SUSADICA - Structured doctoral programme on Sustainable Agricultural Development in Central Asia:

Overview of PhD research topics

Research area 1: Farm restructuring & labour relations

Supervisor: Martin Petrick (Justus Liebig University Giessen, Germany)

Analysis of cotton production under the emerging cluster system in Uzbekistan

Jakhongir Babadjanov

The main research objective: to investigate cotton production in cluster system in Uzbekistan by applying value chain approach, labour arrangements in clusters, identifying location for organizing clusters. The following goals are formulated to study value chain analysis approach under institutional framework and stakeholders' interaction, labour arrangements and identifying location for clusters: (a) to investigate value chain in cotton production in Uzbekistan; (b) to study labour arrangements in cotton textile clusters, 3) to identify location to organize textile clusters. In the framework of this research cotton production under cluster system in Uzbekistan will be analysed. This research will use a variety of methods to collect data to explore the topic through such as literature reviews, in depth and semi-structured interviews, surveys, observations on site visits and satellite data for GIS modelling.

Livestock, poverty and household behaviour in Kyrgyzstan

Kadyrbek Sultakeev

This research will assess the impact of livestock (with shock and non-shock households) on poverty in Kyrgyzstan. The research questions in this study are: (a) what is the impact of having and giving-up livestock on rural poverty among shock and non-shock groups?, and (b) what are the factors affecting poverty dynamics (falling into poverty and moving out of poverty) with a specific focus on weather and agricultural shocks? Answering these questions provides useful information on how well the livestock sector can reduce poverty and how well the households can cope with shocks in rural Kyrgyzstan. The data for the current study is taken from the survey "Life in Kyrgyzstan (LIK)" survey, which is a panel survey conducted annually between 2010 and 2013 and again in 2016. The original 3000 households were drawn through stratified two-stage random sampling. The data are representative at the national, urban/rural, and North/South levels.

Research area 2: Agricultural innovations & technology

Supervisors: Nodir Djanibekov and Golib Sanaev (both IAMO, Germany)

Technology adoption for sustainable agriculture in Central Asia

Abdusame Tadjiev

Concerns for environmental sustainability in irrigated and degraded areas prone to water shortage, call for the adoption of proper technologies and methods. Various sustainable technologies such as crop rotation, conservation agriculture, and drip irrigation have been tested in agricultural settings in Central Asia and demonstrated economic feasibility at the field level for various crops. Despite the demonstrated advantages at the field level, their adoption level by farmers is still low. Therefore, the objective of this PhD study is to investigate the factors affecting farmers' adoption decisions in Central Asia. The study will use a cross-country comparison of technology adoption patterns among farmers in irrigated areas of Turkistan (Kazakhstan) and Samarkand (Uzbekistan) provinces. The main research question is: How can adoption of sustainable agricultural practices (SAPs) among Central Asian farmers be promoted? To address this topic, the AGRICHANGE farm survey database will be enriched with farmers' risk preference measurements using behavioural experiments with the sub-sample farmers.

Agricultural diversification in irrigated areas of Central Asia: Policies, determinants and social implications

Suray Charyyeva

Following the collapse of the former Soviet Union, Central Asian governments decided to implement reforms in agricultural sector. For irrigated areas these reforms included liberalization of cotton sector and follow-up diversification to other food and commercial crops. Among positive effects of diversifying crop portfolio are the resistance to risks of crop failures, more secure and improved farm incomes, poverty reduction, improved child nutrition, sustainable use of land and water, lower environmental pressure, potential to contribute to economic growth through higher incomes, employment and export promotion. Acknowledging these points, this PhD research's objectives are to (a) study determinants of farmers' crop diversification decisions, and (b) identify social implications of crop diversification. The study will also update an analytical overview of the cotton reforms in Central Asia and their outcomes. The thesis aims to contribute this process via addressing an overarching question: How to make crop diversification an effective option for rural development in Central Asia?

Research area 3: Agricultural policy for sustainable development

Supervisor: Thomas Herzfeld (IAMO, Germany)

Time preference and household income diversification: the case from Central Asia

Zafar Kurbanov

The research will examine the impact of time preference measured with discount rate and present bias, on on-farm and off-farm employment of households in Kazakhstan and Uzbekistan. The overarching goal of dissertation is to understand employment typology, and relate it to time preference. The central question is thus to examine whether time preference can explain household decisions for employment choice. The AGRICHANGE 2 survey data provides farm and bio-physical variables. We obtain employment and time preference covariates with another survey coupled with the experimental task in the format of Multiple Price List on the same sub-set of farmers from the AGRICHANGE farm survey database. We expect households with low time preference (patience) to practice high-return economic activities such as exporting and reprocessing agricultural products. We also expect that impatient households should diversify more than their patient counterparts.

Impact of agricultural subsidies on agricultural trade and growth in Kyrgyzstan

Barchynai Kimsanova

The general research question of this study is “What is the impact of agricultural subsidies on agricultural trade and growth in Kyrgyzstan? What role should the government pursue to increase agricultural growth? (Possible government policy suggestions)”. The thesis will consist three papers and each will relate to the general research question above. More precisely, the first paper will analyze the impact of agricultural credit subsidies that have been systematically issued since 2014 in Kyrgyzstan on agricultural trade (export and import of agricultural goods) based on macro-level data. In the second essay we are going to analyze the impact of all types of agricultural subsidies on agricultural growth in Kyrgyzstan modifying the model in the first paper and providing suitable empirical analysis with macro level data. The third paper will analyze farmer’s production, consumption and labor market decisions under the various subsidies. The empirical analysis will be provided using the “Life in Kyrgyzstan (LIK)” survey data.

Research area 4: Environmental change & agriculture

Supervisor: Daniel Müller (IAMO, Germany)

Impacts of climate change on irrigated agriculture in Central Asia.

Daniela Peña-Guerrero

Knowing that the effects of changes in water runoff on downstream agricultural production in Central Asia remain poorly understood along with the effect of climate change on crop production, the main objective of this research project will be to assess the impacts of climate change on irrigated agriculture using as a case study the Kashkadarya province, southern Uzbekistan. This will be accomplished through three objectives: 1) to establish past spatio-temporal changes in hydro-climatic variables, crop yield and land use along with the occurrence of extreme events, 2) to determine water availability and demand through coupling of crop modeling of irrigated crop production in the region with hydrological/climatological estimates of snowfall and snowmelt in the mountains, and 3) to establish forecasting possibilities of the coupled system for agricultural management. The result of this project will be an advance in the development of a scarce, and in an early stage approach such as the understanding of the agro-hydrologic systems; provide information to stakeholders, managers and policymakers to foster sustainable development of irrigated crop production, and improve the knowledge on sustainable crop production and hydrologic systems resilience in Central Asia under climate change.

Impact of climate variability and climate change on water availability for irrigated agriculture in Central Asia

Atabek Umirov

This research looks into impacts of climate induced growing temperatures and change in precipitation patterns on seasonal and long-term water availability for irrigated crops in endorheic basins of Central Asia. In particular, it will explore capabilities of RE and hydrological modelling for predicting seasonal discharge in selected Central Asian river basins that are characterized by intensive water withdrawals for agriculture. In addition, it will determine long term water availability for irrigated agriculture under climate change, using as a case study the Zarafshan river basin. It is expected that the research will thus estimate needed improvements in water use efficiency and crop yields to match the water deficit in the basin in future, as well as to establish an easy-to-operate early warning system techniques for forecasting seasonal water discharge in selected rivers.

Research area 5: Water governance

Supervisor: Insa Theesfeld (Martin Luther University Halle-Wittenberg, Germany)

Linking patterns of property rights in land and water: Understanding effects of reviving agricultural cooperatives in Uzbekistan

Davran Niyazmetov

The recent agricultural policy in Uzbekistan promotes cooperative as a new organizational form of production of fruits and vegetables. This policy formally promotes self-organization of land/water users and proclaims some benefits by promising to secure land lease rights, rights to independently determine crop structure, and economic incentives via specific subsidies. The research problem lies in the need to assess institutional fitness of the policy to existing effective rules, as well as the eventual changes in land and water use. General research questions address: the specifics of the policy implementation; the institutional compatibility of the new policy with existing formal and informal rules; the potential effect of the new policy on current formal and informal property rights in land and water. The author will employ the mix of longitudinal and comparative research designs to test two hypotheses: top-down policy implementation helps to achieve policy goals; cooperatives decrease the mismatch between formal rights and customary claims of the farmers in land and water. Qualitative data collection methods include in-depth interviews and focus group discussions with relevant stakeholders: farmers and smallholders, policymakers, experts. Additional survey of the farmers, members of the selected cooperatives, will serve to capture the changes in land and water use. Analysis of the legal documents, pertaining to regulation of the activities of farmers and smallholders, will help to understand how the policy on cooperatives is in line with a general trend(s) in the agricultural policy development. Two locations in Samarqand and Tashkent provinces are preliminary selected as case studies with a focus on the reasons for the similarities and differences between them.

Conjunctive water management in Uzbekistan

Hannes Knorr

Interest in the use of groundwater for irrigation in Uzbek agriculture is growing. This is becomes evident not only in recent legislation, but also on the ground in the form of increased borehole drilling and groundwater use to grow fruits and vegetables in Uzbekistan. Since the institutions governing groundwater use in this part of Central Asia are underexplored, this thesis strives to provide an overview and comparison of the formal and informal institutions governing the use of groundwater for irrigation. Further, it seeks to identify the consequences of the institutional settings for actors' use patterns and sustainable conjunctive water management opportunities. The data collected in the field through semi-structured interviews with commercial and household farmers, as well as experts will form the basis of the thesis. Field research will be conducted during several visits to Uzbekistan from 2019 to 2021, with the main research locations being the regions of Samarkand, Tashkent, and Khorezm.