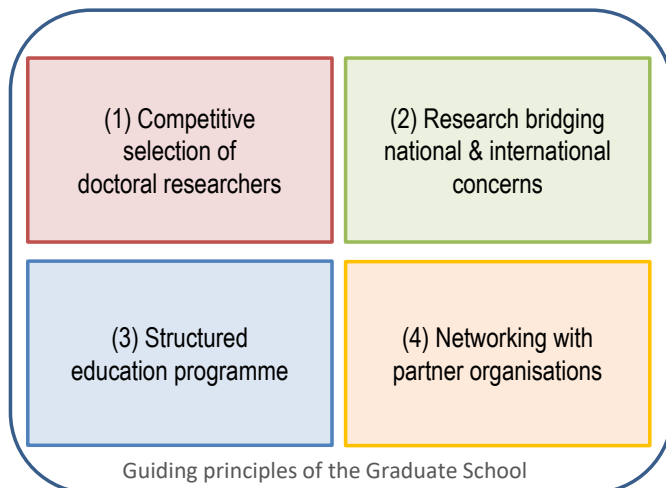


### Change! Research Group Rural Community Resilience in Central Asia



- Interdisciplinary framework for understanding and measuring rural community resilience using transdisciplinary approach

## Events and field research in SUSADICA



## Lessons learned

- Co-supervision can be challenging and requires good match
- Next career steps for PhD students depend a lot on academic environment
- Positive long-term effects to be expected (post-docs)

## Project achievements to date

- 6 doctoral defenses in Germany
- 21 peer-reviewed journal articles
- 5 science and policy briefs

## Project webpage



# Success and sustainability of digital health solutions in Central Asia in the Tuberculosis control area and beyond

Olga Hovardovska<sup>1</sup>, Berit Lange<sup>1</sup>, Harald Hoffmann<sup>2</sup>, Dirk Wagner<sup>3</sup>, Gulmira Kalmambetova<sup>4</sup>, Meerbubu Sydykova<sup>4</sup>, Eduard Kabasakalyan<sup>5</sup>, Ohanna Kirakosyan<sup>6</sup>

<sup>1</sup>Helmholtz Centre for Infection Research, Epidemiology Department, Braunschweig, Germany; <sup>2</sup>Institute of Microbiology and Laboratory Medicine Department, IMLred WHO Supranational TB Reference Laboratory Munich, Gauting, Germany; <sup>3</sup>Division of Infectious Disease, Department of Internal Medicine, Medical Center, University of Freiburg, Freiburg, Germany; <sup>4</sup>National Tuberculosis Center, National Reference Laboratory, Bishkek, Kyrgyzstan; <sup>5</sup>National Center of Pulmonology SNCO MH, RA National Reference Laboratory, Abovyan, Armenia; <sup>6</sup>Research Center Borstel, Leibniz Lung Center, Germany.

## Introduction

### DIGG-TB project - Success and sustainability of digital tools in Tuberculosis control in the South Caucasus and Central Asia

Tuberculosis (TB) national programs are challenging, especially in countries with low/middle income with a high burden of TB (Tab.1). The role of digital health solutions (DHS) in supporting TB programs in those countries is important to further progress in reaching program aims.

National and international organizations have developed various DHS to support the surveillance, diagnosis, and clinical management of TB patients in both countries. However, evidence is lacking that these DHS improve patient and surveillance outcomes.

The overarching goal of the cooperation project is to create an evidence base for the use of DHS for TB control in the South Caucasus and Central Asia and to build potential capacities for the context-sensitive and patient-centered controlled implementation of such tools in these regions.

### The scientific and/or technical objectives of the project:

1. Mapping and description of DHS for the control and treatment of TB in Armenia and Kyrgyzstan in recent years (WP 1).
2. Evaluation of these DHS concerning their usability, interconnectivity, and ability to improve patient outcomes and TB surveillance, based on existing datasets, newly collected data, and surveys of healthcare professionals (WP 2).
3. Long-term establishment of a prospective cohort study of TB patients to continuously evaluate changes in digital medical and laboratory information systems, as well as changes in diagnostics and treatment (WP 2).
4. Provision of solutions for existing gaps and, where necessary, new DHS, including a tool for reporting whole-genome sequencing (WGS) results to clinicians (WP 3).
5. Preparation of a database usable with AI methods concerning completed imaging diagnostics (WP 3).
6. Adaptation of the PIA software for use within an epidemiological evaluation platform in Kyrgyzstan, as well as training of local staff (WP 3).
7. Expansion of the partnership to include suitable German and Kyrgyz partners and other potential partners in Central Asia (WP 3).
8. Evaluation of the acceptance and usability of the new instrument for reporting WGS (WP 4).

### WP1 Mapping and description of DHS

#### Methodology:

To map DHS, the authors reviewed the available literature, created a list of possible digital interventions, and a questionnaire focused on the target audience of a tool and the type of intervention that can be covered by it. Interviews with national representatives were held and summarized in the database (Tab. 2 and 3)

#### Type of intervention:

- TB diagnostics
- TB treatment
- surveillance and monitoring
- E-learning.

#### Target audience :

- healthcare workers (HCW)
- patients (Ps)
- policymakers

Possible Digital Intervention	Armenia	Kyrgyzstan
• Video Directly Observed treatment (VDOT)	ReWeb based, Leavestone	One Impact (pilot study)
• Text messages (control of treatment)	Mobbis	
• Mobile phone apps	Adhere TB Armenia	
• Mobile app for E-learning		
• Using Artificial Intelligence in TB Treatment		

Table 2: A part of a database of DHS for TB treatment and The patient as the target audience.

#### Legend:

The database was built with the principle of a heatmap, where colors represent the status of the digital solution:

- **No** – there is no DHS for intervention;
- **Partial** – if the DHS covers intervention but doesn't fulfill all requirements;
- **Yes** – if the DHS covers full intervention in all regions of the country at all levels of the healthcare system.

Indicator (per 100 000 population)	Armenia	Kyrgyzstan
Total TB incidence	25 (19-32)	130 (106-152)
HIV-positive TB incidence	2.4 (1.5-3.4)	3.7 (2.8-4.6)
MDR/RR-TB incidence	5.9 (4.1-7.7)	45 (36-54)
HIV-negative TB mortality	0.37 (0.32-0.4)	5.9 (5.2-6.7)
HIV-positive TB mortality	1.3 (1.1-1.5)	1.5 (0.85-2.3)

Table 1. Estimates of TB burden in Armenia and Kyrgyzstan for 2022, WHO TB report 2023, national profiles.



Design-Thinking Workshop in Bishkek, Kyrgyzstan 2025

Possible Digital Intervention	Armenia	Kyrgyzstan
• GeneXpert automated recording and reporting		TB MIS
• Culturing and drug susceptibility automated recording and reporting		EpiCenter (only for BACTEK 960)
• Polymerase Chain Reaction automated recording, and reporting		TB MIS
• WGS analyzing, recording, and reporting		
• Text messages (test results reported to clinicians)	e-TB-manager	E-TB register
• Using Artificial Intelligence in TB Diagnosis	CAD4TB	
• Mobile app for E-learning		
• Digital platform for training of practical skills	TB Project ECHO	
• Repository of national and international guidelines etc.		TB MIS
• Educational platform for video lectures		
• Using Artificial Intelligence in TB Treatment		
• Chest X-ray analyzing, recording, and reporting	CAD4TB	CAD4TB, TB MIS
• Health information system webpages	e-TB-manager	TB MIS
• Program management	HISAM, Quan-TB	Quan-TB

Table 3: A part of a database of DHS for TB diagnostics and healthcare workers as the target audience.

### WP1 Results:

TB diagnosis: The Kyrgyzstan laboratory system allows the automatic recording and reporting of test results to HCWs by text messages, except WGS. AI is partially used for Chest X-ray analysis in Armenia, but DHSs are not implemented in TB laboratories.

TB treatment: In Armenia, DHS for VDOT is used, text messages for Ps and HCWs can be sent through a mobile App, and another App is suggested for Ps to increase treatment adherence. Those interventions in Kyrgyzstan are covered partially by the pilot App.

Surveillance and monitoring of TB: e-TB-manager in Armenia and TB MIS in Kyrgyzstan are used as health information systems; HISAM and Quan-TB partially cover program management in Armenia and Quan-TB in Kyrgyzstan for PMs.

E-learning: The platform for HCWs training in Armenia and the repository of guidelines in Kyrgyzstan are in use.



Figure 2: DHS in the TB control system in Kyrgyzstan

### WP2 Evaluation of DHS concerning their usability, interconnectivity, and ability to improve patient outcomes

- 1) Retrospective cohort studies are conducted in both countries. In Kyrgyzstan, datasets from ISULD and ETBR are studied, study period 2019-2024. Datasets include all new TB cases, relapse cases, previously treated patients, cases of RR/MDR/XDR-TB; pulmonary and extrapulmonary TB. Outcomes: diagnostic and treatment delays; TB incidence and mortality.
- 2) Interviews and a survey with DHS users. In Kyrgyzstan, a survey-based assessment of user experience and satisfaction with the services of various TB labs and centers is underway. Interviews with HCWs have already been done in Armenia

## Planned joint projects with partners from Central Asian institutions

### DIGG-TB-CA

(application to BMFTR submitted)

**Title:** Joint Development and Evaluation of Digital Health Solutions for Tuberculosis Management and Research in Central Asia. (2027-2029)

**Partners:** National Scientific Center of Phthisiopulmonology of the Republic of Kazakhstan; National Tuberculosis Center, National Reference Laboratory (NTC), Kyrgyzstan;

### UZLIMS'25

(application to GIZ submitted)

**Title:** Clinical Impact of an electronic Laboratory Information System (LIMS) in Uzbekistan: A prospective, multi-site, cohort comparison study (2026-2027)

**Partners:** Center of Phthisiology and Pulmonology, Uzbekistan.

### KAPT

(searching for funding opportunities)

**Title:** Developing National Strategy for Transplantation Management in Kyrgyzstan: Epidemiology, Capacity Building, and Digital Health Integration.

**Partners:** Kyrgyz State Medical Academy

**Tilman Brück**<sup>1,2,3</sup>, **Damir Esenaliev**<sup>2,3</sup>

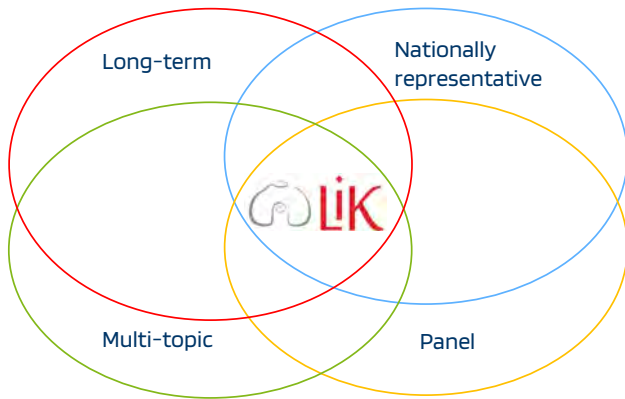
<sup>1</sup> Humboldt-Universität zu Berlin, Berlin, Deutschland

<sup>2</sup> Leibniz-Institut für Gemüse- und Zierpflanzenbau (IGZ), Großbeeren, Deutschland

<sup>3</sup> ISDC - International Security and Development Center, Berlin, Deutschland

- The Life in Kyrgyzstan (LiK) Study is a research-based, open-access, multi-topic longitudinal survey of households and individuals.
- It is the longest-running panel study in Central Asia based on 3,000 nationally representative households and 7 waves (2010–2025).
- It is an academic-led data infrastructure that supports and engages the German, Central Asian, and international research community.

## Methodology



## Research

LiK data have been used in many **highly cited papers**



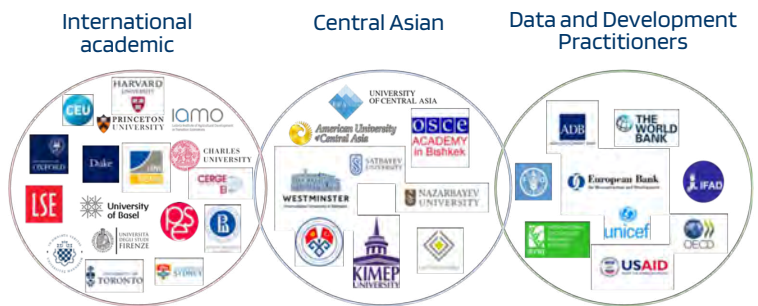
## Knowledge platform

We have **engaged with academics and policy makers** in Central Asia through our research since 2010



## Data users

LiK data is used in over **180 institutions in 35 countries**



## Annual Life in Kyrgyzstan conference

- The LiK Conference is a **premier academic event** held in Bishkek since 2015.
- Brings researchers and experts from academia, development institutions, government, and NGOs.
- Shares insights on socio-economic developments in Kyrgyzstan and Central Asia.

## Contacts

LiK website: [www.lifeinkyrgyzstan.org](http://www.lifeinkyrgyzstan.org)

Email: [lifeinkyrgyzstan@gmail.com](mailto:lifeinkyrgyzstan@gmail.com)

## Key Publications

-  Brück et al., (2014), Journal of Comparative Economics
-  Freudenreich, H. [...], Brück, T. (2022), World Development
-  Esenaliev, D. (2023), Journal of Development Studies

## Cooperation Partners and Donors

