Between Europe and the Orient

A Focus on Research and Higher Education

in/on Central Asia and the Caucasus

Status symposium

16–18 April 2018 | Almaty

Between Europe and the Orient - Status symposium

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Между Европой и Востоком

Центральная Азия и Кавказ в фокусе

науки и высшего образования

Международный симпозиум

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Международный симпозиум. Алматы, 16-18 апрель 2018 г – Алматы: АСБК, 2018. – 132с.

This collection presents materials of the International Conference „Between Europe and the Orient – A focus on Research and Higher Education in/on Central Asia and the Caucasus", which was held in Almaty on April 16–18, 2018. Topics comprise biodiversity conservation in Central Asia and on the Caucasus, sustainable land use in these regions taking into account socio-economic factors, and others.

В сборнике представлены материалы Международной конференции «Между Европой и Востоком – Центральная Азия и Кавказ в фокусе науки и высшего образования», которая состоялась в Алматы 16–18 апреля 2018 г. Они охватывают проблемы сохранения биоразнообразия Центральной Азии и Кавказа, а также вопросы устойчивого землепользования с учетом социально-экономических факторов в этих регионах и др.

Editors:
Johannes Kamp and Wieland Heim
Institute of Landscape Ecology
University of Münster
Heisenbergstraße 2
D-48149 Münster, Germany
E-mail: johannes.kamp@uni-muenster.de

Cover photo:
Feather-grass steppe near Ereymentau,
Akmola province, Kazakhstan (Johannes Kamp)

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Preface

Few would have predicted the magnitude and scale of political and societal changes that were triggered by the break-up of the Soviet Union in 1991, and the global consequences of this turning point in history. Following independence, plenty of chances and challenges were ahead for the emerging republics of Central Asia and the Caucasus. Traditions, languages and values had persisted throughout Soviet rule, but new borders, human migration and urbanization meant fundamental change after 1991. Land-use changes occurred over vast areas, with consequences for people, biodiversity and ecosystem services. Scenarios of climate change picture a bleak future for the glaciers of the region's high mountain ranges that provide the much-needed water supply for the vast arid lowlands.

A region changing fast is always fertile ground for research. The funding initiative "Between Europe and the Orient – a focus on research and higher education in/on Central Asia and the Caucasus" has been supporting research projects for more than 15 years. The main aim of the initiative was to provide a platform for inter- and transdisciplinary projects across borders, thereby connecting the social and the natural sciences that had so far often thrived in isolation. Equally important, young scholars from the region (and adjacent countries of Central Asia such as China and Mongolia) have been supported in dedicated trainings, and have enjoyed joint fieldwork and data collection together with their German counterparts.

The status symposium in Almaty in April 2018 that we introduce here is the third of its kind. It follows similar events in Berlin in 2006, and Tbilisi and Bishkek in 2010. The symposium is an exciting opportunity to take stock of the results of 16 invited projects, strengthen links between researchers and stimulate new collaboration. Three workshops are offered to improve the capacity of doctoral students and young scholars to write grant applications and research papers independently. They also prepare current PhD students to apply for post-doc funding in an upcoming call of the Europe-Orient programme.

Keynote speeches, synthesis talks from the projects and nearly 60 poster presentations illustrate the breadth of research in the region, ranging from mobility and security in Central Asian cities over employment and education to agricultural research. A recurring theme is also the sustainable land management in the region, and the conservation and restoration of depleted biodiversity.

The Caucasus and Central Asia have always been a region linking Europe and the Orient. A recently established direct freight train connection between Chongqing in China and Duisburg in Germany (embarking on the 12,000 km stretch three times a week), reminds us of the historical importance of the silk road countries for the exchange of goods and ideas – but also of the acceleration of lifestyles we are observing. "The West" and "The East" are coming closer, and we hope this symposium helps to harness the great opportunities that are arising.

Johannes Kamp, University of Münster, Germany
Sergey Sklyarenko, Association for the Conservation of Biodiversity of Kazakhstan (ACBK)

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Plenaries and Oral Presentations

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EXCLUSION VS MOBILITY: LIMITS TO IDEAL FREE DISTRIBUTIONS IN PASTORALIST SYSTEMS

Behnke R.[1], Kerven C.[1], Robinson S.[2], Kushenov K.[3] , Milner-Gulland E.[2]

1. Department of Life Sciences, Silwood Park Campus, Imperial College London, UK
2. Department of Zoology, Oxford University, UK
3. Kazakhstan Scientific Research Institute of Pasture and Livestock, Almaty, Kazakhstan

* corresponding author: sarah.robinson09@gmail.com

Abstract

According to economic theory, open access to grazing land represents institutional failure since it invites resource overexploitation. Yet observations of actual rangeland systems suggest that these are often more open than common property theories would predict. Conversely, the ecological theory of the ideal free distribution explains how, in a heterogeneous environment, free movement (open access) enables resource users to maximise the forage available to them over the year. We employ this theoretical framework to describe and explain livestock distributions in two Central Asian countries with contrasting political and economic constraints to livestock mobility. We mapped annual livestock distributions across large sites in Kazakhstan and Turkmenistan and used bio-physical data including vegetation and water availability to model the extent to which stocking density matched these factors over the year. Quantitative and qualitative information from livestock-owning households was also used to explore factors affecting decision making. In Kazakhstan, the importance of bio-physical variables in determining the frequency, amplitude and timing of movements have decreased since the Soviet period, whilst the significance of economic and institutional factors have increased. These observations reflect high costs of pasture access and the move to livestock management by small household units owning highly variable numbers of animals. At the Turkmenistan site, the distribution of livestock can be interpreted in terms of the model of the ideal free distribution: the number of livestock supported by desert settlements varies with the level of resources in a settlement whilst the propensity of herds to migrate seasonally is a density-dependent function of grazing pressure. A formal tenure system, involving the state ownership of land and the management of state lands by collective farms was combined with a relatively free movement of herders within these areas. Large herd sizes including state animals, strong collective herding systems and cheap fuel also underlie these patterns.

DEVELOPING TOOLS FOR CONSERVING THE PLANT DIVERSITY OF THE SOUTH CAUCASUS — AN OVERVIEW

Borsch T.[1,*]

1. Botanischer Garten und Botanisches Museum Berlin, Freie Universität Berlin, Königin-Luise Str. 6-8, 14195 Berlin, Germany

* corresponding author: t.borsch@bgbm.org

Abstract

The Caucasus ecoregion is one of the biologically most diverse areas in the northern hemisphere. Human activities such as shifts in land use and global change increasingly influence flora and vegetation. This makes the Caucasus one of the global biodiversity hotspots, with urgent needs to assess, monitor and conserve its biodiversity. The overarching goal of this project is to provide a scientific basis for the conservation and management of plant diversity in the Caucasus.

The collaboration with partners from the three South Caucasian countries, Armenia, Azerbaijan and Georgia, implements different complementary subprojects which are being presented in a series of posters. Several of these subprojects focus on a better understanding of the evolution and species diversity of selected plant genera such as Campanula (bell flowers; Campanulaceae), Pyrus (wild pears; Rosaceae), or Scutellaria (Lamiaceae) which are important in the Caucasus. These genera serve as models to build scientific capacity in the use of modern phylogenetic approaches to assess and understand species diversity. Other work aims at analyzing the genetic diversity of relic trees (e.g. Pterocarya, Zelkova) or endangered species with the goal to identify populations of particular conservation relevance and to gain insights into population structure and gene flow to support species conservation strategies.

In order to mobilize specimen data from herbaria, another focus of the project is on digitization and database development. Through the integration of such collection data with research results, species distributions can be investigated, as the basis for conservation status assessment and planning. Apart from research, training of doctoral students and exchange of scientists, our project is active in supporting the development of technical capacities including the training of technical staff.

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MODELING, GIS, AND REMOTE SENSING
FOR DISCUSSION SUPPORT IN IRRIGATED LAND MANAGEMENT IN
THE INNER ARAL SEA BASIN

Conrad C.[1,2,*], Lamers J. [3], Muratova N.[4], Dukhovny V.[5]

1. University of Würzburg, Institute of Geography and Geology, Remote Sensing Department, Oswald-Kuelpe-Weg 86, 97074 Wuerzburg, Germany
2. University of Halle, Institute of Geosciences and Geography, Von-Seckendorff-Platz 4, 06120 Halle, Germany
3. Center for Development Research (ZEF), Department of Ecology and Resource Management, University of Bonn. Genscheralle Str. 3, 53113 Bonn, Germany
4. Research Institute of Ecology problems of the Al-Farabi's Kazakh National University, Kazakhstan, Almaty, 71 Al-Farabi av., 050040
5. Scientific Information Center of the Interstate Coordination Water Commission (SIC ICWC), 100187 Tashkent, Uzbekistan

* corresponding author: christopher.conrad@uni-wuerzburg.de

Abstract

The interdisciplinary research project "Assessing Land Value Changes and Developing a Discussion-Support-Tool for Improved Land Use Planning in the Irrigated Lowlands of Central Asia" (LaVaCCA) aimed at identifying factors that explain changes or trends of land-use production in the inner Aral Sea Basin (ASB). Since this region is severely affected by immense land degradation and consequent losses of land productivity, methods were developed for closing existing data gaps that hamper spatially explicit analyses. These are urgently required for land use planners to improve future land management in the ASB. As a result of three years project implementation, and while tapping free Landsat Archives, effective mapping routines have been developed for monitoring the dynamics of cropland use on study sites in Kazakhstan and Uzbekistan. The resulting maps document a strong decline of rice cropping intensity between 1984 and 2004 in the Kazalinsk region, Kazakhstan, as well as the impact of rehabilitation activities implemented in 2005-2016. This was, according to farmers, due to changes in farm management from the previous state-order to the currently dominating private production systems. Remote sensing (RS) based routines for mapping crop biophysical parameters were analysed for their accuracy through standardized field campaigns. For instance, regression trees allowed for accurate estimations of the leaf area index, a basic parameter of Uzbekistan's national monitoring program, permitting rapid and wide-spread crop yield estimations. The combination of the analyses with optical RS and hydrological modelling resulted in more detailed assessments of salt dynamics than any of the methods alone. Overall, due to an effective collaboration between the partners from Central Asia and

Germany, LaVaCCA findings could not only support the knowledge gain about drivers of land use production changes, but also on land abandonment dynamics as identified through statistical modelling. Further salient results and achievements of the on-going project will conclude this presentation.

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TOWARDS SUSTAINABLE MANAGEMENT OF CENTRAL ASIAN FLOODPLAINS: RESEARCH AND CAPACITY BUILDING ALONG THE RIVERS TARIM AND NARYN

Cyffka B.[1*], Betz F.[1], Halik Ü.[2], Baibagyshov E.[3], Chymyrov A.[4], Kurban A.[5], Welp M.[6]

1. Catholic University Eichstaett-Ingolstadt, Applied Physical Geography, Ostenstr. 18, 85072 Eichstaett, Germany
2. Xinjiang University, Key Laboratory of Oasis Ecology College of Resources and Environmental Science, Shengli Road 666, 830046 Urumqi, China
3. Naryn State University, Departement of Ecology, Orozbak uluu str. 25, 722900 Naryn, Kyrgyz Republic
4. Kyrgyz State University for Construction, Transport and Architecture, Departement of Geodesy and Geoinformatics, Maldybaev str. 34, 720020 Bishkek, Kyrgyz Republic
5. Xinjiang Institute of Ecology and Geography, Chinese Academy of Science, South Beijing Road, 830011 Urumqi, China
6. Eberswalde University for Sustainable Development, Faculty of Forest and Environment, Alfred-Moeller-Str. 1, 16225 Eberswalde, Germany

* corresponding author: bernd.cyffka@ku.de

Abstract

In the semi-arid to arid climate, the riparian ecosystems along the large inland rivers have an enormous ecological importance. They are local hotspots of biodiversity and provide manifold ecosystem services like the reduction of sand and dust storms, the provision of timber and non-timber forest resources or the provision of pastoral land. Despite their importance, Central Asian floodplains are heavily under pressure by an overexploitation of water resources for intensive agriculture, dam construction or overgrazing by livestock. In addition changing climatic conditions modify the discharge with further, potentially negative consequences. Nevertheless, there is no comprehensive, interdisciplinary monitoring of the riparian areas, their functions and services.

Against this background, the project 'Ecosystem Assessment and Capacity Building for sustainable Management of Floodplains along the Central Asian Rivers Tarim and Naryn (Eco-CAR)' was started in 2014. While the environmental setting is very different at the Tarim and the Naryn River and also ecosystem services and anthropogenic pressures are not the same, there is the similar lack in interdisciplinary assessment of the floodplain ecosystems required for a sustainable management.

Within the EcoCAR project we conducted integrative research on hydrological, geomorphological, ecological as well as socio-economic aspects of riparian ecosystems along both rivers.

To have a practical outreach of the project, we focused on an intensive capacity building for students and early career scientists in Kyrgyzstan and China under the slogan "Todays' students are tomorrows' decision makers". In the presentation, we give a brief overview of the research outputs of our project and highlight the relevance of the interdisciplinary floodplain research in the Central Asian context. Beyond the scientific aspects, we share our experience with the capacity building approach and discuss its relevance for a sustainable management of riparian ecosystems.

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SOVIET MEMORIES, POST-COLONIAL SOCIETIES AND ALTERNATIVE MODERNITY IN CENTRAL ASIA

Dadabaev T.[1,*]

1.   University of Tsukuba, Japan

* corresponding author: dadabaev@gmail.com

Abstract

There is no consensus regarding the manner in which the Soviet past should be narrated in post-Soviet Central Asia (CA). On the one hand, the Soviet era brought about significant development and produced the political systems of the post-Soviet Central Asian states. There also seems to be an understanding that the Soviet era positively influenced the region by bringing industrialization, more effective administrative tools and education. In addition, the narrative of Soviet years in many CA countries is still significantly influenced and shaped by individuals who were educated by the Soviet educational institutions largely influencing evaluations. On the other hand, the Soviet era resulted in considerable (ethnic, linguistic and religious) sacrifices in these states, which is reflected in the disapproving narration of the Soviet past historians. Such disapproving narration of Soviet past emphasizes issues of ethnic, religious restrictions and Stalin-era repressions as well as scapegoating of Gorbachev years. Thus, evaluation of Soviet years by various scholars tends to be conducted in binary opposition of either praising the events of the Soviet era or praising post-independence achievements. Also, the very vision of the Soviet years in these republics varies depending on both the government's official master narrative and public perceptions of the past. Many citizens of the Post-Soviet Central Asia partially subscribe to the criticism of the Soviet past and frequently refer to the abuses of Soviet administration in linguistic, religious and cultural. At the same time, there are a considerable number of senior citizens who recall Soviet times with a sense of longing and nostalgia. Such contradictory evaluations of Soviet life among Central Asians raise the following set of questions. What are the ways in which Central Asian citizens recall Soviet times? What are the aspects of Soviet life recalled with nostalgia and rejection, if any? How can such narrations be explained and interpreted? The goal of this project is to analyse the way older generation of people in Uzbekistan, Kazakhstan and Kyrgyzstan recollect years of life in Soviet period. In doing so, this project aims to place these recollections within academic debates about the meaning. of Soviet administration for its citizens, which has been described in post-independence years either along the lines of overwhelming criticism or support. This project further aims to demonstrate how the historical narrative based on memory is socially constructed under influences of master narratives, historical clichés and respondents' individual selves and alternative modes of modernity presented to respondents. In order to answer the questions posed by this project,

this study uses qualitative data from an collective memory project within the framework of the Islamic Area Studies Project jointly undertaken by several research institutions in Japan and internationally. These qualitative data include lengthy face-to-face interviews, life stories and narratives concerning everyday experiences in Soviet Uzbekistan, Kazakhstan and Kyrgyzstan conducted with or obtained from individuals in their 60s and 70s (the sample size was 75 individuals). The present chapter chooses to focus on the senior group (who possessed occupational backgrounds unrelated to the Communist Party's central apparatus and the government) because this group's experiences significantly contribute to public opinion regarding the Soviet past

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SOCIAL LIVES OF THE NARYN-SYRDARYA RIVER

Feaux de la Croix J.[1], Suyarkulova M.[2*]

1. Department of Ethnology, University of Tubingen, Germany
2. Department of Sociology, American University of Central Asia, Kyrgyzstan

* corresponding author: suyarkulova_m@auca.kg

Abstract

Often described as essential arteries in bodies of land, rivers that 'flow all by themselves' seem to suggest a self-evident mode of natural connectivity, a narrative thread as compelling as gravity itself. Yet the 20th-century history of the Syr Darya do not tell the story of an effortless quasi-road.

Since the early Soviet period, great effort has been spent in creating greater river connectivity. In the post-war period, the region's population and economy became increasingly connected through the building of large hydropower stations and irrigation canals.

These key aspects of the Syr Darya can be readily grasped as an enviro-technical system, one which does not just encompass watery ecotopes and immediate users. An enviro-technical system allows the river to be understood as both a natural and a technical construct, while keeping in mind that the river is not only a construct, but exists as a material force in its own right. The Syr Darya's evolving characteristics and life can be understood as the effect of particular infrastructures linked to it, including the artefacts, people and skills that go with them.

As the leaky infrastructure grown from the dream of total river exploitation limps along, human and non-human river-dwellers are however making use of it in unexpected ways. The potential liveliness of these post-capitalist – and also post-socialist – spaces often fails to reach our attention, as they fit neither the model of 'pristine nature' nor of total modernist control.

Over the last century, it has clearly been hard work controlling how and when the Syr Darya connects different kinds of people, forces and environments to each other.

With hundreds of glaciers in the Tian Shan now clearly ebbing, the question of whether and how the Syr Darya reaches human and non-human habitats now connects to a climatic world well beyond Central Asia. And this then is a world where the 'environmental' elements of the Syr Darya start to put into question the dominant, highly reductionist engineering visions of river life.

OPPORTUNITIES AND BARRIERS AT THE TRANSITION FROM EDUCATION TO WORK - A COMPARATIVE YOUTH STUDY IN AZERBAIJAN, GEORGIA AND TAJIKISTAN

Gebel M.[1,*], Olimova S.[2]

1.   Chair of Methods of Empirical Social Research, University of Bamberg, Germany
2.   SHARQ (ORIENS) Research Center, Dushanbe, Tajikistan

* corresponding author, michael.gebel@uni-bamberg.de

Abstract

This interdisciplinary project has carried out a multi-country study on youths' labor market integration in Azerbaijan, Georgia and Tajikistan in times of increasing uncertainty. Based on a micro-macro theoretical model we have studied the opportunities and constraints young individuals face during their transition from education to work in different cultural, economic and institutional contextual settings. Original data have been produced in a mixed-method approach with a focus on conducting three large-scaled quantitative youth surveys (N=2,000 persons per country) and supplementary qualitative in-depth interviews in a comparative design in Azerbaijan, Georgia and Tajikistan. The explicit focus on studying the dynamic processes of youth transitions in a life course perspective represents the key innovation of the project. A multidimensional perspective on both objective and subjective dimensions of the situation of young people has been applied in order to reach a holistic assessment and to understand how objective conditions are translated into subjective youth identities and vice versa. At the institutional level, it has been analyzed how education and training institutions, labor market institutions and related segmentation, welfare institutions and family/gender regimes ease or hamper youth chances of a successful integration into gainful employment. By performing comparative analyses examples of best practices and recommendations for institutional reforms and policies will be developed that help to improve the transition from school-to-work in particular and the socio-economic situation of youths in general in the South Caucasus and Central Asian region.

In our talk, we will discuss some of our key findings of the nationally representative retrospective life history surveys on 6,000 young men and women from Azerbaijan, Georgia, and Tajikistan. As an example of our research we will highlight our findings on whether vocational education and general academic education pave the way to work for young people.

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ECOLOGY AND SOCIOECONOMICS OF RURAL LAND USE IN THE FOREST-STEPPE OF THE WIDER ALTAI REGION UNDER CONTRASTING DEVELOPMENTS OF LIVESTOCK NUMBERS IN KAZAKHSTAN AND MONGOLIA

Hauck M.[1,*], Dulamsuren C.[1,*]

1. Department of Plant Ecology and Ecosystems Research, Albrecht von Haller Institute for Plant Sciences, Georg August University of Göttingen, Untere Karspüle 2, 37073 Göttingen, Germany
* corresponding authors: mhauck@gwdg.de, dchoima@gwdg.de

Abstract

The breakdown of the Soviet Union and the concomitant resignation of the Communist regime in Mongolia had strong effects on land use and the living conditions of the rural population in Kazakhstan and Mongolia. These changes also strongly affected the livestock sectors of both countries. Livestock numbers in Kazakhstan decreased and have only little recovered in the recent past. In Mongolia, the numbers of herders and livestock have increased. This increase extends to goats in particular, as Mongolia got connected to the world market for cashmere.

Land use in rural areas of Kazakhstan and Mongolia does not only involve grasslands and arable land, but also affects forests in the forest-steppe. Forests in Central Asia are subjected to forest grazing, logging, fuel wood collection, and the harvest of non-wood forest products. The modalities of forest use are strongly different between the Kazakh and the Mongolian forest-steppes. In Kazakhstan, livestock grazing and fuel wood collection are of minor significance at present, whereas these factors exert strong influence on Mongolian forests. Forests in Kazakhstan, however, have suffered from heavy overuse during Soviet times, and many conifer forests have been degraded to birch pioneer forests and shrublands. Today, forest fragmentation and forest degradation are ecological key problems, the Kazakh and Mongolian forest-steppe region is faced with, in addition to climate warming.

In a first project term, we studied forest edge-forest interior gradients and quantitatively analyzed the differences in the pastoral land-use impact on plant and animal diversity and ecosystem functions between the forest edge and the interior. In a second term we analyzed the effects of forest fragmentation (studied on the case example of Mongolia) and forest degradation (investigated on the case example of Kazakhstan) on biodiversity, ecosystem functions and the socioeconomic significance of forests in the forest-steppe ecotone.

BALANCING TRADE-OFFS BETWEEN AGRICULTURE AND BIODIVERSITY IN THE STEPPES OF KAZAKHSTAN

Kamp J.[1,*], Baumann M.[2], Bräuer P.[1], Dara A.[2,3], Esengalieva A.[4], Freitag M.[1], Grigoreva I.[4,5], Hankerson B.[3], Hölzel N.[1], Kuemmerle T.[2,6], Müller D.[2,3], Prishchepov A.[7,8], Shmalenko A.[1,4], Schierhorn F.[3], Stirnemann I.[1], Urazaliev R.[1,4], Velbert F.[1]

1. Institute of Landscape Ecology, University of Münster, Heisenbergstr. 2, 48149 Münster, Germany
2. Geography Department, Humboldt-University Berlin, Unter den Linden 6, 10099 Berlin, Germany
3. Leibniz Institute for Agricultural Development in Transition Economies (IAMO), Theodor-Lieser-Str. 2 06120 Halle (Saale), Germany
4. Association for the Conservation of Biodiversity of Kazakhstan (ACBK), Beibitshilik Str. 18, 010000 Astana, Kazakhstan
5. Karaganda State University, Universitetskaya Str. 28, 100028 Karaganda, Kazakhstan
6. Integrative Research Institute for Transformations in Human Environment Systems (IRI THESys), Humboldt-University Berlin, Unter den Linden 6, 10099 Berlin, Germany
7. Department of Geosciences and Natural Resource Management (IGN), University of Copenhagen, Øster Voldgade 10, DK-1350 København K, Denmark
8. Institute of Environmental Sciences, Kazan Federal University, Kazan, Tovarishcheskaya str. 5, Kazan, 420097, Russia
   * corresponding author: johannes.kamp@uni-muenster.de

Abstract
Grassland ecosystems harbour unique biodiversity, but agriculture has led to their widespread degradation and conversion. However, opportunities for restoration and for reconciling agricultural production and conservation goals are emerging. This is especially so in Kazakhstan, where the collapse of the Soviet Union triggered the widespread abandonment of cropping and grazing systems. Abandoned lands constitute considerable untapped agricultural potential, which is likely to be exploited in the near future, yet would also allow for restoring steppe ecosystems and preserving Kazakhstan's unique biodiversity.
Using remote sensing methods, we mapped cropland abandonment and recultivation from 1985 to 2015 for Northern Kazakhstan, as well as current livestock distribution and untapped potentials for the expansion of grazing systems. We also mapped human outmigration as a reason for land abandonment and fire patterns, as the latter are related to livestock biomass consumption. Based on field surveys in 2015–2017, we investigated responses of soil carbon stocks, plant functional diversity, bird and mammal populations to abandonment, grazing intensity and fire rates, and their interactions. We spatially identified areas with de-

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creasing human pressure on the environment ("rewilding") and areas of conflict between agricultural expansion and biodiversity conservation. Based on this we assessed the effectiveness of the current Protected Area system and identified suitable areas for new PAs. In a stakeholder-based process, we developed scenarios of agricultural development until 2050 that will allow us to identify spatially explicitly address future trade-offs and hotspots of conflict between food production and biodiversity.In our talk, we will present an overview of the scientific project results, and will showcase the successful inter- and transdisciplinary collaboration between Kazakhstani and German partners, stakeholder involvement and training of young scholars.

INFORMAL MARKETS AND TRADE
IN CENTRAL ASIA AND THE CAUCASUS

Karrar H.[1], Fehlings S.[2]

1.   Department of Humanities and Social Sciences, Lahore University of Management Sciences, DHA, Lahore, Pakistan
2.   Department of Social and Cultural Anthropology, Norbert-Wollheim-Platz 1, 60629 Frankfurt am Main, Germany

* corresponding author: Susanne.fehlings@gmx.net

Abstract

The end of the Cold War and the emergence of independent states in the Caucasus (Armenia, Azerbaijan, and Georgia) and Central Asia (Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan, and Uzbekistan) was accompanied by the proliferation of new marketplaces across the periphery of the former Soviet Union. These new marketplaces emerged as a consequence of the easing of restrictions on small-scale, private commercial activity. They have continued to grow since 1991, and some, such as Kyrgyzstan's Dordoi Bazaar (in Bishkek) and Georgia's Lilo Market (in Tbilisi) serve as pivots for the circulation of goods within Eurasia. While markets in the Caucasus and Central Asia frequently enjoy support from oligarchs, the daily exchanges by sellers and buyers are largely unregulated by the state, and consequently, within the domain of the informal economy.

Informality has been an underlying theme in scholarship on post-Soviet Central Asia and the Caucasus. Likewise, there is extensive scholarship on regional markets and trade. Our research adds to the body of knowledge through two lines of inquiry: (1) Asking, conceptually, what informality, as understood in our field, brings to the study of regional markets and trade? And what does embedded informality – the market embedded within the state and society, and individual networks embedded within the market – add to our understanding of the region? And, (2) Exploring, through parsing new empirical evidence, what new commercial activities emerged after the Soviet Union? What form did these take and what values did they promote? How was this a negotiation of statehood and ideology?

Our ongoing fieldwork is in Armenia and Georgia, Kazakhstan and Kyrgyzstan (as well as China and the Himalayan regions of Pakistan). In our fieldwork, we have been following local trade routes, exploring border markets, flee markets, religious markets, bazaars and the local entrepreneurs engaged in trade activity.

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AGROFORESTRY IN MITIGATION OF ENVIRONMENTAL DEGRADATION IN CENTRAL ASIA

Khamzina A.[1,*]

1. Div. Environmental Science and Ecological Engineering, Korea University, Korea

* corresponding author: asia_khamzina@korea.ac.kr

Abstract
Climate change is likely to exacerbate water scarcity, potentially increasing drought stress and salinity-induced cropland degradation and thus hampering economic development in Central Asia. As opposed to the cropland abandonment for natural regeneration and to water-intensive reclamation by leaching of highly salinized croplands, degraded landscape parcels can be converted to tree plantations of salt-tolerant species. Long-term, multi-disciplinary case studies from the lower Amudarya River Basin will be presented to demonstrate the impact on agroecosystem services, such as carbon sequestration and provision of non-timber products, and the monetary value of these services at field, farm, and regional scale. The potential scale of afforestation as well as socio-economic constraints for the adoption of afforestation on degraded cropland can be evaluated leading to improved formulations of incentives for tree planting by the farmers. The combined findings facilitate spatial targeting and provide policy advice on introduction of forestry among farm activities for the landscape rehabilitation and improving rural resilience to the climate change. The integrated multidisciplinary approach suggested and tools developed ight be applicable in adjusted form for the assessment of the afforestation potential in irrigated agroecosystems beyond the study region.

SCENARIO DEVELOPMENT FOR SUSTAINABLE LAND USE IN THE GREATER CAUCASUS, GEORGIA − FINDINGS OF THE INTERDISCIPLINARY RESEARCH PROJECT AMIES II

Magiera A.[1,2], Aurbacher J.[3], Bedoshvili D.[4], Felix-Henningsen P.[5], Hanauer T.[1,5]
Hüller S.[1], Kalandadze B.[6], Leonhäuser I.[1], Otte A.[1,2], Salukvadze J.[6], Shavgulidze R.[4],
Tedoradze G.[7], Theissen T.[1,2], Waldhardt R.[1,2]

1. Center for International Development and Environmental Research (ZEU), Justus Liebig University Giessen, Germany
2. Division of Landscape Ecology and Landscape Planning, Institute of Landscape Ecology and Resources Management, Justus Liebig University Giessen, Germany
3. Institute of Farm and Agribusiness Management, Justus Liebig University Giessen, Germany
4. I. Lomouri Institute of Crop Science, Agricultural University of Georgia
5. Institute of Soil Science and Soil Conservation, Justus Liebig University Giessen, Germany
6. Department of Geography, Ivane Javakhishvili Tbilisi State University, Georgia
7. Department of Plant Systematics and Geography, Institute of Botany, Ilia State University, Georgia

* corresponding author: Anja.Magiera@agrar.uni-giessen.de

Abstract

High-mountain regions are highly valued ecosystems with complex human-environmental interrelationships. In such coupled system political or socio-economic transformations impact the local population as well as the landscape and its ecological functions like soil productivity and species richness. In the rural, high-mountain region Kazbegi, Greater Caucasus Georgia the transformations after the breakdown of the Soviet Union lead to the marginalization of the local population followed by the abandonment of agricultural practices. The interdisciplinary research project AMIES II thus aims to support the rural development of the Kazbegi region in the Greater Caucasus by interdisciplinary research.

In order to show sustainable, alternative land-use futures and to support decision making processes within the region, we used a normative scenario approach, integrating quantitative and qualitative findings of empirical research in landscape ecology, soil science, vegetation ecology and research in agronomics and socio-economics. According to the studied environmental and socio-economic resources, we defined three sets of scenarios with normative assumptions that combine optimized livestock production (in dairy cow keeping and cattle fattening) with ecological limitations to maintain the integrity of the mountain ecosystem functioning. GIS generated spatially explicit scenario maps picture the related land-use patterns and visualize the alternative futures from local to the regional scale.

In our talk we focus on the data generation for the project, the normative scenarios as well as the implications for sustainable land development in the Kazbegi region.

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COLLECTIVE MANAGEMENT AND OPEN SOCIO-ECOLOGICAL SYSTEMS - THE CHALLENGE OF SUSTAINABLE USE OF COMMON VILLAGE PASTURES IN THE CAUCASUS REGION

Neudert R.[1*], Salzer A.[1], Allahverdiyeva N.[2,3]

1. Institute of Botany and Landscape Ecology, University of Greifswald, Soldmannstr. 15, 17489 Greifswald, Germany
2. Department of Finance Theory and Economics, Azerbaijan State Agrarian University, Ataturk avenue 262, Ganja, Azerbaijan
3. Department of Farm Management, University of Kassel, Steinstrasse 19, 37213 Witzenhausen, Germany

* corresponding author: regina.neudert@uni-greifswald.de

Abstract

Common village pastures in Azerbaijan and Georgia are an important resource for mobile and sedentary livestock keepers against the background of increasing livestock numbers in the post-socialist transition period, whereas problems with pasture degradation and unsustainable use are already politically recognized. An important feature of village pastures is common use, making collective management in a frame of national level institutions necessary. Common village pastures share these features with common property regimes, well known from the work of Elinor Ostrom. However, common village pastures in the Caucasus region are also open systems, as livestock mobility decisions lead to strong interactions between village pastures and other pasture resources on regional level.

The project aimed at analyzing common village pasture use against the background of post-socialist transition countries, increasing livestock numbers and reported degradation problems from different disciplinary perspectives:

• Ecological investigations investigated to what extent and which pasture degradation problems occur,
• Socio-economic analyses provided insights into the profitability of livestock keeping, marketing, household income and mobility decisions
• From an institutional economics perspective laws and informal rules for village pasture management were investigated,
• With economic field experiments the cooperation capacity of villagers was analyzed.

All investigations were conducted in six case study villages in Azerbaijan and Georgia differing in the scarcity of village pasture resources, which allows for a comparative case study analysis of various factors between countries along this gradient.

Using the social-ecological systems approach, the talk gives an overview on interdisciplinary project results, showing different patterns and levels of pasture degradation, cooperation capacity, conomic profitability, user access rules and conflicts between pasture user groups. By using the archetype analysis approach, we combine these results whereby four archetypes of village pasture management dynamics become apparent.

LEARNING FROM CHANGE: UNEXPECTED TRANSFORMATION PROCESSES IN THE CENTRAL ASIAN COTTON AREAS

Petrick M.[1,*], Djanibekov N.[1]

1. Leibniz Institute of Agricultural Development in Transition Economies (IAMO), Theodor-Lieser-Str. 2, 06120 Halle (Saale), Germany

* corresponding author: petrick@iamo.de

Abstract

Water-thirsty cotton cultivation caused the desiccation of the Aral Sea, it salinizes fertile cropland and forces women and children into the drudgery of manual harvest work – a snapshot of widely held beliefs about agriculture in Central Asia. Many observers thus take cotton as a symbol for political and economic standstill, the plunder of natural resources by a small elite, and the apparent ineptitude of political leaders to solve their transboundary conflicts in a constructive manner.

In close-up, however, the irrigated plains of Central Asia exhibit a surprising diversity of reforms. Comparing South Kazakhstan with Samarkand in Uzbekistan, AGRICHANGE researchers realized that cotton quotas had been abolished in Kazakhstan many years ago and that farmers benefited from increasing cotton prices and better integration into value chains. At the same time, also in Uzbekistan, more and more farmers started growing fruits and vegetables. AGRICHANGE brings together researchers from universities in Almaty and Samarkand with German and international partners who contribute local knowledge, innovative methods and access to the global academic community. Eight PhD students explore local change by asking: What are the causes and effects of the differences between Kazakhstan and Uzbekistan? Who benefits from these changes? Which are the consequences for sustainable land and water use? Farm and rural household surveys permit an evidence-based analysis of land reforms, labor relations, and trade. Behavioral experiments enable insights into collective rule setting concerning water use. Annual summer schools and workshops provide unique reflection opportunities with international experts. They set the ground for future strategic collaboration with Central Asian academic partners.

According to first results, farmers are able to develop water regulations endogenously that alance the interests of canal users. Producers benefitted from state regulation when it provided reliable rules rather than intervened unpredictably. In our talk, we summarize these insights and share the lessons learned from the ongoing cross-country collaboration.

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THEORISING INFORMALITY AND SOCIAL EMBEDDEDNESS FOR THE STUDY OF INFORMAL TRANSPORT. LESSONS FROM THE MARSHRUTKA MOBILITY PHENOMENON

Rekhviashvili L.[1,*], Sgibnev W.[1]

1.   Leibniz Institute for Regional Geography, Schongauerstraße 9, 04328 Leipzig, Germany

* corresponding author: l_rekhviashvili@ifl-leipzig.de

Abstract

With the breakdown of the Soviet Union and the following economic downturn of the early 1990s, the extensive public transport infrastructure started decaying rapidly. In combination with very low (albeit rising) private car ownership levels, the collapse of public transport systems severely impaired mobility provision. Simultaneously, privately owned minibuses, locally known as marshrutkas, massively spread as a substitute of public trams, buses and trolleybuses, and have since become an important, or even prevailing mode of public transport. The proliferation of th is flexible, privately owned and operated, and barely coordinated transport was considered to be one of the key signifiers of bottom-up entrepreneurship in a period of economic transition 'from state to market'. Marshrutkas, as much of the informal paratransit of the Global South, are portrayed as commercial, profit-driven endeavours.

The central purpose of this article is to critically re-evaluate existing definitions of what is formal and informal, what is market and what is social embeddedness, and to offer a consistent definition and a theoretically sound relational scheme of these concepts. The article proposes a critical reading of the informal transport literature canon, which largely assumes a naturality and omnipresence of markets. We show that a closer look at the sector reveals that the marshrutka phenomenon is much less market-like and more socially embedded then it seems at the first sight. The relations in the sector talk of a range of norms and institutions that govern economic exchange on the principles other than market demand and supply; that is rather on the principles of redistribution or reciprocity. The relationships at different scales between diverse actors – passengers and drivers, drivers and operating companies, companies and city governments – are negotiated informally and influenced by a range of social-political considerations defying the profit-seeking principle as well as private property enforcement.

LOCAL SECURITY-MAKING IN KYRGYZSTAN AND TAJIKISTAN - THE PRODUCTION OF SECURITYSCAPES BY EVERYDAY PRACTICES

Schetter C.[1], von Boemcken M.[2], Bagdasarova N.[3], Ismailbekova A.[4], Hojiev K.[5]

1. Bonn International Center for Conversion (BICC), Pfarrer-Byns-Str. 1, 53121 Bonn, Germany
2. Bonn International Center for Conversion (BICC), Pfarrer-Byns-Str. 1, 53121 Bonn, Germany
3. American University of Central Asia (AUCA), 7/6, Aaly Tokombaev, Bishkek, Kirgisistan
4. Max Planck Institute for Social Anthropology, Advokatenweg 36, 06114 Halle (Saale)
5. National University of Tajikistan, Rudaki Avenue 17, Dushanbe 734025, Tadschikistan

* corresponding author: boemcken@bicc.de

Abstract
Security has become an important focus of academic work on and in Central Asia. Most studies highlight the geo-strategic importance of the region and underline the threats to states posed by non-state armed groups and transnational criminal organizations. They are largely concerned with armed conflict, states of exceptions, international relations and elite discourses. Our project takes a radically different approach to studying security in Central Asia. As a point of departure, we understand security as an everyday practice of people that consists in identifying and engaging threat perceptions threat. We ask: How do various marginalized groups of people in Tajikistan and Kyrgyzstan deal with security issues in their daily lives? For the purpose of addressing this question, we develop and apply the innovative concept of securityscapes, which is partly inspired by the work of the anthropologist Arjun Appadurai as well as recent debates in sociology and political science on studying security as an everyday practice. In our field research we traced the securityscapes of various social groups, including the Pamiri and Ruszabon' minority in Tajikistan as well as the Uzbek, Lyuli and LGBT (lesbian, gay, bisexual and transgender) community in Kyrgyzstan. We found that the security practices of many people from these groups markedly differ from more orthodox accounts that conceive of security primarily in terms of drawing boundaries, identifying enemies, risk management, surveillance and social control. Security practice may equally pertain to pro-active and creative agency, to crossing and transgressing boundaries, to daptation and mimicry, hiding and withdrawal. This insight has relevance for the wider field of critical security studies.

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GOVERNANCE IN EMERGING ECONOMIES

Timm C.[1,*]

1.   PFH-Private University Göttingen, Pfalzburger Straße 43-44, 10717 Berlin

*corresponding author: timm@gee-research.net

Abstract

Following the 2008–09 financial and economic crisis and the remarkable success of emerging global powers such as China, notably through heterodox policy choices, there has been a global resurgence in interest for industrial policy. In particular, with regard to low- and middle-income countries (LMIC), a greater openness for experimentation with state interventions has begun to emerge. Governance in Emerging Economies (GEE) investigates the determinants of successful contemporary state-activism. As the post-communist region is particularly affected by this development, the differing cases of Kazakhstan and Georgia provide the starting points for various case and comparative studies.

The conceptual framework is informed by the New Institutional Economics and the Developmental State literature based on the historical experiences of the East Asian region. The project puts institutions into the centre of its analysis and focuses on the specific incentive structures shaping the interaction within the administration and between state and private sector. GEE applies a performance-oriented governance framework. State governance performances that can be distinguished on three levels: 1) structural performances as capability to create and adapt effective governance structures, 2) policy performances as the provision of state services and incentive structures as specific solutions for market and coordination failures and 3) embedding performances as the ability to embed the economic model and its specific incentive structures within the given socio-political order. The applied performance-oriented governance approach gives opportunity to study varying governments' responses to create a capable and adaptive-efficient administration, to mobilize and direct economic resources or to build effective partnerships in order to enhance economic performances and structural transformation.

Given the practical dimension of the project, GEE has initiated a workshop series "GEE-Dialogue with Experts" bringing together scholars, policy-makers and private sector representatives to discuss industrial policy experiences in the respective countries.

CHANGES IN GLACIER AND SNOW-MELT RUNOFF COMPONENTS IN CENTRAL ASIA AND SOCIETAL VULNERABILITY — GLASCA-V — OVERVIEW OF THE PROJECT ACHIEVEMENTS

Vorogushyn S.[1,*], He Z.[1], Kalashnikova O.[2], Nurbatsina A.[3], Galayeva A.[3], Sultanaliev K.[4], Weise S.[5], Ershova N.[6], Hagenlocher M.[7], Groth J.[7], Renaud F.[7], Gafurov A.[1], Unger-Shayesteh K.[1], Merz B.[1]

1. GFZ German Research Centre for Geosciences, Potsdam, Germany
2. Central Asian Institute for Applied Geosciences, Bishkek, Kyrgyzstan
3. Regional Centre for Hydrology, Almaty, Kazakhstan
4. Tien-Shan Policy Center, American University Central Asia (AUCA), Bishkek, Kyrgyzstan
5. Helmholtz Centre for Environmental Research – UFZ, Halle, Germany
6. Kyrgyz-Slavic University (KRSU), Bishkek, Kyrgyzstan
7. United Nations University, Institute for Environment and Human Security (UNU-EHS), Bonn, Germany

* corresponding author: sergiy.vorogushyn@gfz-potsdam.de

Abstract
Meltwater from glaciers and seasonal snow cover substantially feeds Central Asian rivers. The riparian states use the water for economic activities such as irrigated agriculture and hydropower generation. Depending on the type and intensity of water use, the societies exhibit a varying vulnerability to changes in runoff availability and regimes.
In the GlaSCA-V Project, we have developed hydrological modelling methods to quantify past and future changes in runoff in river basins at various scales. At the small scale in the Ala-Archa basin, the novel model calibration method based on Hydrograph Partitioning Curves was extended by model calibration/validation on the runoff components identified by extensive multi-year water isotope sampling campaign resulting in a more robust parameter identification. In this region, climate adaptation measures have been developed in participatory manner and then piloted in selected communities to increase farmers' resilience in face of climatic changes. At the meso-scale, the past and future changes in the runoff components in the Upper Chu basin have been quantified based on the calibrated hydrological model WASA. For the Chu basin the social vulnerability indicators have been analysed and the vulnerability maps to agricultural drought were developed. The dependency of the Vegetation Health Index (VHI) derived from the satellite remote sensing on the hydrological variables was also assessed for this region. Finally, at the large scale for the Ili Basin, the changes in natural runoff driven by climatic changes have been assessed against the background of growing water use for irrigation in the upstream areas in this

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transboundary river basin at the border of China and Kazakhstan. Based on hydrological modelling results, the share of runoff Abstraction could be quantified along with the past changes in runoff components.

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DEVELOPMENT OF LAND MARKET IN KAZAKHSTAN AND THE IMPACT ON AGRICULTURAL SECTOR: EMPIRICAL EVIDENCE

Aitkhozhayeva G.[1*], Tireuov K.[2], Kerimova U.[3]

1. Department of Land Resources and Cadastre, Kazakh National Agrarian University, 8, Abay ave, Almaty
2. Department of Management and AgriBusiness Organization, Kazakh National Agrarian University, 8, Abay ave, Almaty
3. Department of Management and AgriBusiness Organization, Kazakh National Agrarian University, 8, Abay ave, Almaty

* corresponding author: gulsuma-89@mail.ru

Abstract

In Kazakhstan, after the political and economic transition period of the nineties, the transformation of agriculture, the privatization brought about fundamental change in the land ownership structure. As a result of the restoration of individual shares of the co-operatives members, unfavourable farm structures were established in a great number of cases; and consequently the redistribution of land property has become indispensable. The transition to market economy led to land privatization. These changes demanded measures for creation of conditions for the development of land relations, the land market and management of land resources, land management, monitoring and protection of lands. In recent years positive tendency of government involvement in use of land for various needs of different economy sectors have occurred. The revival of the market is hold up, on one hand, by the present legislation of land acquisition and, on the other hand, by the repugnance of the land acquisition of foreigners by a great number of people. In this case, important is the settlement of estates in lands and unification of law of real property in the areas of ownership, utilization, change of land type, soil conservation, and land use planning and building multiple function agriculture with a legislation of the market economy countries.

We concentrate on the changes of ownership ongoing in Kazakh agriculture in the period 1991–2015. A major element of the assets undergoing privatisation after 1991 was agricultural land. The size of the ownership change has varied from region to region. We investigate the process of land market development in Kazakhstan. Based on statistical data, the implications of land relations development process on agricultural producers are investigated.

SOCIO-ECONOMIC ANALYSES OF FARMING HOUSEHOLDS IN AZERBAIJAN AND GEORGIA

Allahverdiyeva N.[1,2], Mammadov N.[2]

1. Department of Farm Management, University of Kassel, Steinstrasse 19, 37213 Witzenhausen, Germany
2. Department of Finance Theory and Economics, Azerbaijan State Agrarian University, Ataturk avenue 262, Ganja, Azerbaijan

 * corresponding author: naibaallahverdiyeva@gmail.com

Abstract

The users of common villages pastures in Azerbaijan and Georgia are households farming arable land and keeping livestock. Many farming households choose their strategies of land use and keeping livestock depending on their economic and social situation, e.g. households may decide to keep livestock in a sedentary or semi-mobile way. We investigated which agricultural activities besides livestock keeping have socio-economic importance for the households.

The data collection took place in 2016 with two survey stages. In the first survey in total 392 households in six case study villages were interviewed with a structured questionnaire. The rimary objective of the survey design was to collect data on household demographic characteristics, agricultural and non-agricultural activities, pasture use, income sources, assets, housing characteristics and wealth status. For an in-depth analysis of the economic situation of households we conducted a second survey with 64 sedentary households using a semi-structured approach. Drawing on a farm economics approach, we developed a model farming household for each case study village, which was the basis for contribution margin calculations for typical agricultural activities.

On the poster, we give an overview of household characteristics in terms of agricultural activities and their economic importance. Livestock keeping is the main economic activity for the majority of households with low non-farm income. Cropping as the second most important agricultural activity is more widespread in the case study villages of Azerbaijan compared to Georgia. Households having non-agricultural activities have a higher income and wealth status than households without non-agricultural income. Moreover, they tend to have less livestock.

Concluding our findings, we discuss the possibilities of arable farming, bee keeping and poultry as alternative income sources to livestock keeping to avoid unsustainable use of pastures in case study villages in Azerbaijan and Georgia.

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LONG- AND SHORT-TERM DETERMINANTS OF WATER USER COOPERATION: EXPERIMENTAL EVIDENCE FROM CENTRAL ASIA

Amirova I.[1,*], Petrick M.[1], Djanibekov N.[1]

1. Leibniz Institute of Agricultural Development in Transition Economies (IAMO), Halle (Saale), Germany

* corresponding author: Amirova@iamo.de

Abstract

This study contributes to the understanding of long- and short- term determinants of cooperation among water users. We experimentally investigate the potential of water users' self-governance in enhancing their contributions to a common pool as opposed to external regulation. Our focus is on the irrigated areas of Kazakhstan and Uzbekistan. Due to their Soviet past, these countries have a reputation for low bottom-up cooperation potential. Based on the different pre-Soviet irrigation traditions of the two study sites, we assess the effectiveness of short-term incentives compared to long term cultural factors of cooperation. History might matter, but we find it does not predetermine the success of current water decentralization in ancient as compared to relatively recently established irrigation sites. As the first analysis of water management based on field experiments conducted in the post-Soviet countries, it reveals that external regulation, in fact, decreases farmers' cooperation, whereas face-to-face communication increases it. This finding calls into question the top-down approach prevalent in current water policies of the region. Moreover, it suggests the viability of endogenous cooperation and hence encourages the implementation of truly self-governed water management policies in Central Asia. However, the substantial hete-rogeneity in individual contributions apparent at the village level also signals a warning that one-size-fits-all approaches to local cooperation are unlikely to succeed.

DIVERSITY ASSESSMENT AND CONSERVATION OF PLANTS IN ARMENIA: THE CASE OF WILD PEARS (PYRUS, ROSACEAE)

Nersesyan A.1*, Akopian J.1, Hovhannesyan M.1, Parolly G.2, Muradyan N.1, Zaroyan G.1, Borsch T.2, Korotkova N.2

1. A. Takhtajyan Institute of Botany NAS RA, Acharyan 1, Yerevan 0040, Armenia
2. Botanischer Garten und Botanisches Museum Berlin, Freie Universität Berlin, Königin-Luise-Str. 6-8, 14195 Berlin, Germany

* corresponding author: annersesyan1@gmail.com

Abstract

The Armenian Flora is very rich in valuable plant species including crop wild relatives, medicinal, food, dye and ornamental plants. Wild pears (the genus Pyrus) are among remarkable representatives of fruit-trees of Armenian flora. According to the currently available taxonomic treatments about 34 wild pear species grow in Armenia. Twelve of them are Armenian endemics. Ten species are included in the Red Book of Armenia and need to be protected. The genus Pyrus was therefore selected as a model group of flowering plants for research as well as ex situ conservation measures within the project "Developing Tools for Conserving the Plant Diversity of the South Caucasus".

One of the big challenges are the often unclear species limits, also complicating the identification of species. We have therefore started to reconstruct phylogenetic relationships in Pyrus based on multiple plastid regions but also nuclear markers and morphology. As some species turned out to be not monophyletic, their limits require taxonomic revision. Moreover, molecular markers indicate patterns of significant infraspecific diversity, which also is of conservation relevance. Within the project we are currently working to expand the sampling of wild populations throughout the country in order to identify the most important entities for in situ and ex situ measures.

The ex situ conservation activities on wild pear species are being carried out in the "Flora and vegetation of Armenia" plot of the Institute of Botany in Yerevan. The pear collection of the plot now comprises 18 species including Armenian endemics Pyrus elata, P. daralaghezi, P. megrica, P. tamamschjanae, P. sosnovskyi. Further endangered species such as Rhinopetalum gibbosum (CR) and Astragalus paradoxus (EN), are introduced in the "Exposition of Armenian Plant Communities". "Seed Bank of Armenian Flora" safeguards seeds of very rare species as Campanula massalskyi (CR) and Rhaponticoides hajastana (EN).

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SYSTEMATICS AND EVOLUTION OF CARNATIONS WITH A FOCUS ON THE DIANTHUS ORIENTALIS GROUP (CARYOPHYLLACEAE)

Nersesyan A.1*, Korotkova N.3, Ayvazyan N.2, Borsch T.3
  1. A. Takhtajyan Institute of Botany NAS RA, Acharyan 1, Yerevan 0040, Armenia
  2. L.A. Orbeli Institute of Physiology NAS RA, Orbeli Brothers St. 22, 0028 Yerevan, Armenia
  3. Botanischer Garten und Botanisches Museum, Freie Universität Berlin, Königin-Luise-Str. 6-8, 14195 Berlin , Germany

  * corresponding author: annersesyan1@gmail.com

Abstract

The genus Dianthus (carnations) has been shown to possess among the higest rates of species diversification in plants. From the estimated total of 300 species, about sixty are native in the Caucasus; ten species are Caucasian endemics and three of them are endemic to Armenia. There are several polymorphic species groups in the region that could result from active speciation, such as the D. orientalis alliance. Our goal is therefore to infer phylogenetic relationships of the Caucasian Dianthus and to get insights into species limits using a molecular phylogenetic approach. Morphology is also studied, which then can be mapped on the trees to test if lineages found with molecular data are also characterized certain morphological characters.

The first phylogenetic results based on four plastid DNA regions (trnL-rpl32, trnQ-rps16, trnK/matK and trnK-psbA) as well as nuclear ITS includes a dense sampling of Caucasian taxa as well as their Central European, Mediterranean and Irano-Turanian relatives. Genetic distances among Dianthus species are low but permit some resolution in phylogenetic analyses of combined plastid data, whereas the trees inferred from ITS are hardly resolved at all. No clade of Caucasian taxa was found, indicating that the Caucasian Dianthus as a whole do not have a common origin. The plastid tree reveals the D. orientalis group as non-monophyletic. Thus, the morphological characters used to link these species are probably convergent but no indicators of a close relationship. At the same time, the nuclear ITS data indicate extensive hybridization in most Dianthus species sampled. An integrative approach is therefore needed including the analysis of morphological and molecular characters, which also permits the placement of the type specimens on which species names are based.

Our work further includes the study of herbarium specimens (which are digitized in the Yerevan herbarium ERE) with the goal to use this information to assess the distribution of species.

NARYN RIVER AS ENVIROTECHNICAL SYSTEM

Baialieva G.[1,*]

1.   University of Tuebingen, Burgsteige 11, Schloss Hohentübingen, Germany

* corresponding author: gbaialieva@gmail.com

Abstract
The Naryn river is glacially fed largest river in Kyrgyzstan which flows to the Syr Darya to form the Aral Sea. The case to be presented in the poster Shamaldy-Sai is located on the lower gorge of the Naryn river which accommodate first and oldest hydropower plant of the lower Naryn cascade. Designed as a dam-worker town with attendant industries, this windy lowland site was populated by dam workers, geologists and other applied specialists. It has been transformed in the post-soviet period by a newly relevant border with Uzbekistan and mass outmigration. Today, Shamaldy Sai presents a fascinating mix of borderland ruins and prosperity drawn from the river's hydropower and border trade.
Current research examines how the river harnessing as an energy-producer and site of industry changed human-environment interactions and how the bordered riverine life is being appropriated to socioeconomic, political and ecological challenges. Using ethnographic data from everyday life of the Kyrgyz-Uzbek transboundary riverine community, this poster shows changing environmental sensitivities, water management and bordered life of local people. It will depict local everyday life, how human-nature-infrastructure affected each other.
In-depth interviews, archival research and participant observation during 10 months of fieldwork grasp materials and local perceptions, strategies of post-industrial life, bordered life and natural environment. Preliminary findings show that resources, technology and people's coping strategies to involve are interdependent on local envirotechnical landscape. Therefore, the Naryn river and the bridge have strong power in fertilizing the riverine social lives and vice versa. Like many industry harnessed rivers, the Naryn river can be characterized as envirotechnical water with specific configuration of cultural, ecological and technological systems.

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STRENGTHENING THE ACTIVITIES
OF THE NATIONAL BOTANICAL GARDEN OF GEORGIA
TO IMPLEMENT CONSERVATION OF PLANT DIVERSITY IN GEORGIA

Darchidze T.[1*], Barblishvili T.[1], Asanidze Z.[1], Parolly G.[2]

1.   National Botanical Garden of Georgia (NBGG), 0105 Tbilisi, Georgia
2.   Botanischer Garten und Botanisches Museum Berlin (BGBM), Königin-Luise Str. 6-8, 14195 Berlin, Germany

* corresponding author: tinabar7@yahoo.com

Abstract
Plant conservation has a long background in the National Botanical Garden of Georgia. Together with its partner institution, the Institute of Botany from the Ilia State University, the activities of NBGG contribute to meet Georgia's commitments under the Convention on Biological Diversity. In recent years botanic gardens have expanded their role in society in line with the need to respond to the environmental challenges. At the NBGG this has led to a new institutional strategic plan that covers all themes of a modern botanic garden: Science, plant conservation, collections, visitor attraction & environmental education. On the management side this involves development of staff, infrastructure and self-generated income. Within the project "Developing tools for conserving the plant diversity of the South Caucasus", NBGG's involvement aimed at strengthening the scientific capacities through academic education, internships and also practical training of staff. Topics covered include curation and horticultural management of plant collections, database management, and environmental education. Apart from exchange of scientists and technical staff a training module on "Collection management & botanic garden curation" was organized within the 2nd phase of the project (September 15-October 6) at BGBM. Specific attention is given to the exemplar plant groups also investigated in other work packages of this project in terms of species diversity and evolution such as Campanula (Campanulaceae) or Pyrus (Rosaceae). This allows incorporating a scientific knowledge base into practical activities, starting with a reliable documentation and identification of plant materials. For example, in situ and ex situ conservation activities can be complemented. Research in the field and the herbarium results in robust conservation status assessments of species, supports the priority setting for conservation activities (e.g. by identifying relevant populations) and at the same time provides material for seed bank and living collections as well as educational purposes. Moreover, the activities facilitate the participation of Georgian scientists in global activities aimed at the study and conservation of plant diversity.

DETECTING SPATIO-TEMPORAL PATTERNS OF LAND ABANDONMENT IN THE LOWER REGION OF THE AMU DARYA AND SYR DARYA RIVERS USING EARTH OBSERVATION DATA

Bauer C.[1*], Löw F.[2], Klein D.[3], Conrad C.[1,4]

1. University of Würzburg, Institute of Geography and Geology, Remote Sensing Department, Oswald-Külpe-Weg 86, 97074 Würzburg, Germany
2. MapTailor Geospatial Consulting GbR, Bonn, Germany
3. German Aerospace Center (DLR), German Remote Sensing Data Center (DFD), Oberpfaffenhofen, 82234 Wessling, Germany
4. University of Halle, Institute of Geosciences and Geography, Von-Seckendorff-Platz 4, 06120 Halle, Germany

* corresponding author: christian.bauer2@uni-wuerzburg.de

Abstract
The collapse of the Soviet Union initiated an increased abandonment of farmland in Uzbekistan and Kazakhstan. However, the dependency on agricultural production is still high, particularly in the context of food security and the rapidly growing population. Despite vast research on land degradation, the processes and drivers for abandonment remain hardly understood. One reason for this gap may be the little attention that was paid to site-specific information about abandonment of arable land in irrigation agriculture. In this study, analysis of time series from Landsat satellite data is recognized as highly suitable to establish retrospective and current land use changes. A methodological framework was developed, which utilizes Random Forest (RF) machine learning to classify arable land and to discriminate between used and unused fields. It further subdivides fields classified as "unused" in sparse, open and dense shrubland by analyzing the intensity of their vegetation signal in the satellite data. The framework also encloses a ruleset for accurate decisions for extremely heterogeneously vegetated fields. These steps, together with the application of the methodological framework to the study region in the observation period 1998-2016 permit to receive area-wide information on the timing when a land parcel was abandoned. The RF regression was applied to assess the most important spatial parameters (drivers) leading to land abandonment. The complexity of the crop rotations, long fallow cycles, and the data scarcity challenged the detection of abandoned land. The annual maps show that abandonment mainly occurred on fields at the edges of the irrigation area and on fields close to main drainage systems. The methodological framework is now ready for the identification of abandoned land hotspots, time steps and drivers and can hence support regional land use planners to improve land management, e.g. to take site specific decisions on the potential reuse of fields, irrigation maintenance, or alternative land use options.

CROPLAND ABANDONMENT, REWILDING AND PROTECTED AREA CONNECTIVITY IN THE STEPPES OF KAZAKHSTAN

Baumann M.[1,*], Bleyhl B.[1,2], Kamp J.[3], Dara A.[4], Prishchepov A.[5], Kraemer R.[1], Urazaliev R.[6], Hölzel N.[3], Kuemmerle T.[1,2]

1. Geography Department, Humboldt-Universität zu Berlin, Unter den Linden 6, 10099 Berlin, Germany
2. Integrative Research Institute on Transformations of Human-Environment Systems (IRI THESys), Humboldt-Universität zu Berlin, Unter den Linden 6, 10099 Berlin, Germany
3. Biodiversity and Ecosystem Research Group, Institute of Landscape Ecology, University of Münster, Heisenbergstr. 2, 48149 Münster, Germany
4. Leibniz Institute of Agricultural Development in Transition Economies (IAMO), Theodor-Lieser-Str. 2, 06120 Halle (Saale), Germany
5. Association for the Conservation of Biodiversity in Kazakhstan (ACBK), 18 Beibitshilik Str., Office 406, Astana 010000, Kazakhstan

* corresponding author: matthias.baumann@hu-berlin.de

Abstract
Human pressure on nature is increasing worldwide, leading to widespread biodiversity loss and ecosystem transformation. Identifying areas where restoration can take place is therefore important, and areas where socio-economic trends have led to relaxing human pressure are particularly promising in this context. Northern Kazakhstan is such a region as agricultural abandonment, population outmigration from rural areas, and the abandonment of livestock stations was widespread after the breakdown of the Soviet Union in 1991. What remains unclear, however, is how land-use changes and population decline may have resulted in opportunities for rewilding; that is - for restoring large, self-regulated ecosystem -, how such areas are located in relation to the current protected area network. Here, we used Landsat image composites to identify areas of agricultural abandonment in northern Kazakhstan between 1990 and 2015. We combined these maps with geodata of changes in settlements and livestock stations, which we gathered through digitization of historic Soviet maps and high-resolution aerial images. We then used self-organizing maps (SOMs) to identify 'rewilding clusters', and a combination of least-cost modelling and electric circuit theory to assess how these potential wilderness areas would increase protected area connectivity in the area. Our results suggest that between 1990 and 2015 a total of 52,250 km2 of cropland (28.5% of all cropland in 1990) were abandoned, whereby abandonment was stronger during 1990-2000 (80% of all abandonment) compared to 2000-2015 (20%). Simultaneously, ongoing rural outmigration and subsequent abandonment of livestock stations resulted in an effective rewilding of the landscape, with generally positive effects on protected area connectivity. Yet, our results also suggest that since 2000 the region experiences strong re-cultivation trends (up to 20% of the cropland abandoned after 1990), indicating that the window of opportunity for restoration through rewilding may disappear soon.

OPEN SOURCE RIVERSCAPES: WHAT CAN WE LEARN ABOUT THE
STRUCTURE OF LARGE RIVER CORRIDORS BY MEANS OF
OPEN ACCESS DATA AND OPEN SOURCE SOFTWARE?

Betz F.[1,*], Lauermann M.[1], Cyffka B.[1]

1.   Catholic University Eichstaett-Ingolstadt, Applied Physical Geography, Ostenstr. 18,
     85072 Eichstaett, Germany

     * corresponding author: florian.betz@ku.de

Abstract

The riparian ecosystems along the inland rivers are important landscape features in Central Asia. They are regional hotspots of biodiversity and deliver manifold ecosystem services to local people. For a sound scientific assessment as well as for comprehensive management, spatially continuous information along the entire river corridor is required. For large rivers like the Naryn in Kyrgyzstan with a length of more than 700 km, field based surveys cannot fulfil this task. Thus, many attempts have been made to use remote sensing and digital terrain analysis for the derivation of manifold river corridor parameters. While the use high resolution data derived from airborne LIDAR or very high resolution satellite imagery becomes more and more popular, the costs of such data is often too high for a large scale assessment in the context of developing countries like Kyrgyzstan.

This study presents an assessment of riparian ecosystems along the Naryn River in Kyrgyzstan using open access data and open source software. In this context, we define riparian ecosystems as consisting of natural vegetation connected to the hydrological and geomorphological processes in the river channel. The connectivity to the channel is modelled using a fuzzy logic approach and different DEM derived indicators. Natural vegetation is represented by means of vegetation indices derived from Landsat imagery. With this combination, the extent and spatial distribution of the riparian ecosystems along the Naryn have been analysed. Further GIS derived river corridor parameters like the confinement, the channel gradient and the stream power are used for further insights in the control of the structure of the river corridor.

In summary, we state that our open source approach is meaningful for the analysis of large scale river corridors and generates interesting and relevant information about the structure of the Naryn River which was not available before.

DRIVERS OF SOIL CARBON STOCKS
IN THE STEPPE ZONE OF KAZAKHSTAN

Bräuer P.[1], Freitag M.[1], Koshkina A.[1,2], Wertebach T.[1], Kamp J.[1], Hölzel N.[1,*]

1. Institute of Landscape Ecology, University of Münster, Heisenbergstr. 2, 48149 Münster, Germany
2. Association for the Conservation of Biodiversity of Kazakhstan (ACBK), Beibitshilik Str. 18, 010000 Astana, Kazakhstan

* corresponding author: norbert.hoelzel@uni-muenster.de

Abstract

The abandonment of croplands, induced by the break-up of the Soviet Union in 1991, has led to enhanced carbon sequestration of global relevance. Kazakhstan accounts for 20.6 Mha of abandoned croplands. Yet, estimates about the magnitude of this globally relevant carbon pool diverge and ground-based studies are rare. We investigated carbon stocks in thirteen test areas (240 plots) in Northern Kazakhstan (Kostanay Province). Test areas were arranged along a bioclimatic south-north gradient from desert steppe to meadow steppe and included cropland, young and old abandoned fields and grasslands. We used sand content and soil types to reveal to what extent land use effects on soil organic carbon (SOC) are influenced by site conditions. Soil type specific properties and climatic conditions had a greater impact on SOC stocks than land-use. SOC concentrations generally decreased with increasing sand content, but most significantly in the subsoil. Towards increasing aridity in the south, SOC concentrations in the topsoil (0 - 5 cm) generally decreased but no such effect was observed for the total SOC stocks. Chernozems, predominantly located in the meadow steppe, had the highest SOC stocks and Kastanozems in the South the lowest, but variation was high. SOC stocks declined with time since abandonment, likely because the less productive and hence less carbon-rich soils were abandoned at first in the 1990s. Croplands revealed the highest and old fallows lowest SOC stocks (means 15.69 kg C*m^{-2} and 11.24 kg C*m^{-2}, respectively). In contrast, young fallows revealed highest values for the topsoil (1.43 kg C*m^{-2}). We were able to demonstrate that land-use effects are also affected by site conditions and that a large number of samples of several depth increments are needed to detect the effects of land-use change of SOC stocks.

ADAPTIVE EFFICIENCY IN STRUCTURAL TRANSFORMATION: A CASE STUDY OF UZBEKISTAN

Choi M.[1,*]

1.   Researcher, Governance in Emerging Economies, 10717 Berlin, Germany, PhD Candidate, University of Groningen, 9712 CP, the Netherlands

   * corresponding author: choi@gee-research.net

Abstract
After the collapse of the Soviet Union, newly independent countries had to deal with the dismantled planning system, inefficiency of production, regional and sectorial distortions, limited access to world market along with the reduction in the living standards. However, Uzbekistan rose as an important outlier, as the transitional economy accomplished favourable production structure and attained near self-sufficiency in several fundamental industries. Moreover, the country completed series of planned industrial shifts within 25 years with a success by diversifying from agriculture and cotton production to key strategic industries including oil and gas and automobiles. And recently, Ustyurt Gas and Chemical Complex was established with the largest ever foreign investment in the history of Central Asia and all of these capital-intensive projects survived. Although full-fledged industrial linkages or spill-over effects among different sectors were not seen yet, the state was able to come to terms with the problems of old Soviet system, i.e., unfeasible planning, the deformation of economic behaviour and inefficiency of production.
In theory and historical experiences, structural transformation involves large-scale changes, impacts and shocks, as new sectors emerge as drivers of employment creation and technological upgrading. Therefore, adaptation is central issue during the process and overall institutional structure which facilitates adaptation plays a key role in its success. More specifically, governance of institutional structure determines the degree to which the society and the economy encourages the trials, experiments and innovations. Given that theories on adaptive efficiency are rather sporadic and inconclusive about what are adaptively efficient institutions, this study attempts to identify adaptive properties of institutional building which has been conducive for successful structural transformation in Uzbekistan with a particular focus on the institutional change in accordance with each stage of structural transformation using archival data and interviews.

REVEALING SPATIAL AND TEMPORAL PATTERNS OF CROPLAND ABANDONMENT AND RECULTIVATION IN NORTHERN KAZAKHSTAN AFTER THE BREAKDOWN OF THE SOVIET UNION

Dara A.[1,2,*], Baumann M.[1], Kuemmerle T.[1,3], Pflugmacher D.[1], Rabe A.[1], Griffiths P.[1], Hölzel N.[4], Kamp J.[4], Freitag M.[4], Hostert P.[1,3]

1. Geography Department, Humboldt-Universität zu Berlin. Unter den Linden 6, 10099 Berlin, Germany
2. Leibniz Institute for Agricultural Development in Transition Economies (IAMO). Theodor-Lieser-Str. 2 06120 Halle (Saale), Germany
3. Integrative Research Institute on Transformations of Human-Environment Systems (IRI THESys), Humboldt-Universität zu Berlin. Unter den Linden 6, 10099 Berlin, Germany
4. Institute of Landscape Ecology, University Münster, Heisenbergstr. 2, 48149 Münster, Germany

* corresponding author: andrey.dara@geo.hu-berlin.de

Abstract
Cropland abandonment may have substantial effects on biodiversity and carbon stocks globally. Yet, it received considerably less attention from the scientific community than cropland expansion. Knowing when and where cropland contraction and expansion took place is important for conservation and land-use planning. In this study, we mapped the exact timing of cropland abandonment in northern Kazakhstan between 1988 and 2013 and recultivation between 1991 and 2013. We then calculated soil organic carbon (SOC) sequestration for our area of interest. Our approach was based on the analysis of annual time series of cropland probabilities derived from Landsat imagery using a random forest algorithm. The maps yielded overall accuracies of 89%. According to our results 59.8% of our study area was cultivated in 1985, and about 40% of these croplands had been abandoned by 2013. The maximum annual abandonment (13.0% of all cropland abandonment) was found for the year 1995. A substantial proportion of the abandoned cropland (20%) had been recultivated by the end of our study period in 2013. The study accordingly underlines the importance of the adequate temporal resolution for mapping land-use change, such as abandonment. One major insight is that detailed maps of abandonment help to uncover that relatively productive croplands were abandoned last and recultivated first, as recultivation after 2007 happened mostly on recently abandoned croplands. Another important insight is that a finer temporal resolution of abandonment mapping also allowed for substantially more accurate estimates of SOC sequestration. We estimated SOC sequestration to be 16.3 ± 3.5 Gt C compared to 24.0 ± 5.8 Gt C when assuming all abandonment happened in 1990, with the uncertainty decreasing by 63%. Our study demonstrates the value of Landsat time series for conservation and land-use planning in steppe areas.

PROXIMITY REVISITED: CAN MUTUAL ACCESS TO 'THIRD PLACES' OFFSET DISTANCE'S EFFECT ON SOCIAL RELATIONS

Darkhan M.[1,2,*]

1. Leipzig University, Augustusplatz 10, 04109 Leipzig, Germany
2. Nazabayev University, Qabanbay Batyr Ave 53, Astana 010000, Kazakhstan

* corresponding author: darkhan.medeuov@nu.edu.kz

Abstract

Studies of propinquity effects on friendship usually conclude that likelihood of friendship decreases with geographical distance between actors. One of the explanations for this is that friendship grows through tangible interactions that easier at shorter distances. In the urban context however, public transportation can offset effects of distance by providing actors with mutual access to "third places" scattered around the city.

In this study, I compare effects of pairwise distance and access to public transportation on friendship among a cohort of 157 high-school students in a city in Kazakhstan. To measure actors' inclusion in the public transport network, I construct a weighted network of bus stations, calculate combined M-reach centrality of bus stations within 10-min walking distance for each actor, and use its absolute pairwise difference as a dyadic covariate. Physical proximity enters modeling either as linear (as "the crow flies") or walking (as "the wolf runs) distance between actors. To account for possible non-linear relations between access, distance, and friendship, I follow 3-step analytic strategy: first I explore overall dependencies of distances and access on friendship using non-parametric regression; then I approximate explored dependence with logistic regression; and finally I include the corresponding transformation of distances and access into Exponential Random Graph Models to compare the effects' explanatory power and to examine if their effects retain significance in the presence of structural and individual covariates.

Results provide support for access hypothesis: while linear distance effect tends to be somewhat stronger than that of walking distance, both effects lose significance once structural dependencies are controlled. The difference in access, however, remains significant, suggesting that in this case mutual access to public transportation may be more salient for friendship than pairwise proximity.

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TAPPING THE POTENTIAL OF LANDSAT ARCHIVES FOR THE MONITORING OF IRRIGATED LAND USE DEVELOPMENT IN THE LOWER SYR DARYA CATCHMENT, KAZAKHSTAN, 1984-2016

Degtyareva O.[1,*], Löw F.[2], Conrad C.[3,4], Thiel M.[3], Muratova N.[5]

1. National Center of Space Research and Technology, Kazakhstan, Almaty, 15 Shevchenko str, 050010
2. MapTailor Geospatial Consulting GbR, Bonn, Germany
3. University of Würzburg, Institute of Geography and Geology, Department of Remote Sensing, Oswald-Külpe-Weg 86, 97074 Würzburg
4. University of Halle, Institute of Geosciences and Geography, Von-Seckendorff-Platz 4, 06120 Halle, Germany
5. Research Institute of Ecology problems of the Al-Farabi's Kazakh National University, Kazakhstan, Almaty, 71 Al-Farabi av., 050040

* corresponding author: kartograf@inbox.ru

Abstract

Agriculture is one of the economy priorities of Kazakhstan. After the collapse of the Soviet Union in 1991, the country had to cope with enormous transformation processes including land privatization and implementation of new organizational structures in agriculture. Together with the existing land degradation problems that negatively affected crop production, these processes led to land abandonment, e.g. in the downstream rice cropping systems along the Syr Darya River. However, potential solutions for a more sustainable production demand for more detailed information on the use of croplands over time. Therefore, a temporal transect of land use maps for the rice-dominated Kazalinsk region, Southwest Kazakhstan, was generated through a remote sensing and GIS analysis. We processed 84 images of different Landsat sensors recorded between 1984 and 2016. For the elaboration of the approach and for the verification of the maps ground data were collected in 2015 and 2016. Three temporal windows (early, mid, and end of season) and a simple but effective mapping approach permit the accurate identification of actively used rice fields. The results returned a remarkable decline of rice production area during the late Soviet Union era (annually, 17,000 ha out of entirely 38,444 ha were used for rice production) until 2004 (5,000 ha), which was followed by some re-use of cropland for rice production afterwards (~10,000 ha). Counting the number of years under rice production highlighted that compact blocks of rice production are more likely to be active than fragmented fields, which could be attributed to the costs required for irrigation under the risk of water scarcity. Next steps include the overlay of the land use indicators with GIS information such as the irrigation canal network, soil quality, soil salinity, and groundwater tables in order to model the mechanisms that led to variations in rice production, or land abandonment.

CARBON POOL DENSITIES AND A FIRST ESTIMATE OF THE TOTAL CARBON POOL IN THE MONGOLIAN FOREST-STEPPE

Dulamsuren C.[1,*], Klinge M.[2], Degener J.[2], Khishigjargal M.[1,3], Chenlemuge T.[1], Bat-Enerel B.[4], Yeruult Y.[4], Saindovdon D.[5], Ganbaatar K.[3], Tsogtbaatar J.[5], Leuschner C.[1], Hauck M.[1*]

1. Plant Ecology, Albrecht von Haller Institute for Plant Sciences, Georg August University of Göttingen, Untere Karspüle 2, 37073 Göttingen, Germany
2. Cartography, GIS and Remote Sensing, Institute of Geography, Georg August University of Göttingen, Goldschmidtstraße 5, 37077 Göttingen, Germany
3. Agroecology, Mongolian University of Life Sciences, Zaisan, Khan-Uul District 53, 17024 Ulan Bator, Mongolia
4. Botany, Institute of General and Experimental Biology, Mongolian Academy of Sciences, Zhukov Street 77, 13330 Ulan Bator, Mongolia
5. Geography and Geoecology, Mongolian Academy of Sciences, Baruun Selbe 15, Chingeltei District, 15170 Ulan Bator, Mongolia

* corresponding authors: mhauck@gwdg.de, dchoima@gwdg.de

Abstract

The boreal forest biome represents one of the most important terrestrial carbon stores, which gave reason to intensive research on carbon stock densities. However, such an analysis does not yet exist for the southernmost Eurosiberian boreal forests in Inner Asia. Most of this forest is located in the Mongolian forest-steppe, which is largely dominated by *Larix sibirica*. We quantified the carbon stock density and total carbon pool of Mongolia's boreal forests and adjacent grasslands and draw conclusions on possible future change. Mean aboveground carbon stock density in the interior of *L. sibirica* forests was 66 Mg C ha^{-1}, which is in the upper range of values reported from boreal forests and probably due to the comparably long growing season. The density of soil organic carbon (SOC, 108 Mg C ha^{-1}) and total belowground carbon density (149 Mg C ha^{-1}) is at the lower end of the range known from boreal forests, which might be the result of higher soil temperatures and a thinner permafrost layer than in the central and northern boreal forest belt. Land use effects are especially relevant at forest edges, where mean carbon stock density was 188 Mg C ha^{-1}, compared to 215 Mg C ha^{-1} in the forest interior. Carbon stock density in grasslands was 144 Mg C ha^{-1}. Analysis of satellite imagery of the highly fragmented forest area in the forest-steppe zone showed that Mongolia's total boreal forest area is currently 73,818 km[2] and 22 % of this area refers to forest edges (defined as the first 30 m from the edge). The total forest carbon pool of Mongolia was estimated at c. 1.5-1.7 Pg C, a value which is likely to decrease in future with increasing deforestation and fire frequency, and global warming.

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FROM GRAZING TO FIRE: POST-SOVIET DISTURBANCE SHIFT ALTERS STEPPE VEGETATION

Freitag M.[1,*], Velbert F.[1], Kamp J.[1], Koshkina A.[1,2], Sidorova T.[2], Stirnemann I.[1], Ullrich B.[1], Hölzel N.[1]

1. Institute of Landscape Ecology, University of Münster, Heisenbergstr. 2, 48149 Münster, Germany
2. Association for the Conservation of Biodiversity of Kazakhstan (ACBK), Beibitshilik Str. 18, 010000 Astana, Kazakhstan

* corresponding author: martin.freitag@uni-muenster.de

Abstract

The steppes and semi-deserts of Central Asia, in particular those of Kazakhstan, have been subject to major land-use changes during the 20th century. After the collapse of the Soviet Union in 1991, livestock numbers declined rapidly. The remaining animals now concentrate around settlements, whereas across vast areas further away from human settlements, pastures have been abandoned. We hypothesized that the widespread cessation of grazing has led to an increase in wildfire frequency and subsequent shift in plant functional characteristics of steppe vegetation.

To examine the effects of the altered fire-grazing interplay on vegetation we sampled 204 vegetation plots stratified by grazing intensity and fire frequency (the latter derived from the MODIS burned area product). Multivariate RLQ analysis and fourth-corner analysis was used to assess the relative importance and effects of environmental drivers and plant functional traits.

Livestock grazing was confined to the surroundings of villages whilst fires occurred solely in ungrazed or hardly grazed areas. Tussock grasses were favoured by high fire recurrence rates whereas with increasing grazing intensity, small-growing plants with a short life cycle benefitted. The transition from high livestock numbers managed in a semi-nomadic way to intensive grazing of smaller areas near villages has led to biomass being now exclusively consumed by fire across vast areas.

The current fire regime in the Kazakh steppes rates creates and stabilizes rather monotonous grassy swards which may lead to changes in ecosystem functioning. We suggest the reintroduction of livestock grazing into the remote areas of Kazakh steppe to reduce fuel for wildfires, which would require considerable investment into rural infrastructure for a sustainable socio-economic development.

VULNERABILITY AND RISK OF SOCIAL-ECOLOGICAL SYSTEMS TO CHANGES IN GLACIER AND SNOW-MELT RUNOFF AND HOUSEHOLD LEVEL COPING STRATEGIES IN CHUI PROVINCE, KYRGYZSTAN

Hagenlocher M.[1], Groth J.[2], Fang-Ju Lin R.[1], Renaud F.[3], Sultanaliev K.[4], He Z.[5], Vorogushyn S.[5]

1. United Nations University, Institute for Environment and Human Security (UNU-EHS), Bonn, Germany
2. Helmholtz Centre for Environmental Research – UFZ, Leipzig, Germany
3. University of Glasgow, School of Interdisciplinary Studies, Dumfries, UK
4. American University of Central Asia, Bishkek, the Kyrgyz Republic
5. GFZ German Research Centre for Geosciences, Potsdam, Germany

* corresponding author: hagenlocher@ehs.unu.edu

Abstract
The main rivers of Central Asia are key to people's livelihoods in the semi-arid region of Central Asia. The economies of the riparian states rely heavily upon the use of the river water, mainly for irrigated agriculture and for hydropower generation, making them highly vulnerable to changes in river runoff regimes.

As part of the GLASCA and GLASCA-V projects, we analyzed vulnerability and risk of social-ecological systems to agricultural drought using a spatial explicit approach for Chui province in northern Kyrgyzstan. Relevant vulnerability indicators were identified based on a literature review, expert interviews and focus group discussions in the study area. Following data acquisition, indicators were combined in a vulnerability and risk index using a hierarchical, spatially explicit approach. In this context the remotely-sensed vegetation health index (VHI) was used as a proxy for agricultural drought. Correlation analysis indicates that changes in the VHI are highly related to changes in seasonal runoff components (RCs) generated from the headwater mountain catchments, including snowmelt, rainfall, groundwater, and glacier melt. In addition, three villages in the province were selected for an in-depth investigation of hazard impacts, socio-economic and ecological conditions as well as of coping and adaptation strategies of local farmers towards flood and drought risks by means of expert interviews (n = 5), household surveys (n = 139) and three focus group discussions (one in each community).

In our poster, we will present the findings of the spatial vulnerability and risk assessment for Chui province as well as the outcomes of the in-depth investigations regarding (1) flood and drought occurrences and associated impacts, (2) household level coping and adaptation strategies for droughts and floods, and (3) perceived constraints for coping and adaptation actions.

MODELING THE SPATIAL DISTRIBUTION OF GRAZING INTENSITY IN KAZAKHSTAN

Hankerson B.[1,2,*], Schierhorn F.[1], Prishchepov A.[3,4], Dong C.[1], Eisfelder C.[5], Müller D.[1,2,6]

1. Leibniz Institute of Agricultural Development in Transition Economies (IAMO), Halle (Saale), Germany
2. Geography Department, Humboldt-Universität zu Berlin, Berlin, Germany
3. Department of Geosciences and Natural Resource Management (IGN), University of Copenhagen, Copenhagen, Denmark
4. Institute of Environmental Sciences, Kazan Federal University, Kazan, Russia
5. German Remote Sensing Data Center (DFD), German Aerospace Center (DLR), Oberpfaffenhofen, Germany
6. Integrative Research Institute on Transformations of Human-Environment Systems (IRI THESys), Humboldt-Universität zu Berlin, Berlin, Germany

* corresponding author: hankerson@iamo.de

Abstract

With increasing affluence in many developing countries, the demand for livestock products is rising and the increasing feed demand contributes to pressure on land resources for food and energy production. However, there is currently a knowledge gap in our ability to assess the extent and intensity of the utilization of land by livestock, which is the single largest land use in the world. In this research, we developed a novel model that combines fine-scale livestock numbers with their associated energy requirements to distribute livestock grazing demand onto a map of energy supply, with the aim of estimating the distribution and intensity of pasture utilization. We applied our model to Kazakhstan, which contains large grassland areas that historically have been used for extensive livestock production but for which the current extent, and thus the potential for increasing livestock production, is unknown. The grazing demand for Kazakhstan in 2015 amounted to 286 Petajoules, which was 21% of the estimated maximum sustainable energy supply provided by grasslands. The model resulted in a grazed area of 122.2 million hectares, or 48% of the area theoretically available for grazing in Kazakhstan. While most utilized land was grazed at low intensities (average of 13% of total biomass energy production), substantial portions of south and southeast Kazakhstan are at risk of overgrazing, due to inadequate pasture resources near settlements. In other parts of Kazakhstan, there is potential to greatly increase livestock productions under current conditions, and much greater with infrastructure development. This model is an important step forward in evaluating pasture use and available land resources, and can be adapted at any spatial scale for any region in the world.

HOW ACCESS TO AGRICULTURAL SERVICES IMPACT TO FARM PERFORMANCE IN SAMARKAND REGION

Ibragimov G.[1,*], Murtazaev O.[1], Sanaev G.[1]

1. Samarkand Agricultural Institute, Mirzo Ulugbek street, 77, 140103, Samarkand, Uzbekistan

* corresponding author: gaibragimov@yahoo.com

Abstract
Agriculture is one of the main sectors for the economy of Uzbekistan. During the 20th century, agriculture mainly relied on state and collective property, which not only had production, but also included a production infrastructure.

Farming has different stage of history in Uzbekistan. First farms were created even Soviet period in 1990. In 1998 the Uzbek government introduced a new law on farm activity. After adopting new law, decollectivization process was speeded up since 1998. By 2003, all former collective farms were fragmented into individual farms with an average size of 10 ha. By 2008, the number of farms in Samarkand reached 25,000. Exactly this year, the government initiated a program of farm optimization. Uzbek government always pays attention to the development of farms and this has already provided results.

The aim of the research is to learn the impact of access of agricultural services in the efficiency of farms in the period of transition economy.

This research aims to address the following question: (1) What is the impact of the quality of agricultural service provision on farm performance? (2) How did organizational and economic mechanisms of Agricultural service sector evolve since 1991? (3) What are the alternative mechanisms for efficient agricultural service provision in Uzbekistan?

Research is based on survey from key experts interview (farm managers, representatives of service providers) and official statistics period from years 2007-2016. We used random effect model and production function. We estimate 14 districts, 10 years, 6 Agricultural service providers (bank services, Diesel supply, Fertilizer supply, technical service (By MTP, farm cooperation, tractor holders), Consulting service, Water supply). Preliminary results gave us that some variables have significantly affected on farm efficiency, but some of them has not significantly affected.

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COMBINING REMOTE SENSING AND HYDROLOGICAL MODELING FOR ASSESSING THE DYNAMICS OF SOIL SALINITY IN THE ARAL SEA BASIN

Ibrakhimov M.[1,2], Sultanov M.[1], Conrad C.[2,3], Lamers J.[4]

1. Khorezm Rural Advisory Support Service (KRASS). 14, Khamid Olimjan street, 220100 Urgench, Khorezm, Uzbekistan
2. University of Würzburg, Institute of Geography and Geology, Department of Remote Sensing, Oswald-Külpe-Weg 86, 97074 Würzburg, Germany
3. University of Halle, Institute of Geosciences and Geography, Von-Seckendorff-Platz 4, 06120 Halle, Germany
4. Center for Development Research (ZEF), Department of Ecology and Resource Management, University of Bonn. Genscheralle Str. 3, 53113 Bonn, Germany

* corresponding author: hayot_i@yahoo.com

Abstract
Land salinization threatens sustainability of irrigated agriculture. It severely limits land productivity and hence rural livelihoods in the Aral Sea Basin (ASB). Sound monitoring and mapping techniques are required to define proper management countermeasures. However, traditional salinity monitoring methods are resource and time demanding yet limited in spatial and temporal coverage. This study aimed at assessing the predictive quality of soil salinity assessment with remote sensing (RS) tools in the basin's irrigated areas. Salinity was assessed indirectly, from vegetation indices estimated from Landsat 5TM imagery in 75.5 ha irrigated area during 2008-2009. To assess the precision of salinity prediction, the HYDRUS-1D model was employed based on in-situ sampling for soil EC at depths of 0-30, 30-90 and >100 cm, measurements of groundwater depth and EC, irrigation amounts and evapotranspiration (FAO-56) from climate data. Daily salinity dynamics were modelled in slightly, moderately and highly saline spots, identified in the RS maps. The findings showed that an RS-based salinity assessment alone allows for modest reliable prediction only: the relationship of the salinity maps and empirical data collected with an electromagnetic EM38 device were weak (R^2=0.15-0.29) during, but became more reliable (R^2=0.35-0.56) beyond irrigation periods. Salinity modelling with HYDRUS-1D at slightly, moderately and highly saline sites at various depths underlined that under present irrigation and drainage infrastructure, salts tend to only move to deeper layers during water applications, but reappear in the profile during dry periods. In contrast, beyond irrigation events, salts gradually increased in the upper soil layers without fluctuations. We argue that coupling RS techniques with numerical modelling provided valuable insight into within-season salinity dynamics than any of these approaches alone. This should be of interest to farmers and policy makers in the ASB since the combination of methods will allow for better planning and management of melioration measures.

STATE BUSINESS RELATIONS IN THE FOOD AND AGRICULTURE SECTOR OF GEORGIA

Jugheli T.[1,*]

1. Hermanstrasse,18., 12052, Berlin

* corresponding author: jugheli@gee-research.net

Abstract

The research paper aims to understand the forms and effectiveness of the State Business Relations (SBRs) in the Food and Agriculture Sector of Georgia. Agribusiness (including fruits and vegetables, hazelnuts, wine) is perceived to be among the high potential industries for Georgia's growth prospects (Onugha & Lootty, & Kilroy & Plmade, 2013; FAO, 2012;). Since 2012, the food and agriculture sector of Georgia became the target of selective industrial policy of the Government of Georgia. The state took the role of financier in order to create incentives for private actors to direct investment in this sector and to support growth of production and export. Considering the prominence of the effective SBRs for effective state intervention, this research aims to understand the characteristics/forms of SBRs and its adaptive efficiency in the food and agriculture sector of Georgia. Understanding how SBRs evolve over time, will help to understand their adaptive efficiency (North, 1993;) as well, meaning their flexibility to be changed or replaced in response to the political and economic feedback. The analytical framework of the research relies on the institutionalist approach to SBRs. This research assesses the effectiveness of SBRs in the food and agriculture sector of Georgia based on the ollowing criteria: information exchange mechanisms, reciprocity and credibility between state and private actors.

The research is based on the data collected from the interviews with the representatives of the relevant state agencies, agribusinesses, umbrella, research and international donor organizations, as well as document studies. The paper will contribute to the academic literature on the state activism, industrial policy and SBRs.

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MONITORING BIOPHYSICAL PARAMETERS OF IRRIGATED RICE PRODUCTION IN THE LOWLANDS OF THE ARAL SEA BASIN FROM SPACE

Kenjabaev S.[1,*], Degtyareva O.[2], Sultanov M.[3], Thiel M.[4], Conrad C.[4,5]

1. Scientific Information Center Interstate Coordination Water Commission (SIC ICWC), 100187 Tashkent, Uzbekistan;
2. National Center of Space Research and Technology (NCSRT), 050010 Almaty, Kazakhstan;
3. Khorezm Rural Advisory Support Service (KRASS), 220100 Urgench, Uzbekistan;
4. University of Würzburg, Institute of Geography and Geology, Department of Remote Sensing, Oswald-Külpe-Weg 86, 97074 Würzburg, Germany.
5. University of Halle, Institute of Geosciences and Geography, Von-Seckendorff-Platz 4, 06120 Halle, Germany

* corresponding author: kenjabaev@yahoo.com

Abstract
Rice production in the lowlands of the Aral Sea Basin (ASB) contributes to the national food baskets of Kazakhstan and Uzbekistan. However, due to the exposure to water scarcity in the downstream location of the river systems and enormous land degradation problems, a high risk of crop failure exist. Early and area-wide information on irregularities in rice crop growth through remote sensing could help to reduce this risk. In this study, statistical relations between vegetation indices (VIs) from Landsat 8 surface reflectance and biophysical in situ measurements (plant height, crop density, green biomass, fraction of absorbed photosynthetically active radiation and leaf area index) of broadcast sown and transplanted rice were investigated. Special attention laid on the accurate derivation of the LAI. Field experiments conducted in three different irrigation subsystems of the ASB during the growing period of rice in 2015 revealed enormous spatial variations in observed rice biophysical parameters, both among the fields and sites owing to different land, water and crop management. Linear regression analysis techniques of paired variables comprising each one biophysical parameter and one out of six VIs showed diverse coefficients of determination. Tasseled Cap Greenness (TCG) was superior to all other indices in its explanatory power. Multivariate linear regression and particularly Classification and Regression Trees exhibited stronger statistical relations between four VIs (TCG, Normalized Difference Vegetation Index - NDVI, Transformed Vegetation Index - TVI and Green Chlorophyll Index - GCI) and LAI than the univariate assessments. The multi-location field experiments can be concluded to be useful for estimating certain effects of crop management on modeling biophysical parameters of rice. The results suggest furthering multivariate assessments of rice biophysical parameters and promoting remote sensing techniques to support local and regional policies and planning approaches in the irrigated lowland of the ASB.

RELATING WATER USE TO TREE VITALITY OF POPULUS EUPHRATICA OLIV. IN THE LOWER TARIM RIVER, NW CHINA

Keyimu M.[1], Halik Ü.[1,*], Rouzi A.[1]

1.   Xinjiang University, Key Laboratory of Oasis Ecology, College of Resource and Environment Sciences, 830046 Urumqi, China

* corresponding author: halik@xju.edu.cn

Abstract

Populus euphratica Oliv. is a rare, ancient, and endangered tree species which forms the riparian floodplain forest ecosystem in inland river basins in central Asian arid regions. Estimating the water consumption of P. euphratica forest is of great importance in scientific allocation of water resources for irrigated agriculture, nature and ecosystem conservation as well as for industry, oasis settlements and human well-being in the lower reaches of Tarim River, Northwestern China. This study aims to compare the hydraulic characteristics of P. euphratica which were in different vitality to reveal the differences of their water use strategies and water consumption to provide useful data to scale water use of riparian poplar forest more accurately. Findings in present study further showed that sapwood area can be estimated based on its correlation with tree biometric parameters. However, the sapwood area of vital poplar tends to be larger than the senesced poplar though both had the same diameter at breast height. It indicates that the vitality of poplar should be taken into account when estimate the sapwood area of P. euphratica. Therefore, we established two different sapwood area estimation models for vital and senesced poplar (sapwood area=$1.452 \times DBH1.553$, $R2=0.891$; sapwood area=$0.915 \times DBH1.618$, $R2=718$). Sap flow process of vital and senesced poplar had certain differences and similarities; the average sap flow velocity and water consumption of vital poplar were 15.85 cm/h and 45.95 L, respectively; as for the senesced poplar it was 9.64 cm/h and 18.17 L, respectively, which were smaller than of vital poplar. The influence of environmental factors on the sap flow was similar; sap flow of both vital and senesced poplar had positive correlation with air temperature ($R2=$ 0.800 and 0.851), solar radiation ($R2=0.732$ and 0.778), vapor pressure deficit ($R2=0.508$ and 0.643) and groundwater depth (0.301 and 0.171), negative correlation with air humidity ($R2=-0.313$ and -0.478).

HIGHER CLIMATE WARMING SENSITIVITY OF SIBIRIAN LARCH IN SMALL THAN LARGE FOREST ISLANDS IN THE FRAGMENTED MONGOLIAN FOREST STEPPE

Khansaritoreh E.[1], Dulamsuren C.[1,*], Klinge M.[2], Ariunbaatar T.[3], Bat-Enerel B.[3], Batsaikhan G.[4], Ganbaatar K.[4], Saindovdon D.[5], Yeruult Y.[3], Tsogtbaatar J.[4], Tuya D.[6], Leuschner C.[1], Hauck M.[1*]

1. Plant Ecology, Albrecht von Haller Institute for Plant Sciences, University of Goettingen, Untere Karspüle 2, 37073 Göttingen, Germany
2. Physical Geography, Institute of Geography, University of Goettingen, Goldschmidtstraße 5, 37077 Göttingen, Germany
3. Institute of General and Experimental Biology, Mongolian Academy of Sciences, Zhukov Street 77, 13330 Ulan Bator, Mongolia
4. Institute of Geography and Geoecology, Mongolian Academy of Sciences, Baruun Selbe 15, Chingeltei District, 15170 Ulan Bator, Mongolia
5. School of Natural Sciences, Mongolian State University of Education, Baga Toiruu 14, Sukhbaatar District, 210648 Ulan Bator, Mongolia
6. Tarvagatai Nuruu National Park, Tosontsengel Sum, Zavkhan Aimag, Mongolia

* corresponding authors: mhauck@gwdg.de, dchoima@gwdg.de

Abstract

Forest fragmentation has been found to affect biodiversity and ecosystem functioning in multiple ways. We asked whether forest size and isolation in fragmented woodlands influences the climate warming sensitivity of tree growth in the southern boreal forest of the Mongolian Larix sibirica forest-steppe, a naturally fragmented woodland embedded in grassland, which is highly affect by warming, drought and increasing anthropogenic forest destruction in recent time. We examined the influence of stand size and stand isolation on the growth performance of larch in forests of four different size classes located in a woodland-dominated forest-steppe area and small forest patches in a grassland-dominated area. We found increasing climate sensitivity and decreasing first-order autocorrelation of annual stemwood increment with decreasing stand size. Stemwood increment increased with previous year's June and August precipitation in the three smallest forest size classes, but not in the largest forests. In the grassland-dominated area, the tree growth dependence on summer rainfall was highest. Missing ring frequency has strongly increased since the 1970s in small, but not in large forests. In the grassland-dominated area, the increase was much greater than in the forest-dominated landscape. Forest regeneration decreased with decreasing stand size and was scarce or absent in the smallest forests. Our results suggest that the larch trees in small and isolated forest patches are far more susceptible to climate warming than large in continuous forests pointing to a grim future for the forests in this strongly warming region of the boreal forest that is also under high land use pressure.

GENDER DIFFERENCES AT THE TRANSITION FROM EDUCATION TO WORK - A COMPARATIVE YOUTH STUDY IN AZERBAIJAN, GEORGIA AND TAJIKISTAN

Kobakhidze N.[1,*], Mirov L.[2], Rodin V.[3]

1. I.Javakhishvili Tbilisi State University and Georgian Centre of Population Research (GCPR)
2. Technological University of Tajikistan and SHARQ (ORIENS) Research Center, Dushanbe, Tajikistan
3. Baku State University and International Centre for Social Research (ICSR), Baku, Azerbaijan

* corresponding author: ninokobakhidze95@gmail.com

Abstract

The TEW-CCA project has carried out a multi-country study on youths' labor market integration in Azerbaijan, Georgia and Tajikistan. Based on a micro-macro theoretical model we have studied the opportunities and constraints young individuals face during their transition from education to work in different cultural, economic and institutional contextual settings. In our poster, we will present some of our key findings of the nationally representative retrospective life history surveys on 6,000 young men and women from Azerbaijan, Georgia, and Tajikistan that were conducted in the TEW-CCA project.

Young people often face difficulties in finding a good job and they experience precarious periods of unemployment, temporary and informal employment. This applies particularly to young women despite education expansion, decreasing fertility rates and policy reforms that aim at a better reconciliation of work and family life. Against this background this poster analyses the gender gap in education attainment and the transition from education to work in Azerbaijan, Georgia, and Tajikistan. Specially, gender differences in terms of education attainment, search duration for the first job, inactivity and unemployment risks after leaving education as well as the type of first job (distinguishing forms of informal and formal employment) are investigated.

The analyses are performed separately for each country. Cross-country similarities are expected due to the common post-socialist heritage from Soviet time. Cross-country differences are expected due to differences in the economic transformation process and different ethnic and religiouscultures.

MARMOTS IN THE STEPPES OF KAZAKHSTAN - ASSESSING THE IMPACT OF LAND-USE CHANGE ON A KEYSTONE RODENT SPECIES USING PUBLICLY AVAILABLE SATELLITE IMAGES

Koshkina A.[1,2,*], Grigoreva I.[1,3], Tokarsky V.[4], Urazaliev R.[1,2], Kuemmerle T.[5,6], Hölzel N.[2], Kamp J.[2]

1. Association for the Conservation of Biodiversity of Kazakhstan (ACBK), Beibitshilik Str. 18, 010000 Astana, Kazakhstan
2. Institute of Landscape Ecology, University of Münster, Heisenbergstr. 2, 48149 Münster, Germany
3. Karaganda State University, Universitetskaya Str. 28, 100028 Karaganda, Kazakhstan
4. V. N. Karazin Kharkiv National University, 4 Svobody Sq., Kharkiv, 61022, Ukraine
5. Geography Department, Humboldt Universität zu Berlin, Unter den Linden 6, 10099 Berlin, Germany
6. Integrative Research Institute for Transformations in Human Environment Systems (IRI THESys), Humboldt-University Berlin, Unter den Linden 6, 10099 Berlin, Germany

* corresponding author: alyona.koshkina@acbk.kz

Abstract

Burrowing, social rodents are keystone species in grassland ecosystems, but agricultural expansion threatens these species in many regions of the world. Losses and declines of burrowing rodents may have dramatic effects on ecosystem processes, as their complex functions may be irreplaceable. The Bobak Marmot *Marmota bobak i*s the largest and most widely distributed burrowing rodent in the Eurasian steppes. Across its range, Bobaks are considered to be major ecosystem engineers, e.g. species changing the surrounding conditions and creating new habitat niches.

Much of the Eurasian steppes (more than 75% of Bobak Eastern range) were converted to cropland in the mid-20th century, but subsequently abandoned after the collapse of the Soviet Union in 1991. How these massive land-use changes affected marmot populations, however, remains poorly understood. Here, we aimed to assess the current distribution and abundance of Bobak Marmots in Kazakhstan in relation to land-use patterns, using very-high-resolution satellite imagery.

We surveyed 1300 random plots using publically available Google and Bing images to map marmot occupancy and abundance. We related occupancy and density to habitat and agricultural management as well as fire and soil parameters and used MaxEnt to construct a species distribution model. Based on the modeled distribution and density, we calculated a new population estimate for Kazakhstan. The feasibility of using satellite images to map

marmot burrows using an existing database was assessed by field-based validation of marmot occupancy in 10% of all occupied random plots.

Based on our findings on habitat preferences we discuss potential future population developments and threats for the species related to agricultural development. We also analyze perspective and constrains of using our new method for deriving population estimate and species management by national wildlife agencies.

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SPECIES COMPOSITION, PRODUCTIVITY, AND FUNCTIONALITY OF MOUNTAINOUS GRASSLAND IN THE GREATER CAUCASUS - A REMOTE SENSING BASED ASSESSMENT

Magiera A.[1*], Feilhauer H.[2], Waldhardt R.[1], Wiesmair M.[3], Otte A.[1]

1. Division of Landscape Ecology and Landscape Planning, Institute of Landscape Ecology and Resources Management, Justus-Liebig University, Heinrich-Buff-Ring 26-32, 35392 Giessen, Germany
2. Institute of Geography, Friedrich-Alexander University, Wetterkreuz 15, 91058 Erlangen, Germany
3. Center for International Development and Environmental Research (ZEU), Senckenbergstrasse 3, 35390 Giessen, Germany

* corresponding author: Anja.Magiera@agrar.uni-giessen.de

Abstract

The ongoing abandonment of traditional grassland management practices – which is typical for many high mountain regions - impacts the unique floristic composition of high mountain grassland, with severe consequences for ecosystem functioning, since, amongst other factors, fodder production and erosion protection are likely to change with the ongoing abandonment. To halt abandonment, sustainable, economically, socially and ecologically viable land-use options are needed. Spatially explicit information of high mountain grassland properties are needed as reference data.

Thus, we modelled the vegetation composition, biomass and plant functional groups (content of graminoid, herbaceous and legume plants) of the subalpine grassland in the Kazbegi region, Greater Caucasus, Georgia.

We found that the subalpine grassland vegetation is closely related to the physical site conditions (elevation a.s.l. and exposition to the east), characterized by broad transitions between grassland types but with distinct attributes, such as aboveground biomass, vegetation cover, species richness and plant functional groups. The results of the gradual modelling approaches show that species composition, biomass and to a lesser degree plant functional groups can be modelled by multispectral imagery, vegetation indices and topographical parameters. Species composition is furthermore a good predictor for biomass.

Identification of species-rich grassland types with a high conservational value, from the resulting multi scale maps helps to apply site specific and case sensitive grassland management. At the same time yield maps can be used to identify the few highly productive sites in the landscape. The distribution of plant functional groups provides important information about the usability, such as hay meadow, and the erodibility. A multi scale prognosis of grassland properties is an important tool for sustainable land use planning in the high mountain landscape, allowing an integrative analysis of the high mountain landscape for modified, site specific agricultural land use measures.

GENETIC DIVERSITY AND EVOLUTIONARY HISTORY OF COLCHIC AND HYRCANIAN RELICT TREES — IMPLICATIONS FOR CONSERVATION AND MANAGEMENT

Maharramova E.[1,2,3], Huseynova I.[1,2], Kolbaia S.[4], Safarov H.[5], Kozlowski G.[6], Grünstäudl M.[7], Muller L.[7], Borsch T.[3,7,*]

1. Institute of Botany, Azerbaijan National Academy of Sciences, AZ1073 Baku, Azerbaijan
2. Institute of Molecular Biology and Biotechnology, Azerbaijan National Academy of Sciences, AZ1073 Baku, Azerbaijan
3. Botanischer Garten und Botanisches Museum Berlin, Freie Universität Berlin, 14195 Berlin, Germany
4. National Botanical Garden of Georgia, 0105 Tbilisi, Georgia
5. Hirkan National Park, AZ4235 Lankaran, Azerbaijan
6. Department of Biology and Botanic Garden, university of Fribourg, CH-1700 Fribourg, Switzerland
7. Institut für Biologie - Botanik, Freie Universität Berlin, 14195 Berlin, Germany

* corresponding author: t.borsch@bgbm.org

Abstract
Mesophytic forests in the Hyrcan on the southern coast of the Caspian Sea and the Colchis on the eastern coast of the Black Sea represent important habitats of the Caucasus ecoregion. Their species diversity is considered to result from climatic refugia, where different species survived during the Quaternary climatic oscillations. The diversity of trees includes species of the genera Acer, Diospyrus, Fagus, Populus, Pterocarya, Quercus, Tilia, Ulmus, Zelkova along with many other relict and enemic taxa. We evaluated the genetic diversity of the relict trees Pterocarya fraxinifolia (Juglandaceae) and Zelkova carpinifolia (Ulmaceae) shared between the two refugia and distributed throughout the Caucasus and adjacent areas. For this purpose, populations were sampled throughout the ranges of distribution of the species. We developed specific nuclear microsatellite loci as well as chloroplast markers and used them for the screening of individuals. We employed Bayesian clustering methods and haplotype networks to analyse spatial genetic structure, calculated molecular variance, tested for allelic richness, heterozygosity etc.
In Zelkova, nuclear microsatellites evidence that gene flow associated with long distance pollen dispersal is an important factor, but this contrasts with the pattern found with chloroplast markers that exhibit a strong genetic differentiation into Colchic and Hyrkan populations. In Pterocarya, populations from both regions are strongly differentiated from each other but the Hyrcan populations are considerably more diverse and show

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isolation by distance). Genetic data indicate the colonization of the region from southeast to northwest but this migration into the Colchic predates the last glacial maximum (LGM). To conserve and manage genetic diversity within these tree species, a multi-site approach is needed in order to represent the considerable diversity. Production and use of plant material should be on the basis of local seed sources. Since different tree species exhibit significantly different geographical patterns of genetic diversity. Further research is necessary on additional species to better understand Hyrcan and Colchic biodiversity.

RIPARIAN ECOSYSTEM SERVICE VARIATION
IN THE LOWER REACHES OF TARIM RIVER, NORTHWEST CHINA

Mamat Z.[1], Halik Ü.[1,*], Kurban A.[2]

1. Xinjiang University, Key Laboratory of Oasis Ecology, College of Resource and Environment Sciences, 830046 Urumqi, China
2. Xinjiang Institute of Ecology and Geography, Chinese Academy of Science (CAS), Urumqi 830046, China

   * corresponding author: halik@xju.edu.cn

Abstract

Ecosystem services and human activity assessment is essential to effective natural resources allocation. In this study, firstly by using the theory that proposed by Millennium Ecosystem Assessment, the ecosystem services provided by the floodplain forest in the lower reaches of Tarim River was analyzed. Results showed that: (i) in the research area, the ecosystem service values of ca. 216.78×108 \$ that occurred from 1972-2015 showed decrease trend; (ii) the aggregated ecosystem service values for riparian vegetation and water area for all land type accounted 87.43 % of the total value of the research area and water supply, biodiversity protection and waste treatment accounted 55 % of the total service values which are the highest service values; In the end, based on field survey and data from interview in 2015, using the theory and methods of ecological economics, the soil erosion was estimated, and evaluated the main ecosystem services functions value of the riparian vegetation. Total amount of sand-fixation of study area was 4.14×1013 t and the total ecosystem service values was 5.91×1014 \$. Among the main ecosystem service functions values, the contribution of windbreak and sand fixation was highest, second was air purification. Results indicated that conclusion of evaluation was identical with the regional actual situations, which proved this method was scientific and applicable in this field, and highlights the need for further research on windbreak and sand fixation function.

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INFORMAL EMPLOYMENT IN THE CAUCASUS AND CENTRAL ASIAN REGION: DETERMINANTS OF THE INFORMAL EMPLOYMENT AT MICRO LEVEL.

Mandieva E.[1,*]

1.   Methods of Empirical Social Research, University of Bamberg, Germany

* corresponding author: eliza.mandieva@uni-bamberg.de

Abstract
Informal employment, employment exercised outside the framework of formal labour legislation, comprises more than half of the global labour force worldwide. In the Caucasus and Central Asian (CCA) region the share of it is highest among post-communist states according to UNDP report from 2006. There is a growing body of evidence to suggest that such form of employment in the CCA region is associated with poverty, precarious working conditions as well as social exclusion. A considerable academic literature shows that the economic reforms and the costs triggered by formal employment regulations i.e. income tax or social security contributions are the main causes of informal employment at the macro level. However the determinants of informal employment at the micro level are scarcely studied and limited to a few countries. Accordingly, the purpose of this study is to improve our understanding of the role of human capital in the allocation of workers into formal vs. informal labour markets in the transition economies. In particular, this study focuses on the effect of education on the participation of workers in the informal labour market while considering other individual (gender), social (parental occupation) and institutional factors (urban vs. rural). Within this poster presentation, it will be discussed first findings of the bivariate and multivariate analysis of these determinants of informal employment. The empirical analysis is based on the Life in Transition Survey of 2014, conducted by the European Bank for Reconstruction and Development (EBRD). The Life in Transition survey is conducted every four years and comprises 34 countries, including states of the CCA region, e.g. Armenia, Azerbaijan and Georgia in the Caucasus as well as Kazakhstan, Kyrgyzstan, Tajikistan and Uzbekistan in Central Asia. Turkmenistan does not participate in the survey. Accordingly Turkmenistan is excluded from the analysis.

INFORMAL ECONOMIC PRACTICES IN THE POST-SOVIET CAUCA-SUS: TRAVELING GOODS AND VALUES IN FLEA MARKETS

Melkumyan H.[1,*]

1.   Institute of Archaeology and Ethnography, NAS Armenia, Yerevan, Charents str. 15, 0025, Yerevan, Armenia.

* corresponding author: melkumian.h@gmail.com

Abstract
Among the new features of the economy in Armenia in the 1980s and Georgia in the 1990s were open-air marketplaces of second-hand souvenirs and household goods in Yerevan (Armenia) and in Tbilisi (Georgia). This was a result of the increase of urban poverty.
The Flea Markets Yerevan and in Tbilisi have some structural similarities: In both cases, they are located in the city center; they are a place to sell art and souvenir production, and they are surrounded with smaller flea markets, where one can find vendors of second-hand household goods. Comparison of cases in Yerevan and Tbilisi gives us the possibility to explore how the informal economy appeared in the 1980 and 1990s in the shape of flea markets in urban public spaces and illustrates how the informal economy and flea markets began to grow.
I examine social practices that have been used to negotiate with the state to allow continued informal economic activity in Tbilisi's and Yerevan's flea markets: What are the common strategies of survival found in both settings, on the one hand, and what are the differences between the strategies of survival deriving from the different cultural backgrounds in Armenia and Georgian, on the other?
Another aspect of the research is to understand how informal economic linkages and exchange practices are formed. For example, "goods" are traveling from Yerevan to Tbilisi. The subject will investigate the regional and international trader-consumer networks, which foster "globalization from below." This is a starting point for interregional comparison to understand how informal market activity has been shaped and how it has changed within the post-Soviet context.

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ECOLOGICAL CONDITION OF VILLAGE PASTURES IN AZERBAIJA AND GEORGIA

Merabishvili M.[1,*], Guliyev S.[2,*], Etzold J.[3]

1. Agricultural University of Georgia, Institute of Crop Science, Kakha Bendukidze University Campus, # 240 David Aghmashenebeli Alley, Tbilisi, Georgia
2. Azerbaijan State Agrarian University, Agronomy Faculty, Department of Plant and Plant Diseases, Ataturk avenue 262, Ganja, Azerbaijan
3. University of Greifswald, Institute for Botany and Landscape Ecology, Soldmannstr. 15, 17487 Greifswald, Germany

* corresponding authors: mmera2008@agruni.edu.ge; squliyev280@gmail.com

Abstract

Village pastures are key resources for livestock keeping by predominantly village smallholders in Azerbaijan and Georgia. Many of these pastures face erosion and degradation and thus declines of productivity due to overgrazing and unsystematic management.

Within the frame of Co4 project, in summer 2016 the ecological condition on the village pastures of six project villages in western Azerbaijan and eastern Georgia was assessed. The three Azerbaijani villages Atabey, Keremli and Plankend are located in Ganja-Gazakh region; in neighbouring Kakheti region in Georgia the three villages are called Shakhvetila, Gombori and Arashenda. All six villages encompass comparable climatic conditions in the montane belt between around 700 and 1300 m a.s.l., however differ in territory and socio-economic settings.

In a random sampling designed by means of a Geographic Information Systems (GIS) in Azerbaijan altogether 220 and in Georgia 206 plots of 10 x 10 m size were assessed. Based on a monitoring manual for high mountain pastures in Azerbaijan developed in 2010, collected physical site parameters were used for calculating a Susceptibly to Erosion-Index (SEI), while with data on soil and vegetation cover a Pasture Degradation-Index (PDI) was calculated.

These results were depicted in maps for each village pasture territory, showing in traffic light colors each plot with its individual erosion risk (SEI) and degradation properties (PDI). Statistical analyses revealed uneven patterns of pasture use intensity with areas close to villages being mostly overgrazed and remoter parts featuring still better pasture conditions or even signs of "underuse" shown by shrub encroachment. Degradation signs were stronger on steeper slopes and on those facing south were regeneration potential after disturbance is less.

STATE RECOGNITION IS KEY, BUT NOT EVERYTHING — GOVERNING COMMON VILLAGE PASTURE USE IN THE CAUCASUS REGION

Neudert R.[1,*], Didebulidze A.[2], Bregvadze Z.[2]

1. Institute of Botany and Landscape Ecology, University of Greifswald, Soldmannstr. 15, 17489 Greifswald, Germany
2. Agricultural University of Georgia, Kakha Bendukidze University Campus, # 240 David Aghamashenebeli Alley, Tbilisi, Georgia

* corresponding author: regina.neudert@uni-greifswald.de

Abstract

Village pastures in Azerbaijan and Georgia are characterized by common use and management by the local population. Elinor Ostrom analyzed in her well-known work long-lasting pasture common property regimes, illustrating the capacity of users to manage common resources sustainably. In contrast to these long-lasting regimes, common management systems in the Caucasus are partly relatively new, as the governance was completely reorganized in the post-socialist transition period. Predominantly sedentary semi-subsistence farm-households keeping few livestock now use collectively the pasture in the vicinity of their village. Mobile farms use winter and summer pastures in remote regions, but may pass village pastures during their seasonal migrations.

On the poster, we depict (1) how state regulates common village pasture use and (2) how property rights for different stakeholder groups are distributed in practice. We use the bundles for property rights approach (distinguishing access, withdrawal, management, exclusion and alienation rights) and data from 6 case study villages.

State governance approaches are different between both countries: In Azerbaijan, legal regulations enable local management including aspects of co-management, while in Georgia a pending privatization process prevents common management. This leads to insecurity of property rights for the Georgian pasture users.

Actual pasture management approaches by pasture users are similar in both countries: While sedentary livestock keepers have undisputed withdrawal rights, rights for mobile pasture users are restricted depending on the actual scarcity of village pastures. Conflicts might occur between different user groups, especially regarding access restrictions. A management, i.e. rotational use, resting or pasture care, does not take place, leading partly to problems with pasture degradation.

Thus, we show that state recognition is an important precondition for collective management, but, given that, collective management efforts by locals need further facilitation and strengthening.

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QUANTIFICATION OF WATER ABSTRACTION
IN THE TRANSBOUNDARY ILE BASIN (CHINA/KAZAKHSTAN)
AND CHANGES IN FUTURE RUNOFF WITH A PHYSICALLY-BASED
HYDROLOGICAL MODEL

Nurbatsina A.[1,*], He Z.[2], Gafurov A.[2], Galayeva A.[1], Unger-Shayesteh K.[2], Vorogushyn S.[2]

1. Regional Centre for Hydrology, Almaty, Kazakhstan
2. GFZ German Research Centre for Geosciences, Potsdam, Germany

* corresponding author: aliya.nurbatsina@gmail.com

Abstract

Understanding runoff changes in the transboundary Ile River basin, Central Asia, is of key importance for preservation of the unique ecosystem of the Balkhash Lake and for sustaining economic activities in Chinese and Kazakh parts of the catchment. Since late 1980s, rapid population growth and expanding irrigated agriculture in the upstream Chinese part of the Ile basin led to increasing water consumption, which is, however, poorly quantified. This change occurred at the background of ongoing climatic changes affecting natural river runoff and presumably causing discharge increase due to increasing glacier melt. This study quantifies the natural river discharge in the Ile basin since 1960s till today by means of a calibrated hydrological model and contrast it with river flow altered by human activities. In the period from 1987 to 2014 the average water consumption at the territory of the P.R. China was estimated to 3 km3 per year on average or 20 % from average annual runoff. Furthermore, we quantified the runoff components at the outlet gauge of the Ile catchment (164 km) for the past period (1971-1986). Based on the precipitation data from meteorological stations runoff components are as follows: 44 % - of underground runoff, runoff from snow melting - 7 %, runoff from liquid precipitation - 32 %, runoff from glacier component – 17 %. Based on the precipitation data from global climate data APHRODITE: underground runoff – 35 %, snowmelt runoff – 24 %, runoff from precipitated water – 17 %, glacier melt runoff – 24 %. Based on the precipitation data from global climate data WATCH: underground runoff is 44 %, snowmelt runoff – 3 %, runoff from precipitated water – 44 %, glacier melt runoff – 9 %. Finally, we have analyzed the changes in total runoff and runoff components based on the CMIP5 climate change scenarios, taking into account dynamic changes of the cryosphere. Annual and seasonal changes in total runoff and the runoff components are discussed against the background of growing water demand for irrigated agriculture in the upstream parts of the Ile basin.

CARBON IMPLICATIONS OF VIRGIN LANDS CAMPAIGN CROPLAND EXPANSION AND POST-SOVIET AGRICULTURAL LAND ABANDONMENT IN NORTHERN KAZAKHSTAN

Prishchepov A.[1,*], Kurganova I.[2], Schierhorn F.[3], Lopes de Gerenyu V.[2], Kamp J.[4], Kuzyakov Y.[5]

1. Department of Geosciences and Natural Resource Management (IGN), University of Copenhagen, Øster Voldgade 10, DK-1350 København K, Denmark
2. Institute of Physicochemical and Biological Problems in Soil Science, Russian Academy of Sciences (RAS), Institutskaya st., 2, Pushchino, Moscow region, 142290, Russia
3. Leibniz Institute of Agricultural Development in Transition Economies (IAMO), Theodor-Lieser-Strasse 2, 06120 Halle (Saale), Germany
4. University of Münster, Institute of Landscape Ecology, Heisenbergstr. 2, 48149 Münster, Germany
5. Department of Soil Science of Temperate Ecosystems, Department of Agricultural Soil Science, Büsgenweg 2, Georg-August-University Göttingen, 37077 Göttingen, Germany

* corresponding author: alpr@ign.ku.dk

Abstract

Political economy and institutional changes regarding land use play a crucial role in shaping land cover worldwide. Among such events was the Soviet Virgin Lands Campaign, when 45.2 million ha of virgin steppes were plowed up from 1954 to 1963 in northern Eurasia. We took the opportunity to evaluate carbon (C) costs of this Campaign, particularly with the account of massive cropland abandonment in the former Campaign area of northern Kazakhstan after the demise of the Soviet Union in 1991. Within a cropland mask produced with 1:3,000,000 map depicting cropland expansion in Northern Kazakhstan (1953-191) and remotely sensed data, we spatially disaggregated historical annual sown area statistics in northern Kazakhstan based on cropland suitability assessment. We used C bookkeeping approach to assess C dynamics based on soil stratification and C field measurements. The Campaign resulted in huge C losses from soils, which accounted for 241±11 Mt C in Kazakhstan for upper 0-50 cm soil layer during the first 20 years of cultivation. Despite the huge C losses from soils during the Campaign, the total C budget in soils was balanced out after 1991 due to sequestered C on abandoned lands, albeit the patterns of C loss during the Campaign and C sink in post-Soviet period differed. The C sink from 1991 to 2010 on abandoned croplands Kazakhstan (12.9Mha) comprised 240±34Mt C. However, already ongoing recultivation of abandoned cropland in Kazakhstan releases stored C on abandoned lands. Our study highlights the importance of environmental evaluation of cropland programs and their alternatives, particularly, crop production/ C release efficiency remains low in northern Kazakhstan.

SPATIAL DETERMINANTS OF AGRICULTUAL LAND-USE CHANGE IN THE FORMER VIRGIN LANDS CAMPAIGN AREA OF KAZAKHSTAN

Prishchepov A.[1,*], Kraemer R.[2], Schierhorn F.[3], Müller D.[2,4]

1. Department of Geosciences and Natural Resource Management (IGN), University of Copenhagen, Øster Voldgade 10, DK-1350 København K, Denmark
2. Geography Department, Humboldt Universität zu Berlin, Unter den Linden 6, 10099 Berlin, Germany
3. Leibniz Institute of Agricultural Development in Transition Economies (IAMO), Theodor-Lieser-Strasse 2, 06120 Halle (Saale), Germany
4. Integrative Research Institute on Transformations of Human-Environment Systems (IRI THESys), Humboldt Universität zu Berlin, Unter den Linden 6, 10099 Berlin, Germany

* corresponding author: alpr@ign.ku.dk

Abstract

Massive land-use changes are shaping ecosystem functioning and impact biogeochemical cycles. One of the prime examples of massive land-use change in Northern Eurasia is Virgin Lands Campaign, when from 1954 to 1963 roughly 20 Mha of grasslands were converted to croplands in northern Kazakhstn. Cropland continued to expand until 1990, when transitioning from state-command to market-driven economy resulted in the withdrawal of agricultural subsidies, resulting in precipitous livestock decline and massive cropland abandonment. Our major goal was to understand the patterns and determinants of agricultural land-use change from 1953 to 2010 for several time steps. By bringing an example of Konstanay oblast in northern Kazakhstan, we reconstructed agricultural land-use with archival land-use maps and classifications of Landsat satellite imagery. We also prepared spatially explicit datasets about agro-climatic characteristics, soil quality, proximities to markets and settlements, but also about infrastructure and population. We then utilized logistic regressions and boosted regression trees to develop the models to explain the patterns of agricultural land –use change. Our study revealed, during Virgin Lands Campaign (1954-1963) cropland expansion was common on agro-environmentally enowded lands in Kostanay, while in post-Campaign (1954-1963) further cropland expansion occurred on lands less suitable for farming. From 1990 to 2000 agricultural land abandonment occurred primarily on lands plowed up in the post-Campaign period, the lands with poorer soils, lower yields and more arid. We noticed factors such low population density and being further away from settlements partially explained land abandonment patterns from 2000 to 2010, but not from 1990 to 2000. Interestingly, ongoing recultivation

of abandoned lands after 2000 primarily took place on best agro-environmentally endowed lands and socio-economic factors, such as distances to settlements and population density, did not matter. The ongoing cropland expansion on remaining best soils leaves for biodiversity and ecosystem services only marginal areas.

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DIVERSITY AND EVOLUTION OF SCUTELLARIA (LAMIACEAE) IN AZERBAIJAN AND ADJACENT COUNTRIES

Salimov R.[1,3,*], Parolly G.[2], Isgandarova L.[1], Borsch T.[2]

1. Institute of Botany, Azerbaijan National Academy of Sciences, Baku, Badamdar highway, 40. AZ1004, Azerbaijan
2. Botanischer Garten und Botanisches Museum Berlin, Freie Universität Berlin, Königin-Luise Straße 6-8, 14195 Berlin, Germany
3. Biology Department, Baku Engineering University, Hasan Aliyev 120, AZ0102, Khirdalan, Azerbaijan

* corresponding author: resad_selimov@yahoo.com

Abstract
The genus Scutellaria L. (Lamiaceae) is estimated to comprise 350 to 400 species distributed almost worldwide. The Irano-Turanian floristic region, and especially the Caucasus and Central Asia are centers of diversity for the genus. Most species are highly variable morphologically, what has led to a complex taxonomy and significantly different treatments of species in the different flora accounts. There are some 40 species in the Caucasus and SW Asia, most of which belong to the so-called S. orientalis group. In the flora of Azerbaijan 15 species were so far determined, five of which are endemic to the country and six to the Caucasus. The goal of the study is to understand the phylogenetic relationships in Scutellaria, to get insights into the evolution of Caucasian species and to evaluate species limits.
So far no phylogenic study of the whole genus exists. We have therefore started to generate the first overall molecular data set of the genus Scutellaria using plastid genomic regions (trnK-matK, rpl16 and trnLF) and including a thorough sampling of species from Azerbaijan and adjacent countries. In addition we have made a list of phenotypic characters from floral and inflorescence morphology, microstructures of hairs and seeds (being investigated by scanning electron microscopy), to rhizome and habit characters, which are comparatively analysed. Field work has been carried out to collect representative specimens.
Molecular phylogenetic analysis of plastid data provides good resolution at species level, underscoring high levels of diversity in the group. First results also indicate that the S. orientalis and allies may constitute a monophyletic group. The study will not only be relevant to evaluate which species occur in Azerbaijan and adjacent countries but also provide a phylogenetic framework for understanding the evolution of secondary compounds, considering that Scutellaria spp. are used as aromatic plants.

POTENTIALS AND CONSTRAINTS OF COMMON PASTURE USE — FIELD EXPERIMENTS ON COMMON POOL RESOURCE MANAGEMENT — A COMPARATIVE CASE STUDY IN AZERBAIJAN AND GEORGIA

Salzer A.[1,*], Neudert R.[1], Beckmann V. [1]

1. Institute of Botany and Landscape Ecology, University of Greifswald, Soldmannstr. 15, 17489 Greifswald, Germany

* corresponding author: anja.salzer@uni-greifswald.de

Abstract

Village pastures represent an important resource for the rural population in many ways. As common pool resource (CPR) they become crucial for safeguarding livelihoods. However, many pastures in the Caucasus regions show signs of depletion, mainly due to unregulated grazing. Preventing pastures from degradation and ensuring a long-term sustainable use, thus, depends on their (successful) collective management.

The research of Elinor Ostrom and colleagues on common property regimes has already elucidated many features of collective action concerning CPR. A successful "commons" management – and consequently also its understanding – depends on various aspects such as the cooperation capacity of stakeholders, their self-organization and decision making on own rules and agreements on management practices. By means of the implementation of an "extended" framed field experiment, which is based on an adapted protocol of a rangeland experiments by Prediger et al. (2011) and combined with qualitative approaches, different aspects of common pasture use in Georgia and Azerbaijan were studied.

This poster aims at the identification of potentials and constraints of collective CPR-management and provide for lessons learned on the cooperation of villagers in six Azerbaijani and Georgian case study villages. Therefore, in particular, individual and group performances regarding strategies in pasture-use, actors' behavior in terms of self-organization, agreements and rules are considered against the backdrop of socio-cultural factors of the respective countries.

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SYR — TIRISHILIKTIN KÖZI:
SYRDARYA AS THE SOURCE OF LIVELIHOODS
IN THE RIVER DELTA

Samakov A.[1,*]

1.   Department of Ethnology, University of Tübingen, 72074 Tübingen

* corresponding author: aisamakov@gmail.com

Abstract
The Syrdarya delta has been declared a Zone of Ecological Catastrophe since early 90s due to shrinking of Aral Sea. The main goal of the study was to document how local communities in the river delta view, understand and engage with the Syrdarya River. Based on ethnographic research in Syrdarya delta (namely, Kazaly and Aral districts of Kyzylorda, Kazakhstan), I claim that locals mostly view and engage with the river as a main source of their livelihoods. This interaction is not limited to just the river bed but rather includes a ramified network of 'natural' and 'technological' elements that stem from the river such as dams and dikes, canals, ditches and pumps, lakes fed by those canals and pastures, which are flooded in spring and fall. Local livelihoods include herding (cattle, sheep and goats, horses and camels), gardening (bakchalyk), fishing and reed harvesting. I claim that these livelihoods are river-dependent and that they are mostly run as common pool resources (aka commons). I am observing how people here share, negotiate the use of and manage those commons.

EVALUATION OF REGULATION IN THE TEXTILE INDUSTRY AND QUESTIONS ABOUT THE PROCESSING OF COTTON IN KAZAKHSTAN

Saudambekova I.[1,*]

1.   Narhoz University, Zhandosov Str. 55, 050035 Almaty, Kazakhstan

* corresponding author: inkar.saudambekova@gmail.com

Abstract
The government took significant steps to develop the textile industry. In particular, a legislative base has been created with the adoption of the laws „On Special Economic Zones in the Republic of Kazakhstan", „On Free Economic Zone", „On the Development of the Cotton Industry". This branch in the republic remains extremely undeveloped.
One of the solutions to the problems of light industry should be an increase in the innovative activity of enterprises in the industry. The most important is the technological modernization, which involves the renewal of obsolete equipment and technologies. A particularly important role will be played by state support, primarily related to the financing of innovations. In our study, we will discuss methods: for calculating the economic effect and economic efficiency of modernizing the branches that make up the manufacturing industry.
This research is based on methods of statistical analysis, *Abstract*-logical. We are used official statistics and covering the entire post-independence period from 1991 till 2015 (2018).
In order to achieve the competitiveness of products, the main ones are replacement of obsolete equipment, modernization and technical re-equipment, reduction of production costs, investment attractiveness, and production of goods for a wide population.
The main problem of the textile industry is that all cotton fibers exported until 92-95% outside the republic due to the lack of deep processing. Moreover, cotton fiber exporters incur large financial losses when exporting cotton fiber.
The textile industry is technologically most connect with the agrarian sector of the economy. Main research question of the thesis: What are the public policy of supporting for developing the agro processing sector in Kazakhstan?
As a results of the study we are considering theories, state reforms and LLP „Myrzakent" we observed the analysis of costs and profits this cotton processing company.

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RECONSTRUCTION OF PHYLOGENETIC RELATIONSHIPS IN THE CAUCASIAN CAMPANULA SUBG. SCAPIFLORAE

Silakadze N.[1,2,*], Kilian N.[1], Korotkova N.[1], Mosulishvili M.[2], Borsch T.[1]

1. Botanischer Garten und Botanisches Museum Berlin, Freie Universität Berlin, Königin-Luise-str. 6-8, 14195 Berlin, Germany
2. Ilia State University, Cholokashvili Avenue 3/5, 0162 Tbilisi, Georgia

* corresponding author: nana.silakadze.1@iliauni.edu.ge

Abstract

Campanula is the largest genus of the bellflower family (Campanulaceae) with around 600 species inhabiting a wide range of, in particular mountainous, habitats, including meadows, woodland edges, moorlands, cliffs, and steppes in the Northern Hemisphere. The Caucasus ecoregion, one of the most diverse and endangered Biodiversity Hotspots harbours 10% of species diversity of Campanula. Campanula subgenus Scapiflorae is even endemic to the Caucasus region. It comprises around 20 species of perennial rock plants, which develop a short single-flowered stem from a basal leaf rosette. Several authors attempted to develop a workable classification of this subgenus based on morphological characters. However, delimitation of species is difficult with morphology alone, which has led to different views on which species should be accepted taxa, and complicated their identification. The goal of this study is to understand evolutionary relationships of the Scapiflorae at the species level. Building upon these results, more reliable distribution and conservation assessments can be made.

We densely sampled the species diversity of Campanula across its entire geographical range in the Caucasus region in order to i) elucidate the phylogenetic relationships of the Scapiflorae group based on plastid and nuclear markers. ii) estimate divergence-times of the Scapiflorae group. iii) infer its biogeography and iv) provide a more comprehensive taxonomic circumscription of the Scapiflorae group.

The current results include phylogenetic analyses of three plastid regions (petD, rpl16 and trnK/matK) based on 220 accessions of 45 taxa (20 species of the ingroup and 25 other Campanula species). Maximum Parsimony and Bayesian Inference analyses indicated that subg. Scapiflorae is non-monophyletic in its current circumscription but indicate a core Caucasian clade. Morphological characters used to identify members of the Scapiflorae group are not consistent with the phylogenetic relationships inferred. Within the Scapiflorae clade four subclades with a clear geographical structure were resolved.

PILOTING CLIMATE ADAPTATION OPTIONS IN RURAL COMMUNITIES OF CHUY VALLEY IN KYRGYZSTAN

Sultanaliev K.[1,*]

1. American University of Central Asia, 7/6 Tokombaeva Street, Bishkek, the Kyrgyz Republic

* corresponding author: sultanaliev_k@auca.kg

Abstract

Climate change is expected to impact all aspects of human activities. In Kyrgyzstan, as in other Central Asia countries, it's impact on agriculture is going to be quite significant. Taking into account that agriculture still contributes up to 15% to the national GDP of the Kyrgyz Republic and that around 2/3 of the whole population resides in rural areas, rural communities are clearly one of the most vulnerable groups in the face of upcoming climatic changes.

To get rural communities better prepared for these changes, we have conducted participatory training on climate change with specific focus on water-related implications in selected villages of Chuy valley of Kyrgyzstan. Upon training, participants were requested to compile relevant project ideas aimed at climate change adaptation in their communities. As a result of these trainings several project ideas were developed by local activists and considered for grant financing within the frames of the Project. The most viable among these proposals were thoroughly analyzed and later funded. Communities and local authorities took active role during the actual works, as it was one of the main pre-requisites for financing.

By now, 2 micro-projects were already successfully implemented and preliminary feedbacks from beneficiaries are being collected. Poster will present more detailed information on these activities, as well as some pictures and other evidence from the communities.

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REMOTE SENSING OF SOIL SALINITY LEVELS IN IRRIGATED COTTON PRODUCTION SYSTEMS IN THE ARAL SEA BASIN

Sultanov M.[1,*], Conrad C.[2,3], Bauer C.[2], Thiel M.[2], Ibrakhimov M.[1]

1. Khorezm Rural Advisory Support Service (KRASS), 14 Khamid Olimjan street, 220100 Urgench, Uzbekistan
2. University of Würzburg Institute of Geography and Geology, Department of Remote Sensing, Oswald-Külpe-Weg 86, 97074 Würzburg, Germany
3. University of Halle, Institute of Geosciences and Geography, Von-Seckendorff-Platz 4, 06120 Halle, Germany

* corresponding author: s.murod@mail.ru

Abstract

Soil salinization is among the major constraints of sustainable agricultural production in the irrigated areas of the Aral Sea Basin (ASB). Existing field investigations on cotton production area underlined that irrespectively of the salinity level, the salt moves downwards through irrigation events and re-enters upper soil layers when soils dry up. A good impression of the salinity level within a soil profile can thus be gathered after the last irrigation application. It is hypothesized that these salinity levels can be explained through multi-temporal optical remote sensing (RS) data that cover the entire cropping season. Time series of soil and vegetation indices calculated from Landsat imagery were used for indirect assessments of salinity levels in a cotton production area of 75.5 ha during 2008-2011. Accuracy of the RS-based maps was assessed against salinity maps obtained by dense points of EM-38 electromagnetic induction measurements (returns salinity in mS/cm). Several environmental variables such as topography, groundwater depth and salinity, were also included as predictors beside the spectral information. The application of random forest regression showed that RS allows for moderate precision of salinity prediction with coefficients of determination (r^2) ranging between 0.44 and 0.58, while the inclusion of environmental variables did not improve the prediction quality. The estimated root mean square error (RMSE) ranged between 8.45 and 21.81. The variations of accuracy most likely depended on the different image acquisition dates among the years. The unexplained variance may result from the fact the indirect mapping of vegetation also shows effects of other growth-limiting factors, such as inappropriate timing of irrigation or reduced water supply. However, the results suggest that multi-temporal optical RS data can support the monitoring of soil salinity levels in the irrigated lowlands of the ASB and can hence be of practical use, e.g. for monitoring the success of maintenance operations in the drainage system.

URBAN PRACTICES OF MARSHRUTKAS IN TBILISI'S MICRORAIONS

Svanidze M.[1,*]

1.   Tbilisi State University (TSU), Chavchavadze Ave 1, 0179 Tbilisi Georgia

* corresponding author: svanidze@gmail.com

Abstract

Proliferation of marshrutkas (minibuses) as important public transport is a common feature in many large and medium sized post-soviet cities since 1990s. This was the case in Georgia as well: towards the end of the 1990s marshrutkas were the by far most used public transport. Because marshrutkas and the travel or urban ways associated with them are not immediate products of soviet planning, because this system spread in order to fill "the hole" in mobility provision, and due to various levels of autonomy from the state in which they operate, they have brought forth new ways and habits of mobility for wellers in these cities. This has been especially true with the relatively new soviet-built microraions, which were meticulously planned as urban entities that would have all the basic urban needs (mobility, education, recreation, availability of green space) met within their space and therefore both the marshrutka system and its users had to adopt particular practices of operation and use to adapt to them.

In this expose I will overview the ways in the short-route marshrutkas and their flexible arrangements have influenced the micro-habits and mobility behaviuor of their dwellers, based on empirical insights including participant observation and interviews with marshrutka drivers and passengers in two of Tbilisi's microraions. I will then then connect these to a larger framework to situate the marshrutka system within the context of the post-soviet city.

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ESTIMATING POLITICAL REFORM EFFECTS ON AGRICULTURAL OUTPUT: THE CASE OF SAMARKAND PROVINCE, UZBEKISTAN

Tadjiev A.[1,*], Djanibekov N.[2], Petrick M.[2], Hasanov S.[3]

1. PhD student at Samarkand Agricultural University, Mirzo Ulugbek street, 77, 140103, Samarkand, Uzbekistan
2. Leibniz Institute of Agricultural Development in Transition Economies (IAMO), Halle (Saale), Germany
3. Dr. at Samarkand Agricultural University (SamAI), Mirzo Ulugbek street, 77, 140103, Samarkand, Uzbekistan

* corresponding author: aaabdusame@gmail.com

Abstract

After independence, Uzbekistan introduced a variety of reforms in agriculture that differed in the manner and speed of implementation. For example, (i) by 2006 collective and state farms were transformed into individual farms; (ii) water management was transferred to water user associations; (iii) cotton area was reduced in favour of wheat and high-value crops; (iv) farm fragmentation was followed by an optimization program. Such characteristics of reforms produced different effects on agriculture. Therefore, in our study the main research question is "how did the agricultural reforms affect monetary crop output in Uzbekistan?" To answer this question, we analyse official district-level statistics of the Samarkand province covering the post-independence period of 1991-2015. We use a panel-data model with fixed effects to estimate the influence of land and water reforms on crop output along with other variables such as total water use and sown area, employment in agriculture, number of tractors, number of individual farms and their share in total sown area, share of cotton and wheat area in total sown area, density of irrigation infrastructure and presence of water user associations.

The results show that land reform, particularly the share of individual farms in land use, was important for agricultural growth in Samarkand province. However, the number of farms, or the progress of fragmentation of state and collective farms, did not contribute to higher output. In contrast to the land reform, water reform had no significant effect on agricultural output as the established water user associations lacked financial means to improve and coordinate water management.

Finally, when measured in the share of sown area occupied by two strategic crops, the results show that agricultural output was not affected by the presence of traditional cotton, while expansion of wheat as part of the food self-sufficiency policy led to losses in agricultural output.

GENDER AND TRANSPORT IN CENTRAL ASIA

Turdalieva C.[1,*]

1. Humboldt University, Institute for Asian and African Studies, Invalidenstraße 118, 10115 Berlin, Germany

* corresponding author: turdalieva@gmail.com

Abstract

Bishkek, the capital of Kyrgyzstan, with around 958,461 officially registered inhabitants, is one of the fastest growing and changing cities in Central Asia. Unofficially, more than one million people now live in the greater Bishkek area, and according to statistics from 2016, Bishkek consists of 710,725 (53.3%) women and 447,736 (46.7%) men. Considering the annual growth rate of 2–3%, the city's population could double in 25 years to exceed 2.5 million. This rapid growth is concurrent with internal migration that brings women from rural areas to the city – a notable feature of most developing countries, and one that is related to public transport and urban settings. To realize everyday mobilities, women need to use public transport, and in the context of Bishkek, the most convenient and popular mode of public transportation is the minibus, or 'marshrutka'. The popularity of this public vehicle has grown since the collapse of the USSR and has brought to former Soviet republics, such as Kyrgyzstan, not only independence, renewed identity, and consciousness, but also new forms of public mobility.

Gender mobility in Bishkek, a city in the Global South, is characterized by social exclusion and that this arises in the space of the marshrutka. On one hand, marshrutkas, being a faster public vehicle than buses and trolleybuses, provide benefits in terms of time economization, speed mobility, and the potential to access different places and therefore situations and information. At the same time, the marshrutka can negatively affect women's experience of transportation due to petty crime such as pickpocketing, or molestation. These factors can lead to the restriction of mobility for women. Moreover, due to the risks and difficulties engendered by marshrutka travel, many women participate in a type of 'self-exclusion' (authors' term) from non-essential activities, thus limiting their own mobility in a way that constrains their possibilities for social, leisure, and economic activities.

In our presentation, we will discuss about production of women's inequality in the context of mobility systems in Bishkek through the lens of transport and social exclusion theory. We will present our findings on how the marshrutka and its relation to the city creates conditions for the practices and negotiations of everyday mobility of women.

USING SPECIES DISTRIBUTION MODELLING TO PRIORITIZE AREAS TO PROTECT STEPPE AND SEMI-DESERT BIRD SPECIES OF CONSERVATION INTEREST IN KAZAKHSTAN

Urazaliev R.[1,4,*], Law E.[2], Kuemmerle T.[2,3], Hölzel N.[4], Kamp J.[4]

1. Association for the Conservation of Biodiversity of Kazakhstan (ACBK), Beibitshilik Str. 18, 010000 Astana, Kazakhstan
2. Geography Department, Humboldt-University Berlin, Unter den Linden 6, 10099 Berlin, Germany
3. Integrative Research Institute for Transformations in Human Environment Systems (IRI THESys), Humboldt-University Berlin, Unter den Linden 6, 10099 Berlin, Germany
4. Institute of Landscape Ecology, University of Münster, Heisenbergstr. 2, 48149 Münster, Germany

* corresponding author: ruslan.urazaliyev@acbk.kz

Abstract

Steppe and semi-desert are the most vulnerable and least protected ecosystems in the world. They cover 41.5% of Kazakhstan's territory (its northern half) and have important biodiversity, such as populations of biome-restricted and globally threatened birds.

Only in the last decade in Kazakhstan special attention was paid to the territorial protection of steppe and semi-desert ecosystems, as most existing protected areas covered wetlands and mountain areas. Now, a National Strategy and Action Plan for the conservation and sustainable use of biodiversity until 2030 has been adopted. According to this Strategy, 2.2 million hectares are allocated for future protected areas in these ecosystems.

Predicting species distributions is a valuable tool to plan and focus efforts for biodiversity conservation. We selected 15 bird species of conservation concern and modelled their distributions across the steppe and semi-desert in Kazakhstan using a machine-learning technique. Then we produced species richness maps based on different threshold scenarios. This allowed us to analyze the efficiency of existing protected areas for the protection of hotspots of endangered birds. Our aim is increasing the representation of endangered steppe and semi-desert birds' diversity in the protected area network. For the selected species, we established conservation goals based on conservation priorities, and mapped potential new protected areas using systematic conservation planning software.

Our study allows defining a viable strategy for biodiversity conservation by combining species distribution modelling and systematic conservation planning in Kazakhstan. This approach is useful for complementing protected area networks in countries with limited resources for conservation.

STATE-BUSINESS RELATIONS FOR INDUSTRIAL DEVELOPMENT: DETERMINANTS OF EFFECTIVE COOPERATION

Usmanova D.[1,*]

1.   Pfalzburger Str. 43/44, 10717 Berlin, Germany

* corresponding author: usmanova@gee-research.net

Abstract

A sound and rapid reaction of Kazakhstan to declining oil prices was to set out to the industrialization route that prioritized innovation and upgrading. The implementation of the plan began as early as in 2009, right after the wake-up call of the Global Financial crisis. Yet, a plan, that was drafted quite ambitiously and without adequate consideration of not only economic but also legal and institutional capacities of Kazakhstan, proved to bear very limited outcomes. Obviously, along with implementation of the industrialization program there was an urge to adapt Kazakhstan's legal and institutional framework, enhance investment climate, develop mechanisms of state support and create effective incentive structures to private businesses. This paper focuses on one of the aspects considered crucial for economic performance in industrialising nations: state-business relations. The research analyses the nature of state-business relations in Kazakhstan as compared to other states where industrial policy was actively pursued by the state. The end goal is to identify which features of state-business cooperation have proven decisive in achieving successful economic policy performance.

Ideally, state-business relations should be characterised by strategic collaboration between the private sector and the government. This collaboration exists when there is (are) (i) political leadership at the top; (ii) co-ordination and deliberation councils; and (iii) mechanisms of transparency and accountability. These three criteria serve as the basis for the analysis of state-business cooperation on the structural level. On the policy level, the research evaluates the specific policy mechanisms applied by the states to secure cooperation from the private sector. More specifically, policy-level analysis will discover if and how states provided incentives for private actors, whether policies reflected mutual interest and reciprocity, ensured transparency, discipline and feedback, encouraged competition, included performance targets and conditions for withdrawal of state support, etc.

LATITUDINAL SHIFTS IN PLANT FUNCTIONAL TRAITS IN HERBACEOUS VEGETATION ALONG A 1.200 KM TRANSECT IN KAZAKHSTAN AND WESTERN SIBERIA

Velbert F.[1,*], Freitag M.[1], Brinkert A.[1], Kämpf I.[1], Mathar W.[1], Sidorova T.[2], Ivanova L.[3,4], Kamp J.[1], Hölzel N.[1]

1. Institute of Landscape Ecology, University of Münster, Heisenbergstr. 2, 48149 Münster, Germany
2. Association for the Conservation of Biodiversity of Kazakhstan (ACBK), Beibitshilik Str. 18, 010000 Astana, Kazakhstan
3. Plant Ecophysiology Group, Institute Botanic Garden, Ural Branch of the Russian Academy of Sciences, 8 Marta Str. 202a, 620144 Ekaterinburg, Russia
4. Tyumen State University, Semakova Str. 10, 625003 Tyumen, Russia

* corresponding author: frederike.velbert@uni-muenster.de

Abstract

As temperature and precipitation changes along latitudinal gradients, they are particularly valuable to study the impact of current climate on vegetation to predict its reaction to climate change. Therefore, we studied vegetation along a transect from the northern central Asian desert in Kazakhstan to the Western Siberian hemi-boreal forest zone (45°N to 57°N). The dataset, comprising ca. 1.400 vegetation relevés and more than 800 species, spans a plant community gradient from dwarf-shrub dominated northern desert with Salsola arbusculiformis and Artemisia terrae-albae via true steppe communities with Stipa lessingiana and Festuca valesiaca to herb-rich meadow steppes dominated by Festuca rupicola and Poa angustifolia. With increasing humidity and productivity towards the north, average vascular plant species richness per 100m^2 increases from around 10 to 35.

These plant species have different capabilities to cope with environmental hardships like drought and grazing by livestock, which reflects in measurable traits of the plants morphology. As this bioregion is severely understudied, we measured leaf traits and canopy height for 170 steppe grassland species ourselves.

Specific leaf area (SLA) decreases steeply from the lush northern meadow-steppe to the more drought adapted, yet slow growing leaves of true steppe. The subsequent transition from still herbaceous dry steppes to dwarf shrub dominated semi-desert takes place around an aridity index of 0.3, where woodiness and the especially water efficient C4-photosythetic pathway increases.

In addition to the main climatic gradient, land-use-change influence functional traits. Post-so-

viet abandonment of arable land has led to a higher seed mass and a higher SLA in the early stages of uccession compared to pristine steppe. High grazing pressure around settlements leads to a decreased canopy height and an increase of short-lived ruderals. Our preliminary results suggest that plant functional traits can predict vegetation responses to global change.

CARRIED BY MIGRANTS — CENTRAL-ASIAN MINIBUS-DRIVERS AS CONFLICTING ACTORS IN THE RUSSIAN PRIVATE TRANSPORT SECTOR

Weicker T.[1,*]

1.   Technische Universität Berlin, Marchstraße 23, 10587 Berlin, Germany

* corresponding author: t.weicker@campus.tu-berlin.de

Abstract

One major employment sector of Central Asian labour migrants in the Russian economy is the private urban transport service, namely the marshrutka mobility. In the last decade the formerly 'prestigious' profession of marshrutka drivers – generally perceived as successful self-made entrepreneurs in times of economic decline – has been experiencing a loss of reputation as well as increased precariousness of the working conditions. At the same time, the public discourse on marshrutkas took a negative turn, perceiving mini buses as dangerous and archaic while stigmatising the so called 'Samarkand Squads' as rude drivers, who do not follow the rules or are incapable of driving appropriately. This is also reflected in the recent enactment of local laws denying, for instance, the thus far accepted validity of Central Asian or former Soviet driver licenses.

Drawing from empirical evidence from my fieldwork in Southern Russia, the poster describes currently problematized mobility assemblages and embeds the actor's articulations in broader conflicts about social affiliations, recent political reforms and market demands. This leads to the question how labour migrants have been forced to accept unfavourable working conditions in the enterprises, partly a result of politically triggered reforms of the marshrutka market. The poster provides insights into the social arena "marshrutka" which serves as a societal encounter of post-imperial marginalisation and discrimination mechanisms. Lying at the intersection of migration and mobility studies, this poster offers an analysis of the current migration phenomena in the Russian society by observing them within everyday urban mobility performances.

APPLICATION OF TRACER METHODS FOR DELINEATING RUN-OFF COMPONENTS OF A GLACIERIZED BASIN, CENTRAL ASIA

Weise S.[1,*], Unger-Shayesteh K.[2], He Z.[2], Vorogushyn S.[2], Gafurov A.[2], Kalashnikova O.[3], Ershova N.[4], Merz B.[2]

1.   UFZ Helmholtz Centre for Environmental Research, Halle, Germany
2.   GFZ German Research Centre for Geosciences, Potsdam, Germany
3.   Central Asian Institute for Applied Geosciences, Bishkek, Kyrgyzstan
4.   Kyrgyz-Slavic University (KRSU), Bishkek, Kyrgyzstan

* corresponding author: stephan.weise@ufz.de

Abstract
The glacierized upper Ala-Archa catchment is located in Northern Kyrgyzstan and has a size of about 230 km^2. Catchment runoff shows a distinct peak during the warm season with snowmelt and glacier melt contributing to river runoff in the spring and summer months, respectively. Based on an extensive field data set collected since 2014 this study aims to identify melting processes of snow versus glacier and to consequently quantify the contributions from snow / glacier melt and rain to warm season river runoff at the catchment outlet. For this, stable isotope signatures (δ2H, δ18O) of river water, melt water and rain, as well as electric conductivity measurements were applied for identifying the respective components and for endmember definition in simple mixing models. The investigation period is characterized by a high inter-annual variability in precipitation amount and summer run-off. Thus, the isotopic composition of run-off water is found to be governed strongly by the interplay of air temperature, precipitation history, and snow coverage covering indications of its origin from direct precipitation, snow- or glacial melt.

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A TYPOLOGY OF STATE CAPITALISM AND DEVELOPMENTAL PHASES IN RUSSIA, KAZAKHSTAN, SINGAPORE AND SOUTH KOREA

Wölk A.[1,*]

1. Wilhelm-Beer-Weg 53, 60599 Frankfurt Germany

* corresponding author: axel-woelk@t-online.de

Abstract

State Capitalism is a global phenomenon that is not covered extensively in the literature. Most economists mention this economic order as an inferior system vis-à-vis market capitalism. Various countries ranging from China and Russia to Brazil and Kazakhstan have opted for this economic order, though. Thus, it appears to deserve a thorough economic analysis. As a matter of fact, in state capitalism a large variation can be observed when it comes to performance results. In countries such as China, South Korea from the 1960s to the 1990s or Malaysia developmental indicators were impressive. On the other hand, in countries such as Russia, Algeria or Azerbaijan performance trails behind those of more successful state capitalist countries. The aim of this project is to account for these performance divergences. First, a typology of state capitalism is created, from a theoretical point of view and with the help of data from upper middle-income countries. Second, there are case studies of Russia, Kazakhstan, Singapore and South Korea (from the 1960s to the 1990s) as particular examples of respective forms of state capitalism with varying degrees of developmental success. As a matter of fact, Russia stands out as an example where state capitalism in a number of ways failed. In Kazakhstan state capitalism worked only partially. On the one hand the country has temporarily become one of the 50 most competitive countries in the world. But on the other hand, Kazakhstan still relies tremendously on commodity exports. In this regard South Korea and Singapore can serve as state capitalist role models, since both countries have created technologically advanced economies. It is a proposition of this project that the developmental divergences observed in state capitalism can be explained with structural and policy superiority of countries such as South Korea and Singapore.

COMPARING DIVERGING STATE POLICIES IN THE HYDROPOWER AND RENEWABLES SECTOR IN GEORGIA AND ARMENIA: WHAT ROLE DO STATE-BUSINESS RELATIONS PLAY?

Zabanova Y.[1,*]

1.   Private University of Applied Sciences Göttingen, Berlin Campus, Pfalzburger Str. 43-44, 10717 Berlin

* corresponding author: zabanova@gee-research.net

Abstract

Georgia and Armenia, two South Caucasus neighbours poor in fossil fuels but rich in hydropower resources, are both facing a growing domestic demand for electricity and have emphasized the need to further harness their hydropower potential. Both have been encouraged by the EU and international donors to develop their renewable energy sector (which includes small hydropower plants, SHPPs). Despite these similarities, the strategies adopted by the two countries over the past decade have differed significantly. Armenia has engaged in market-shaping policies: it has developed an extensive regulatory framework promoting renewables, set up the Renewable Resources and Energy Efficiency Fund facilitating investment in this sector, introduced cost-based feed-in tariffs and long-term contracts (15 and 20 years) for electricity generated from renewables, and established an independent regulator. As a result, Armenia was able to attract significant private investment in small HPPs. Georgia, on the other hand, has chosen to minimize regulation, opening grid access to third parties, allowing investors and buyers to negotiate tariffs bilaterally, and deregulating export of electricity. It still lacks a comprehensive strategy for developing renewables. The liberalization has not been unproblematic: the Georgian regulator's actual independence is limited and tariff negotiations often lack transparency. Unlike in Armenia, the government has particularly promoted investment in large HPP plants. Drawing on new institutionalist theoretical concepts and on theories of state-business relations, the research aims to explain the diverging Armenian and Georgian approaches from the political economy perspective. It will analyze stakeholders, institutions and incentives, investigating how the nature of state-business relations in each country affects the policy reform process. It will also take into account the potential influence of new institutional arrangements such as the DCFTA and Association Agreement with the EU in the case of Georgia and membership in the Eurasian Union in the case of Armenia.

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QUANTIFYING THE CONTRIBUTIONS OF RUNOFF COMPONENTS USING HYDROLOGICAL MODELING AND TRACER MEASUREMENTS IN A GLACIERIZED BASIN, CENTRAL ASIA

He Z.[1,*], Vorogushyn S.[1], Kalashnikova O.[2], Weise S.[3], Ershova N.[4], Barandun M.[5], Gafurov A.[1], Unger-Shayesteh K.[1], Merz B.[1]

1. GFZ German Research Centre for Geosciences, Potsdam, Germany
2. Central Asian Institute for Applied Geosciences, Bishkek, Kyrgyzstan
3. Helmholtz Centre for Environmental Research – UFZ, Halle, Germany
4. Kyrgyz-Slavic University (KRSU), Bishkek, Kyrgyzstan
5. Université de Fribourg · Department of Geosciences, Fribourg, Switzerland

* corresponding author: zhihuahe@gfz-potsdam.de

Abstract
We adopted two approaches to estimate the contributions of runoff components to river streamflow in the Ala-Archa basin, Kyrgyzstan. First, we advances a physically-based glacio-hydrological model based on the discretization of the landscape into spatial model units. The hydrological model was calibrated by multiple datasets, including observed discharge, remotely-sensed snow cover area, glacier mass balance and water stable isotope measurements. Contributions of runoff components, including groundwater, rainfall, snowmelt and glacier melt, were estimated based on the simulated runoff processes driven by the corresponding water sources. Second, we collected water samples from multiple water sources to measure the water stable isotopic compositions and electrical conductivity. The contributions of multiple runoff components were estimated by conservation equations of water sources and tracers. The glacio-hydrological model tends to produce the similar estimations of runoff components with the tracer-mixing approach, when the water isotope measurement was involved for the model calibration. The contributions of runoff components show strong inter- and intra-annual variability in the Ala-Archa basin. The contribution of glacier melt increases with decreasing annual precipitation. Snowmelt and glacier melt are critical water source for the river runoff in summer and autumn. On average, the contributions of snowmelt and glacier melt in summer are around 35% and 21%, respectively. At annual scale, the contribution of snow and glacier meltwater is around 50%, followed by the 33% contribution of groundwater and 17% contribution of rainfall. We expect our results could provide significant reference for the management and utilization of local water resources.

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Overview of funded projects

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1. Institutional Change and Social Practice. Research on the Political System, the Economy and Society in Central Asia and the Caucasus

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INFORMAL MARKETS
AND TRADE IN THE CAUCASUS AND CENTRAL ASIA

Website: https://informalmarkets.wordpress.com/

The projects intends to build new understanding on the role of local markets and the informal circulation of traders and goods across the Caucasus and Central Asia; field research in neighboring northern Pakistan, and the Xinjiang Uighur Autonomous Region (XUAR) in western China shall provide a comparative perspective from within the region. The emphasis is on commercial activities and exchanges managed by individual entrepreneurs, that is, exchange taking place outside of state regulation, or what Saskia Sassen (2001) describes as „informal economic activity". Seven sub-projects frame their individual projects as „globalization from below" that is distinguished from „globalization from above" and converge in their focus around three themes: understanding how statehood is negotiated through informal practices, a comprehensive study of markets both as sites of exchange and as practice, and the new value dynamics that are generated through this process.

Dr. Susanne Fehlings
Universität Frankfurt am Main
Fachbereich 08 - Philosophie und
Geschichtswissenschaften
Institut für Ethnologie
Campus Westend / IG-Farben-Haus
Frankfurt am Main
Germany

Dr. Hasan Karrar
Lahore University of Management Sciences
School of Humanities and Social Sciences
Department of Humanities and Social Sciences
Lahore
Pakistan

Prof. Dr. Yulia Antonyan
Yerevan State University
Department of Cultural Studies
Yerevan
Armenia

Prof. Dr. Ketevan Khutsishvili
I. Javakhishvili Tbilisi
State University
Faculty of Humanities
Institute of Ethnology
Building 8
Tbilisi
Georgia

Dr. Hamlet Melkumyan
Yerevan State University
Institute of Ethnography and Archeology
Department of Contemporary Anthropological
Studies
Yerevan
Armenia

Dr. Philippe Rudaz
Universität Fribourg
Academic Swiss Caucasus Network
Fribourg
Switzerland

FLUID MOBILITIES FOR CITIES IN TRANSFORMATION: SPATIAL DYNAMICS OF MARSHRUTKAS IN CENTRAL ASIA AND THE CAUCASUS

Website: http://marshrutka.net/

The project deals with the role of the marshrutka mobility phenomenon in the production of post-Soviet urban spaces, in and beyond Central Asia and the Caucasus. It provides an empirically founded contribution to the larger discussion on post-Soviet transformation, and fosters a still under-represented view on post-Soviet transformation, highlighting - through the lens of the marshrutka phenomenon - the bottom-up and everyday emergence of new orders in the fields of economy, morale, urban development and migration. The project is carried out by means of five complementary PhD projects under supervision of academic project partners; in addition, a post-doc based at the IfL in Leipzig is charged with a cross-cutting research project and ensures the conceptual coherence of the project. The project sees its outcomes in terms of a solid and sustainable transfer of knowledge and methods, from German partners towards the academic institutions in the target regions, and vice versa, strengthened local research capacities and infrastructures, and long-lasting research cooperation. To achieve these objectives, the partners will create an interdisciplinary research-practice learning environment consisting of comprehensive individual and network-wide training elements, helping thereby to educate self-reflexive specialists, and raise the employability of trained researchers in science, politics, public service, private business or civil society.

Dr. Wladimir Sgibnev
Leibniz-Institut für Länderkunde e.V.
Leipzig
Germany

Prof. Dr. Sebastian Lentz
Leibniz-Institut für Länderkunde e.V.
Leipzig
Germany

Prof. Dr. Nabijon Rahimov
Khujand State University
Department of Ethnology and Archaeology
Khujand
Tajikistan

Prof. Dr. Joseph Salukvadze
I. Javakhishvili Tbilisi
State University
Department of Human Goegraphy
Tbilisi
Georgia

Prof. Dr. Oksana Zaporozhets
State University - Higher School of Economics
Sociology Department
Moskau
Russian Federation

Dr. Alima Bissenova
Nazarbayev University
School of Humanities and Social Sciences
Astana
Kazakhstan

Dr. Emil Nasritdinov
American University of Central Asia
Department of Anthropology
Bishkek
Kyrgyz Republic

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OPPORTUNITIES AND BARRIERS AT THE TRANSITION FROM EDUCATION TO WORK. A COMPARATIVE YOUTH STUDY IN AZERBAIJAN, GEORGIA AND TAJIKISTAN

Website: http://www.tew-cca.de/

Based on a micro-macro theoretical model the project investigates the opportunities and constraints young individuals face during their transition from education to work in different cultural, economic and institutional contextual settings. Original data are produced in a mixed-method approach with a focus on conducting three large-scaled quantitative youth surveys (N=2,000 persons per country) and supplementary qualitative in-depth interviews in a comparative design in Azerbaijan, Georgia and Tajikistan. The explicit focus on studying the dynamic processes of youth transitions in a life course perspective represents the key innovation of the project. A multidimensional perspective on both objective and subjective dimensions of the situation of young people is applied in order to reach a holistic assessment and to understand how objective conditions are translated into subjective youth identities and vice versa. At the institutional level, it is analysed how education and training institutions, labour market institutions and related segmentation, welfare institutions and family/gender regimes ease or hamper youth chances of a successful integration into gainful employment. By performing comparative analyses examples of best practises and recommendations for institutional reforms and policies will be developed that help improving the transition from school-to-work in particular and the socio-economic situation of youths in general in the South Caucasus and Central Asian region.

Prof. Dr. Michael Gebel
Universität Bamberg
Fakultät Sozial- und Wirtschaftswissenschaften
Lehrstuhl für Soziologie, insb. Methoden der empirischen Sozialforschung
Bamberg
Germany

Dr. Tair Faradov
ICSR
International Centre for Social Research
Baku
Azerbaijan

Assoc. Prof. Dr. Rajab Sattarov
Baku State University (BSU)
Department of Social Sciences and Psychology
Baku
Azerbaijan

Dr. Irina Badurashvili
Georgian Centre of Population Research
Tbilisi
Georgia

Prof. Dr. Giorgi Meladze
I. Javakhishvili Tbilisi State University
Faculty of Exact and Natural Sciences
Department of Geography
Tbilisi
Georgia

Dr. Saodat Olimova
Research Center „SHARQ"
Dushanbe
Tajikistan

Prof. Dr. Subhon Ashurov
Tajik Technical University
Dushanbe
Tajikistan

STATE ACTIVISM IN POST-SOVIET ECONOMIES.
CHANCES AND OBSTACLES FROM A GOVERNANCE PERSPECTIVE

Website: www.governance-in-emerging-economies.net

After decades of neoliberalism shaping economic thinking and policymaking, the state is having a noteworthy comeback on the global stage and is again gaining a growing influence in national economies. At the latest since the global financial crisis, a deviation from neoliberal recipes in politics and an increasing experimentation with state interventions is being observed. Whereas state interventions in OECD countries primarily focus on reducing systemic risks and releasing short-term stimulus packages, various governments in low-and-middle-income-countries increasingly seek to steer long-term economic and social development through active state policies. The diminishing importance of the neoliberal paradigm has provoked an academic debate about the constituents of a prospective Post-Washington Consensus. It centers around two questions: Which forms of interventions and patterns of state-led policy do occur and what are the prerequisites for state-centered economic policy to be successful? The post-communist region is particularly affected by this development and is therefore examined in this research project through a comparative analysis of the differing cases of Kazakhstan and Georgia. For the purpose of analyzing the contemporary manifestations of state activism, a performance-oriented governance approach based on institutional economics and inspired by the historical experiences of the East Asian developmental states is being applied. Specific governance performances are examined in three distinct areas: the administrative-institutional prerequisites, the socio-political embeddedness, and the specific regulatory and intervention instruments within the applied economic policy. Given the current policy relevance of the project, a close and systematic cooperation with national and international practitioners is sought.

Prof. Dr. Joachim Ahrens
PFH Private Hochschule Göttingen
FB Wirtschaftswissenschaften
International Economics
Göttingen
Germanz

Prof. Alessandro Frigerio
KIMEP University
College of Social Sciences
Almaty
Kazakhstan

Prof. Teimuraz Beridze
I. Javakhishvili Tbilisi
State University
Faculty of Business Studies and Economics
Tbilisi
Georgia

Prof. Dr. Herman Hoen
University of Groningen
Department of International Relations
Groningen
The Netherlands

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THE ‚SOCIAL LIFE‘ OF A RIVER: ENVIRONMENTAL HISTORIES, SOCIAL WORLDS AND CONFLICT RESOLUTION ALONG THE NARYN-SYR DARYA

Website: https://www.uni-tuebingen.de/en/faculties/faculty-of-humanities/departments/aoi/social-and-cultural-anthropology/forschung/the-social-life-of-a-river-environmental-histories-social-worlds-and-conflict-resolution-along-the-naryn-syr-darya.html

The project involving anthropologists, political scientists and historians from Kyrgyzstan, Uzbekistan and Germany aims to produce a social and environmental history of the Naryn and Syr Darya river, from the mid-20th century to the present day. The team will work with archival documents, oral histories, ethnographic fieldwork and visual materials and is guided by three core research questions: how was the river perceived in past and present? How is it used by different actors and groups? And how do the interactions between river and humans affect the waterway itself, and social and political life along its course? To answer these questions, the Naryn-Syr Darya is approached from a political ecology perspective, conceptualizing the river as an envirotechnical system subject to moral economies. Five field sites have been selected to reflect the varieties of riverscapes and uses. The studies are conducted by two doctoral candidates and three Post Doc fellows and should result in a series of three monographs (Post Doc fellows), two dissertations, a special issue and edited volume as well as a number of peer-reviewed articles.

Dr. Jeanne Feaux de la Croix
Universität Tübingen
Philosophische Fakultät
Asien-Orient-Institut
Abteilung Ethnologie
Junior Research Group Leader
„Cultural History of Water in Central Asia“
Tübingen
Germany

Dr. Adham Ashirov
Uzbek Academy of Sciences
Institute of History
Tashkent
Uzbekistan

Dr. Mokhira Suyarkulova
University of Central Asia
Mountain Societies Research Institute
Bishkek
Kyrgyz Republic

INSTITUTIONAL CHANGE IN LAND AND LABOUR RELATIONS OF CENTRAL ASIA'S IRRIGATED AGRICULTURE (AGRICHANGE)

Website: https://www.iamo.de/agrichange

Institutional change in the post-socialist Central Asian societies has been characterised by incomplete and non-linear reforms, the dominance of informal over formal institutions, and the absence of a predictable economic and policy environment. These issues are clearly visible in agriculture, a sector that is of crucial importance for food security, rural livelihoods, and the generation of national export revenues. While many observers consider these outcomes as disappointing, from a scientific viewpoint they are also fascinating. The extent of land reform, the degree of state control, and the resulting land and labour relations vary considerably across the region. The reforms in different countries gave quite different answers to the questions of who owns what, earns how much and using what resources. The key idea of the project is to study these questions empirically, by using the example of two regions with irrigated agriculture, South Kazakhstan in Kazakhstan and Samarkand in Uzbekistan. The project is aiming at a more comprehensive understanding of change processes by promoting theory development, and at integrating local universities and their scholars into international academic networks. It takes a long-run, evolutionary perspective and attempts to understand institutional change in its social, historical and cultural context. The project comprises research topics on farm organisation and rural planning practices, rural entrepreneurship and labour incentives as well as agricultural modernisation and collective action. The partners in the project are the German project coordinator Leibniz Institute of Agricultural Development in Transition Economies (IAMO) in Halle (Saale), the Kazakh National Agrarian University in Almaty, Kazakhstan, the Samarkand Agricultural Institute in Samarkand, Uzbekistan, and a scientific reflection board of international senior experts who will be engaged in mentoring the project partners. The partners represent various social science disciplines, including development studies, economics, rural planning, and social anthropology. Important goals of the project are to enhance the mutual cooperation of social scientists across Central Asia and to provide researchers originating from the region a unique opportunity for career development.

Prof. Dr. Martin Petrick
Leibniz-Institut für Agrarentwicklung in Transformationsökonomien (IAMO)
Abteilung Rahmenbedingungen des Agrarsektors und Politikanalyse (Agrarpolitik)
Halle (Saale)
Germany

Dr. Nodir Djanibekov
Leibniz-Institut für Agrarentwicklung in Transformationsökonomien (IAMO)
Department of External Environment for Agriculture and Policy Analysis
Halle (Saale)
Germany

Prof. Dr. Ukilyay Kerimova
Kazakh National Agrarian University
Department of Economics and Management of Agro-industrial Production
Almaty
Kazakhstan

Prof. Dr. Olim Murtazaev
Samarkand Agricultural Institute
Department Agricultural Economics and Management
Samarkand
Uzbekistan

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LOCAL SECURITY-MAKING IN KYRGYZSTAN AND TAJIKISTAN. THE PRODUCTION OF SECURITYSCAPES BY EVERYDAY PRACTICES

Website: https://www.bicc.de/research-themes/project/project/forms-of-local-security-inkyrgyzstan-and-tajikistan-the-emergence-of-securityscapes-125/

Security' has emerged as a decisive notion of domestic and international politics in Central Asia. In contrast to the ‚securitization' debate, which dominated academia over the last decade, this project aims to focus on the other side of the ‚security-coin', namely the everyday practices of people in coping with security challenges. The research project looks into overlapping securityscapes, which can be understood as individual as well as collective space-making approaches. The intention is to investigate everyday practices of the production of securityscapes in Kyrgyzstan and Tajikistan, both in security high-sensitive and low-sensitive regions. The project is interdisciplinary by design and based on intensive, long-term field research. It will be carried out jointly with the Research Center for Contemporary Processes and Future Planning at the Academy of Sciences of Tajikistan, the Regional Studies Department of the University of Osh and the Bonn International Center for Conversion being equal partners. Emphasis is given to the training of young scholars (PhD and post-doc-level) as well as to capacity-building of the Central Asian partner institutions.

Prof. Dr. Conrad Schetter
Bonn International Center for Conversion (BICC)
Bonn
Germany

Dr. Marc von Boemcken
Bonn International Center for Conversion (BICC)
Bonn
Germany

Dr. Hafiz Boboyorov
Academy of Sciences of the Republic of Tajikistan
Center for Anthropology
Dushanbe
Tajikistan

Dr. Nina Bagdasarova
University of Osh
Regional Studies Department
Osh
Kyrgyz Republic

Dr. Joomart Sulaimanov
University of Osh
Regional Studies Department
Osh
Kyrgyz Republic

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2. Environment, Natural Resources and Renewable Energies - Interdisciplinary Transboundary Research on Human-Environmental Interactions

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BALANCING TRADE-OFFS BETWEEN AGRICULTURE AND BIODIVERSITY IN THE STEPPES OF KAZAKHSTAN (BALTRAK)

Website: https://www.uni-muenster.de/Oekosystemforschung/en/forschung/BALTRAK.html

Abandoned grasslands in Kazakhstan constitute considerable untapped agricultural potential, which is likely to be exploited in the near future, yet would also allow for restoring steppe ecosystems. Balancing the potentially conflicting goals of conservation and agricultural production is currently hampered by a poor understanding of (1) the spatial patterns of post-Soviet landuse change, (2) the complex interactions of cropland abandonment, grazing, fire regimes and biodiversity, and (3) various potential future trajectories in land use. The aim of the proposed project is to quantify spatio-temporal trends in land use and fire in Kazakhstan, to understand the links between land use, fire, and biodiversity, and to explore potentials for increasing agricultural production. The results will be used to assess current and future trade-offs between steppe restoration and agricultural production. Together, this will provide guidance for implementing placebased rural development strategies that lessen the emerging land-use conflict between conservation and agriculture in Kazakhstan's steppe region. The interdisciplinary approach will rely on remote sensing, fieldbased biodiversity research, and econometric modelling. Major stakeholders in agriculture and the conservation sector will be integrated to ensure the relevance and implementation of our results. A strong focus will be placed on capacity building among Kazakhstani stakeholders and scientists, and on academic exchange with young Kazakhstani scholars.

Dr. Johannes Kamp
Universität Münster
Institut für Landschaftsökologie
AG Ökosystemforschung
Münster
Germany

Dr. Daniel Müller
Leibniz-Institut für Agrarentwicklung in
 Transformationsökonomien (IAMO)
Abt. Betriebs- und Strukturentwicklung im ländlichen
Raum
Halle
Germany

Prof. Dr. Tobias Kümmerle
Humboldt-Universität Berlin
Geographisches Institut
Abt. Biogeographie
Berlin
Germany

Dr. Sergey Sklyarenko
Association for the Conservation of
Biodiversity
of Kazakhstan
Center for Conservation Science
Almaty
Kazakhstan

Dr. Aidar Aitkulov
Karaganda State University (KSU)
Faculty of Biology and Geography
Karaganda
Kazakhstan

HERDERS COPING WITH HAZARDS IN KYRGYZSTAN AND MONGOLIA: A NEW RESEARCH APPROACH BASED ON GPS-TRACKING

With climate change, Kyrgyzstan and Mongolia are increasingly experiencing natural hazards. The livelihoods of herders are particularly affected by natural hazards, which render them vulnerable to poverty. The proposed project has two objectives: (1) to extend the available knowledge on how herders in Central Asia cope with natural hazards and (2) to improve the research capacity (concerning both methodology and data) within the Central Asian region. This project will collect and analyze a new database, bridging the disciplines of geoinformatics, development economics, spatial statistics, and geography. Using Global Positioning System (GPS) technology, the project will track the movements of semi-nomadic herders in Kyrgyzstan and of nomadic herders in Mongolia. Moreover, it will collect a socio-economic survey from the same herding households that particularly captures households' exposure to natural hazards and the coping strategies applied by households. The novelty of the approach lies in combining geographic location data of (semi-) nomadic households with socio-economic survey data and assessing the data jointly. The project will investigate to what degree mobility, land use patterns, the geographic environment at a household's location, and access to markets mitigate the effects of natural hazards. The analyses will be comparative, combining insights and methods in Kyrgyzstan and Mongolia, thereby fostering trans-boundary cooperation in research.

Dr. Kati Krähnert
DIW Berlin - Deutsches Institut für Wirtschaftsforschung
Abteilung Entwicklung und Sicherheit
Berlin
Germany

Prof. Dr. Edzer Pebesma
Universität Münster
Institut für Geoinformatik
Münster
Germany

Dr. Ainura Nazarkulova
Kyrgyz State University of Construction, Transportation and Architecture (KGUSTA)
Geodesy and GeoInformatics Department
Bishkek
Kyrgyz Republic

Dr. Gantulga Gombodorj
National University of Mongolia
School of Geography and Geology
Ulaanbaatar
Mongolia

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ECOSYSTEM ASSESSMENT AND CAPACITY BUILDING FOR SUSTAINABLE MANAGEMENT OF FLOODPLAINS ALONG THE CENTRAL ASIAN RIVERS TARIM (XINJIANG/CHINA) AND NARYN (KYRGYZSTAN) (ECOCAR)

In the Central Asian drylands the inland rivers and their floodplains have an enormous ecological importance. The riparian vegetation is not only a hotspot of biodiversity, but also provides a number of ecosystem functions and services like the avoidance of erosion, the reduction of the effects of sand and dust storms or the provision of pastoral land. Despite this importance the Central Asian floodplains are heavily endangered or already destroyed by anthropogenic influences (e.g. overexploitation of water resources, intensive agriculture and overgrazing by pastoral use) as well as climate change. The project intends to develop methods for the terrestrial and remotely sensed monitoring of riparian ecosystems and its most important stress indicators in two selected investigation areas at the Tarim (Xinjiang) and the Naryn (Kyrgyzstan) rivers. Based on this the potential of providing certain ecosystem services will be predicted and suggestions for sustainable land use will be given. A special focus will be on the integration and networking with and among local scientists, decision makers and students to build up the necessary capacities to use the methods developed within this project. This should help them to cope with the environmental problems in their countries on the way to more sustainability in riparian ecosystems. Therefore the results of the project can be used for regional development with involvement of local stakeholders in Northwest of China as well as in the other Central Asian countries.

Prof. Dr. Ümüt Halik
Katholische Universität Eichstätt-Ingolstadt
Fachbereich Geographie
Eichstätt
Germany

Prof. Dr. Bernd Cyffka
Katholische Universität Eichstätt-Ingolstadt
Fachbereich Geographie
Eichstätt
Germany

Prof. Dr. Ding Jianli
Xinjiang University
Xingjiang Institue for Resources
and Environmental Sciences
Urumqi
People´s Republic of China

Prof. Dr. Ermek Baibagyshov
Naryn State University
Departement of Ecology
Naryn
Kyrgyz Republic

Prof. Alishir Kurban
Chinese Academy of Science (CAS)
Xinjiang Institute of Ecology
and Geography
Urumqi, Xinjiang
People´s Republic of China

ASSESSING LAND VALUE CHANGES AND DEVELOPING A DISCUSSION-SUPPORT-TOOL FOR IMPROVED LAND USE PLANNING IN THE IRRIGATED LOWLANDS OF CENTRAL ASIA (LAVACCA)

Immense losses of land productivity have been observed on eight million hectares of irrigated agricultural land in Central Asia during the past decades. Especially the irrigated lowlands of the Amu Darya and Syr Darya Rivers are affected by land degradation problems. The research addresses the identification of hotspots of decreasing land production and gaining knowledge about the drivers of change in land production and land degradation by analyzing socioeconomic and ecological indicators. Economic assessments of land use options under given ecological conditions will be elaborated. A strong methodological focus is set on remote sensing, geographical information systems (GIS), indicator systems, land use modelling, and economic optimization. The generated information will be bundled and presented as a tool of discussion support for politicians and decision makers in their efforts to increase food security and combat environmental degradation in the irrigated areas of Central Asia.

Prof. Dr. Christopher Conrad
Universität Würzburg
Institut für Geographie und Geologie
Würzburg
Germany

Prof. Dr. Ruzumboy Eshchanov
Urgench State University
Khorezem Academy of Mamun
Urgench
Uzbekistan

Prof. Dr. Victor Dukhovny
Scientific Information Center of the Interstate Commission for Water Coordination
Tashkent
Uzbekistan

Dr. Nadiya Muratova
Al-Farabi Kazakh National University
Research Institute of Ecology problems
Almaty
Kazakhstan

Dr. John Lamers
Universität Bonn
Zentrum für Entwicklungsforschung (ZEF)
Bonn
Germany

Dr. Mirzahayot Ibrakhimov
Khorezm Rural Advisory Support Service
Urgench
Uzbekistan

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COLLECTIVE ACTION AND CONFLICT ON COMMON VILLAGE PASTURES - COMPARATIVE CASE STUDIES IN AZERBAIJAN AND GEORGIA

Common village pastures are a heavily used key resource for mobile and stationary livestock keepers in Azerbaijan and Georgia. Village smallholders' livelihood depends in vast parts from livestock husbandry, while intact pastures around villages prevent them from natural hazards. Village pastures are managed locally and collectively by a village community, which has designs and enforces regulations itself. In addition, different user groups, i.e. mobile and stationary livestock keepers, villagers and the village administration, have conflicting interests in resource management which have to be balanced in a complex negotiation process. The project focuses on two neighbouring countries with similar ecological conditions and a similar administrative framework for pasture resource which was developed in the post-socialist transition period. However, due to differences in individual incentives and social experiences, the preferences and capacity for collective action might differ between the two countries. The research intends to contribute to the improved collective management of heavily used pasture resources in both countries by analysing the resource management problem from an interdisciplinary perspective. Institutional economic, farm economic and ecological knowledge are used to analyse in detail the resource management dynamics and to develop from the synthesis of these perspectives
recommendations for the ecologically sound and socially sustainable management of village pasture resources.

Prof. Dr. Volker Beckmann
Universität Greifswald
Institut für Botanik und Landschaftsökologie
Greifswald
Germany

Dr. Michael Rühs
Universität Greifswald
Institut für Botanik und Landschaftsökologie
Greifswald
Germany

Prof. Dr. Maharram Huseynov
Azerbaijan State Agrarian University
Department of Financial and Economic Theory
Ganja
Azerbaijan

Prof. Dr. Gurban Mammadov
Azerbaijan State Agrarian University
Plant Growing, Selection and Genetics Department
Ganja
Azerbaijan

Prof. Dr. Alexandre Didebuldze
Agricultural University of Georgia
Tbilisi
Georgia

Prof. Dr. Teo Urushadze
Agricultural University of Georgia
School of Agricultural and Nature Science
Agriculture and Nature Conservation
Tbilisi
Georgia

CHANGES IN GLACIER AND SNOW-MELT RUNOFF COMPONENTS IN CENTRAL ASIA AND SOCIETAL VULNERABILITY (GLASCA-V)

Website: www.gfz-potsdam.de/sektion/hydrologie/projekte/glasca-v/

Meltwater from glaciers and seasonal snow cover substantially feeds Central Asian rivers. The riparian states use the water for economic activities such as irrigated agriculture and hydropower generation. Depending on the type and intensity of water use, the societies exhibit a varying vulnerability to changes in runoff availability and regimes. Against the background of global climate change, shrinkage of glaciers and changes in snow cover climatology have been observed in the Central Asian High Mountains over the past decades. The project aims at measuring and modelling the contributions of individual runoff components in selected glacierised river catchments in the Northern Tien Shan. With the validated hydrological models, reliably reproducing individual runoff components, the attribution of past changes in runoff components and investigation of potential future changes is intended. The geo-scientific approach will be combined with the assessment of the socio-ecologic vulnerability of individual societal groups and economic sectors to changes in water availability and runoff regimes. The development and evaluation of adaptation measures will be carried out with a focus on the resilience of the local communities to projected changes in water availability. Special emphasis will be put on the training and qualification of young Central Asian researchers.

Prof. Dr.-Ing. Bruno Merz
Helmholtz-Zentrum Potsdam
Deutsches GeoForschungsZentrum - GFZ
Sektion 5.4 Hydrologie
Potsdam
Germany

Dr. Julia Kloos
United Nations University (UNU)
Institut für Umwelt und menschliche Sicherheit
Bonn
Germany

Dr. Natalia Ershova
Kyrgysisch-Russische Slavische
Universität, Bischkek
Hydraulic Engineering and Water
Resources Department
Bishkek
Kyrgyz Republic

Dr. Stephan Weise
Helmholtz-Zentrum für Umweltforschung - UFZ
Standort Halle (Saale)
Department Catchment Hydrology
Halle (Saale)
Germany

Olga Kalashnikova
Central Asian Institute for Applied Geosciences
(CAIAG)
Department of Climate, Water & Geoecology
Bishkek
Kyrgyz Republic

Dr. Sergiy Vorogushyn
Helmholtz-Zentrum Potsdam
Deutsches GeoForschungsZentrum - GFZ
Sektion 5.4 Hydrologie
Potsdam
Germany

Dr. Svetlana Dolgikh
Regional Centre of Hydrology
Climate Research Department
Almaty
Kazakhstan

Kanat Sultanaliev
American University of Central Asia
Tian Shan Policy Center
Bishkek
Kyrgyz Republic

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AMIES II - SCENARIO DEVELOPMENT FOR SUSTAINABLE LAND USE IN THE GREATER CAUCASUS, GEORGIA (EXTENSION)

The follow-up project aims to continue its interdisciplinary research to support the rural development of the Kazbegi district in the Greater Caucasus. The joint investigation focuses on the human-environment-interface and comprises ecological and socio-economic research to develop sustainable agricultural land-use options. The project is divided into four units, with German and Georgian researchers cooperating in each unit. The research topics are dealing with aspects of landscape ecology, soil science, vegetation ecology/agrobiodiversity and socioeconomics. The disciplinary and interdisciplinary results of the project units will be translated into normative scenarios for a sustainable development. The possible consequences and outcome of these scenarios will be depicted and illustrated as alternative futures by means of high resolution maps and socio economic data. The scenario development will be carried out in cooperation with an Advisory Board and Georgian NGO experts. This exchange will ensure a comprehensive consideration of the (local) social and political conditions. The results will be made available to political and societal decision-makers.

Prof. Dr. Dr. Annette Otte
Universität Gießen
Zentrum für internationale Entwicklungs und Umweltforschung (ZEU)
Sektion 1
Gießen
Germany

Prof. Dr. Otar Abdaladze
Ilia State University
Institute of Ecology
Tbilisi
Georgia

Prof. Dr. Maia Akhalkatsi
Ilia State University
Tbilisi Botanical Garden and Institute of Botany
Tbilisi
Georgia

Prof. Dr. Besik Kalandadze
I. Javakhishvili Tbilisi State University
Faculty of Exact and Natural Sciences
Department of Geography
Tbilisi
Georgia

Prof. Dr. Ingrid-Ute Leonhäuser
Universität Gießen
Zentrum für internationale Entwicklungs- und Umweltforschung
Sektion 2
Gießen
Germany

Prof. Dr. George Nakhutsrishvili
Ilia State University
Tbilisi Botanical Garden and Institute of Botany
Tbilisi
Georgia

Prof. Dr. Rainer Waldhardt
Universität Gießen
Zentrum für Internationale Entwicklungs und Umweltforschung
Sektion 1
Gießen
Germany

Prof. Dr. Joseph Salukvadze
I. Javakhishvili Tbilisi State University
Department of Human Goegraphy
Tbilisi
Georgia

Prof. Dr. Joachim Aurbacher
Universität Gießen
Agricultural Production Economics
Gießen
Germany

Prof. Dr. Tengiz Urushadze
Agricultural University of Georgia
Mikheil Sabashvili Institute of Soil Science, Agrichemistry and Melioration
Tbilisi
Georgia

Prof. Dr. David Bedoshvili
Agricultural University of Georgia
Institute of Farming
Tbilisi
Georgia

Prof. Dr. Peter Felix-Henningsen
Universität Gießen
Institut für Bodenkunde und Bodenerhaltung
Gießen
Germany

FOREST REGENERATION AND BIODIVERSITY AT THE FOREST-STEPPE BORDER OF THE ALTAI AND KHANGAI MOUNTAINS UNDER CONTRASTING DEVELOPMENTS OF LIVESTOCK NUMBERS IN KAZAKHSTAN AND MONGOLIA (EXTENSION)

In the second project phase investigations shall focus on the questions how much area a forest must have and how closely connected to other forests it must be to possess characteristic forest traits in terms of biodiversity and ecosystem functions. Moreover,the consequences of forest degradation and conversion into pioneer forests and shrublands are to be studied. Therefore, the key objectives of the second term are to analyze the effects of forest fragmentation (studied on the case example of Mongolia) and forest degradation (investigated on the case example of Kazakhstan) on biodiversity, ecosystem functions and the economic significance of forests in the forest-steppe ecotone. Studies on the plant and animal diversity include the ground vegetation, epiphytic lichens and invertebrates, while the study of ecosystem traits includes the above-ground biomass and carbon pools, productivity, forest regeneration, the nutrient status and the carbon pools of the soil, and drought stress. The economic significance of disturbance for the local populations is analyzed using interviews and secondary information. Interviews with the local population are also used to identify areas of comparable livestock grazing pressures before sample plot selection.

Prof. Dr. Markus Hauck
Universität Göttingen
A.-v.-Haller-Institut für Pflanzenwissenschaften
Abt. Ökologie und Ökosystemforschung
Göttingen
Germany

Dr. Choimaa Dulamsuren
Universität Göttingen
Albrecht-von-Haller-Institut für Pflanzenwissenschaften
Göttingen
Germany

Prof. Dr. Christoph Leuschner
Universität Göttingen
Albrecht-von-Haller-Institut für Pflanzenwissenschaften
Abt. Ökologie und Ökosystemforschung
Göttingen
Germany

Prof. Dr. Badamdorj Bayartogotokh
National University of Mongolia
Department of Zoology
Ulaanbartar
Mongolia

Prof. Dr. Ulagvan Beket
Mongolian Academy of Sciences
Laboratory of Nature Research and Ecology, Ulgii
Ulaanbartar
Mongolia

Dr. Ochirbat Enkhtuya
Mongolian Academy of Sciences
Institute of Botany
Ulaanbartar
Mongolia

Dr. Dorjburgedaa Lkhagvadorj
Mongolian State University of Agriculture
School of Economics and Business
Ulaanbaatar
Mongolia

Prof. Dr. Jamsran Tsogtbaatar
Mongolian Academy of Sciences
Institute of Geoecology
Ulaanbaatar
Mongolia

Prof. Dr. Kaman Ulykpan
Pavlodar State University
Department of Ecology
Pavlodar
Kazakhstan

Prof. Dr. Sholpan Zhumadina
Pavlodar State University
Department of Biology and Ecology
Pavlodar
Kazakhstan

Prof. Dr. Tamara Zozulya
Pavlodar State University
Department of Sociology and Political Sciences
Pavlodar
Kazakhstan

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DEVELOPING TOOLS FOR CONSERVING THE PLANT DIVERSITY OF THE SOUTH CAUCASUS (EXTENSION)

The project extension is structured into five work packages. The spectrum of methods applied in WP 1 - Research includes molecular phylogenetics and taxonomy, analyses of geographical distributions, historical biogeography, and conservation status assessment. Selected plant genera from different ecosystems (Campanula, Pyrus, Dianthus, Scutellaria, Jurinea, and Ramalina) will be studied as models to arrive at a better understanding their evolutionary history and to carry out meta-analyses on Caucasus plant diversity patterns. Population-level analyses (conservation genetics) will contribute information that is essential for conservation planning, such as the distribution of genotypes and effects of habitat fragmentation on gene flow in selected species. Applications extend from protected area management (management of genetic diversity and unique genotypes in situ), to identifying plant material suitable for restoration programs. Research in this context will continue on Pterocarya fraxinifolia (a relict tree) and Calligonum bakuense (a highly endangered endemic shrub). Presenting and disseminating the biodiversity data and insights generated in this project will be the key component of WP 2 - Data management and dissemination. The primary data generated in this project (specimen meta-data, sequence data) will be managed in a way that they can be sustainably stored, shared, and used for scientific syntheses to provide the tools supporting conservation. Among the products of this project will be databases and on-line resources on the plant diversity in the Caucasus. The WP 3 - Endangered species management will then assist the practical implementation of ex situ and in situ conservation measures using results of WPs 1 and 2 on selected plants as exemplars. The WP 4 and 5 will deal with Capacity building and Outreach.

Prof. Dr. Thomas Borsch
Freie Universität Berlin
Botanischer Garten und Botanisches Museum Berlin-Dahlem
Berlin
Germany

Dr. Nadja Korotkova
Freie Universität Berlin
Institut für Biologie
AG Systematische Botanik und Pflanzengeographie
Berlin
Germany

Dr. Anush Nersesyan
National Academy of Sciences of Armenia
Institute of Botany
Jerewan
Armenia

Dr. Esmira Alirzayeva
Azerbaijan National Academy of Sciences
Institute of Botany
Baku
Azerbaijan

Dr. Zezva Asanidze
Ilia State University
Institute of Ecology
Tbilisi
Georgia

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Corrections

Missing poster abstract:

Water availability and the contribution of runoff components in the past and the future periods in the upper Chu River Basin, Kyrgyzstan

Olga Kalashnikova[1]; Zhihua He[2]; Abror Gafurov[2]; Sergiy Vorogushyn[2]; Katy Unger-Shayesteh[2]

[1]CAIAG Central Asian Institute of Applied Geosciences, Department Climate, Water and Natural

Resources, Bishkek, Kyrgyzstan; [2]GFZ German Research Centre for Geosciences, Section 5.4: Hydrology, Telegrafenberg, Potsdam, Germany.

The River Chu is a transboundary River crossing borders of Kyrgyzstan and Kazakhstan, Central Asia. Water resources of the Chu River is mainly used for irrigation (58% of the intake occurs in Kyrgyzstan and about 42% in Kazakhstan). Water availability in future is an important factor for planning of agricultural production and livestock sectors for both countries. We have analyzed water availability of the upper Chu River Basin, up to the gauge Kochkor. Water formed in this basin supplies the inflow into the Orto-Tokoy reservoir which is important for water distribution among different stakeholders. We used a semi-distributed glacio-hydrological model WASA and calibrated it using multiple datasets. Afterwards, we have quantified the runoff components over the past decades since 1960s. Moreover, past changes in runoff components have been analyzed. Finally, we assessed potential future changes in annual and seasonal runoff in this basin, including tributaries, as well as changes in their runoff components based on the IPCC CMIP5 climate scenarios. Our results show the contribution of groundwater to be 18-46%, runoff from liquid precipitation - 13-26%, runoff from seasonal snow melting - 30-53% and runoff from glacier component – 0,01-1,3%, depending on the tributary/ subcatchment. The results in changes in the runoff components demonstrated that the role of liquid precipitation will decrease, while the role of snow melt will increase in the future. In the interim of 2050-2100, liquid precipitation will amount to about 70-80% of the period 1960-1985. The contribution of seasonal snow melting will be 130-160% for the corresponding periods. A rise in air temperature will lead to an earlier melting of the snow cover correspondingly, and flood peaks will not take place in the summer months (July-August), but rather in the spring (May-June). In addition, the groundwater runoff will increase and will make up to 140-180% for the period 2050-2100 comparing to 1960-1985. In order to further use water resources in the future for irrigation purposes in a dry summer period, certain measures are required, such as building reservoirs. This will also protect the population in the middle and lower reaches of the river from spring floods.