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30 Years of Farm Restructuring and Water Management Reforms in Central Asia

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In 1991, when the five Central Asian countries became independent, most of their population was rural and about a third of the workforce was in agriculture. Collective farming was predominant, and land reform was an important component in the transition to a market-based economy. The Soviet rural economy was also characterized by small household plots of under 0.2 hectares that accounted for a large share of output of many farm products, including milk, meat, potatoes, eggs, and vegetables for home or local consumption.

Despite the need to reform the Soviet-era collective and state farms, agrarian reform was among the slowest areas of enterprise restructuring in Central Asia. Except for Turkmenistan, the governments opted for farm fragmentation away from large-scale collective and state farms which resulted in an increasing number of individual farms. Apart from agroholdings operating in Kazakhstan's wheat belt and the recently introduced private cotton-textile clusters in Uzbekistan, agricultural production has been turned to individual farms (Petrick, 2021). Household plots have retained their contribution to the output of labor-intensive food commodities.

However, reflecting differing and evolving attitudes towards private ownership of land and about the desirable structure of production and of farm size distribution, reform paths differed. Governments decollectivized and distributed land to individual

farmers but were to varying degrees cautious about granting full private ownership of land. After initially issuing long-term leases, Kazakhstan and the Kyrgyz Republic supported private ownership of land, but Tajikistan and Uzbekistan provided neither land tenure security nor full decision-making freedom to farmers. Within countries, the speed and nature of change could vary greatly, depending on regional variations in the type of farming, and sometimes depending on the local administration or power of former collective farm managers trying to retain their influence. Early delays in implementation were often associated with a power vacuum in which asset-stripping in the collective farms was rampant. Powerful individuals seized hold-up points in the agricultural supply chain, especially cotton gins, but also for tobacco, sugar and oil-processing. The fragmentation and individualization in Central Asia's farming sector followed the process of "Southernization" of agriculture in the Global South as they did not bring growth in labor productivity, but on the contrary, kept rural incomes low and rural poverty high (Petrick, 2021).

The rural household plots illustrate the potential of the rural population to make production decisions and to work hard when incentives are right. During three decades of post-Soviet transition, rural households contributed the lion's share to agricultural value production through labor-intensive horticultural and livestock output (Lerman and Sedik, 2018). However, the economic potential of smallholder farming beyond supplying local demand is constrained by farm fragmentation. With inadequate access to processing and to transport along cold chains, smallholders may suffer post-harvest losses and miss income opportunities. Plots are often too small to be technically efficient, with limited potential to adopt new equipment or technology that has significant fixed costs.

Land reform in all but the pastoral areas and northern Kazakhstan is intimately linked to water. As the Soviet collective and state farms were dismantled into individual farms, in the southern regions of Central Asia agricultural reforms were accompanied by decentralization of water management and irrigation infrastructure maintenance. To replace Soviet central planning by more egalitarian models of local water governance, the principles of Integrated Water Resources Management (IWRM) were introduced with support of international donors, and governments established water users' associations as self-governing bodies. Overall, the new legal frameworks and institutional setup in water management collided with informal institutions, unequal power relations, and resistance of powerful actors in the state bureaucracy to structural reform in the water sector (Sehring, 2020).

The water sector reforms have thus had, at best, mixed success. In Uzbekistan, the top-down introduction of Water Consumer Associations after 2003, with variation in implementation across regions, led to discontent (Veldwisch and Mollinga, 2013). The Kyrgyz Republic and Kazakhstan decentralized irrigation maintenance to farmers,

who could not afford it. Collapse of monitoring led to piercing of irrigation channels to withdraw water illegally, especially in upstream areas. Downstream farmers became caught in a vicious circle, as diminished water flows increase the cost of maintaining irrigation facilities due to the greater accumulation of silt in irrigation channels. Despite the urge to increase water use efficiency in agriculture, introduction of market-determined pricing of water was widely resisted in the region. Without water pricing and with unclear property rights, the profligate use of irrigation water inherited from the Soviet era has continued, and the maintenance of irrigation systems has deteriorated. Pumped systems are often out of commission due to unavailability of parts. Given the difficulty of farm-level response to the degradation of the irrigation systems and increased salinization, the principal consequence has been substantial declines in agricultural yields and rural incomes.

During the agricultural reforms, cotton has continued to be the dominant crop in irrigated areas of Central Asia. Liberalization of the sector in Kazakhstan and Kyrgyzstan provides examples of thriving export-oriented cotton value chains with free competition among private ginneries that can also benefit smallholders (Petrick et al., 2017). In the more controlled farm sectors of Turkmenistan and Uzbekistan, along with cotton, wheat production was encouraged as a strategic crop to attain food security and reduce imports. The self-sufficiency policy produced startling effects in Turkmenistan and Uzbekistan, as wheat area and output expanded at greater speed and magnitude than any other crop in the region's post-1991 history (Djanibekov and Petrick, 2017). The countries, however, remain dependent on the import of high-quality wheat from "bread baskets" Kazakhstan, Russia, and Ukraine (Burkitbayeva et al., 2020).

Since the end of the resource boom in 2014, Central Asian governments have been seeking to promote economic diversification. In contrast to older agricultural policies that emphasized rent extraction (especially from cotton) and food security, governments are pursuing agricultural diversification strategies that focus on high-value crops such as horticulture and oilseed production (IFPRI, 2019; World Bank, 2020). Such strategies require more efficient supply chains, especially as high-value consumer products tend to be perishable. Lack of access to and inadequacy of transport, storage, and processing facilities weaken agricultural value chains and lead to lost opportunities for maximizing farm and export earnings. Policymakers are paying attention to strengthening agricultural value chains and designing ways to provide support services to fill institutional voids created by the decline of large-scale farming. Besides strengthening agricultural value chains, enhancing agricultural trade requires harmonized cross-border customs and logistics procedures, including strengthened but efficient sanitary and phytosanitary measures.

As national governments seek to develop their respective agriculture sectors, they also contend with limited land and water resources, especially in view of climate change. Key agricultural areas in the region are in arid or semi-arid zones that rely on irrigation fed by glacial melts. Although climate projections vary, average temperatures will increase and glacial melt will decrease in the long term. Flooding and drought episodes associated with irregular rainfall patterns are expected to become more common, while more frequent scarcity and higher variability of water supply are among the major challenges for irrigated agriculture of the region.

The speed and manner of farm restructuring and decentralization in water management have impacted the majority of the Central Asian population. The transformations and spatial variations in policies produced a variety of contrasting outcomes and provide a rich area for research. The breadth and interconnectedness of the challenges confronting Central Asian agriculture sectors afford governments, development organizations, and other stakeholders' insight into opportunities for collaborative research and development interventions in agriculture.

The Special Section invited contributions that cover the past thirty years of agricultural transformation in Central Asia and encouraged submissions from economists, sociologists, and political scientists. Following the review process, the six papers provide new insights into topics pertaining to farm restructuring, land reforms, and institutional changes in Central Asian agriculture and water management. They also provide broad coverage with two papers on Tajikistan, one each on Kyrgyzstan and Uzbekistan, and two addressing overarching issues in the four reforming economies.

Akbikesh Mukhtarova (2021) addresses the important but understudied topic of land governance and the limited role of open data in Central Asia. Although there are frequent reports of corruption associated with land governance (with state/local authorities, large agricultural corporations, and landlords the winners from corrupt practices in the land sector and small-scale farmers the losers) and transparency is often poor, there is little monitoring. Mukhtarova reviews the evidence from international indicators that measure different aspects of land governance, including transparent and accessible information, the level of tenure insecurity, strong small-scale farming systems, inclusive decision making, et cetera. These are still only partial indicators of a multi-faceted problem and, so far, only cover Kazakhstan, Kyrgyzstan, and Tajikistan in Central Asia. Central Asian countries have mixed performance in the international indicators, with some evidence of improvement over time. However, Mukhtarova emphasizes that the data are not well developed for the Central Asian countries, and the principal lesson is the need for better and transparent data.

A related issue in Central Asian agriculture has been the gender impact of agrarian reform. Especially in Tajikistan, there has been a feminization of agriculture,

with females increasing their share of the workforce (Mukhamedova, 2020), while the power asymmetries underlying poor governance often have a gender dimension with men occupying positions of power as local officials, farm managers or key technical people. Following this argument, Zvi Lerman (2021) examines the role of women in the labor market, including both formal and informal female employment, the feminization of agriculture in the region, gender gaps in education and wages, and constraints on women's access to extension services and land ownership. Based on the official statistics, Lerman indicates that among the clear labor market discrimination in the region is that women are paid less than men for equivalent work, and are informally employed. Particularly in agriculture, where almost half of employed workers are female, women occupy mostly short-term, temporary positions without entitled sick leave, paid vacation, and health insurance. Lerman argues that in 1991-2019 women's total employment in Central Asia increased by almost one-third. At the same time, women's agricultural employment went down by about 14%, indicating that women moved into non-agricultural occupations. Training young women in information technologies, computers, and digitalization can address the gender gaps in the labor market by raising women's professional profile and earning potential.

One approach to the fragmentation of landholdings is to encourage the formation of cooperatives. Such a policy has been through various stages in Kazakhstan (Punthakey, 2019). Adopting a case study approach, Nazik Beishenaly and Frédéric Dufays (2021) investigate a lead actor of agricultural cooperatives' development in Kyrgyzstan and the roles it plays in the emergence and strengthening of the coop environment. Their study of archival data on agricultural cooperatives in Kyrgyzstan published between 1991 and 2020 illustrates the existence of autonomous cooperatives which were established through initial assistance from donor-funded projects. The authors extend the conventional 'state-cooperative' perspective by adding international organizations as a third actor that provides support for cooperatives' development. Despite the international donors' importance in the transitional setting of Kyrgyzstan, Beishenaly and Dufays point out that their interactions with cooperatives still remain limited.

Another approach to countering fragmentation and lack of coordination has been the creation of clusters in Uzbekistan's cotton sector since 2018. Etenesh Asfaw (2021) analyzes this policy as an exercise in liberalization, replacing what was a heavily regulated sector with a more market-driven structure. The Karimov government was reluctant to relax control over the cotton sector that provided substantial revenues to the government. In this state-control cotton supply chain, the government controlled output through delivery orders and maintained a large gap between the prices paid to farmers when they delivered cotton to the parastatal gins and the world price that the state marketing agency received when the cotton was

exported. By 2020, ninety-six privately managed cotton-textile clusters controlled 86% of the land under cotton, while the state production quotas and prices were abolished. Output per hectare increased in the clusters due to new investments in equipment, soil improvement, seed quality, and irrigation technology. However, the distribution of the benefits is still unequal as farmers' weak bargaining power has remained a feature of the reformed system.

A feature of the reform process in formerly centrally-planned economies is the legacy of top-down policymaking from the Soviet system. In their description of the Tajik reform process and with evidence from focus groups involving different participants in agricultural and food policymaking, Suresh Babu and Kamiljon Akramov (2022) identify the capacity gaps and conflicting positions of these actors. Representation of the small-scale farmers who are numerous but poorly coordinated in Tajikistan is a gap, because the group has limited scope for providing inputs into policy debates or feedback on policy proposals. Babu and Akramov (2022) argue the need to assemble evidence that can be used to improve decision-making and to reduce politicization of decision-making. Support for independent research institutions is recommended to governments and international institutions.

Nekbakhtshoev and Babu (2022) provide a microeconomic study of the preconditions for successful collective action in water users' associations (WUAs) in Tajikistan. As in Babu and Akramov (2022) macro approach to policy processes, they identify legacy features from the Soviet era and from the 1992-7 civil war. Agrarian reform has been slow but cumulatively significant in replacing collective farms by peasant (dehqan) farms, although the change was often cosmetic as former farm managers retained control of reformed farms. Since the early 2000s, WUAs have been part of the reform process and by 2016 over 300 WUAs had been established, often with support from international agencies. In the five WUAs surveyed by Nekbakhtshoev and Babu, water was distributed unequally, but there was no conflict among users. Apart from location- and crop-specific explanations of these outcomes, a common feature was the ongoing authority of senior officials from the old system and the presence of large farms that received but refused to pay for water; for the small-scale farmers, the power of the elite and privileges of the large farms seemed beyond challenge. The situation has been exacerbated by the feminization of Tajikistan's agriculture and by the continuing observance of traditional gender norms by local elites.

These last two papers, although rooted in Tajikistan's experience, highlight the interconnectedness of different elements of agrarian reform in Central Asia and the importance of entrenched features in the processes of designing and implementing new policies. Attempts to maintain the scale benefits of Soviet agriculture in a setting of fragmented land ownership, whether by encouraging cooperatives or establishing

clusters, have had some success in improving productivity but the distribution of benefits has been unequal. The pattern of some improvement coupled with serious shortcomings is in large part due to ongoing power imbalances and poor land governance.

Difficulties in the policy process return us to the starting point of this Introduction. Agrarian reform has been among the slowest areas of enterprise restructuring in Central Asia. The special section papers help us to understand why this has been the case.

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