



WESTMINSTER

International University in Tashkent

An Accredited Institution of
the University of Westminster (UK)

iamo

Leibniz Institute of Agricultural Development
in Transition Economies

CONFERENCE BOOK OF ABSTRACTS

Navigating Change: Agricultural Sustainability and Rural Development in Central Asia





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IAMO

Leibniz Institute of Agricultural Development
in Transition Economies

Conference Book of Abstracts

Navigating Change: Agricultural Sustainability and Rural Development in Central Asia

14-15 October 2025, Tashkent, Uzbekistan

Keynote Speakers:

Thomas Herzfeld, Leibniz Institute of Agricultural Development in
Transition Economies (IAMO), Germany

Isabel Lambrecht, International Food Policy Research Institute
(IFPRI), Tajikistan

Pierre Jean Gerber, World Bank, Uzbekistan / Wageningen
University and Research

The conference is organized jointly by Westminster International
University in Tashkent (WIUT) and Leibniz Institute of Agricultural
Development in Transition Economies (IAMO)

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Keynote Speaker 1

Thomas Herzfeld

**Leibniz Institute of Agricultural Development in Transition Economies (IAMO),
Germany**



Prof. Dr. Thomas Herzfeld

Director of IAMO

Head of Department

Department: External Environment for Agriculture and Policy Analysis (Agricultural Policy)

Research areas: Institutional change, Corruption, Microeconometric analyses of rural households and consumers, Agricultural policy analysis

Methodological foci: Panel data analysis, non-parametric methods

Personal details: Prof. Dr. Thomas Herzfeld joined IAMO in October 2011 as Head of the Department Agricultural Policy and he holds a joint appointment as Professor of Agricultural Policy and Institutions and teaches at the Martin Luther University Halle-Wittenberg, Germany, where he also is co-opted professor at the Law and Economics Faculty. He studied agricultural economics at the universities Halle and Kiel, Germany, and Rennes, France. Prof. Dr. Herzfeld obtained his PhD degree in 2004 from the Christian-Albrechts-Universität zu Kiel and finalized his Habilitation (venia legend) in 2008 at the same university. From 2007 to 2011, he was employed as an assistant professor at the Wageningen University, The Netherlands. Based on a joint appointment, he teaches at the Martin Luther University Halle - Wittenberg, Germany.

Keynote Speaker 2

Isabel Lambrecht

International Food Policy Research Institute (IFPRI), Tajikistan



Dr. Isabel Lambrecht

Research Fellow and Acting Country Program Manager for Tajikistan

Department: Development Strategies and Governance Unit

Research areas: Land tenure, Women's empowerment

Methodological foci: Quantitative and qualitative research methods, survey data collection, econometric analysis

Personal details: Dr. Isabel Lambrecht is a Research Fellow and acting Country Program Manager for Tajikistan in the Development Strategies and Governance Unit, based in Dushanbe, Tajikistan. She obtained her PhD in Agricultural Economics from KU Leuven University, Belgium, where her research focused on gender and integrated soil fertility management in the Eastern Democratic Republic of the Congo. Prior to her posting in Tajikistan, Dr. Lambrecht was based in Ghana, where she conducted research on land tenure and women's empowerment, and in Myanmar. Her work employs both quantitative and qualitative research methods, and she is experienced in both data collection and the econometric analysis of survey data.

Keynote Speaker 3

Pierre Jean Gerber

World Bank, Uzbekistan / Wageningen University and Research



Dr. Pierre Gerber

Senior Agriculture Economist at World Bank / Special Professor at Wageningen University and Research

Department: Animal Sciences, Wageningen University and Research

Research areas: Global environmental sustainability of livestock systems, Climate change, Livestock operations and financing

Methodological foci: Trend analysis, project design and supervision, analytical work

Personal details: Dr. Pierre Gerber has been appointed as Extraordinary Professor at the Department of Animal Sciences, Wageningen University. He is a senior staff member of the World Bank Group, where he leads a program aimed at mainstreaming climate and environmental considerations within the global portfolio of livestock operations and provides technical leadership for the livestock portfolio in Europe and Central Asia. His work involves project design and supervision, analytical work, and piloting novel financing options in the sector. Dr. Gerber possesses over 20 years of experience in analysing trends in global livestock systems and their interactions with the environment. His research and educational activities at Wageningen University address global environmental sustainability issues in livestock systems.

Session 1: Agricultural policies

Food system transition in Central Asia: New perspectives for research

Irene Mestre

French Institute for Central Asian Studies, Kyrgyzstan

Abstract

This literature review explores the transition of agri-food systems (AFS) in Central Asia, highlighting their vulnerability to global changes and their critical role in achieving social equity and sustainability. The review synthesizes research on AFS components – agriculture, natural resource management, agrarian policy, and supply chains – focusing on Kyrgyzstan, Uzbekistan, and Tajikistan. Utilizing the socio-technical transitions framework by Geels (2002) and enriched by perspectives on governance and spatial dynamics, the review identifies the absence of comprehensive studies on AFS transitions in the region. It underscores the existing work on economic transitions, resource management models, and the multi-scale governance affecting AFS. The findings emphasize the need for interdisciplinary research to address the unique socio-economic and environmental challenges in Central Asia, proposing new avenues for understanding AFS transitions towards sustainability.

Keywords: Transformation, agriculture, natural resource management, public policy.

An agricultural value chain revolution in Central Asia? Evidence from the livestock sector

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Abstract

This study investigates the transformation of livestock value chains in peri-urban areas of Kazakhstan, Kyrgyzstan, Tajikistan, and Uzbekistan. Drawing on unique farm-level data and qualitative research, we examine the limited progress of agri-food value chain modernisation in the region. Findings reveal that while urban demand for meat and processed food has grown, the smallholder-dominated livestock sector remains constrained by deficient fodder resources, fragmented production, and limited access to modern processing and retail channels. Despite growth of livestock numbers, intensification has progressed only slowly, with large-scale enterprises representing a small but dynamic segment. Our survey data shows that smallholder market participation is high, but reliant on heavily on informal market arrangements and local sales channels, often constrained by insufficient vertical coordination and limited quality enforcement. Large enterprises and feedlots often benefit from government support and exhibit advanced integration, with enhanced genetics, own processing plants, and branded retailing. This bifurcated structure in the livestock sector underscores challenges in transitioning toward modern value chains. Government interventions, including subsidies and cooperative development, have largely failed to integrate smallholders or address systemic bottlenecks. We discuss the options for inclusive strategies, such as strengthening public governance or leveraging medium-scale farmers.

Keywords: Livestock value chains; Central Asia, smallholder farming, agri-food transformation, peri-urban livestock systems.

Farmers' risk preferences and perceptions of land use rights

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Abstract

Farmers' perceptions of land tenure rights play a critical role in agricultural decision-making, particularly in contexts where formal ownership is absent or inconsistently enforced. This study investigates how behavioural risk preferences relate to farmers' perceived autonomy and tenure security. Drawing on a lab-in-the-field experiment with 307 commercial farm managers in Samarkand, Uzbekistan, we elicit risk parameters using a Cumulative Prospect Theory framework and link them to survey-based measures of land use perceptions. Results show that probability distortion and risk aversion are consistently associated with perceptions of land tenure among sampled Uzbekistan farmers. These findings highlight the need for tenure policies to consider not only legal reforms but also farmers' behavioural responses to uncertainty, particularly in transition economies with legacies of state control.

Keywords: Risk preferences, prospect theory, lab-in-the-field experiment, land tenure security, Uzbekistan.

Session 2: Institutions

Risk, time, and cotton: Do institutional framework explain differences in farmers, preferences within a country?

Abdusame Tadjiev

Leibniz Institute of Agricultural Development in Transition Economies (IAMO), Germany

Abstract

Most studies on risk and time preferences examine how individuals' behavior changes after traumatic events or prolonged exposure to risk, often overlooking the role of institutional frameworks. This study explores how institutional settings influence farmers' preferences within a single country, controlling for broader socio-economic factors. Focusing on Uzbekistan, where farmers operate under two distinct systems – state-controlled cotton farming and more autonomous horticulture – we conducted lab-in-the-field experiments with 307 farm managers in Samarkand in late 2024. Using lottery-based tasks (Tanaka et al., 2010) and survey data, we measured risk and time preferences through cumulative prospect theory and quasi-hyperbolic discounting. The results show that cotton specialization significantly reduces risk and loss aversion while increasing impatience. Farmers in the centralized cotton system, protected by state guarantees but constrained by delayed payments and rigid practices, show greater tolerance for risk and a preference for short-term gains. This contrasts with horticultural farmers who operate under market-driven conditions.

Keywords: Prospect theory, quasi-hyperbolic time discounting, cotton specialization; Uzbekistan.

Land ownership, risk perception and crop diversification: Evidence from Uzbekistan and Kazakhstan

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Abstract

Farmers' perceptions of land ownership and their attitudes toward risk play a crucial role in shaping agricultural decisions, particularly crop diversification. The paper develops a theoretical framework to examine how perceived land tenure security and individual risk preferences influence crop diversification in developing regions. We draw on unique farm-level survey data collected in Kazakhstan and Uzbekistan in 2018 and 2020, which captures farmers' subjective assessments of land ownership rights, behavioral measures of risk preferences, and their cropping patterns. Descriptive analysis reveals considerable variation in both perceived tenure security and risk attitudes across regions and over time. We apply a two-way fixed effects regression model, controlling for regional and temporal heterogeneity. Our findings show that weaker perceptions of land ownership are significantly associated with lower levels of crop diversification. These insights have important implications for agricultural policy, suggesting that improving land tenure security and supporting risk management strategies could enhance agricultural resilience through increased diversification.

Keywords: Land ownership, risk perception, crop diversity, Kazakhstan and Uzbekistan.

Livestock value chains in Tajikistan and Uzbekistan: Structural weaknesses, institutional bottlenecks, and opportunities for inclusive transformation

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Abstract

The livestock sectors in Tajikistan and Uzbekistan are vital to rural livelihoods and national food security but remain constrained by interlinked production challenges and fragmented institutions. These issues stem from the legacy of centrally planned agriculture, reinforced by current divergent policies that restrict market responsiveness and inclusive growth. Uzbekistan has maintained strong state control over agricultural input and output markets through self-sufficiency strategies and ad hoc interventions, while Tajikistan has pursued a more liberalized trade and pricing regime outpacing its infrastructure development. These contrasting approaches offer an empirical lens to assess how institutional settings shape productivity, input access, market connectivity, and value chain performance in the context of sectoral modernization and both domestic as well as regional trade integration. By linking farm-level decisions to mid-chain institutional frictions and broader policy environments, the study offers comparative insights into how central planning legacies and ongoing policy choices shape value chain performance, and identifies leverage points for inclusiveness, efficiency, and resilience of livestock markets. The findings clarify where targeted interventions can be most effective and how policy design alleviates or reinforces systemic constraints.

Keywords: Markets, value chains, livestock, policy analysis, institutions.

Session 3: Adoption 1

Is there a trade-off between crop diversification and technical efficiency

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Abstract

We provide evidence on the recommendable crop allocation levels from a technical efficiency (TE) perspective, considering heterogeneous farming systems across regions and countries. Towards this aim, we employ a latent profile analysis to identify the main patterns of crop systems among a random sample of 2,830 crop farms from Kyrgyzstan, Mongolia and Uzbekistan. Using a stochastic frontier analysis, we calculate TE scores for the identified crop profiles to examine the relationship between diversification portfolios and TE. We find that, on average, diversified crop profiles exhibit the highest TE scores, particularly those with a greater emphasis on dual-season grain crops. Meanwhile, the specialized farm profile tends to show the lowest average TE score.

Keywords: Crop diversification, Kyrgyzstan, Mongolia and Uzbekistan.

Role of institutional factors in multiple sustainable agricultural practices: Evidence from the Samarkand region in Uzbekistan

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Abstract

This paper explores how farmers in Samarkand, Uzbekistan, adopt four sustainable agricultural practices (SAP) biopesticide use, crop rotation, sustainable manure application, and crop residue retention using data from UzFarmBarometer 2024 and multivariate probit model. The results show SAP practices are often adopted together, reflecting the interconnected nature of decision-making in sustainable farming. Farmers with greater autonomy in decision-making are more likely to use sustainable manure, though the same autonomy has a mixed effect on biopesticide use. Access to diverse training opportunities boosts the adoption of biopesticides, crop rotation, and manure use, highlighting the importance of knowledge-sharing platforms. Conversely, risk-averse farmers are less inclined to adopt biopesticides and crop rotation due to behavioural attributes.

Secure land tenure enables crop rotation and manure use, age, experience also play a role, older farmers are more likely to use biopesticides, while more experienced farmers tend to crop rotation but are less likely to adopt biopesticides or manure use. Interestingly, larger farms are less likely to rotate crops, possibly due to specialization pressures.

District specialization encourages manure use but discourages biopesticide and crop rotation adoption likely a result of limitations by clusters/local government. Findings highlight need for integrated, locally tailored policies to support the broader adoption of SAPs in Uzbekistan.

Keywords: Technology adoption, Uzbekistan agriculture, Joint sustainable agriculture practices (SAP), multivariate probit model (MVP), Institutional factors, and UzFarmBarometer.

Adapting quinoa to salinity, climate stress, and local diets in Central Asia: Insights from a QuinAS project

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Abstract

The Aral Sea Basin, affected by severe soil salinity and climate extremes, presents major challenges for agriculture and the livelihoods of 6.5 million people. A German-Uzbek research project investigates the potential of quinoa, a salt-tolerant crop, as a sustainable alternative to traditional, resource-intensive farming. Beyond agronomic suitability, the study explores farmer adoption, socio-economic impacts, and the crop's potential to improve nutrition, income, and trade opportunities in the region. This work presents preliminary findings from qualitative and quantitative data collection focused on the adoption of unconventional crops like quinoa by farmers, consumer acceptance and perceptions of quinoa as a food source, and the challenges involved in developing quinoa value chains in Central Asia. This work contributes to understanding the feasibility of adopting new, unconventional crops in Central Asia that are better suited to saline soils and water-scarce conditions, while also examining their economic viability.

Keywords: Quinoa, salinity, adoption.

Session 4: Adoption 2

Impact of cluster policy on adoption of sustainable agricultural practices

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Abstract

Central Asia, where institutions and land rights have taken diverging paths since the dissolution of the Soviet Union, lends itself as an area where the effects of land tenure perception on farm sustainability can be comparatively studied between countries. Recent policy interventions targeting agricultural development in Uzbekistan, such as the introduction of clusters, have created uncertainty around land ownership arrangements. However, empirical research assessing farmers' tenure right perception on farm sustainability is still rare. Using farm-level data from Kazakhstan and Uzbekistan, collected in 2019 and 2022, this paper attempted to identify treatment effects of farmer's cluster membership on adoption of sustainable agricultural practices (SAP) through Difference in-Differences (DiD) approach. The results indicate that cluster participation has a negative effect on adoption of SAP. Further Mediation Analysis confirmed that tenure rights perception is a mechanism behind the causal effect. Despite the overall negative effect, a positive channel exists through the tenure right perception, which however does not outweigh the negative impact. Therefore, cluster participation negatively affects adoption of SAP.

Keywords: Sustainable agricultural practices, tenure rights, cluster policy.

Understanding farmers' decisions to adopt biological crop protection approaches in Uzbekistan

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Abstract

In this study, we first provide the status of pesticide use and management in Uzbekistan and then investigate the determinants of sustainable crop protection methods in farm activity. We use cross-sectional farm survey data for econometric analysis. The results suggest that growing cotton is negatively associated with biological crop protection methods. Farmers who are willing to take risks are less likely to adopt biological crop protection methods. If farmers perceive a high risk from pests, they are more motivated to find solutions, and biological control becomes a more attractive option. Farmers who live further away from their home are less likely to adopt biological crop protection. Each additional kilometer of distance decreases the probability. Farmers who have participated in training on biological plant protection are more likely to adopt.

Our findings suggest several policy implications for promoting biological crop protection. First, since risk-tolerant farmers are less likely to adopt biological methods, extension strategies should emphasize the reliability and long-term benefits of such practices, potentially supported by risk-reducing instruments. Second, raising farmers' awareness of increasing pest risks can motivate adoption, highlighting the value of pest monitoring and early warning systems.

Keywords: Pesticide, farm decisions, agriculture, Uzbekistan.

Assessing the potential of carbon finance to enhance adoption of conservation agriculture in Uzbekistan

Alexey Volkov

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Abstract

This article explores the potential of carbon finance as a strategic tool to accelerate the adoption of conservation agriculture and other sustainable farming practices in Uzbekistan. It provides an overview of carbon credit mechanisms and outlines the steps necessary to engage farmers in carbon finance schemes. The paper examines both the opportunities and the key challenges associated with integrating carbon finance into Uzbekistan's agricultural sector. In addition, it highlights policy measures that could facilitate the effective scaling and institutionalization of such mechanisms, thereby promoting broader farmer participation, enhancing the spread of sustainable land management practices, and generating greater environmental and economic benefits. Drawing on national statistics, peer-reviewed sequestration factors, and scenario modelling, the study quantifies potential carbon-credit revenues and compares them with current production costs for key crops. It also considers pending revisions to Resolution No. 117, which are expected to clarify credit ownership, unlock private investment, and broaden farmer participation across diverse agro-ecological zones.

Keywords: Carbon credits, conservation agriculture, no till, climate change, Uzbekistan.

Innovative technologies for agricultural sustainability in Karakalpakstan: Application of Google Earth Engine platform

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Abstract

Sustainable agriculture is a basis for food security and nutritional availability in the world. Currently, its effective management rely on application of modern technologies such as remote sensing, artificial intelligence, and machine learning. Cause previous traditional methods requires more financial and labor recourses. One of the most powerful tools for it is Google Earth Engine which established in 2005 and considered as the most efficient digital world device for monitoring activities on Earth including agriculture. This platform allows to analyze climatic data, soil condition, vegetation and land cover information. However, application of new technologies demands basic skills and knowledge to use and demonstrate obtained data. This research applied FAO Global Administrative Unit Layers 500 m resolution to present regions borders for further selection of study area. Functions as “Map.addLayer”, “var roi = filterBounds” were utilized for this research. Additionally, we offered some basic indexes for agriculture monitoring processes like NDVI, NDSI, EVI.

Keywords: Sustainable agriculture, modern technology, google earth engine, Karakalpakstan.

Session 5: Rural growth

Strengthening agricultural innovation systems through multi-actor platforms: The case of SASRI in Southern Uzbekistan

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International Center for Agricultural Research in the Dry Areas (ICARDA), Tunisia

Abstract

This study explores the strategic role of the Southern Agriculture Scientific Research Institute (SASRI) in advancing agricultural innovation, productivity, and climate resilience in Uzbekistan's Kashkadarya region. As a key public research institution, SASRI has played a critical role in developing drought- and salinity-tolerant seed varieties, promoting improved agronomic practices, and introducing water-saving technologies suited to semi-arid conditions. The study aims to assess SASRI's effectiveness in generating and disseminating farmer-relevant innovations, identify the main barriers to their adoption, and examine institutional mechanisms to enhance impact. A mixed methods approach was employed, combining farm surveys, field trials, cluster and social network analyses, and statistical evaluations. Data were collected from farmers and households in the Karshi district, as well as through interviews with researchers and key stakeholders. Between 2018 and 2023, SASRI implemented 45 research projects and introduced innovations such as climate-resilient seed varieties and no till farming techniques. These technologies contribute to increasing yield and reducing production costs. However, their adoption remains limited due to weak extension services, outdated infrastructure, and fragmented communication channels. To overcome these challenges, the study recommends the establishment of a multi-actor Innovation Platform (IP) to foster collaboration, enhance knowledge exchange, and accelerate the scaling of sustainable agricultural innovations.

Keywords: Agricultural innovation, climate resilience, research institutions, technology adoption, innovation platforms, Uzbekistan.

Green entrepreneurship in Kazakhstan and Uzbekistan: Preliminary findings from a comparative qualitative study

Philipp Schroeder

Nazarbayev University, Kazakhstan

Abstract

This contribution presents preliminary findings from an ongoing exploratory study on green entrepreneurship in Kazakhstan and Uzbekistan. Adopting a comparative approach, it examines differences in entrepreneurial conditions, strategies, and motivations across rural and urban contexts. The ventures under examination include recycling, reforestation initiatives, and smart farming operations, reflecting the breadth of pathways that blend ecological and economic objectives. Methodologically, the study follows a qualitative ethnographic approach, drawing on a small sample of in-depth conversations that inform entrepreneurial case studies. The study's aim is to lay the groundwork for future quantitative research within a mixed-methods design, while also complementing existing endeavors such as the 'UzFarmBarometer.' Conceptually, the analysis is guided by the framework of 'entrepreneurial opportunity structures', which examines the triangular interplay between socio-economic positioning, cultural goals, and individual adaptations. This lens allows for a nuanced understanding how entrepreneurs perceive, seize, and co-create opportunities in the specific market environments they are embedded in. Empirically, the contribution provides situated insights into how entrepreneurial biographies, in/formal market mechanisms, and localized business models intersect with collective identities, cultural values, and social classifications. In this way, the study highlights that gender, generation, and notions such as 'success' shape both constraints and agency in green venturing.

Keywords: Green entrepreneurship, opportunity structures, ethnographic study, intersectionality.

Public perception of environmental problems in Central Asia: Results from Life in Transition survey

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Abstract

Environmental issues adversely impact air quality, biodiversity, and socio-economic conditions in Central Asia. These challenges are gradual, slow, and intense, making it difficult to detect and monitor changes in human experience. This paper utilizes the Life in Transition dataset to analyse climate change awareness and willingness to mitigate among populations from Kazakhstan, the Kyrgyz Republic, Tajikistan, and Uzbekistan. Our findings reveal that public perceptions of environmental problems vary, with the highest concerns about air pollution, waste, species loss, temperature fluctuations, natural disasters, and disease spread noted in Uzbekistan and the Kyrgyz Republic. Conversely, awareness and concern for environmental issues in Tajikistan are relatively low. While individuals express a readiness to contribute to climate change mitigation, those from Kazakhstan and Uzbekistan demonstrate lesser willingness.

Keywords: Environmental problems, climate change, public perception, willingness to contribute, Central Asia .

Session 6: Labor and migration

Does migration drive or impede agricultural productivity? Panel data evidence from rural Tajikistan, 2015-2023

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Abstract

Through remittances, migration can help rural households overcome financial constraints. If invested in agricultural production, remittances could facilitate the transition from smallholder production to commercial, higher-return activities. Remittance recipients may, however, have other priorities to use these remittances. Using fixed effects instrumental variable regressions on a unique panel dataset of 2,000 rural households from Tajikistan, a highly remittance-dependent country, we analyze the impact of migration on agricultural investment, productivity, and commercialization on the one hand; and on various categories of household expenditures and non-farm investments on the other hand. The analyses reveal that migration mainly supports reproductive activities (daily household expenditures or large ceremonies), rather than farm or non-farm productive investments. Given the large amount of remittances flowing into the country each year and the importance of agriculture for rural livelihoods, it's imperative to alleviate constraints and leverage opportunities for remittances to contribute to funding sustainable rural transformation.

Keywords: Migration, agricultural investment, agricultural technology adoption.

Agricultural reform, kinship networks, and female labor participation: Evidence from Central Asia

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Abstract

This paper examines how partially implemented agricultural privatization reforms affect women's labor market outcomes in a transitioning economy. Using farm-level panel data from Uzbekistan and Kazakhstan (2019–2022), we exploit farms in exposure to vertically integrated privatized agricultural “clusters” to estimate labor effects via a difference-in-differences strategy. We find that cluster reforms increased female labor participation overall, but generated a dual labor structure. Women from farm-owning households accessed permanent, skilled positions due to kinship-based networks. In contrast, non-household women were primarily hired into temporary, low-wage, seasonal roles. Mechanization further reinforced this divide by complementing skilled family labor and displacing unskilled pickers. These results suggest that partial market-oriented reforms, when filtered through informal institutions like kinship, can deepen existing inequalities.

Keywords: Agricultural transition, kinship networks, female labor, mechanization, Uzbekistan.

Session 7: Water

How do water and energy security shape food insecurity and diet quality? Evidence from wintertime in rural Tajikistan

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Sarah Pechtl¹

¹ *International Food Policy Research Institute (IFPRI), Tajikistan*

Abstract

Food, water and energy are intrinsically linked and are key to people's wellbeing. While a burgeoning literature on this NEXUS has demonstrated these interlinkages at macro and meso-levels, limited evidence exists to date on the interplay of these elements at a microlevel, i.e., for households and individual household members. The study relies on detailed primary survey data from 3,280 respondents across rural Tajikistan, collected during winter, when food and energy insecurity are at its highest. This study analyses the experiences of food, water and energy insecurity; the relationship between these three factors; their drivers, and the effect on respondent wellbeing.

Keywords: Water insecurity, food insecurity, energy insecurity, diet quality, Tajikistan.

Water scarcity and decision making: Risk and time preferences of smallholder farmers in Kyrgyzstan

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Abstract

The study examines how recurrent irrigation shortages and extreme weather events shape the risk and time preferences of smallholder farmers in Kyrgyzstan. Using lab-in-the-field experiments with 425 farmers in the Jalal-Abad province, we assess how water scarcity influences economic behavior, particularly risk aversion, loss aversion, probability distortions, impatience, and present bias.

Our findings reveal that farmers facing frequent irrigation shortages exhibit higher risk aversion and impatience, while extreme weather events encourage more patient decision-making. Ethnic minorities and older individuals show stronger loss aversion, whereas more educated farmers display lower discount rates, indicating a greater willingness to invest in the future. Farmers in remote areas and those with poor irrigation infrastructure tend to overweight small-probability risks. Female farmers show greater risk aversion and impatience compared to male farmers.

These insights contribute to the broader literature on climate-induced behavioral changes, highlighting the role of chronic environmental stressors in economic preferences. Understanding these dynamics is crucial for designing policies for improving adaptive strategies and enhancing resilience of smallholders in water-scarce areas of developing countries.

Keywords: Risk preferences, time preferences, irrigation scarcity, smallholder farming, Central Asia.

Enhancing water use efficiency in corn cultivation: A review of drip irrigation and mulching practices

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Abstract

Efficient water use is essential for sustainable agricultural production in arid and semi-arid regions with low rainfall. This review examines the application of water-saving technologies, in particular drip irrigation and mulching, in maize production. Drip irrigation allows precise control of water delivery directly to plant roots, increasing water use efficiency and yield, and reducing evaporation and runoff. In addition, the system supports fertilization and improves nutrient uptake. Mulching, especially with plastic film or straw, plays an additional role by conserving soil moisture, suppressing weeds, and regulating soil temperature. Plastic film mulching is widely used in many countries to improve early emergence of maize and increase grain yield, while straw mulching offers an environmentally friendly, biodegradable alternative. The combination of drip irrigation with mulching methods has shown a synergistic effect, leading to improved soil conditions and significant yield increases. This integrated approach provides an effective strategy for conserving water and maximizing yield in maize production, especially under water-scarce conditions.

Keywords: Corn, water use efficiency, mulching, drip irrigation.

