

CENTRAL ASIA

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Since the countries of Central Asia gained independence from the Soviet Union in 1991, the region's food systems have undergone significant transformations shaped by political and economic reforms, institutional shifts, globalization, climate change, and labor migration. At the beginning of their transition to market-based economies, Central Asian countries experienced significant economic decline, poverty, and food insecurity. The region faced immediate policy, governance, institutional, and capacity challenges and largely lacked the macroeconomic setting and enabling environment necessary for a successful transition (Rozelle and Swinnen 2004). As a result, agricultural production and the broader local economies were severely disrupted by the change.

Economic growth in the region has since rebounded and passed the pre-transition levels due to market-oriented reforms, which, coupled with agricultural transformation and some diversification, have led to substantial reductions in poverty, food insecurity, and undernutrition. Food policy research has played a crucial role in the region's evolution, with international organizations, universities, and research institutes developing evidence to inform policy reforms and promote sustainable agricultural development and food security throughout Central Asia. The collaborative research conducted by international research centers supported by CGIAR and other international organizations and universities helped to initiate a food and agriculture policy dialogue and coordination among the Central Asian countries to achieve regional food and nutrition security. In particular, IFPRI helped to carry out a review of the policy reform process and agrifood sector development by convening external technical groups as well as local and international researchers working in the region to identify promising options for agrifood policy reforms (Babu

Box 20.1 IFPRI in food policy dialogue in Central Asia

In 1997, the World Bank invited IFPRI to provide policy analysis training to a group of analysts from the Central Asia region. This led to the development of a working relationship between IFPRI researchers and the agricultural ministries of the five Central Asian countries to help them with policy analysis, work that was supported through World Bank–funded agrarian reform projects. At the same time, CGIAR, with the International Center for Agricultural Research in Dry Areas (ICARDA) taking the lead, established technical collaboration with the national agricultural research systems (NARS) in these countries. It also established a regional program management unit in Tashkent, Uzbekistan, which provided logistical support to CGIAR’s research and capacity development activities. IFPRI, together with ICARDA, the International Water Management Institute, the International Maize and Wheat Improvement Center, the International Potato Center, and the Alliance of Bioversity International and CIAT, participated in this consortium to support the policy aspects of the agricultural transition process while also working independently with country-level collaborators in the region. Collaborative research conducted during the program’s first decade established IFPRI as a reliable partner for national agrifood system policymakers in the region. Later, in the 2010s, two CGIAR Research Programs led by IFPRI—Policies, Institutions, and Markets (PIM) and Agriculture for Nutrition and Health (A4NH)—continued this work, providing research and capacity strengthening support to Central Asian governments, research centers, and individual researchers.

and Djalalov 2006; Babu and Pinstруп-Anderson 2000; Babu and Tashmatov 2000). IFPRI also helped to create a network of researchers and experts who can analyze the challenges and policy issues pertinent to food and nutrition security in the national and regional contexts (see Box 20.1).

Despite significant progress in improving food and nutrition security since the initial transition, serious challenges remain, including vulnerability to climate change impacts, limited availability and management of water resources, limited local employment opportunities, heavy reliance on international remittances, unstable commodity markets, undiversified trade flows, poor diets, and the high cost of healthy diets. Addressing these issues will require further research and policy focus on sustainable agriculture, rural entrepreneurship, regional cooperation, technological innovations in food production and marketing, and greater diversification toward high-value agri-food chains.

Food systems challenges in the early years of independence

As Central Asian countries began their transition in the early 1990s, agriculture dominated the region's economy, contributing about one-third of gross domestic product (GDP) and providing more than 50 percent of employment. Thus, a major policy issue for the transition was the impact of market-oriented agrarian reforms on rural poverty and food security.

During the first decade of independence, aggregate output and productivity declined substantially, with agrifood production falling precipitously as the sector was especially hard hit by the shift away from Soviet-era central planning (Pomfret 2010, 2016). Across the region, gross agricultural output dropped by nearly 40 percent between 1990 and 1998. Improving agricultural performance was essential to boost household incomes, especially in poor rural areas reliant on agriculture, but required changes to producer incentives, a shift to a profit orientation, and individual involvement (Lerman et al. 2004; Lerman and Sedik 2018). To make this transition, governments in the region had to tackle several immediate challenges: distorted prices and incentives, farm reorganization and land reform, irrigation and water management, and the need for market institutions (Rozelle and Swinnen 2004).

Liberalization of input and output prices

Under the planned economy of the Soviet era, central planners attempted to stimulate food production by lowering input prices and raising output prices. Collective and state farms received critical inputs—such as seeds, machinery, and fertilizers—at subsidized rates, and could sell their outputs to state procurement agencies at above-market prices. The elimination of these subsidies and premiums following independence significantly affected the relative prices of inputs and outputs, leading to severe impacts on agrifood production and productivity in the region, as in other post-Soviet countries (Rozelle and Swinnen 2004). Kazakhstan and Kyrgyzstan implemented bold price reforms that increased incentives for profit-oriented individual farms, while Tajikistan, Turkmenistan, and Uzbekistan delayed implementing reforms (Akramov 2011; Anderson and Pomfret 2003; Anderson and Swinnen 2009). Despite differences in the speed and coverage of price reforms, most input and output prices in Central Asian agriculture are now liberalized and determined by market forces, with some minor exceptions.

Land rights, tenure reforms, and productivity impacts

The institutional reforms and liberalization of input and output prices led to the collapse of large collective farms, a drop in agricultural production, and loss

of employment for those formerly working in state and collective farms and state-owned enterprises. Households saw their incomes drop while they also faced limited access to food, which led to a surge in poverty, food insecurity, and malnutrition (Babu and Tashmatov 2000). Compared with large collective farms that employed hired labor and were run by outside managers, individual or family farms were easier to organize and operate. However, the move toward smaller, individual farms brought significant problems in accessing agricultural extension services and input and output markets, as well as in managing critical infrastructure, such as on-farm and common pool irrigation networks. Central Asia's agriculture sector officially recognizes two major types of individual farms: homestead plots and peasant farms, differentiated mainly by their commercial orientation, size, and legal status. Homestead plots are generally smaller and more subsistence-oriented than peasant farms, although there is some overlap between the two groups. The third officially recognized farm type is the agricultural enterprise, or corporate farm, a category that includes state, cooperative (collective), and large private farms.

While all Central Asian governments recognized the need for the individualization of agricultural production, the pace and extent of land tenure reform differed significantly across the region. Kyrgyzstan and Kazakhstan began land reforms in the mid-1990s, eventually introducing private land ownership. Uzbekistan initiated limited land reforms in the 1990s, but by offering long-term leases to farmers, the government was able to control the structure and size of farms and ensure their continued dependence on the state. Tajikistan initiated reforms in 1992, but notable progress began only after the state granted land use rights in 1998. Turkmenistan also initiated land reforms; in 1996, the government began leasing land to farmers but maintained control over land, inputs, and output quotas.¹ Today, all agricultural land effectively remains state-owned in Tajikistan, Turkmenistan, and Uzbekistan, with farmers holding only long-term use rights (Lerman and Sedik 2018).

Land tenure reforms led to significant shifts in agricultural land distribution among different farm types. The total area of agricultural land allocated to agricultural enterprises declined significantly throughout the region, except in Kazakhstan. The share of arable land in individual use (homestead plots and peasant farms) increased from 5 percent in 1991 to nearly 80 percent in 2010, with a corresponding increase in the share of agricultural production generated by these farms (Lerman and Sedik 2018). However, land reforms remain

1 For more on these reforms, see EBRD (2002), Akramov and Omuraliev (2009), Djanibekov et al. (2012), Akramov and Shreedhar (2012), and Ni et al. (2004).

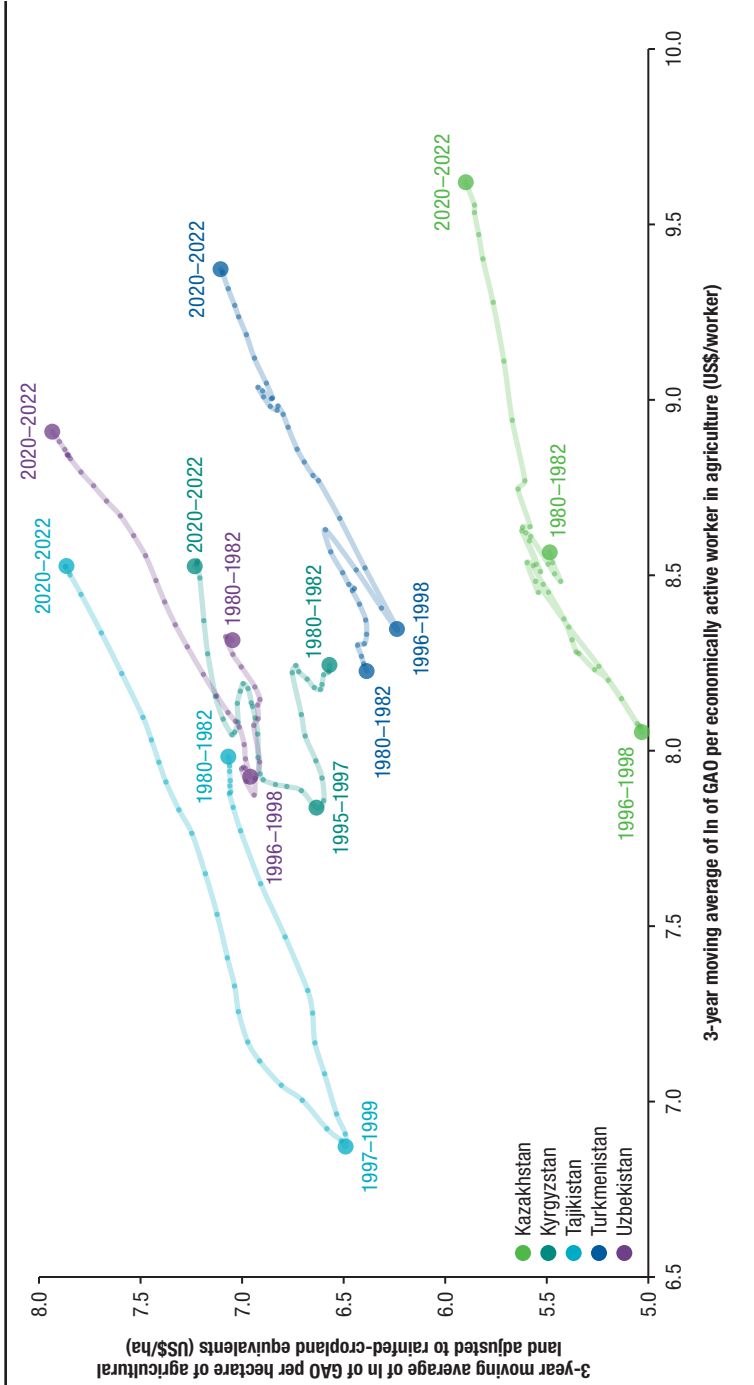
incomplete in some Central Asian countries. While small homestead farms enjoy complete freedom to farm, larger peasant farms still face some restrictions on crop choice and marketing decisions (Lerman and Sedik 2018).

Partial productivity analyses for Central Asia show considerable complexity in the relationship between land and labor productivity as well as substantial differences across countries (Figure 20.1). Although both land and labor productivity dropped at the beginning of the transition across all countries, the subsequent rise in individual cultivation of land coincided with an increase in land and labor productivity, marking a turning point for Central Asia's agriculture sector. Research shows that individual farms have higher levels of productivity and efficiency than large enterprise farms, underscoring the importance of individual incentives for farm efficiency (Lerman et al. 2004; Lerman and Sedik 2018). Research comparing the early and comprehensive land reforms in Kyrgyzstan and Kazakhstan with the slower and incomplete reforms in Uzbekistan, Tajikistan, and Turkmenistan found that early reformers experienced more significant improvements in agricultural productivity and rural incomes (Babu and Tashmatov 2000). Kyrgyzstan saw an early rebound (1995) in labor and land productivity, while productivity in Kazakhstan, Turkmenistan, and Uzbekistan rebounded later (1997). Tajikistan, which experienced a civil war during the transition period, did not see a rebound until 1999 and did not reach pre-transition productivity levels until 2007 (Lerman and Sedik 2018).

The productivity growth patterns illustrated in Figure 20.1 show that output per hectare is higher and has grown faster after the turning point in land-constrained countries (Tajikistan and Uzbekistan), where small homestead farms produce a substantial share of crop and livestock production, than in land-abundant countries (Kazakhstan and Turkmenistan), where large farms still dominate agriculture. Conversely, output per worker is higher in land-abundant countries than in land-constrained countries, although labor productivity growth trends appear similar. Another interesting observation is that land and labor productivity growth in Kyrgyzstan slowed compared to other countries. One explanation is that farms in Kyrgyzstan are too small to mobilize the investment and agricultural machinery needed to support more productive farming practices (Guadagni and Fileccia 2009; Mogilevskii et al. 2017).

While some policy reforms remain incomplete, recently, growing agricultural land acquisitions by large domestic and foreign investors are creating new policy challenges (Hofman 2016, 2021; Visser and Spoor 2011). These investments may lead to land consolidation and higher land and labor productivity by reducing transaction costs and benefiting from economies of scale.

FIGURE 20-1 Land and labor productivity in Central Asian agriculture, 1980–2022



Source: Authors' depiction using data from USDA-ERS, accessed 2024.

Note: GAO = gross agricultural output; ln = natural log.

However, land consolidation also risks a negative impact on employment, as larger farms may require less labor. If the benefits of increased productivity exacerbate income inequality and do not reach the most vulnerable households, this consolidation will not help to address rural poverty.

Water management

Irrigation plays a crucial role in Central Asia's agricultural systems due to the region's generally dry climate (Babu and Djalalov 2006). Kyrgyzstan, Tajikistan, Turkmenistan, and Uzbekistan irrigate more than 80 percent of arable land. Northern Kazakhstan is the exception; reliant on rainfed wheat production, the country irrigates only 7 percent of arable land. The individualization of farming has required reconsideration of irrigation water management policies. Extensive irrigation systems were built throughout the region as part of the significant Soviet-era investments in agricultural infrastructure (Anderson and Swinnen 2009). These systems were designed for large-scale collective farms and consequently are poorly aligned with the water management needs of today's smaller farms. The governments understood these needs and recognized that centralized management of the irrigation infrastructure was not possible in the new individualized agricultural systems. They initiated the decentralization of water management responsibilities to the local communities and promoted collective action among farmers (Babu and Akramov 2022). Water users' associations, found in various forms worldwide, began emerging in Central Asia in the late 1990s and early 2000s to provide micro-level management of water resources and collect irrigation service fees from farmers. However, these associations have struggled to generate adequate revenue and capital for the maintenance and operation of irrigation infrastructure, placing a significant financial burden on government budgets.² Managing local irrigation networks and water allocation among farmers thus remains a major challenge.

Institution building

Amid the more immediate need for reforms to price policies, land tenure, and farm organization, Central Asian countries were slow to build institutions to foster competition, define and enforce property rights and contracts, ensure access to credit, and provide information to farmers and other food system actors. These institutional limitations had predictably negative effects on long-term investment and short-term production decisions (EBRD 2002;

2 Relevant studies include Akramov and Omuraliev (2009), Akramov and Shreedhar (2012), Djanibekov (2008), Babu and Akramov (2022), and Frenken (2013).

Rozelle and Swinnen 2004; Spoor 1999). Ambitious efforts to reorganize and privatize farms were often constrained by the lack of functioning agricultural input, output, and financial markets, and real privatization was stalled in the early years of the transition period. Since then, governments have created legal frameworks and promoted market institutions to nurture competition, protect property rights, and enforce contracts. Similarly, options for rural credit, severely limited in the early stages of independence, have expanded in recent years (Akramov et al. 2023).

During the early years of the transition, comparative analyses provided policy recommendations for improving agricultural productivity and food security, such as reforms to incentives, subsidy reductions, and establishment of market institutions (Anderson and Swinnen 2009; Rozelle and Swinnen 2004). These studies highlighted examples of reforms that reduced distortions to farm incentives, such as the relatively quick liberalization implemented in Kyrgyzstan and the reforms introduced to reduce state control of the cotton sector in Uzbekistan, which have both led to improvements in investment, productivity, and much-needed diversification of agricultural production. The research on Kyrgyzstan and Tajikistan helped to identify focus areas for development partners' support programs. These studies emphasized the need for an integrated approach to improving food and nutrition security that considers macro, sectoral, and household-level components (Akramov and Omuraliev 2009; Akramov and Shreedhar 2012). Efforts have also been made to build local capacity for policy analysis and implementation, including training local researchers and policymakers to develop and execute effective food policies (Babu and Tashmatov 2000).

Evolution of food systems challenges

Since the late 1990s, renewed economic growth, combined with improvements in labor and land productivity, has led to a more than twofold increase in gross agricultural output (Akramov et al. 2023). As agriculture and other sectors rebounded, research attention shifted toward addressing the detrimental effects of climate change and its impact on land degradation and water scarcity, improving the efficiency of agricultural production, and achieving better nutrition. Demographic trends have come under greater scrutiny as well, as labor migration and remittances have become an important coping strategy for poor rural households (Atamanov and Van Dan Berg 2012). Moreover, while poverty and food insecurity have decreased significantly, they remain major concerns throughout the region.

Nutrition and poverty

Despite being agrifood producers, Central Asian countries rely on food imports to meet at least a part of their needs, leveraging regional trade based on comparative advantages in the production of various crops. For example, Kazakhstan exports wheat to other Central Asian countries and imports fruits and vegetables from Kyrgyzstan and Uzbekistan. Rising global food prices and supply chain disruptions in recent years have increased the risk of food insecurity and malnutrition, especially for poor people, who obtain most of their calories from staples (especially wheat). In 2022, 13.1 percent of children under five years old in Tajikistan were stunted, and 9.3 percent of Tajikistan's population faced undernourishment. At the same time, micronutrient deficiencies, overweight and obesity, and diet-related noncommunicable diseases are increasingly common throughout Central Asia, with more than half of all adults overweight or obese (WHO 2025).

Targeted interventions, including social safety nets, nutrition programs, and initiatives to improve rural livelihoods, have been highlighted as key for supporting vulnerable populations (EBRD 2002). Spending on social safety nets in Central Asian countries is relatively high by international comparison, but its effectiveness is low due to limited coverage and adequacy. For example, existing safety nets in Tajikistan do not enable households to invest and enhance resilience or provide sufficient benefits to improve economic access to nutritious diets. Also, targeting of social safety nets remains problematic in the region (Dugarova 2019; Kawabata et al. 2020; World Bank 2022).

Climate change and natural resources

Climate change is already affecting Central Asia's food systems, with an increase in the frequency and intensity of extreme events, notably heatwaves, droughts, and dust storms, in recent decades. Research by IFPRI and partners helped to estimate the costs of these impacts and develop policy recommendations to address their adverse effects on food systems. Land degradation reduces agricultural incomes by lowering crop yields and livestock productivity and increasing production costs. Collaborative research between IFPRI and the University of Bonn estimated the annual cost of land degradation in Central Asia at about US\$5.85 billion between 2001 and 2009, equivalent to 3 percent of GDP in Kazakhstan and Uzbekistan, 4 percent in Turkmenistan, and 10–11 percent in Kyrgyzstan and Tajikistan (Mirzabaev et al. 2016).

Central Asia's limited water resources are being further reduced by climate change. Changes in critical seasonal runoff (meltwater) and precipitation, related in part to earlier and greater glacier melt and snowmelt and increased

evapotranspiration, aggravate regional water shortages and limit the availability of irrigation water in the summer. Making food systems resilient to the changing climate will require water-saving irrigation technologies, such as laser leveling, drip and sprinkler irrigation, drought and heat-tolerant or resistant crops, and climate-resilient crop varieties. Research conducted by the International Water Management Institute in the Karshi region of Uzbekistan shows that improved irrigation practices, such as drip irrigation, can reduce water use by approximately 30 percent compared to traditional irrigation practices (Djumaboev, Manthrithilake et al. 2019; Djumaboev, Yuldashev et al. 2019).³ These technologies were projected to improve crop yields in pump-irrigated areas, as well as reduce energy use and carbon emissions, with estimates suggesting that optimized irrigation could save a half trillion liters of water and 259 gigawatt hours of electricity. These practices could offer a promising path forward for other Central Asian countries, where pump irrigation now covers about 2.84 million hectares, or about 18 percent of the irrigated area.

Climate change and associated extreme weather events affect agricultural production and productivity in Central Asia, leading to declines and volatility in crop yields (Bobojonov and Aw-Hassan 2014; Sommer et al. 2013). Crop diversification is a feasible and cost-effective means to improve the resilience of the region's food systems, and diversification can help farmers use land and water more efficiently and increase their net returns per hectare. Evidence from the region also suggests that agricultural diversification can improve dietary diversity, nutritional outcomes, and intrahousehold equality for women and children (Takeshima et al. 2020, 2022, 2024). Central Asian governments are now pursuing diversification strategies that emphasize high-value agriculture, such as horticulture and oilseed production. In partnership with the Asian Development Bank and the CAREC Institute, IFPRI research on Central Asia's agrifood systems has provided policy-relevant information that can help design interventions for diversification and revitalization of the region's agriculture sector (CAREC et al. 2019).

Migration and remittances

Central Asia's food systems are also being shaped by migration and other demographic trends. A shortage of domestic employment opportunities and historically low wages have led to significant labor migration from Kyrgyzstan,

3 The evidence-based policy recommendations of the CGIAR Research Program on Water, Land, and Ecosystems made a significant contribution to policy change and development and adoption of the state program on water-saving technologies. For more details, see www.cgiar.org/annual-report/performance-report-2020/water-technologies-shift-energy-policies-in-uzbekistan/

Tajikistan, and Uzbekistan, mainly to Russia. This trend has increased over the last 15 to 20 years, with remittances increasingly contributing to economic growth, poverty reduction, and food security in these countries. In mid-2020, an estimated 6.6 million individuals migrated from the region's five countries, accounting for more than 10 percent of the region's total population.⁴ Evidence suggests that remittances increase household incomes, improve food security, and strengthen child nutritional outcomes, and that they outweigh the costs of migration (Azzarri and Zezza 2011; Ghimire et al. 2023). However, labor migration reduces the agricultural income of migrant-sending households, and the benefits from migration decline with farm size. Women in migrant households are more likely to be involved in decisions about productive activities on the household farm, control income, own assets, and achieve workload balance compared to women in non-migrant households (Slavchevska et al. 2021). In addition, women in migrant households are more involved in labor-intensive activities as a result of the loss of male labor (Atamanov and Van Dan Berg 2012; Bloem and Lambrecht 2023; Ghimire et al. 2023), which has important implications for designing gender-inclusive agricultural and nutrition programs and policies in the region.

Future food system challenges and directions for food policy research

By 2050, Central Asia's food systems will likely face multiple interconnected challenges driven by climate change, remaining issues in land use, the market environment and farmers' incentive structure, demographic shifts, socio-economic trends, and geopolitical factors. Policy research can provide evidence to help address these challenges.

Invest in climate change mitigation and adaptation

Central Asia is highly vulnerable to climate change and increasingly faces climate-driven water scarcity, land degradation, and extreme weather events. Rising temperatures are already significantly above the global mean (Yao et al. 2021), and projected impacts suggest that temperatures will rapidly increase even further. A combination of changes in precipitation and increasing glacier melt will likely aggravate regional water shortages. Currently, Turkmenistan and Uzbekistan are severely water scarce, with withdrawal levels for renewable water resources exceeding 100 percent (Akramov et al. 2022). Other

4 Data from the Migration Data Portal, accessed March 7, 2025. www.migrationdataportal.org.

Central Asian countries will also experience a steady decline in the per capita availability of renewable water resources due to degradation of land and water resources. This scenario poses significant risks to agrifood systems, particularly crop yields, given the region's arid climate and reliance on snow-fed rivers. These threats urgently require mitigation and adaptation strategies.

Food policy research can help address these challenges by examining governance and financial arrangements for the implementation of sector-specific strategies at the regional, national, and local levels, identifying innovations for managing climate change–related production and economic risks, and investigating drivers and barriers to the adoption of innovative climate-smart agricultural and water-saving technologies.

Address constraints to land access and land consolidation

Although land tenure reforms have significantly improved access to land, increased employment, and reduced poverty, Central Asia still faces significant issues related to land fragmentation as well as growing concerns about involuntary consolidation. Larger farms benefit from higher labor productivity (and, therefore, income), while land fragmentation increases transaction costs, for instance, due to the need for multiple small farmers to agree on land use. Small farms may also have less access to credit, as lenders may be cautious about providing loans to small, fragmented farms and may not adopt modern technologies and machinery because of the difficulty of coordinating across multiple small peasant farms.

Future research should examine various policy options, including strengthening the regulatory frameworks for leasing and selling land to ensure efficiently functioning land markets, identifying innovative land tenure policies that can secure farmers' property rights, and creating economic incentives for market-based (voluntary) land consolidation. Research can help policymakers better understand the complex trade-offs between promoting economic efficiency and ensuring equitable distribution, as land consolidation policies aimed at maximizing productivity could exacerbate inequalities and poverty. It can also assist in addressing land tenure and structural transformation challenges associated with land consolidation, which can significantly impact rural livelihoods, food security, and environmental sustainability.

Identify policies for better nutrition and inclusivity

As the region's population grows, rising food demand and changing diets will place greater pressure on food systems. Central Asia's population rose to more than 82 million in 2024, an increase of more than 60 percent since 1990, and

it is expected to exceed 112 million by 2050.⁵ The share of working-age people is projected to increase even faster, a trend that will likely exacerbate socio-economic challenges in the region, as many young people and women struggle to obtain employment and earn adequate income even now (Akramov et al. 2020). The high cost of healthy diets, inadequate nutrition knowledge, and unhealthy consumption habits have led to rising trends in overweight, obesity, and other nutrition-related health issues in recent years (Akramov et al. 2024). Addressing these obstacles to healthy diets and creating employment opportunities for youth and women will be essential to strengthening the inclusiveness of food systems, including improving incomes, equity, and nutrition for poor people. Of note is that rising incomes are generally associated with higher dietary diversity and increasing demand for livestock products, fruits, vegetables, and other nutritious foods (Krivonos and Kuhn 2019). Policy research can support these goals by examining and identifying feasible policy, institutional, technological, and behavioral innovations to meet the growing demand for food and help transform food systems in the region for better nutrition and diet quality.

Increase resilience to market volatility

Central Asian countries are vulnerable to volatility in international commodity markets, primarily due to their heavy reliance on exports of just a few commodities, including oil, gas, gold, and cotton, and imports of key food staples such as wheat. This reliance leads to large fluctuations in government revenue as commodity prices rise and fall, impacting economic stability, investment decisions, and social welfare. For example, Kazakhstan, a major oil exporter, is heavily affected by global oil prices. Price fluctuations for cotton, a key commodity in Tajikistan and Uzbekistan, significantly impact the livelihoods of farmers and textile industry workers. Kyrgyzstan, Tajikistan, and Uzbekistan import a substantial share of wheat, and thus are strongly affected by changes in wheat prices. In addition, close economic and trade connections with Russia, a country highly dependent on oil and gas exports, increase Central Asia's vulnerability to market volatility. Similarly, geopolitical and trade tensions linked to Russia negatively affect the region as trade and remittance flows decline (Akramov et al. 2019).

Central Asian countries can reduce their reliance on commodity exports by investing in other sectors, such as manufacturing and agrifood processing.

5 World Population Review, accessed February 5, 2025. <https://worldpopulationreview.com/continents/central-asia>.

They can also foster independence from the Russian economy by diversifying their international trade partners. In recent years, Central Asian countries have begun exporting agricultural products to China. For example, according to the Ministry of Agriculture of Kazakhstan, the country's grain exports to China have reached 1.4 million tons and are expected to reach 2 million tons in the near future. The Ministry of Agriculture of Uzbekistan reports that the value of its edible fruit and vegetable exports to China topped US\$150 million in 2023. Rising demand for food products in China and elsewhere in Asia may provide an opportunity for Central Asian countries to further diversify their agricultural production and increase export earnings, especially from oilseeds, horticulture, and livestock (Burunciuc et al. 2018).

Food policy research can help the Central Asian governments prioritize improved connectivity to better integrate into global value chains and overcome geographic disadvantages. Research can also evaluate the region's remaining trade barriers and recommend reforms for trade facilitation, diagnose obstacles or constraints in individual value chains, and explore the merits of alternative solutions that use data-driven approaches.

Promote food system efficiency and growth

The outcomes of agricultural reforms and reductions in market distortions have varied across Central Asian countries. In addition, evidence suggests that adoption of innovations is slow in the region's agrifood systems due to unfavorable policy, regulatory, and market environments. Future food policy research can help identify remaining bottlenecks and provide insights into what catalyzes agrifood system development. Research should also explore the public foundations necessary for private sector agricultural growth and how government budgets can support public goods investments—especially in infrastructure and institutions—as well as in improving the quality and efficiency of agrifood systems, including through better product traceability. Research can also help to identify the barriers to adoption of innovative practices and technologies by conducting enabling environment diagnostics and dynamic causal evaluations.

Generate data and analysis

Central Asian countries lack reliable data and analysis on important aspects of food systems, including climate change impacts; land, labor, and water productivity; costs and benefits of climate-smart agriculture and water-saving technologies; and nutrition and dietary practices at the national, community, and household levels. For example, a nationally representative

agricultural household survey has never been conducted in Turkmenistan and Uzbekistan.⁶ In Tajikistan, the most recent publicly available nationally representative survey data that included detailed information on household agricultural activities were collected in 2007 and 2009.⁷ This lack of information poses a significant challenge to understanding how the agrifood system functions in these countries and developing appropriate evidence-based policy measures. IFPRI and other research institutions can help address these needs by generating evidence-based policy recommendations, supporting countries in their collection of data, strengthening countries' analytical and applied policy research capacity, and examining political economy and policy coordination problems related to food systems.

Emphasize capacity building

Given the transboundary nature of many challenges in the region, such as labor migration, climate change, and water management, it is crucial to advance a regional approach to capacity building. Collaborative research and capacity-building activities that bring together stakeholders from across the region have been important components of IFPRI's research and outreach in Central Asia, beginning with IFPRI's early work convening stakeholders to identify research priorities for advancing food policy reforms (Babu and Tashmatov 2000). Building on promising examples such as this can enhance the relevance and impact of policy research. Capacity building and collaborative research not only improve research quality but also foster strong policy research linkages across countries in the region, paving the way for more coordinated and effective responses to shared challenges in the future.

6 The National Statistical Committee of the Republic of Uzbekistan regularly conducts household budget surveys. However, these survey data are not publicly available.

7 The Leibniz Institute for East- and Southeast European Studies (Germany), in cooperation with the SHARQ Research Center based in Dushanbe, Tajikistan, conducted a household survey using the sample of the 2007 and 2009 surveys. However, this survey focused on migration and remittances, not agricultural activities (<https://lambda.ios-regensburg.de/tajikistan-household-panel-survey-2011>). In 2017, the Food and Agriculture Organization of the United Nations and the Agency on Statistics under the President of the Republic of Tajikistan conducted a nationally representative rural household survey. However, these survey data are not publicly available.

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