Enhancing Private Sector Participation in Agriculture in Uzbekistan

Diagnostic Study

Final Report

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Definitions

ADB	Asian Development Bank
ADS	Agriculture Development Strategy
AIS	Administration of Irrigation Systems
AKIS	Agricultural Knowledge and Information System
ALC	Agro-Logistical Centres
AP	Availability Payment
BISA	Basin Irrigation System Authority
CIS	Commonwealth of Independent States
CPS	Country Partnership Strategy
CERR	Centre for Economic Research and Reform
FVREDP	Ferghana Valley Rural Enterprise Development Project
GDP	Gross Domestic Product
GOU	Government of Uzbekistan
GPI	Gross Production Index
ISA	Irrigation System Authorities
ISF	Irrigation Service Fees
MOA	Ministry of Agriculture
MOU	Memorandum of Understanding
MoWR	Ministry of Water Resources
MSME	Micro, Small and Medium-Sized Enterprises
NDC	Nationally Determined Contribution
O&M	Operations and Management
PFIs	Participating Financial Institutions
PPP	Public-Private Partnership
PSP	Private Sector Participation
SDGs	Sustainable Development Goals
SOE	State-owned Enterprise
TA	Technical Assistance
TORs	Terms of Reference
US$	United States Dollar
USAID	United States Agency for International Development
USSR	Union of Soviet Socialist Republics
UZS	Uzbek soum
WCA	Water Consumers Association

Executive summary

The Government of the Republic of Uzbekistan (GOU) has embarked on a comprehensive reform program in the agriculture sector in 2017. It wants to transform the sector into a more modern, mechanized sector that's driven by market principles and is export oriented. The GOU is changing the legal and regulatory framework to facilitate the transition and make the environment more conducive to private sector participation (PSP). The GOU has been undertaking concrete steps in the reform direction, including formalizing long-term sectoral strategies, and identifying performance targets; creating agro-clusters led by the private sector; engaging international multi- and bi-lateral agencies; reducing distortive policies and state controls.

The Asian Development Bank (ADB) is supporting the GOU in its efforts to transform the sector and has commissioned a technical assistance (TA) *TA-6839 UZB: Enhancing Private Sector Participation in Agriculture* whose objective is to diagnose the current state of the agriculture and the water resource management sectors, and identify key weaknesses as well as opportunities for improvement through private sector participation (PSP).

The reforms started to show positive dynamics. Export of higher value horticulture crops is growing[1], production and export of processed products increased, several private investors entered the market (e.g., agricultural clusters), a large number of public-private partnerships (PPPs) has been implemented.

However, more work is required, and some gaps still exist. While there is PSP in the sector, the volume of private investment is below the level targeted by the GOU. Certain areas in the agriculture value chain have an insufficient level of private investment despite the existing needs and untapped investment opportunities, for example, in processing, storage, transport and export logistics. This Diagnostic Study (the Study) tries to identify reasons and causes on why the gaps have not been filled by the private sector. The Study looks at different crop cultures and stages of their value chains with an objective to understand the current structure, gaps, and dynamics. Through desk research and direct engagements with private sector players involved in the Uzbek agriculture and GOU agencies, the study identifies the main challenges for a greater PSP in the sector and possible ways forward.

In November 2022, ADB and the Consultant[2] conducted series of meetings with the Ministry of Agriculture (MOA), International Strategic Center for Agri-Food Development (ISCAD), Strategic Reforms Agency (SRA) to hear feedback from the key stakeholders with regards to the current state and problems of the agricultural sector and obstacles for PSP and PPPs. A separate engagement with the Ministry of Water Resources (MOWR) was conducted to understand the current state of the irrigation initiatives in the country, and the status of PPP projects.

[1] The export of horticulture grew more than twofold from 2017 to 2019. Identifying the Potential of Horticulture Exports to China from Pakistan, Tajikistan, Kyrgyzstan, and Uzbekistan, Tehseen Ahmed Qureshi, August 2022, chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/https://www.carecinstitute.org/wp-content/uploads/2022/09/Horticulture-Exports-Report-by-Tehseen-Ahmed-Qureshi.pdf

[2] Mr. Andrew Sprott, Mr. Akmal Mamatkhanov.

The Study finds that there are cross-cutting challenges and barriers to PSP and private investment specific to each distinct agricultural sub-sector: meat and dairy, cotton, wheat, fruit and vegetables. The issues identified in the study have one common theme: the day-to-day operation of agricultural policy is at odds with the high-level strategies and policy objectives articulated by the GOU. The operational challenges undermine viability and create risks for private investment such that fewer investment has been attracted than was intended, the investments that have been attracted are often relatively shallow and focused on short-term gains, and fewer opportunities to boost value added processing and export were created than is possible.

The key insight from this study is that PPP models—which involve long-term contractual commitments by both sides—provide a basis for rectifying the operational challenges while meeting the articulated policy objectives. In essence. The GOU through the contracts would commit to long-term actions and measures which are consistent with its objectives and are needed to attract private investment, but which are currently not in place at the day-to-day level of government operations. Such contracts will provide models for future government operational decision-making, which would improve the overall environment for private investment.

Common challenges in agriculture responsible for creating risks for private investment

GOU has committed to adopting market principles, reducing the role of the state, and encouraging private investment in water supply and agriculture. These commitments have been formally translated into the nationwide sectoral strategies – the Water Concept 2030[3] and the Strategy for Agricultural Development 2020-2030.[4] However, despite the intentions to create a conducive business climate, the investment attractiveness and the environment for agribusiness and value chains is still not sufficiently favourable.

During in-person interviews, the private sector respondents identified a number of bottlenecks they experience in their day-to-day operations. The underlying themes that the respondents brought up during the interviews have to do with ineffective policies and decision-making at different government levels. A common bottleneck identified by the respondents is the continued state intervention in different areas of the agriculture supply chain: from decisions on what to grow, what seeds to use and how much fertilizer to use to the decisions affecting large agro-clusters and private farms with regards to the transfer of irrigation assets and facilities for rehabilitation and maintenance under the PPP framework. Further, state-set prices on procurement of certain crops continue to send distorted signals to individual producers and clusters. In an overly regulated environment, business owners feel restricted and unable to take decisions they think are more optimal for their business and which maximize profit. In addition, restrictions and artificial prices

[3] The Water Concept broadly aims to facilitate introduction of the principles of a market economy, outsourcing and using PPP mechanisms to modernize water facilities and strengthen infrastructure, as well as create positive changes in the legislative base and management of water supply. Decree of the President of the Republic of Uzbekistan № UP-6024 “On the approval of the concept of the development of the water sector of the Republic of Uzbekistan for 2020-2030, dated July 10, 2020.

[4] Presidential Decree No. PP-4575 “On measures for implementation of the tasks defined in the Strategy of agricultural development of the Republic of Uzbekistan for the period of 2020-2030.

which deviate from market outcomes are fundamentally unstable and inconsistent, and hence investors cannot plan on such distorted deviations continuing, even where they may be profitable.

The private sector respondents also see risks in the outdated legislative base that can be open to misinterpretation as well as in new policies and regulations that are sometimes reversed or not applied as intended. It is not unusual that investors perceive a changing policy environment with elements of unchecked bureaucratic discretion as riskier and more uncertain than one which is stable and well-enforced.

These responses and concerns are in line with international experience. In Uzbekistan, as in other countries, the factors that typically keep private investors from doing more in the agricultural supply chain fall into three main categories:

- Rules and regulations that restrict business operations;
- Pricing distortions – artificial price interventions make some investments unviable and increase risk for investment even if it is profitable;
- Insecure and unreliable operating environment – frequent changes in government actions and operational decisions create risks and disincentivize businesses to enter a market.

Key constraints identified in agricultural sector in Uzbekistan are:

- State land used inefficiently with little opportunity for private sector to rent it and optimize the use
- High losses in the water irrigation system and low water availability
- Government directives intended to achieve food security disrupt the market and land productivity
- Financing by commercial banks is not transparent
- Some legislative provisions need an update to better reflect the current state of the sector and the GOU's ambitions vis-à-vis the transition to market principles
- Delayed state decisions can harm the private sector

Lack of qualified human resources in the sector and lack of knowledge of modern techniques and methodsSignificant increase in private investment in the agricultural supply chain in post-Soviet economies—such as private investment in grain logistics in Ukraine—has been associated with the removal of pricing distortions and the exit of the government from day-to-day decisions which affect the operations of the firms in the sector (while, of course, strengthening environmental and labor protections).

This conclusion was similarly reached by donors and international finance institutions (IFIs) that recommended the GOU to adopt best practice in fostering greater PSP, specifically a) provide consistent enabling policies, and 2) reduce barriers to, and incentivize, investment to better encourage businesses to invest and/or diversify investments as well as to mitigate risks for

investors.[5] Strengthening trust in land rental rights and law enforcement are crucial to continue to encourage long-term investments in technologies requiring multiple years to recoup investment – drip irrigation, trellising, infrastructure upgrades for international standards certifications, etc.

This study also looked at selected individual agricultural crops, meat and dairy. The key gaps and opportunities are summarized in the table below.

[5] USAID. 2020. Agricultural Value Chains. Activity in Uzbekistan. Final Report. https://pdf.usaid.gov/pdf_docs/PA00X611.pdf (accessed January 2023)

Table 0.1: Summary of gaps and opportunities for specific industries

Sector	Main gaps	Proposed measures to address the gaps	Opportunities	Comments
Cotton	• Overregulation of cotton cultivation. • Farmers have no choice in seeds, and buy seeds provided by the state provider only. • Farmers have no freedom to choose to whom to sell their cotton. • Cotton is a high-water consuming crop. • Cotton processing/textile facilities face raw product deficit (oversupply of processing)	• Application of market rules Diversify the varieties of seeds • Provide farmers the freedom to choose which cluster to sell products to • Apply water saving technologies • Plan processing in accordance with projected raw cotton supply	• Provide more freedom to farmers, so they can choose better seeds, and stimulate competitiveness • Continue reducing cotton growing areas in favor of higher value crops and less water-consuming crops • Continue supporting textile clusters to convert the raw product into value added goods.	There is land degradation in Uzbekistan due to cotton-wheat cycle of cultivation for decades. If GOU launches a long-term land productivity program, yields of harvest can significantly increase.
Wheat	• Storage facilities for wheat result in high spoilage and physical loss • Private sector needs to use state-owned warehouses without little control over wastage • High water intensity in production of wheat • Presence of state interference, e.g., informal orders on how much fertilizer to use and production quotas • Unpredictability with purchasing price of wheat as set by GOU	• Build and establish modern storage facilities specific for wheat • Attract private investors to build private warehouses • Apply water saving technologies specific for wheat cultivation • Provide farmers the freedom to choose and buy fertilizers • Buy wheat at a market price	• Changing from warehousing to storage in wheat silos with appropriate air circulation can help reduce physical loss of the grain and increase profits of producers as well as reduce logistics and transport cost	Quality of wheat cultivated in Uzbekistan is generally lower than in Kazakhstan (the main wheat exporter to Uzbekistan) due to land and climate conditions. Substitution of wheat cultivation to other higher value-added crops could attract more private players more generally.
Horticulture	• Certification of fruits and vegetables is available, however, there is insufficient infrastructure and experts to make international	• Attract experts and build infrastructure to make international certifications more accessible for producers and processors	• Increase processing of fruits and vegetables by making processing facilities more available throughout the country	GOU should restrict application of pesticides prohibited in developed countries. This will allow local farmers to switch to new quality standards, and their

Sector	Main gaps	Proposed measures to address the gaps	Opportunities	Comments
	certifications more accessible for producers and processors. • Pesticides applied in Uzbekistan often have a high level of prohibited chemical substances that prevents export of fruits and vegetables to premium export markets, like the EU. • Lack of qualified human resources in the sector and lack of knowledge of modern techniques and methods for better handling and processing • Lack of knowledge of farmers on export procedures and requirements, as well as lack of knowledge of consumers' preference (e.g., seedless grapes are increasingly more preferred than the seeded varieties traditionally grown in Uzbekistan). • Land is provided only on a long-term rental basis, but not for ownership, bring to lack of motivation to increase a land productivity	• Define and apply import prohibitions to pesticide based on international food standards • Increase salaries in the sector, and make it more attractive for employment • Improve study curricula and exchange of experience of countries in universities • Develop and launch an export program for farmers • Develop changes in the land regulations to motivate farmers invest in their land for long-term land productivity.	• Extend the shelf-life and storage of fresh products to be able to reach more distant markets and to sell the products at the time when prices rise. This can be done through modern cool storage and packaging facilities combined (or, co-located) with transportation links • Apply calibration, higher quality standards to improve export potential, particularly to premium export markets[6] • Educate farmers on export procedures, certification and quality standards; make financing available for producers and processors to invest in technologies and infrastructure upgrades for international standards certifications. • GOU can foster trade links with new markets, understand their product preference and requirements and then	products to comply with international requirements. GOU should continue providing subsidies and support measures in horticulture, such as concessional loans for drip irrigation. Financing should be easier available for higher capital investments, such as greenfield processing and logistics facilities. Farmers need GOU's support to go through certification process to be able to export their products.

[6] Increasing supply of products in traditional markets often leads to a reduction in the price of these products

Sector	Main gaps	Proposed measures to address the gaps	Opportunities	Comments
			assist producers and processors with meeting those requirements and working with foreign partners.	
Meat and Dairy	• Small farms and dehkans use traditional methods for milk production that keeps low productivity. • Milk producers have a lack of knowledge of types of breeds and possibilities to process milk to produce higher-value products. • No stability for raw products supply for processing • Frequent changes and reversals of state policies do not provide peace of mind • Some legislative provisions need an update to better reflect the current state of the sector and the GOU's ambitions vis-à-vis the transition to market principles • Lack of qualified human resources in the sector and lack of knowledge of modern techniques and methods • Lack of pastureland in the country.	• Open new farms with modern production technologies • Educate farmers on available breeds and processing products that can be produced, and provide knowledge and financing for modern technologies • Establish bigger milk producing farms • Provide long-term (at least 3-5 years) stable subsidies for milk producers • Improve legislation to transfer to market conditions • Increase salaries in the sector, exchange experience of modern technologies • Improve land use efficiency and plan land allocation in accordance with crop/product suitability.	• Increase local production volumes to fulfill country's deficit in meat and milk. • Large milk processing companies are entering the market, creating opportunities for development for milk production and processing facilities. • Aggregation hubs with transportation services for meat industry can help facilitate value addition (for example, through cold storage, packaging, better enforced safety standards, etc.)	Due to the shortage of meat in the country, the GOU prohibits the export of meat and meat products, which limits the market for processing companies.

Water resources management

This study also analyzed the state of water resources management, with a particular focus on irrigation as one of the most important inputs for crops production. Given the topography and the high level of salinity of soil in Uzbekistan, availability and reliability of irrigation remains the most critical issue in ensuring secure agricultural production. The irrigation water supply system in Uzbekistan is characterized by high technical losses, outdated and undermaintained network, and a low collection rate of irrigation fees, meaning the water management authorities are typically loss-making for this service. This also means that while the need for investment is high, GOU does not have sufficient fiscal space for the required upgrade program, and current user fees alone cannot cover the investment costs either.

GOU approached the problem by adopting policy measures (e.g., promoting the application of water-saving irrigation technologies[7], planning to move to charging cost-recovery tariffs), and also targeted private sector investments and expertise. The Water Concept 2030, a long-term national water strategy, prioritizes the introduction of the principles of a market economy, and using PPP mechanisms to modernize water facilities and strengthen infrastructure. In line with this priority, several dozen PPPs in irrigation have been implemented. However, these PPPs were mostly transfers of old pumping stations to the balance and management and maintenance of individual farms and clusters. In these arrangements, there was virtually no competitive pressures, which is one of the key value-for-money drivers in PPP procurement.

In 2017, the GOU introduced agricultural clusters with private ownership and used the arrangement to attract private investment to improve irrigation systems in cluster and other agricultural areas and apply the best practices in water management in agriculture. In practice, this meant that clusters entered into PPP agreements and paid for improvements in the local irrigation systems hoping to recover the investment through better harvests and user charges. However, individual farmers are not accustomed to paying for irrigation water as a service, so cost recovery through user fees collection is not possible.

Further, long-term payback period investment in irrigation systems present high risks to the clusters because they don't have security over the long-term operations. This happens because clusters with the farmers they work with: (1) do not have security of land tenure, (2) there is an unpredictability of harvest yields and profitability, (3) there is a level of insecurity about the procurement prices, as well as (4) there is a risk associated with crop rotations and farmers switching to other crops which would be sold to other crop-specific clusters.

[7] Including incentives for drip and sprinkler irrigation. Subsidies for drip irrigation and other water saving technologies are available in the cotton, horticulture, and livestock production areas through low-interest loans to farmers for 3 years. Decree No. 4499 of the President of the Republic of Uzbekistan

In such uncertain, high-risk environment, the investors cannot be assured to generate sufficient return on or event to recover their investment, nor to recover the investment in the time frame acceptable to them.

Hence, while large investments are needed to update and modernize irrigation infrastructure (the canals, pumping and other infrastructure), there is a lack of financial viability in irrigation projects from a potential investor's perspective.

Notwithstanding, with appropriate risk allocation and government guarantees, it is possible to attract private sector financing and expertise in this area, i.e., through availability payment PPPs as discussed below.

Private sector participation is possible with an appropriate risk allocation between the private and public sector parties.

At this preliminary stage of diagnostic, the Consultant identified preliminary conceptual ideas for prospective projects that can be delivered in cooperation with GOU and private investors. These project concepts are based on the findings of gaps and opportunities for each agricultural sub-sector and for the water supply. According to the findings, the main untapped opportunities for PSP lie in creating more greenfield value-added services and infrastructure, particularly processing, storage, logistics and transportation. However, to unlock these PSP opportunities, the investment climate needs to be made more favorable, particularly because investments in infrastructure and logistics are typically long-term, high capital value commitments. Considering that the private sector faces a high level of uncertainty and an unpredictable policy environment, long term investment is risky and improbable.

A PPP arrangement could be a workable solution in an uncertain investment environment, as it can contractually assure the private investor that the government counterpart would cooperate in a consistent manner and facilitate a favorable operating environment for the project or be liable for not doing so. The government counterpart, bound by the PPP contract, would share the project risks, and would therefore be incentivized in the success of the project and in avoiding penalties for breaking the contract terms. Importantly, in the context of a changing regulatory environment in agriculture, the private sector would be insured from any impact arising from policy changes as those risks could be shifted to the government counterpart.

Further, the inability of investors to take volume risks at the initial stage of market development often prevents them from investing in greenfield projects. In a PPP arrangement, the government can contractually underwrite some volume risk (for example, by providing minimum demand guarantees for several years until demand becomes predictable) and hence facilitate private investment.

Table 0.2 below summarizes the PPP project concepts proposed for consideration. The project concepts were developed with the level of specificity that allows for a wide application across the country – the concepts can be applied to multiple sites and regions in Uzbekistan and can be replicated through multiple projects and may eventually be scaled up into an investment program. At this stage, we do not consider the best locations, specific project scope or scale for implementing these project concepts. These specific details are important for the overall design and will impact the viability and success of the projects and, therefore, will need to be carefully

studied and discussed with the stakeholders at a later stage. (However, already at this stage after interviewing a private sector-led cluster, we understand there is sufficient private sector interest in irrigation PPPs in Jizzakh).

With regards to the water sector, the project concept considers that investments in improving irrigation systems are not sufficiently attractive and viable for private investors and will therefore require provision of government support and de-risking measures. Under the current circumstances, it seems like the only way to get the private sector to invest in irrigation infrastructure is for the GOU to pay for the provision of services through availability payments, given very limited possibilities of commercial revenue streams. The availability payment PPP model is well-suited to deliver the investment required quickly. This contract model mobilizes private finance to cover upfront capital costs and breaks the cost to the government into manageable and predictable amounts over time. As availability payment PPPs are based on strict KPI-based performance requirements, the private partner must maintain the system at the contractual standard and make required repairs. If the private partner fails to perform, it will be penalized for non-fulfillment of operational maintenance criteria, ensuring that these savings will be passed on to GOU. Another benefit of the availability payment-based PPP is that they allow GOU to postpone public side expenditures on these projects. Therefore, with the same available funding, GOU will have more cash available to repair and maintain other irrigation systems in other districts.

Table 0.2: PPP project concepts

Project Concept	Value proposition and a gap the project will address	Conceptual project structure and key project elements	Commercial considerations and the role of public and private partners	Next steps for developing a pre-feasibility study
Horticulture processing and logistics hubs	Value addition can significantly boost profits of producers and generate income across the whole supply chain. Currently, there is a low level of processing in horticulture. While the post-harvest value addition processing industry is developing, important logistical linkages are missing. There is a gap in value added processing and logistics, including cold storage, packaging, transportation, certification, and other export services. Individual entrepreneurs and clusters develop	Considering there are multiple gaps in post-harvest processing, a prospective project can include a range of services. The final scope of services can be refined, but particularly there seems to be a real need for agro-logistics centers offering all or some of the following services: sorting, modern cold storage, inspection and certification, packaging, and dispatch to export markets. An ongoing ADB-funded project confirmed this need and is creating three pilot agro-logistic centers (ALCs) that consolidate production	The public sector can help facilitate availability of land and permits for the construction. During the operations, the public sector can facilitate government services such as customs and sanitary inspections to assist the private operator. The private operator will be responsible for designing, financing, building, and operating the facilities according to the KPIs specified in the contract. Investors will likely be uncomfortable to take the demand risk, so GOU may be required to underwrite the investment volume in the initial years of the project to de-risk it. That is, the GOU would provide	Market sounding to determine the level of attractiveness and viability of such a project. Engagements with GOU stakeholders to test the overall support of the project concept; to identify the likely implementing agency for a PPP; identify key bottlenecks; to understand whether GOU can provide support or a subsidy; if any change in the legislation may be required. Study the experience and the status of the

Project Concept	Value proposition and a gap the project will address	Conceptual project structure and key project elements	Commercial considerations and the role of public and private partners	Next steps for developing a pre-feasibility study
	facilities, however, there is little scale and aggregation.	and post-harvest services. PPP projects can extend on these pilot projects filling in the gaps in logistical solutions in other regions not covered by the pilots.	guarantee of volume for a specified number of years until the demand grows consistently and reliably for the private operator to be comfortable with taking the demand risk. Availability payment can be another way to structure the payment arrangement. This should be considered at the later stage of project concept development.	ADB-funded Horticulture Value Chain Development project[8]
Improvements in irrigation and water supply	The technological state of irrigation infrastructure in Uzbekistan is rather poor (i.e., 94% of pumping stations have exceeded their standard life of 16–18 years and require modernization) and water losses are high. The Water Concept 2030 prioritizes private sector participation to modernize water facilities and strengthen infrastructure.	PPP project scope could include activities such as replacement of energy inefficient pumps by more efficient ones. The energy saved from irrigation can be sold by the energy distribution company to industrial or other consumers.	It may be difficult for investors to start charging water users and achieve an acceptable level of bill collection (today, bill collection (irrigation service fees) by WCAs is only about 40%–50%). Therefore, there is a real risk of investment recovery. Investors may require government support and/or guarantees. Pilot PSP projects in this area could revolve around availability payment (AP) PPP projects in which GOU procures investment and operation from the private operator. The GOU would collect fees from the users and may consider creating a ring-fenced account where funds from the energy saving will be deposited. The GOU would then pay the private party APs in exchange for providing services and infrastructure to the well-specified standards.	Engaging with GOU stakeholders and understanding whether the AP payment mechanism is possible in Uzbekistan, whether ring-fencing accounts is possible, and who will be the counterparts in such a PPP.

[8] ADB. Uzbekistan: Horticulture Value Chain Infrastructure Project. https://www.adb.org/projects/51041-002/main (accessed December 2022)

Project Concept	Value proposition and a gap the project will address	Conceptual project structure and key project elements	Commercial considerations and the role of public and private partners	Next steps for developing a pre-feasibility study
Grain logistics	In Uzbekistan, wheat is often stored on cold surfaces rather than in silos with appropriate air circulation and climate control. As a result, spoilage of wheat in warehousing can reach 30%. As the GOU aims to become self-sufficient with wheat, while on the other hand it is reducing the land area under wheat in favour of horticulture, there is a real need to reduce the spoilage of the grain to meet the domestic demand.	The private partner would be responsible for designing, building, and maintaining and operating the storage facilities (wheat silos) and, possibly, offering transportation services from farms to storage, and possibly long-distance transportation to dedicated railway facilities, as relevant. PPP contract can have additional requirements relating to connecting infrastructure and logistics.	To achieve economies of scale, the private operator may need to operate multiple facilities, or to operate a big project size facility. It is possible the private partner may require GOU to underwrite in the initial years the guaranteed volume until the demand grows and becomes reliable. The role of the GOU would be to help facilitate allocation of land plots and various building permits for the construction sites and define the servicing area. GOU may also need to help the private party arrange connection to power, water and other utilities.	-Understand any legal limitations - A consultation with GOU to understand pricing arrangements and possible payment mechanisms for the services provided by the private sector. - Study the experience in other countries and global PPP models, for example, PPPs in grain logistics in India, Oman, Philippines, Serbia.
Animal slaughtering and processing	To improve production efficiency of meat products, it is necessary to debug the entire process - from fattening and slaughter of animals to processing. Since the Soviet times, beef has been perceived as a single piece of meat, without dividing it into some premium product and cheaper cuts. But today, the world experience has moved to a more rational breeding of animals, up to identifying the optimal proportions and age of animals that are going to be slaughtered. Additionally, Uzbekistan imports meat and meat products due to local deficit of cattle breeding, slaughtering and processing.	The private partner could be responsible for designing, building, and maintaining and operating the slaughtering and processing of animals. PPP contract can have additional requirements relating to connecting infrastructure and logistics.	Private partner may face high market competition due to imported lower priced meat (mostly from Belarus in 2022). However, in the long term, Uzbekistan can improve food security by supporting local animal slaughtering and processing. GOU can support private partner by providing subsidies and tax exemptions that will help local producer to compete with the importers.	Market sounding to determine the level of attractiveness and viability of such a project. Engagements with GOU stakeholders to test the overall support of the project concept.

More detailed business cases will be developed in the next stage of this TA in close consultation with GOU stakeholders and the ADB. The first step in advancing the work on pre-feasibility studies is to present the concept ideas to the GOU and agree on the key elements of the proposed project structures, test what locations the GOU prefers to pilot, and understand any impediments and blockages that can come on the way of implementing the project concepts into real PPP transactions. We suggest these conversations take place as soon as possible to avoid delays.

Conclusion and next steps

This Diagnostics Study confirms that the GOU is on the right track to achieve its priority objectives with regards to transitioning the agriculture sector towards a more productive, innovative, and private sector led sector. However, and understandably, more effort and time is required to fully complete the transition.

While the GOU is implementing its sectoral strategies, it should continue cooperating with IFIs and other agencies and tap on their expertise and experience in agriculture, attract more technical assistance and capacity building trainings for both the public sector staff, and private sector.

A key finding in this diagnostic is that the state still has a strong level of control in the value chain, what can be distortive in the framework of market principles. The interviews with the private sector players revealed the transition is taking place but can be bumpy, particularly observed with regards to interactions with state bodies at different levels. Without seamless coordination among state agencies, consistent messaging and application of policies and regulations, investors will continue to perceive high risks, particularly for longer-term investments in value-adding greenfield and expansion projects. The higher the perception of risks, the less the likelihood that investors will invest in longer-term more complex projects, such as improvements in value chains. Investors would be more willing to engage in simpler projects, like management contracts, build-operate, or design-build-operate.

The Diagnostic Study revealed there are two avenues that can help the GOU progress its efforts in bringing more PSP in agriculture.

First, the ministries and regional governments identified in this report appear to have limited experience and knowledge in identifying PPP opportunities, structuring PPPs, and implementing them (see section 2.4 for the list of the identified gaps). Second, despite a number of gaps in the sector and in the respective evolving framework, there are real opportunities to attract the private sector to particular areas in the supply chain.

Given the above findings, the Consultant proposes that the next phases in this TA should focus on two activities: 1) capacity building of relevant public sector agencies, and 2) pre-feasibility assessment of pilot PSP/PPP projects. The objective of capacity building and training is to strengthen the knowledge and the capacity for ministerial and regional government officials to deliver PSP/PPP projects in agriculture. The objective of the pre-feasibility studies is to expand the project concepts to detailed business cases, specifying their scope and location as well as confirming their feasibility.
Capacity building

There is a need for a tailored comprehensive training course for selected public sector staff on the key principles of PPP procurement and attracting private investors in agriculture. The development and delivery of the training course, along with a training package, and a PPP/PSP toolkit will be useful to some government agencies have limited exposure and expertise with regards to the cycle of structuring and implementing PPPs and when it comes to identifying PSP opportunities. The development and delivery of the training course, along with a training package, and a PPP/PSP toolkit will be useful to:

- Identify, evaluate, procure potential PPPs and manage ongoing PPP projects in agriculture and irrigation, evaluate, procure, manage ongoing PPP;
- Improve decision making in PPP/PPP assessment and implementation; and
- Strengthen the public sector's knowledge of PSP/PPP project.

Training materials can include three components:

- *An online course on a learning management platform* – to enable trainees to master the training materials by provide the necessary knowledge framework and understanding;
- *Face-to-face workshops* – to discuss case studies and address the relevant issues and concerns, and a simulation session; and
- *A face-to-face simulation session* – to provide hands-on experience in developing a PSP/PPP project.

Both foundational modules and more specific PPP-related topics could be delivered to the public agency representatives.

- Foundational modules – these could include the overview of PPP, legal and regulatory and contractual aspects of PPP projects. Following modules would include project structuring, risk allocation, project management, financial structuring, fiscal risks and consideration, bid evaluation, and others.

Further to the capacity building activities around the general principles of the PPP model, the Consultant believes there is high merit in adding customized training around the identified project concepts. That is, having agreed with the public stakeholders on the pilot PPPs in agriculture, the relevant agencies and staff could be involved in a practical real-life development of project structure, risk allocation, and other key elements of PPP project development.

Pre-feasibility studies

The immediate next step is to confirm the project concepts in consultation with the ADB and GOU stakeholders. The project concepts were designed based on the findings of this study; however, more specifics are required to advance the project ideas. Those specific details include the locations, appropriate scale of projects, as well as the GOU willingness and ability to provide de-risking measures, such as guarantees.

After the concepts receive public sector support, the next step will be to expand the concepts to detailed business cases, specifying their scope, location as consulted with the stakeholders, as well

as confirming feasibility. Working with the public sector, it will also be important to determine if there are any legal impediments or restrictions that may need to be overcome to enable the implementation of the projects. For example, PPP procurement models, such as Design, Build, Finance, and O&M, typically depend on the ability to use an availability-based payment funding model and GOU being able to manage such contracts. These critical aspects will need to be confirmed.

Engagements with GOU stakeholders will also help identify the likely implementing agency for a PPP, what type of guarantees are available and what government ministry provides them. The latter will be critical to developing the structure of the project and the risk sharing matrix. Further, the public sector will help define the locations for the pilots.

The pre-feasibility studies will not be complete and accurate without market feedback from potential investors. The next step would be to test the project concepts with the potential private sector parties and identifying major concerns, risks, and requirements from the government to de-risk the projects and make the investment attractive and possible.

1 Introduction

Agriculture is a significant contributor to Uzbekistan's economy. It is the third[9] largest contributor to the national gross domestic product (GDP) and employs approximately a quarter of the country's workforce.[10] In 2021, agriculture accounted for 28% of Uzbekistan's GDP, 27% of labor force, 25% of merchandized exports, and 8.3% of external earnings.[11] Despite its importance in the country's economy, there has been limited innovation and modern mechanisation of post-harvest handling. This led the country to not fully tap on its climatic advantages and fully exploit the potential of the sector. At the same time as the state didn't invest sufficiently in modernization and diversification of the sector, there was a lack of private investment in the same. The Asian Development Bank (ADB) commissioned *TA-6839 UZB: Enhancing Private Sector Participation in Agriculture*. In the context of improving the capability of the Government of Uzbekistan (GOU) in attracting efficient investment to the agriculture sector, ADB has commissioned this TA to evaluate measures to increase private sector participation (PSP) in agriculture in Uzbekistan.

Historically, the private sector was constrained from participating in Uzbekistan's agricultural sector due to the dominance of state-owned enterprises (SOEs), inadequate land ownership policies, various market and pricing distortions, unconducive regulatory framework, and underdeveloped credit market. Prior to 2017, the Government of the Republic of Uzbekistan (GOU) almost fully controlled agricultural sector in the country. Cotton and wheat were two main crops produced for the state needs accounting for over 82% of irrigated land. The state order mechanism and the pricing distortions made the cultivation of cotton and wheat unprofitable for most farmers.[12] For example, the difference between the state procurement price and market prices for wheat could reach and exceed 3 times.[13] Additionally, the system of land quotas did not allow farmers to optimize the production structure due to the varied soil features, climate, water availability, staff qualifications, and other characteristics. Often, land plots allocated for cotton and wheat were more productive for growing other, higher value, crops, however, the state's prohibition to use the land for other purposes did not allow the farmers to change production structures.

Recently, the GOU acknowledged there are several distortions plaguing the agriculture sector, and that a reform was necessary to make the sector more productive and resilient. Thus, starting in 2017, GOU started a comprehensive reform program in the agriculture and water resources management which broadly aimed to:

- Improve the use and management of land, water, and agricultural resources;

[9] Behind services and industry

[10] World Bank. World Development Indicators

[11] International Trade Administration. Uzbekistan – Country Commercial Guide. Agricultural Sectors. 2022. https://www.trade.gov/country-commercial-guides/uzbekistan-agricultural-sectors.

[12] For wheat, see: Petrick, M., Djanibekov N. (2016) Obstacles to crop diversification and cotton harvest mechanisation: Farm survey evidence from two contrasting districts in Uzbekistan. IAMO, Discussion Paper No

[13] For example, while the farmers were paid 380,000 sum per ton of wheat, the domestic market price was 908,000 sums per ton. The Agricultural Sector of Uzbekistan: Features, Key Problems, the Need for Reforms, Central Asian Bureau for Analytical Reporting, 2019

- Introduce market relations and attract private investments into the sector; and
- Improve the public administration system, strengthen frameworks for relations among different production stages, and bolster capacity by providing modern facilities.

The reforms targeted the reduction of market distortions and a move from lower value-added (cotton and wheat) to higher value-added (horticulture and livestock) agriculture. Notably, in 2020, GOU abrogated the state cotton system removing mandatory production targets and mandatory state procurement.[14] With the end of mandatory state procurement, farmers received increased freedoms to determine, based on market conditions and availability of technologies, how and how much cotton to grow. Land being freed from cotton is being used for higher value products, the production of which is supported by the state through various incentives and subsidies. As agricultural production is shifting towards high-value horticulture products, export barriers for them have also been removed. This shift is creating more opportunities for the private sector participation in storage, processing, and packaging for higher value export.

One of the most prominent initiatives is the Uzbekistan's Strategy for Agricultural Development 2020-2030 which set out an ambitious and transformative agenda to create a diversified, competitive, market-based, and export-oriented agri-food sector through nine priorities.[15]

Between 2017 and today, GOU enabled several critical changes targeted at removing market distortions and creating an enabling environment for more efficient agricultural investment and practices. Among the main changes were:

- Removing export barriers on horticulture products;
- Converging cotton farmgate prices and market prices;
- Eliminating the procurement quota system for both cotton and bread;
- Reducing cotton and wheat growing areas and planting horticulture crops on the released lands;
- Reorganization of the public institutional management;
- Introducing online auctions for land lease;
- Providing subsidies and additional financing loans to farmers through commercial banks;
- Partially subsidizing the expenses on agricultural equipment; and
- Delaying payment of value added tax for up to 180 days, and others.

[14] This system previously required all cotton produced in the country to be surrendered to the state, and for all cotton growing areas to meet (stringent) annual production targets. With historically severe penalties (including the loss of land ownership) levied against farmers who missed the target, the policy was widely viewed by observers as a binding constraint to ending forced and child labor in the cotton sector.

[15] The nine priorities are: (i) enhancing food security for the population; (ii) creating a favourable environment for agribusiness and value chains; (ii) decreasing state involvement in sector management and enhancing investment attractiveness; (iv) encouraging rational use of natural resources and environmental protection; (v) developing modern public institutions; (vi) diversifying state expenditures; (vii) developing research, education, and advisory services; (viii) developing rural areas; and (ix) developing transparent statistics and information systems.

The reform efforts started to bear fruit. Notably, the export of higher value horticulture products is growing[16], production and export of processed products increased, several private investors entered the market (e.g., agricultural clusters), a large number of public-private partnerships (PPPs) has been implemented. However, more work is required, and some gaps still exist. The objective of this diagnostic study is to provide an overview of the current situation of private sector participation (PSP) in the agriculture sector supply chain; identify main challenges that private enterprises encounter; and propose project concepts which can help fix some of the identified gaps with PSP and PPPs.

This Diagnostic Study Report is the second deliverable for the *Enhancing Private Sector Participation in Agriculture* project which was commissioned by the Asian Development Bank (ADB) to evaluate measures to increase private sector participation (PSP) in agriculture in Uzbekistan. This report outlines the technical consultants'[17] approach to the diagnostic of the agriculture and water resource management sectors, presents key findings, including a review of the legal framework, key constraints, risks, and opportunities for PSP and the development of PPPs.

To identify existing barriers and constraints for PSP, the Consultants adopted a dual approach – (i) desktop research including a review of previous studies and donor and IFIs projects, and (ii) in-person interviews with private sector players and GOU representatives in Uzbekistan.

The Consultants' research focused on the major crops in Uzbekistan – cotton, wheat, horticulture and meat and dairy. The analysis looked at the environment within which each product is produced and what happens in the value chain pre- and post-production where PSP can be encouraged – irrigation, fertilizers and seeds, collection and storage, and processing and logistics. The analysis excluded examination of farming as economic activity. The diagnostic study identifies barriers for PSP of different nature: legal, regulatory, institutional, commercial, and others. Based on the findings, the Consultant developed recommendations on possible interventions to facilitate a more PSP-enabling environment.

The remainder of this report is organized as follows. The Diagnostics Study begins by laying out the sectoral background: describing the reform initiatives that took place since 2017 and providing statistical data on the development of the sector over the years. The study then provides cross-cutting diagnostics of all sub-sectors in agriculture, showing the common challenges and gaps observed across all industries. After discussing the reservations and issues mentioned by the private sector respondents, the study presents a high-level overview of the legal and regulatory framework, identifying gaps with respect to facilitating market-based principles in agriculture when compared with global best practice. Then, the study presents the analysis of individual crop cultures – cotton, wheat, horticulture – and the meat and dairy industry. The individual analyses delve into the specific characteristics of each industry, specific issues, and opportunities. Based on the diagnostics of gaps

[16] The export of horticulture grew more than twofold from 2017 to 2019. Identifying the Potential of Horticulture Exports to China from Pakistan, Tajikistan, Kyrgyzstan, and Uzbekistan, Tehseen Ahmed Qureshi, August 2022, chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/https://www.carecinstitute.org/wp-content/uploads/2022/09/Horticulture-Exports-Report-by-Tehseen-Ahmed-Qureshi.pdf

[17] Mr. Andrew Sprott, Mr. Akmal Mamatkhanov.

and opportunities in each industry, we identify potential projects that can attract PSP and help address the gaps. The last section concludes and lists the next steps for this technical assistance.

2 Sector Background

To identify existing barriers and constraints for PSP, the Consultants adopted a dual approach – (i) desk research including a review of previous studies and donor projects, (ii) in-person interviews with private sector players in Uzbekistan, and (iii) GOU representatives, including MOA, ISCAD, SRA and MOWR.

The Consultants' research focused on the major crops in Uzbekistan – cotton, wheat, horticulture – and meat and dairy. The analysis looked at the environment within which each product is produced and what happens in the value chain pre- and post-crop production where PSP can be encouraged – irrigation, fertilizers and seeds, collection and storage, and processing and logistics. The analysis excluded examination of farming as economic activity.

This section provides general background and statistics of the agricultural sector.

2.1 Sector Dynamics

Since Uzbekistan's independence from the Union of Soviet Socialist Republics (USSR) in 1991, agriculture has been and is projected to be a significant contributor to Uzbekistan's economy. Today, it is the third largest contributor to GDP (behind services and industry) and employs approximately a quarter of the country's workforce.[18] In 2021, agriculture accounted for 28% of Uzbekistan's GDP, 27% of labor force, 25% of merchandized exports, and 8.3% of external earnings.[19]

The main agricultural crops in Uzbekistan have traditionally been cotton and grains. Wheat has been the dominant grain crop, with a 5-year production average of 6.1 million tons and accounted for over 80% of total production of cereals and legumes.[20] Cotton is another significant agriculture product and main agricultural export with a 5-year production average of 3.08 million tons.

With the abolition of production and procurement quotas and price controls on cotton and grains in 2020-2021, the composition of agricultural production is set to change. The agriculture sector is already seeing a transition towards higher added value outputs (like textiles) and a greater diversification of crops, including towards vegetables and fruits. A 2.6% decrease in cotton production volume is expected in the next two years, while the number of cotton-textile clusters has risenquickly – from 15 in 2018 to 92 clusters in 2020. Within that same period, the percentage of cotton growing area covered by these clusters have increased by more than five times, from 16% to 88%. The remaining area of nearly 148,000 hectares is to be cultivated by cotton farm cooperatives.[21]

[18] World Bank. World Development Indicators

[19] International Trade Administration. Uzbekistan – Country Commercial Guide. Agricultural Sectors. 2022. https://www.trade.gov/country-commercial-guides/uzbekistan-agricultural-sectors.

[20] Except for 2021

[21] World Bank. Cotton-Textile Clusters in Uzbekistan: Status and Outlook. Policy Dialogue on Agriculture Modernization in Uzbekistan. 2020. https://documents1.worldbank.org/curated/en/305731601271791257/pdf/Policy-Dialogue-on-Agriculture-Modernization-in-Uzbekistan-Cotton-Textile-Clusters-in-Uzbekistan-Status-and-Outlook.pdf.

Considering limited land and a growing focus on agricultural activities with high added value, in recent years there has been a growth in greenhouse vegetable production development. Between January and November 2021, 398 modern greenhouses with a total area of 797 hectares were built in Uzbekistan, concentrated in two regions – Tashkent (44%) and Surkhandarya (44%).22 In the previous five years, greenhouses with a total area of over 3,000 hectares were built.[23]

The value of agriculture products and livestock has consistently increased every year between 2016-2021 except for cereals and legumes whose production has declined by 7.6%. Between 2015 and 2020, the average yields of cotton and wheat were lower than expected. Uzbekistan exported US$1.34 billion in agro-food, or US$330 per hectare of fertile land by 2020. This is much lower compared to countries like Vietnam, whose export figures reached US$6,100 per hectare of fertile land.[24] The volume of other agricultural products increased as follows: vegetables (6.5%), fruits and berries (9.2%), livestock (21.3%), and cow milk (16.3%).[25]

In the near future, crops like corn and barley are forecast to gradually increase in production and account for a larger proportions of Uzbekistan's total agricultural output – 4-16% increase in production in the next three years.[26]

In terms of livestock, animal husbandry is an important contributor to agricultural output, accounting for 40% of the country's agriculture yields in 2021. In the past five years, national livestock production increased by 21% and poultry increased by 1.5 times. Ninety-five percent of the country's livestock is nurtured through commercial farms and small private holdings, which satisfy more than 90% of the country's meat and milk demand and 55% for eggs.[27] However, there is a significant difference between how commercial farms, small households, and other agricultural enterprises distribute their shares in crop growing and livestock keeping. Figure 2.1 demonstrates this composition.

[22] The total amount of investments in their construction amounted to 2.3 trillion soums (US$212.4 million).

[23] East Fruit. Uzbekistan: around 400 modern greenhouses were built in 2021. East Fruit News. 2021. https://east-fruit.com/en/news/uzbekistan-around-400-modern-greenhouses-were-built-in-2021/.

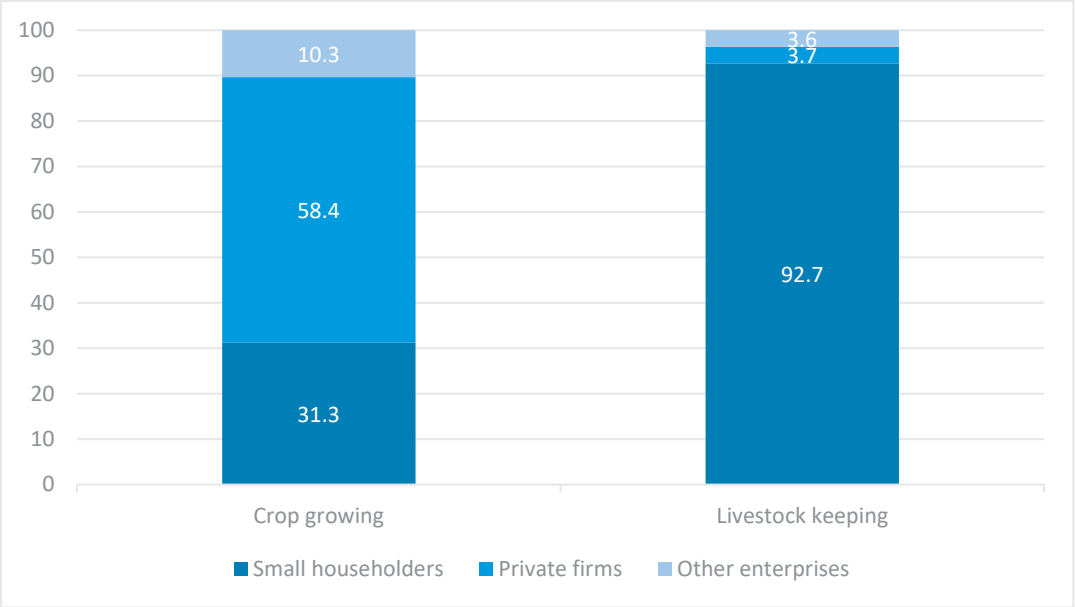
[24] Mansur Eshov, Lochinbek Amirov & Mavluda Askarova. Development of the agricultural sector and its importance in Uzbekistan. E3S Web of Conferences 244, 03014. 2021.

[25] The State Committee of the Republic of Uzbekistan on Statistics.

[26] U.S. Department of Agriculture (USDA) Production Assessment Division. Uzbekistan Production | Sorted by year 2022/2023. 2022. https://ipad.fas.usda.gov/countrysummary/default.aspx?id=UZ.

[27] IFW Expo | AgroExpo Uzbekistan/Agrotech Expo 2022. Agricultural machinery, Animal husbandry, Horticulture, Plant Cultivation. 2022. https://ifw-expo.de/exhib/agroexpo-uzbekistan-agrotech-expo-2022-en/.

Figure 2.1: Share of economic categories in growing agricultural products (in %)



Source: The State Committee of the Republic of Uzbekistan on Statistics, 2021

Population predominantly raises traditional types of livestock. Raising higher productivity cattle requires additional costs, labor, and is limited by dry climate in Uzbekistan. Population owns limited pasture lands[28] and therefore pastures its livestock on reserve lands and other public lands almost free of charge. Recently, a 2021 law[29] permitted smallholder farms to have up to 10 livestock units, which had previously been restricted due to the lack of land for pasture and fodder. Table 2.1 presents selected key performance indicators for Uzbekistan's agriculture sector from 2016 to 2021.

Table 2.1: Key performance indicators for Uzbekistan's agriculture sector (2016-2021)

Indicators	2016	2017	2018	2019	2020	2021
Sown area of agricultural crops (in thousand hectares)	3,706.7	3,474.5	3,396.0	3,309.4	3,396.1	3,260.7
Total agricultural products (in billions of so'ms and thousands of USD)	115,599.2 ($10,634)	148,199.3 ($13,633.8)	187,425.6 ($17,244.4)	216,283.1 ($19,901.2)	250,250.6 ($23,026.7)	303,415.5 ($27,918.7)
Crop products (in billions of so'ms and thousands of USD)	61,755.1 ($5,681.3)	83,303.4 ($7,664.7)	98,406.4 ($9,054.3)	111,904.8 ($10,296.3)	123,858.8 ($11,397.2)	152,130.4 ($13,998.6)

[28] In Uzbekistan, land (including agricultural land) is owned by the State and is leased to farmers.

[29] Resolution no. 20 (2021) on "Measures to develop family business in fruit and vegetable growing and viticulture, to increase the share of farms in agricultural production".

Indicators	2016	2017	2018	2019	2020	2021
Livestock products (in billions of so'ms and thousands of USD)	53,844.1 ($4,952.7)	64,895.9 ($5,969.1)	89,019.2 ($8,190.1)	104,378.3 ($9,604.9)	126,391.8 ($11,629.5)	151,285.1 ($13,920.1)
Cereals and legumes (in thousands of tons)	8,261.3	7,288.5	6,535.5	7,437.8	7,636.0	7,634.6
Wheat (in thousands of tons and as a percentage of total cereals and legumes)	6,934.9 (83.9%)	6,079.2 (83.4%)	5,410.8 (82.8%)	6,093.5 (81.9%)	6,157.8 (80.6%)	5,984.8 (78.3%)
Barley (in thousands of tons as a percentage of total cereals and legumes)	167.4 (2%)	134.3 (1.8%)	111.8 (1.7%)	133.5 (1.8%)	161.5 (2.1%)	95.8 (1.3%)
Corn for grain (in thousands of tons and as a percentage of total cereals and legumes)	491.9 (6%)	389.4 (5.3%)	413.2 (6.3%)	421.3 (5.7%)	475.3 (6.2%)	590.0 (7.7%)
Vegetables (in thousands of tons)	10,184.0	10,219.9	9,760.3	10,215.1	10,431.4	10,850.2
Fruits and berries (in thousands of tons)	2,612.9	2,614.9	2,706.2	2,752.7	2,812.6	2,852.6
Livestock and poultry produced for slaughter (in live weight in thousands of tons)	2,172.5	2,286.8	2,430.5	2,473.6	2,519.6	2,635.1
Cow milk (in thousands of tons)	9,663.2	10,005.5	10,415.7	10,662.3	10,930.1	11,242.7

Source: The State Committee of the Republic of Uzbekistan on Statistics. The currency exchange from UZS to US$ is conducted on 30 August 2022 (1 USD = 10,934.99985 UZS)

Agricultural productivity indices for Uzbekistan have also improved in the last five years, although most categories ranked below the regional and worldwide averages (see Table 2.2 below).

Table 2.2: Productivity indices for agriculture in Uzbekistan

Indices	Uzbekistan	Region average	Regional rank	World average	World rank
2018 (using the period of 2014 – 2016 as the base with a score of 100)					
Food Production Index[30]	105.04	109.74	16/28	106.56	95/183
Gross Production Index (GPI)[31] **for Agriculture**	102.02	109.61	21/28	106.59	116/183
GPI for livestock	110.93	116.44	12/28	107.85	52/182
GPI for crops	99.49	105.78	22/28	105.53	131/183
2021 (measured in percentage)					
Contribution of food to merchandise exports[32]	9.09	18.31	14/28	26.86	120/181
Contribution of food to merchandise imports	12.87	13.57	13/28	12.87	104/181

Composition of agricultural producers

Most land in Uzbekistan is cultivated by large producers. Around 17.3 million hectares (or roughly 85%) of the agricultural land is cultivated by large farms, while the remaining area is shared among nearly five million small dekhan[33] and household units.[34] Large producers produce largely cotton and wheat as part of the state order system[35], with an average plot size of 100 ha. The small plots of dekhans are often not registered (informal) and have an average size of 0.3 ha. Smaller households cultivate the remaining 15% of irrigated arable land and produce largely higher-value horticulture and livestock products which compensate for their small size. Because they operate outside of the cotton and wheat production systems overseen by the GOU, dehkans have been excluded for decades from state support.[36] Further, they are often excluded from the formal banking

[30] The index considers food crops that are edible and contain nutrients. Data are collected by FAO from national sources via the questionnaire and are supplemented with information from websites of national ministries, national publications, and related country data from international organizations.

[31] The index shows the relative level of the aggregate volume of agricultural production compared with the base period, using sums of price-weighted quantities of agricultural commodities.

[32] Food includes commodities in sections 0 (food and live animals), 1 (beverages and tobacco), and 4 (animal and vegetable oils and fats) of the Standard International Trade Classification (SITC) revision 3 and SITC division 22 (oil seeds, oil nuts, and oil kernels).

[33] "Dehkan" is a term used for individual or family farms in Central Asia. In Uzbekistan, when the Law of Dehkan Farms was passed in 1998, household plots were reclassified into this category. These farms cannot be sold or gifted to someone outside of the family. Owners of these farms can grow or raise whatever they wish, but mainly vegetables and livestock.

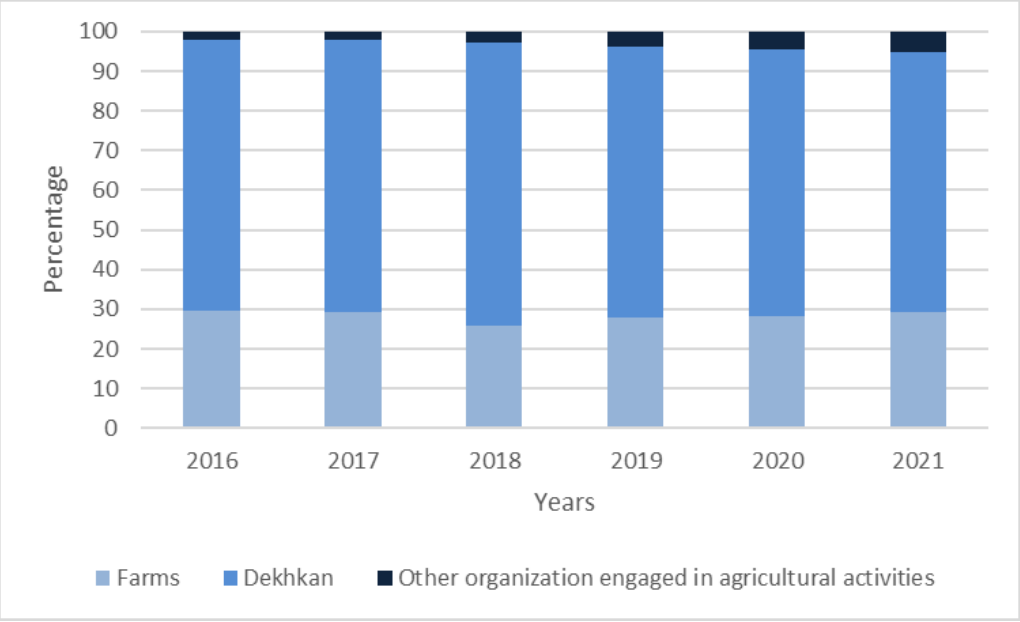
[34] World Bank. Project Appraisal Document: Proposed Loan to the Republic of Uzbekistan for Agriculture Modernization Project. 2020. https://documents1.worldbank.org/curated/en/434601585015259716/pdf/Uzbekistan-Agriculture-Modernization-Project.pdf.

[35] Juan Jose Robalino & Jack Bathe. Agriculture Sector in Uzbekistan and Karakalpakstan – Legal & Political Framework Review. GGGI Uzbekistan Insight Brief. 2022. https://gggi.org/site/assets/uploads/2021/08/Insight_Brief_Legal__Policy_Review_Agriculture_Sector.pdf.

[36] During the COVID-19 pandemic in 2020, small farmers were included in anti-crisis economic and social programs

system. Figure 2.2 shows the structure of production in Uzbekistan based on three categories of producers.

Figure 2.2: Composition of agricultural producers by % of total



Source: The State Committee of the Republic of Uzbekistan on Statistics

2.1.1 Production chain

Food processing accounts for 13% of Uzbekistan's GDP, 6.4% of total exports, 9.8% of total industrial investment, and is the fourth largest FDI recipient in the country.[37] The sector has a large potential and has been growing steadily in the past decade. Between 2014-15 and 2017-18, the number of registered food processing enterprises increased by almost 50%, from 8,050 to 12,065. Capital investments in food processing increased from US$102 million in 2015-2017 to US$495.7 million in 2018.

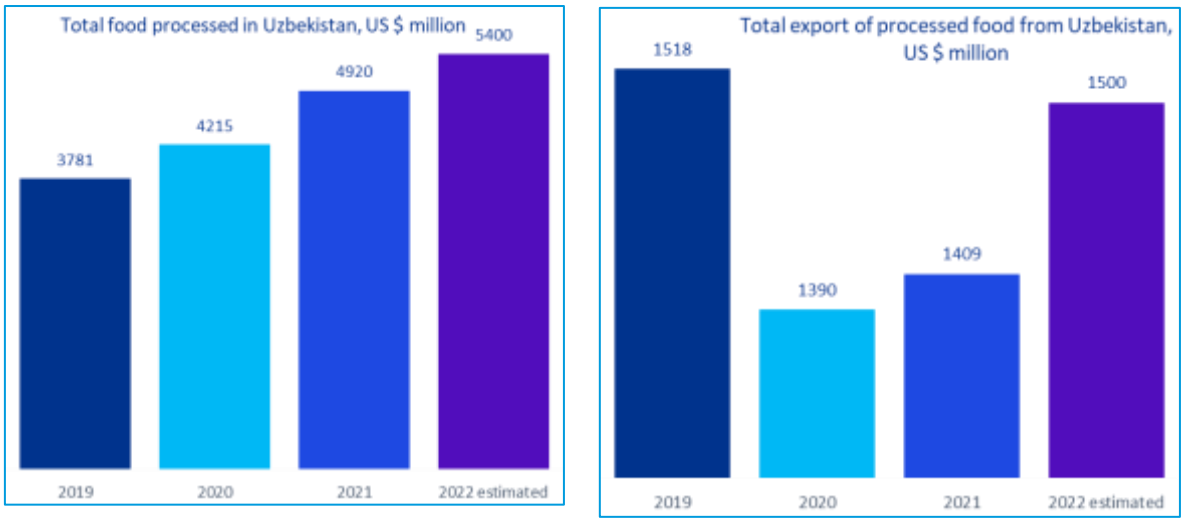
Uzbekistan targets to increase the level of processing, production, and export of value-added products – this is one of the priority areas of the Agriculture Strategy. There are unexploited opportunities in the processing sector, with only 15% of fruits and vegetables being processed, and only 16% of meat and milk being processed. The country targets to increase agricultural products processing to 7.4 million tons, processing of milk to 32% from total production, meat - 25%, and fruits and vegetables - 28% by 2026. Fifty investment projects in this sector, worth US$440 million,

[37] Food industry, Foreign Investment Promotion Agency under the Ministry of Investment and Foreign Trade of Uzbekistan, https://invest.gov.uz/ru/investor/pishhevaya-promyshlennost/ (accessed January 2023)

are planned for 2022. In 2021, GOU approved the list of 676 types of technological equipment (including for food processing equipment) for customs duties and VAT exemption at import.

On September 9, 2020, the Main Directorate for the development of the food processing industry at the Ministry of Agriculture was established in accordance with the President's Decree. The Directorate is responsible for creating a strategy for the development of food processing industry, developing collaboration between agricultural producers and food processing companies, facilitating construction of required trade and logistics centers, and promoting export of processed products. The Minister of Investments and Foreign Trade has been assigned to attract financing from IFIs.

Figure 2.3: Total food processed and total export of processed food in Uzbekistan [38]



In line with its commitment to increase processing, the GOU adopted a resolution[39] according to which the GOU will support new promising projects in the sector: up to 50% of the costs of development, infrastructure costs and the involvement of foreign experts will be reimbursed from the state budget.[40] The state subsidies in a total amount of US$1.85 million will cover 50% of the costs for:

[38] Foreign trade turnover of the Republic of Uzbekistan, Department of Statistics of Foreign Economic Activity and Trade, Preliminary data for January-December 2021, stat.uz, https://www.stat.uz/files/331/qrJanuary-march-2021/1530/8Foreign-economic-activity.pdf?preview=1

[39] "On measures to further support food producers". https://lex.uz/uz/docs/5834104 (accessed December 2022)

[40] Uzbekistan will start subsidizing promising projects in food production, 30 January 2022, EastFruit, https://east-fruit.com/en/news/uzbekistan-will-start-subsidizing-promising-projects-in-food-production/

- Development of a feasibility study for new promising projects on food production in an amount up to US$9,300 per project;
- Provision of infrastructure for new promising projects on food production up to US$9,300 per project;
- Involvement of foreign experts in the field of production and deep processing of food products up to US$4,600 per project.

Market conditions for food processing companies

Food processing is typically supported by wholesale, infrastructure, logistics, quality standards, consumer spendings, human resources, research and development, incentives, and GOU programs. In Uzbekistan agricultural productivity is lower than the productivity of other sectors of the economy. However, GOU, through its Modernization and Technical Re-equipment Programme, encourages producers to introduce new technologies and the emergence of industrial-scale farms.

Fruits and vegetables from Uzbekistan are primarily exported to Kazakhstan and Russia. The production of fruit and vegetables has the potential for further growth and the agricultural sector is growing to accommodate the demand for exports and the demand for domestic food processing. As mentioned above, only a small fraction of fruit and vegetables are processed (15%) and there is a high level of spoilage due to old methods for storage and processing (around 30% of total production of fruits and vegetables is lost annually due to insufficient storage and limited processing capacity.)[41] Around 25% of the harvest is wasted due to the market surplus, improper logistics and packaging materials. Currently fruit and vegetable farms operate below optimal capacity. Often, they are not equipped with the latest agricultural technology. Additionally, distribution systems are not linked efficiently.

Dairy farms are mostly small and are characterized as having low productivity. In some cases, a farm yields only a few liters of milk per day. Consumers in Uzbekistan buy processed milk and raw milk in rural areas. The volume of production of whole-milk products in 2019 in Uzbekistan amounted to 42.8 thousand tons, 2% lower than in 2018, while in 2018 the growth in the production of whole-milk products was 44%.[42] Dairy wholesale and logistics are usually handled by the dairy producers themselves. An efficient wholesaling system has not yet been developed, and dairy companies work directly with dairy farmers to obtain quality and reliability of sourcing.

There are many livestock farms in Uzbekistan, and the quality of Uzbek meat is generally high. The government policy was to increase the number of livestock to ensure employment and food supply. However, due to the internal shortage of meat in the country, GOU set prohibition on the export of meat and meat products, which limits the market for meat processing companies in Uzbekistan.

[41] All value data in the paragraph based on Uzbekistan - Country Commercial Guide, Food Processing, 8 July 2022, https://www.trade.gov/country-commercial-guides/uzbekistan-food-processing

[42] Uzbekistan. Dairy market, 2020, Daily News, https://dairynews.today/news/molochnyy-rynok-respubliki-uzbekistan-.html

The quality and efficiency of wholesale and logistics operations are not high but are steadily improving. Wholesale trade in fruits and vegetables is carried out by agro-firms established throughout the country, mainly to increase the export of agricultural products. They charge up to 20% for their services. As a result of high margins charged, some industries, like the sugar industry, organize their own logistics.

Uzbek consumers are consuming more processed foods as their purchasing power grows. The sales of fruit juices and bottled water have risen sharply, though per capita consumption is still lower than in Kazakhstan and Russia.

The availability and quality of packaging and labeled products in Uzbekistan is still relatively low. High investments are required if the quality of the products is to meet the international premium markets' export standards. There are, for example, several manufacturers of glass jars, as well as some specialized manufacturers, but relatively simple products such as cartons for fruit packaging still must be imported.

Export development

Policy reforms, along with the shifting policy environment, have led to changes in the export sector. In 2017, the state agency UzAgroExport regulated and facilitated all agricultural export operations was disbanded. This decision simplified the process for individual entrepreneurs, as it allowed them to export products without time-consuming licensing procedures, abolished the 100% prepayment requirement, and removed the minimum export price restriction. The reforms led to a sharp increase in exports in 2019 (although in 2020, due to COVID-19 restrictions, which included border closures and border crossing restrictions, the value of exports dropped).

Table 2.3: Agriculture Market Size, million USD

	2019	2020	2021	2022 estimated
Total Local Production	14,775	15,041	17,297	18,500
Total Exports	1,436	1,336	1,372	1,500
Total Imports	1,609	1,851	2,510	2,800
Total Market Size*	14,948	15,556	18,435	19,800

The State Statistics Committee of Uzbekistan

The initial reforms targeted at facilitating international trade are showing positive results and dynamics, including the increase in agricultural growth and agri-food exports. But compared with,

for example, Vietnam, Uzbekistan has just begun its export-oriented journey. A hectare of cropland in Vietnam generates US$3,650 of exports, while in Uzbekistan it is only US$760.4.[43]

The main obstacle to increasing exports of horticultural products for Uzbekistan is the lack of access to the sea, as well as its remoteness from key markets in Asia and Europe. Delivery to East Asia by land takes 30-60 days, and to Western Europe, 6-14 days. Air travel is for the most part prohibitively expensive and unaffordable for companies that want to take their products to new markets. One USAID project targeted and sought to eliminate the impact of transportation and logistics barriers by: 1) reducing costs to reduce transportation risk to new markets, and 2) introducing new packaging technologies to reduce labor and transportation costs. One feasible solution identified was pallet preparation technologies and market-specific packaging materials. Based on the results of five trial air shipments in 2017, the project determined that it was more appropriate to use air freight only for large shipments of high-value products. Additionally, given the challenges in logistics and transport in particular, the Horticulture Value Chain Infrastructure Project by ADB recommended to consider setting up of agro-logistic centers (ALCs) in Uzbekistan as marketing and logistics centers, rather than as agricultural production and processing centers.

The key export markets for key crops are Russia and Kazakhstan (Table 2.4). Other key markets are Turkey, India, Korea, and the EU. Self-reports from cold storage and processing partners show that most of the stored fruit is exported to Kazakhstan and Russia, followed by India, China and the Baltic States, with a small share of the EU, Turkey and Korean markets.

Table 2.4: Geography of export of fruits and vegetables (for January-December 2021)[44]

Country	thous. Tonnes	mln. USD	share in %
Russian Federation	396,0	291,8	30,5
Kazakhstan	231,6	196,5	20,5
Kyrgyzstan	131,9	116,7	12,2
PRC	130,7	111,7	11,7
Pakistan	32,3	63,3	6,6
Afghanistan	34,3	26,9	2,8
Turkey	15,2	22,5	2,4
Ukraine	31,2	15,2	1,6
Iran	12,3	11,7	1,2
Azerbaijan	9,7	11,6	1,2

[43] The World Bank. Ivailo Izvorski et al. Assessing Uzbekistan's Transition – Country Economic Memorandum. 2021.

[44] Foreign trade turnover of the Republic of Uzbekistan, Department of Statistics of Foreign Economic Activity and Trade, Preliminary data for January-December 2021, stat.uz, https://www.stat.uz/files/331/qrJanuary-march-2021/1530/8Foreign-economic-activity.pdf?preview=1

Country	thous. Tonnes	mln. USD	share in %
Belarus	15	11	1,2
Turkmenistan	27,7	9,9	1
Germany	4,4	9,3	1
UAE	5,3	7,3	0,8
Iraq	3,9	5,2	0,5
Other	40,2	46,7	4,9
Total	1121,7	957,3	100

Incentives for exporters

GOU provides incentives to attract foreign investments to agriculture. According to Section 21 of the Tax Code of Uzbekistan, tax incentives in the form of exemption from land tax, property tax and water use tax are provided to legal entities established with the attraction of foreign direct investment and specializing in the production of goods (services) in the selected sectors of the economy, including agricultural sector.[45] Additional tax benefits may be provided in accordance with the investment agreement concluded by a foreign investor with the GOU.[46]

In recent years, a number of structural reforms have been implemented in the sphere of foreign trade aimed at strengthening export potential, improving customs administration, and creating an effective system of incentives for doing business. Thus, to stimulate exports of domestic products[47], subsidies and compensation are provided to exporting enterprises to cover partially interest expenses on pre-export loans by commercial banks and railway transportation for exporting certain goods. VAT incentives are available for qualified exporters as well.

Further, with the objective to support export to existing and new market, the Export Promotion Agency under the Ministry of Investment and Foreign Trade provides financial assistance to

[45] Tax incentives are provided to organizations depending on the amount of investment:

- from $300,000 to $3 million - for a period of 3 years;
- from $3 million to $10 million - for a period of 5 years;
- above $10 million - for a period of 7 years.

[46] In accordance with the Law of the Republic of Uzbekistan "On investments and investment activities".

[47] Resolution of the President of the Republic of Uzbekistan No. PP-4337 of Measure to expend mechanisms of financing and insurance protection of export activities, 26.04.2022, https://lex.uz/docs/4351734

exporters to cover the costs associated with meeting international standardization and certification standards.[48]

Logistics for agriculture

High costs for harvesting, transportation, storage, processing, packaging, and certification of products before delivery to the final consumer reduce the profits of agricultural producers. Realizing the challenge, the GOU's Agriculture Strategy[49] pays special attention to the development of value chains.

Further development of the food industry and an increase in exports can be achieved through the rational use of existing opportunities and the expansion of deep processing of products. To increase the number of modern agri-logistics centers covering the processes of collecting, transporting, storing, processing, packaging and exporting agricultural products.

According to the data of 2019, there are 31 agri-logistic centers and 1.5 thousand refrigerated warehouses in Uzbekistan. However, the capacity of such warehouses allows to store only 4.5% of the total volume of fruits and vegetables grown.

As of beginning of 2021, 134 projects were implemented, and 4,744 new jobs were created in the logistics space:

- 17 modern agro-logistics enterprises
- 103 processing agro logistic companies
- 14 facilities for the processing of import-substituting agricultural products.

GOU set a task to increase the number of refrigerated warehouses to 4.5 thousand, agri-logistics centers - to 140 by 2025. It was instructed to organize such centers in Andijan, Samarkand and Tashkent regions using a concessional loan from the ADB.

However, there are certain challenges such as a lack of strong cooperative ties between the producers and processing enterprises.

Plans for digitalization and innovations in agriculture

GOU targets to increase farmers' income twofold and ensure a minimum 5% annual growth of agriculture in 2022-2026 through intensive development programs, application of advanced scientific achievements, digitalization, and adoption of new technologies. The further development of processing and packaging capabilities to add value to domestic and export products also remains a priority. Support for creation of vertically integrated clusters, 465 of which had been registered as

[48] Resolution of the Cabinet of Ministries of the Republic of Uzbekistan DCM No.826 on Approval of the regulation on the procedure for providing financial assistance to exploring organizations by the export promotion agency under the Ministry of Investment and Foreign Trade of the Republic of Uzbekistan, 31.12.2020, https://lex.uz/docs/5201216

[49] Decree of the President of the Republic of Uzbekistan dated October 23, 2019 No. PF-5853 "On Approval of the Strategy for the Development of Agriculture of the Republic of Uzbekistan for 2020-2030"

of 2022, and a cooperative system providing a complete production chain "from the field to consumer" to improve productivity, are a primary focus of ongoing agriculture reforms. Loans and grants in the amount of US$600 million will be attracted to digitalize agriculture, increase land fertility, and introduce modern agricultural technologies.

Agricultural Knowledge and Innovation Centers (AKIS) will be created during the 2022-2026 in all regions, providing more than 100 types of agricultural services on a one-stop shop basis, including such important services as improving soil conditions, combating plant diseases, and selecting seeds, and available innovative solutions[50]. Uzbekistan also needs to invest in modernization of the existing infrastructure. The GOU plans to double textile production by 2026, improve the value-added chain and hence process more of its own raw cotton into intermediary or consumer goods for export. Agriculture consumes 90% of water resources of Uzbekistan. The state is subsidizing the adoption of water-saving technologies and plans to save at least 7 billion cubic meters of water by 2026 through efficiency improvements. Uzbekistan currently ranks among the bottom 20 countries in the world in terms of water productivity, according to the World Bank, and produces only US$0.6 per cubic meter of water compared with a global average of US$15 per cubic meter. Currently large textile producers apply filter basins to minimize water pollution at production and reuse water, however, smaller textile producers in the regions of Uzbekistan mostly do not apply filter technologies for water and need to be supported by the state to apply green economy principles.

Marketing and Processing of Horticultural Produce

The distribution quantity of horticultural produce was 25.7 million tons in 2017. Of which, 67.0%, 6.4%, 3.6% and 12.7% were for regional consumption, urban consumption at Tashkent City, export of fresh produce and processing materials, respectively. Out of the 12.7%, export and local market accounted for 3.5% and 9.2%, respectively. Regarding processed products, dried vegetables/ spice powders, dried fruits and frozen vegetables /fruits are mainly exported, while fruits juice is used for domestic consumption.

The production of horticultural crops is increasing; however, a rapid increase of domestic consumption cannot be expected, due to the limited population growth ratio at 1.56% (IMF prediction, 2019). Therefore, export and processing of horticultural crops are significant measures to increase incomes and sales for farmers, traders, exporters, and processing companies. But the ratio of export, including fresh and processed ones, is only 7.1% of total amount, and further increase can be expected due to huge demands in Russia and neighboring countries. The distributing quantities of horticultural crops by the marketing channel are shown in the table below.

[50] AKIS CENTER - A NEW APPROACH TO THE AGRICULTURAL SECTOR USING INNOVATIVE TECHNOLOGIES AND SCIENCE, https://brightuzbekistan.uz/en/akis-center-a-new-approach-to-the-agricultural-sector-using-innovative-technologies-and-science/

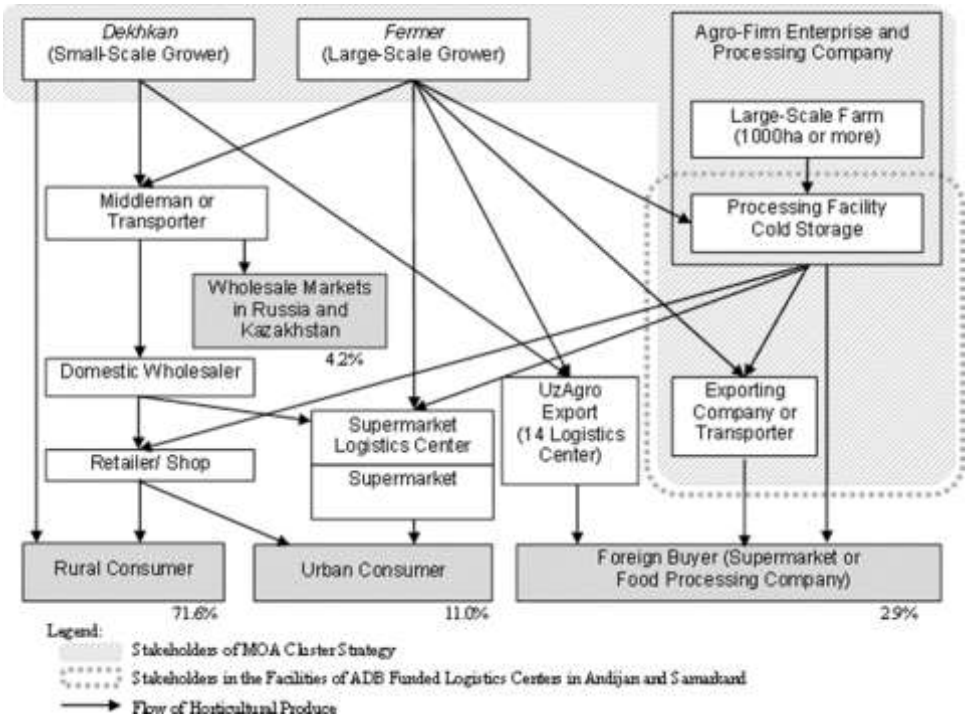
Table 2.5: Distributing Quantities of Horticultural Crops by Marketing Channel, tons

Crops	Total Distribution of Horticultural Produce	Fresh, Regional Consumption	Fresh, Urban Consumption in Tashkent City	Fresh, Export	Processing Materials	Stock (for next season)	Public Orgs	Seeds
Total & Percentage	25,664,918 (100%)	17,199,644 (67.0%)	1,647,111 (6.4%)	918,111 (3.6%)	3,262,825 (12.7%) (Export 3.5% Local 9.2%)	743,951 (2.9%)	1,097,369 (4.3%)	795,907 (3.1%)
Fruits	3,380,240	2,090,921	177,515	231,277	693,281	101,066	86,180	
Vegetables	12,962,574	8,637,011	883,882	243,275	1,991,839	320,648	642,502	243,417

Estimated by UzbekOzikovkatholding JVC, 2019 (in 2020 is restructured to the General Directorate for the Development of the Food Industry under the Ministry of agriculture)

In the past, horticultural produce used to be sold from farmers to middlemen, wholesale markets and retailer markets/grocery stores, but, in the recent decade, channels of horticulture crops through supermarkets have been developed in urban areas. For export, the routes are to Russian supermarkets by UzAgroExport purchased from farmers to wholesale markets in Kazakhstan and Russia by exporters, and to foreign food processing companies by Uzbek processing companies based on supply contracts for dried vegetables, concentrated fruit juice, frozen vegetables/fruits, and nuts.

Figure 2.4: Marketing Channels for Horticultural Produce



Ministry of Investment and Foreign Trade and the General Directorate for the Development of the Food Industry under the Ministry of agriculture, 2019

Clusters as processing drivers

The cluster system is currently in the stage of formation. As the GOU is encouraging the establishment of more clusters, there are several issues of an organizational and legal nature. However, its further development will make it possible to effectively use the production potential of agriculture in Uzbekistan.

The cluster system provides for the formation of a chain according to the principle "seeds - seedlings - growing products - harvesting - storage - processing - transportation - delivery to the market." There are 465 clusters in the country as of the end of 2022, fixed land areas devoted to clusters are: 2,210,385 ha, including, clusters – 282,004 hectares, behind farms – 1,930,975 hectares.

Given international experience, clusters as they are currently implemented in Uzbekistan—that is, providing a private operator with a monopoly over a particular crop in an area, while in turn being required to supply both finance and inputs to farmers—are unlikely to be optimal in the longer term:

- They create a regional monopoly for a single private operator. Farmers may prefer to have a choice of who to contract with and for how long. In some areas, a single processor may be more efficient but, in many areas, multiple processors and traders could compete, offering a range of long-term and short-term contracts;

- As financial and agricultural markets improve, farmers may prefer to arrange their own financing and procure inputs competitively, while selling into a competitive market.

However, given the existing cluster model, PPPs will provide a basis for improving its performance and can also serve as a bridge to more competitive and longer-term model.

Starting from 2018, the process of transforming industrial farms into diversified ones began to take place, which, along with production, are engaged in processing, storage, sale, industrial production of agricultural products, as well as the provision of agricultural services.

Standardization

The quality of food products and their competitiveness in the foreign market also depend on qualified laboratory testing. In this area, much remains to be done in Uzbekistan. Only 100 out of 775 international standards for testing food products that meet the requirements of the World Trade Organization have been introduced by 2021, and out of more than 100 laboratories operating in Uzbekistan, only 10 have international accreditation. All this hinders effective exporting products of Uzbek enterprises, as well as checking the quality of imported goods.

In this regard, the Uzstandard Agency, the Ministry of Health, and the relevant government inspectorates were instructed to increase the number of implemented food quality standards to 500 and organize laboratories capable of carrying out the full range of checks.

UZstandard has made some efforts to improve and maintain its recognitions including the following:

1. It is a member of ISO, an Associate Member of APAC and of BIPM. However, it is not a member of the international recognition bodies, ILAC nor IAF;
2. Most standards are adopted from internationally recognized source such as ISO, Codex and related sources;
3. Testing, inspection, certification and calibration services, and certificates are accredited by the Uzbekistan Accreditation Body; however, the Uzbekistan Accreditation Body is not internationally recognized, and the certificates issued by the overall UZstandards bodies could only be recognized within Uzbekistan;
4. In recognition of the importance of accreditation, including regional and international recognitions, the Accreditation Body is working to be full member of APAC, and an affiliate member of ILAC and IAF to join step by step international recognition;
5. Standards are harmonized within the traditional markets; there are memorandums of understanding with 48 countries established (2019).

In general, there are encouraging developments to enhance the capacity of the laboratories, inspection, calibration and certifications services; however, these services are not yet recognized internationally, and much effort and intensive and extensive capacity building programs are needed.

2.2 Legal framework and major policy reforms to date

The GOU started major transformation of the agricultural sector in 2017 as a part of Uzbekistan's Development Strategy (2017–2021) with an objective to modernize and increase sustainability of the sector. The reform agenda has been largely driven by the imminent climate change induced hazards (for example, the Aral Sea catastrophe and desalination of soil[51]) and their adverse impacts on agriculture and food security.

The GOU acknowledged there are several distortions plaguing the sector, and that a comprehensive reform program was necessary to make the sectors more productive and resilient. Starting in 2017, the GOU targeted reforms through various decrees and resolutions passed by the President of the Republic of Uzbekistan and the Cabinet of Ministers. Government work programs and initiatives broadly aim to:

- Support the efforts to improve and transform the long-term use and management of land, water, and agricultural resources and present resource-saving technologies;
- Introduce market relations and attract private investments into the sector; and
- Improve the public administration system, strengthen frameworks for relations among different production stages, and bolster capacity by providing modern facilities.

The GOU is aiming to abolish ineffective legacy state planning procedures and move towards market-driven principles of production and trade in agriculture. In 2017-2018, the GOU took actions to liberalize the trade of agriculture products and simplify cumbersome bureaucratic and administrative procedures for export: allowing business entities to export fresh fruits and vegetables on the basis of direct contracts; abolishing the requirement for surrender of 25% of foreign exchange earnings by exporting business entities; allowing businesses to export fruits and vegetables without a wholesale trade license.

Further, the GOU cancelled state order for the cultivation of agricultural products. Since the harvest of 2020, the state order for grain has been reduced by 25%, and starting from the harvest of 2021, the practice of setting state purchase prices for grain has been completely abolished. From June 1, 2022, the GOU switched to market prices when buying and selling grain to reflect a steep rise in global wheat prices in 2022 and to continue the sector liberalization.[52]

Also, since the harvest of 2020, the practice of setting purchase prices for raw cotton has been abolished. The GOU granted the producers of raw cotton (farms, cotton-textile clusters, cooperatives) the right to free variety placement of zoned cotton.

The Government's reform agenda has also prioritized a transformation of the cotton sector—a dominant but lower value-added agricultural product—into a more value-added industry. Thus, by 2026, the GOU plans to double textile production and improve the value-added chain. Specifically,

[51] Soil salinization has damaged over 50% of irrigated land (which produces 97% of agricultural output). https://thedocs.worldbank.org/en/doc/471affb83bf3d9de370fa691fa67561f-0080062021/original/Uzbekistan-SCD-preliminary-findings-en.pdf

[52] https://www.trade.gov/country-commercial-guides/uzbekistan-agricultural-sectors

the GOU seeks to reduce the exports of raw cotton and instead promote domestic textile production by processing more of its own raw cotton into intermediary or consumer goods for export. As part of these efforts, the GOU introduced an agriculture cluster system, focusing primarily on cotton cultivation but also including wheat and horticulture production. The agriculture clusters are expected to stimulate PSP, help boost technical progress, modernize the cotton value chain, and create more viable employment in the cotton textile industry.[53] The GOU has provided land to the cotton and horticulture clusters under long-term leases.[54] Under this scheme, small family farms will receive ten-year horticulture leases on 200,000 hectares of cotton and grain land transferred from large farms and clusters. Along with the textile clusters, the GOU established a legal framework and piloted on several districts of 4 provinces of the country reintroduction of the cooperatives and/or agriculture associations for horticulture producers starting from 2019, once the positive results of the pilot are proved to be viable, the GOU is expected to adopt a corresponding law of the Republic of Uzbekistan.[55]

GOU is promoting agricultural cooperatives as one of the primary forms of agricultural organization.[5657] In horticulture sector, farmers voluntarily form or join such cooperatives where they own, control, and benefit from the production and sell of products.[58] Legal framework exempts members of land cooperatives from state expropriation and land reallocation and allows them to freely select the crop structure, land allocation, and production targets.[59] However, state bodies supervise those structures and pre-define the location of cooperatives without necessarily consulting with farmers.

The core long-term strategy in agriculture is Strategy the for the Development of Agriculture of the Republic of Uzbekistan for 2020-2030.[60] This sectoral strategy aims to mobilize greater interest from the private sector and tackle issues of using natural resources and climate change.[61] The strategy paves the way for reduced state participation in the agricultural sector and activities aimed at increasing private sector interest and investments to enhance, diversify and support continued

[53] Government of Uzbekistan. 2019. Decree of The President No 5853 October 2019 on the Approval of the Strategy for the Development of the Agri-Food Sector for 2020–2030. Tashkent; World Bank. 2020. Cotton-Textile Clusters in Uzbekistan: Status and Outlook. Policy Dialogue on Agriculture Modernization in Uzbekistan. Washington, DC.

[54] Uzbekistan: Agri-Food Job Diagnostic. World Bank, 2020. Washington, D.C.

[55] Presidential Resolution no. 4239, dated 14 March 2019 on “Measures for development of agricultural cooperation in the horticulture sector"

[56] Presidential Decree no. 4239 (2019)

[57] As an experiment, eight agricultural cooperatives were planned to be created between 2019 and 2020, two each in Ferghana, Tashkent, Jizzakh, and Samarkand. Employees of these associations were expected to jointly engage in the production, procurement, storage, and sales of fruits and vegetables. However, no official detailed analysis of the results has been presented to the public (https://anhor.uz/news/fermeram-v-uzbekistane-predlozhili-obedinyatysya-v-kooperativi/)

[58] Constantine Iliopoulos. Public Policy Support for Agricultural Cooperatives: An Organizational Economics Approach. Annals of Public and Cooperative Economics. Volume 84. No.3. pp. 241-252.

[59] LexUZ Online. Decree of the President of the Republic of Uzbekistan on Measures to Develop Agricultural Cooperation in the Fruit and Vegetable Industry. English version available at: https://lex.uz/ru/docs/4242012.

[60] Decree no. 5853 (2019) on “Approval of the Strategy for the Development of Agriculture of the Republic of Uzbekistan for 2020-2030”.

[61] N.K. Yuldashev et al. Modernization and intensification of agriculture in the republic of Uzbekistan. E3S Web of Conference 222, 06033 – DAIC. 2020. https://www.e3s-conferences.org/articles/e3sconf/pdf/2020/82/e3sconf_daic2020_06033.pdf.

stable development in the agro-food sector. The strategy identifies challenges to the sector and includes proposals to address these challenges. Challenges identified include water deficiency for irrigation practices, which are the consequences of mismanagement, outdated technologies, and climate change. By addressing the challenges, the Strategy sets to increase annual agricultural exports to US$20 billion and employment in the sector by 1% by 2030.[62] The achievement of such goals involves nine priority pillars that aim to make the industry greener and more resilient, as summarized in Box 1.

Box 1: Priorities for Uzbekistan's transition to a green and climate resilient agriculture

Priority 1: Increase food security of the population

Priority 2: Create a favorable agri-business environment and value chains by:

- Enhancing the export potential and value-added production;
- Raising quality standards; and
- Strengthening the partnership between farmers and agricultural companies.

Priority 3: Reduce state involvement and improve the investment environment by facilitating investment to modernize, diversify, and sustainably develop the industry.

Priority 4: Ensure the rational use of natural resources and enhance environmental protection by restructuring and establishing new systems and structures to support farms and agri-businesses

Priority 5. Develop modern public administration systems.

Priority 6: Gradual diversification of state expenditures by:

- Maintaining efficient consumption of resources (water, land, forestry, fisheries); and
- Adapting and mitigating the negative impact of climate change.

Priority 7: Development of research, education, information, and advisory services by establishing an integrated yet flexible system to support farmers and businesses.

Priority 8. Development of rural territories.

Priority 9. Development of a transparent system of sectoral statistics.

As part of the Strategy, the GOU is developing new agricultural land and targets improvements in soil fertility and productivity through the introduction of new technologies.[63] By 2026, the GOU plans to put into circulation about 900,000 hectares of agricultural land, including land with water-saving technologies and drip irrigation. Adoption of modern technologies in Uzbekistan's agriculture has been very low and kept land and labor productivity as well as the overall farm profitability at low levels. At the same time, it offers opportunities to rapidly increase profitability by adopting technologies, including through public investments in agricultural knowledge and information

[62] Sergiy Zorya et al. Uzbekistan: Second Agricultural Public Expenditure Review. The World Bank. 2021. https://openknowledge.worldbank.org/bitstream/handle/10986/36561/Uzbekistan-Second-Agricultural-Public-Expenditure-Review.pdf?sequence=1.

[63] Loans and grants in the amount of $600 million will be attracted to digitalize agriculture, increase land fertility, and introduce modern agricultural technologies.

system (AKIS).[64] The further development of processing and packaging capabilities to add value to domestic and export products also remains a priority.

Table 2.6 below briefly summarizes recently passed pieces of legislation that form a legal framework for the sector.

Table 2.6: Main decrees and resolutions promulgated

Document	Main contents
DECREES	
Presidential Decree No. 2460, dated December 29, 2015 "On measures for further improvement reformation and development of agriculture for period 2016-2020"	With a greater focus on food crops, it was decreed that, between 2016 and 2020, the land area used for the cultivation of cotton and cereals to be decreased by 170,500 ha and 50,000 ha, respectively. Provisions were also made for the introduction of the more advanced agricultural technologies for irrigation and crop selection and diversification, as well as to better enable horticultural development.
Presidential Decree no. 5199 dated 9 October 2017 on "Measures to radically improve the system of protection of the rights and legitimate interests of farmers, dehkan farms and owners of household lands, effective use of agricultural acreage"	▪ Improve the system to protect rights and legitimate interests of farmers, dehkans, and owners of household lands; and ▪ Support the effective usage of agricultural acreage.
Presidential Decree no. 5330 dated 12 February 2018 on "Measures to radically improve the system of agriculture and water sector governance"	These decrees serve to create a system of state management of agriculture and water
Presidential Decree no. 5418 dated 17 April 2018 on "Measures to radically improve the system of state management of agriculture and water management"	
Presidential Decree no. 5708 dated 17 April 2019 on "Measures to improve the system of public administration in the sphere of agriculture"	
Presidential Decree no. 5853 dated 23 October 2019 on "Approval of the Strategy for the Development of Agriculture of the Republic of Uzbekistan for 2020-2030"	The Strategy's vision is to develop a competitive, market-based and export-oriented agri-food sector that will increase farm incomes, create new jobs, enhance food security and ensure sustainable use of natural resources. This vision is supported by nine priorities.
Presidential Decree no. 6159 dated 3 February 2021 on "Further improvement of the knowledge and innovation system, as well as the provision of modern services in agriculture"	The legal foundation for future improvement in the knowledge and innovation system and provision of advanced services in the sector
Presidential Decree no. 60 dated 28 January 2022 on the "Development Strategy of New Uzbekistan for 2022- 2026"	Includes a variety of initiatives such as additional green transitions, increased export potential, innovative agro-tech deployment, forest expansions, environmental and ecological protection. From an agricultural standpoint, goal 30 of the

[64] World Bank. 2020. "Uzbekistan: Agri-Food Job Diagnostic," World Bank, Washington, D.C.

Document	Main contents
	decree commits to having districts specialize in producing one type of agricultural product – thereby consolidating production – and scaling up export crops, intensive gardens and greenhouses. Goal 81 targets the expansion of forests, including those designed to protect irrigation lands from erosion and the incursion of salt and dust storms from the dried Aral Sea lakebed.
RESOLUTIONS	
Presidential Resolution no. 3318 dated 10 October 2017 on "Organizational measures on further development of activities of farmers, dehkan farms and owners of household lands"	Established a Council of farmers, dehkan farms and owners of household lands, which will represent the needs of the members of the Council, supports them with introduction of know-how, new agricultural technologies, exporting the produce, legal support for contracting needs.
Resolution of the Cabinet of Ministers no. 324 dated 17 April 2019 on "Measures to improve the efficiency of the use of farms and land plots"	A program to use farms and land plots to increase the agricultural production and improve income and living standards of rural people
Presidential Resolution no. 4919 dated 11 December 2020 on "Measures to further accelerate the organization of the introduction of water-saving technologies in agriculture"	The legal foundation to accelerate water-saving technologies in the sector by approving proposals from the MWR, the council of Ministers of the Republic of Karakalpakstan, and regional hakimiyats[65]
Presidential Resolution no. 5006 dated 24 February 2021 on "Additional measures to improve the system of use and protection of agricultural land"	Maintain the sustainability of relations regarding agricultural land; Cardinally improve the system of using, monitoring, and protecting agricultural land; and Introduce information and communication technologies in the agricultural sector.
Resolution of the Cabinet of Minister no. 149 dated 28 February 2018 on "Measures for the widespread introduction of market mechanisms in agriculture"	Approval of state-guaranteed purchase prices and volume of distribution of credit resources by regions for cotton and cereal crops
Presidential Resolution no. 20 dated 23 November 2011 on "Measures to develop family business in fruit and vegetable growing and viticulture, to increase the share of farms in agricultural production"	Measures to develop family businesses in fruit and vegetable growing and viticulture, as well as to increase the share of farms in agricultural production. Phased transfer of more than 200,000 hectares of land provided to citizens on the basis of the right of lease 0.1 to 1 ha at the expense of low-profit lands released from cotton and grain production. (In the past, dehkan farmers were not allowed to legally lease or sublease farmland and could farm only on their small plots, which have an average size of 0.17 ha and rarely exceed 1 ha). In addition, this Law permitted dehkan farms to have up to 10 livestock units, which had previously been restricted due to the lack of land for pasture and fodder.

[65] A hakimyat is a type of district administrative body in Uzbekistan, which typically consists of hakim (mayor) and deputies for capital construction issues, social-economic issues, and women's committee

Document	Main contents
Presidential Resolution no. 120 dated 8 February 2022 on "Approval of the program for the development of the livestock sector and its branches in the Republic of Uzbekistan for 2022-2026"	The Program for the development of livestock sector and its branches in the Republic of Uzbekistan for 2022-2026 is aimed at achieving priority goals and objectives for the accelerated development of the livestock sector and its branches, uninterrupted provision of food products to the population of the republic and expansion of production capabilities of livestock industries.

Source: GCCI. Legal & Political Framework Review for the Agriculture Sector in Uzbekistan and Karakalpakstan (2022). https://www.greengrowthknowledge.org/sites/default/files/2022-03/8.1%20Legal_%26_Policy_Agri_ENG_0.pdf (accessed in September 2022)

The role of the private sector

In 2019, ADB found that a lack of a robust PPP framework contributed to preventing the government from maximizing private sources to modernize, expand, and improve ageing or inadequate infrastructure.[66] The private sector was also constrained from participating in Uzbekistan's agricultural sector due to the dominance of state-owned enterprises (SOEs), inadequate land ownership policies, and underdeveloped credit market.

The GOU acknowledged that without an enabling environment for privately financed projects, Uzbekistan may not strategically maximize investments to support improved agricultural practices. In addition to the overall improvements in the PPP framework, the Ministry of Water Resources of the Republic of Uzbekistan (MWR) has committed to strengthening the sector's performance via PPPs by providing incentives for private stakeholders to participate in PPPs and present more efficient technologies and management approaches. In 2020, MWR promulgated a decree to engage private investors to develop the water sector more actively.[67] Measures presented in the Decree include introducing market principles for PPPs and implementing 50 water management projects on such principles. To date, MWR has authorized more than 100 projects in irrigation on the basis of PPP.[68] These projects mostly involve the transfer of ownership and operation of pumping stations in regional areas with costs up to UZS53 billion (US$4.875 million).[69]

Between 2019 and 2021, the PPP Development Agency under the Ministry of Finance had worked on 105 water management PPP projects with total value of UZS1,233.7 billion (US$110.4 million).[70] To boost execution of future PPP assignments, the Cabinet of Ministers had promulgated a Resolution to facilitate PPPs for rational water resources and agricultural facilities. In accordance

[66] Asian Development Bank. Uzbekistan, 2019-2023–Supporting economic transformation. ADB Country Partnership Strategy. 2019.

[67] Ministry of Water Resources of the Republic of Uzbekistan. On Approval of the Concept of Development of Water Management Sector of the Republic of Uzbekistan for 2020 – 2030. 2020. https://water.gov.uz/en/posts/1545735855/396.

[68] PPP Development Agency. List of Public-Private Partnership Projects Registered. 2022. https://www.pppda.uz/en/reyestrga-olingan-loyihalar.

[69] So'm (UZS) is the Uzbekistan currency, 1 USD = 10,870.8 UZS as of 30 August 2022 via xe.com.

[70] 1 USD = 11,170.6 UZS as of 27 October 2022 via xe.com.

with the 2022-2026 National Development Strategy, 53 projects in the water management sector are planned to be implemented. So far, 10 has reached the project documentation stage, 20 has been conceptualized, and feasibility studies are being prepared for the rest of the projects.[71]

Further, the suite of legal documents passed since 2017 aims to make the environment more conducive for greater private sector participation The GOU has started to reduce state overregulation and interference in the economy including in the agriculture sector, which is expected to positively affect the existing farmers and prospective new entrants.

2.3 Financing available to private sector

Financing available for private sector in agriculture in Uzbekistan includes various sources, such as state programs executed through state-owned banks and institutions, and on-lent concessional financing from IFIs.[72] State programs often provide subsidized loans and incentives to support farmers, dehkans, and processing companies. Additionally, loans for drip irrigation systems are provided by the state-owned banks under targeted state subsidy programs.

While there is available financing in the sector, interviews with the local private sector players reveal that loan sizes are too small to make a material growth or change in the sector. Most of the loans are provided for turnover rather that for capital expenditures, which means there is a limited financing available for processing companies. Additionally, loans provided to dehkans are small and are perceived as a support measure rather than targeted at expansion of the agricultural activities. The loans for agriculture do not exceed 5% of the banks' total loan portfolio even though agriculture is one of the key sectors in Uzbekistan. Therefore, significant additional financing in the sector is required to achieve a tangible growth both in farming but particularly in processing, logistics, and expansion projects.

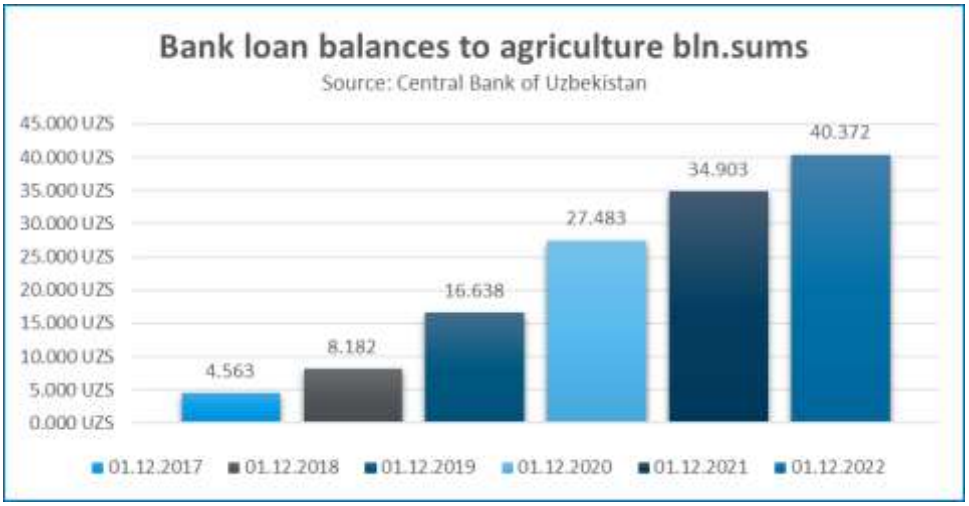
2.3.1 Financing from commercial banks

Commercial bank loans for agriculture are increasing. GOU offers commercial banks to open revolving credit lines to finance the introduction of drip irrigations systems, operations of agricultural clusters, purchasing new agricultural machinery for the farmers and agricultural clusters. However, loans in agriculture are mostly provided under the state-funded programs by the state-owned banks. Private banks do not typically provide any loans or bank products to the agricultural sector.

[71] Public-Private Partnership Development Agency under Ministry of Finance of the Republic of Uzbekistan. Information on the public-private partnership projects in the water management sector. 2022. https://www.pppda.uz/en/5433.

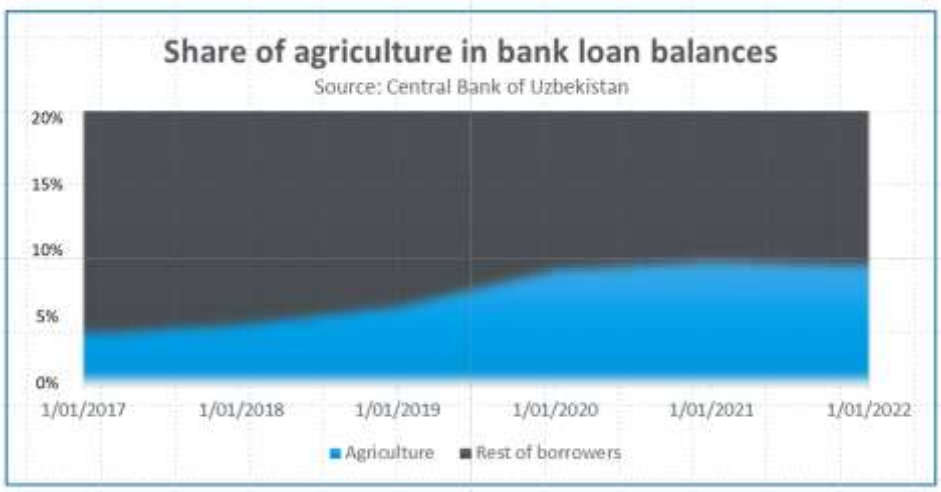
[72] For example, ADB's Horticulture Value Chain Development Project (Closed) provided a loan to participating financial institutions to on-lend to horticulture farmers and businesses for fixed asset investments to address the lack of long-term financing options (funds released for disbursement for on-lending amounted to US$340.2 million)

Figure 2.5: Commercial banks loan balances to agriculture



Source: Central Bank of Uzbekistan/ Statistics/ Indicators of Banking System. https://cbu.uz/en/statistics/bankstats/?arFilter_DATE_ACTIVE_FROM_1=&arFilter_DATE_ACTIVE_FROM_2=&arFilter_ff%5BSECTION_ID%5D=3497&year=2023&month=01&set_filter=&set_filter=Y (accessed January 2023)

Figure 2.6: Share of agriculture in commercial banks loans balances



Source: Central Bank of Uzbekistan/ Statistics/ Indicators of Banking System. https://cbu.uz/en/statistics/bankstats/?arFilter_DATE_ACTIVE_FROM_1=&arFilter_DATE_ACTIVE_FROM_2=&arFilter_ff%5BSECTION_ID%5D=3497&year=2023&month=01&set_filter=&set_filter=Y (accessed January 2023)

Agricultural sector farmers and producers often lack knowledge to develop quality business plans to support their loan applications. This often leads to rejected loan applications, while those who receive loans often have difficulties to pay back due to not being capable to sell internally or export their products.

2.3.2 Financing from GOU

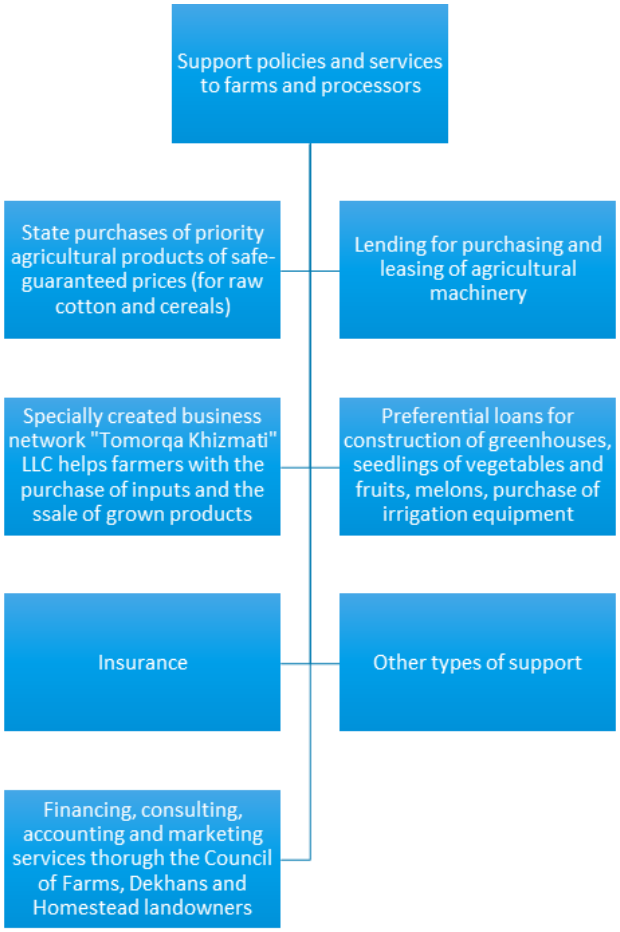
Uzbekistan has developed a policy-based finance system which accumulates and channels financial resources to priority sectors in agriculture, and to the related processing industries (such as agri-food processing and textiles). Strategy and policies to develop the agri-food economy consists of public support and commercial financing to agriculture.

The system of state institutions financing agriculture include:

- State Support Fund for Agriculture under the Ministry of Finance
- JSC Commercial Bank “Agrobank” (preferential lending)
- JSC “Uzagrosuguruta” (insurance)
- JSC “Uzagrolizing” (leasing of machinery)
- JS Commercial Bank “Kishlokkurilishbank”
- Council of Farms, Dehkans and Homestead Landowners (loans, services)

The diagram below shows the key roles of these institutions.

Figure 2.7: State support policies and services to farms and processors of agricultural products



State Support Fund for Agriculture under the Ministry of Finance[73]

The GOU has established[74] the State Support Fund for Agriculture tasked with the following responsibilities targeted at supporting the development of the sector:

- Providing financing for cotton and grain producers;
- Allocation, on a repayable basis, of a loan to stimulate the supply of modern high-performance agricultural machinery on preferential leasing terms to farms and other agricultural organizations involved in the cultivation of agricultural products for public procurement;
- Introduction and further improvement of the settlement financing system based on the use of modern information and computer technologies;
- Studying the experience of developing and developed countries in financing the agricultural sector with a view to the subsequent implementation of positive results in the republic.

Executing agents of the Fund are:

- JSC "Agroban"–- financing the cultivation of cotton and grain, purchases, as well as supplies of modern high-performance agricultural machinery on preferential leasing terms;
- JSC "Uzdonmahsulo" is a state-owned company responsible for the purchase, storage, processing and sale of grain;
- JSC "Uzagroleasin" and LLC "Uzmashlizin" responsible for the supply of modern high-performance agricultural machinery on preferential leasing terms;
- OOO "Tomorkahizmati" is a state-owned company responsible for providing seeds and equipment to farmers.

Commercial banks have various types of loans for agricultural enterprises which comprise loans for:

- Development of cattle breeding, poultry farming, fishery and beekeeping;
- Development of horticulture and fruit and vegetable farming;
- Development of viticulture;
- Creation of greenhouses, purchase of seedlings, mineral fertilizers, fuels and lubricants, purchase of equipment for chemical plant protection and their services;

[73] Official website - State Support Fund for Agriculture under the Ministry of Finance, https://agrofin.uz/ru/pages/view?slug=umumiymalumotru

[74] By Decree of the President of the Republic of Uzbekistan dated February 7, 2017 PD-4947 "On the strategy of action for the further development of the Republic of Uzbekistan" to support the implementation of the "Action Strategy for five priority areas of development of the Republic of Uzbekistan in 2017-2021"

- Purchase and repair of equipment for growing agricultural products;
- Construction and reconstruction of agricultural facilities, as well as the development of agricultural activities not prohibited by the legislation of the Republic of Uzbekistan.

Agrobank provided loans to farmers and dehkans under the following state programs:

- “On the organization of state financial support for agricultural producer", loans for cotton and wheat clusters are issued to farms from 30 ha size and more. The farmer can apply for any size of the loan for growing cotton/grain with the minimum borrowers’ own participation of 40% of the project size.
- “On measures to expand potato production and further develop potato seed production in the republic”. Starting from 2020, commercial loans for up to 12 months are allocated to finance the costs of purchasing seed potatoes. At the same time, at the expense of the State Fund for the Support of Entrepreneurial Activities, part of the interest rate on commercial loans issued in the national currency, exceeding the main rate of the Central Bank of the Republic of Uzbekistan, but not more than 10 percentage points is compensated. Also, up to 30 percent of the interest rate on loans issued in foreign currency, but not more than 3 percentage points is compensated.
- "On measures to further accelerate the organization of the introduction of water-saving technologies in agriculture". The bank issues an advance payment for the construction of a system of water-saving irrigation technologies in the amount of up to 70% of the total amount of financing. After the bank receives subsidies from the Ministry of Water Resources, the bank pays the contractor the balance of the loan amount in the amount of 30% of the total financing amount.
- "On additional measures to increase the provision of technical equipment for agriculture". Bank provides loan for purchasing agricultural equipment from Uzagroservice JSC.
- "Every family is an entrepreneur". The bank issues loans to individuals and legal entities who have expressed a desire to engage in family business in agriculture. The bank provides loan for the organization of gardening, viticulture, lemon growing (up to 7 years, grace period–- 3 years), and loan for animal husbandry, breeding of cattle, sheep, goats (up to 3 years, grace period–- up to 1 year).
- "On additional measures to improve the activities of farms, dehkan farms and owners of household land". The bank issues loans to agricultural producers to strengthen the material and technical base, purchase agricultural equipment and vehicles, purchase materials and components for the installation of greenhouses.
- "On measures to improve and increase the efficiency of work to ensure employment of the population”. The bank issues the credit lines and microcredits for small businesses, farms and dehkan farms.

2.3.3 Financing from IFIs

Financing is available to the private sector include from IFIs-funded projects that on-lend to private sector through intermediary local banks, or projects that invest in what could facilitate future PSP and investment. Below are some examples.

- ADB's US$198 million in additional financing is primarily aimed at supporting the horticulture farmers and businesses of Uzbekistan and the autonomous region of Karakalpakstan.[75] The funding, which will be provided through seven local financial institutions, will allow horticulture farmers and businesses to access long-term financing to invest in and improve their operations. In addition, the financing will be used to improve processing and storage capacity and reduce post-harvest losses through the establishment and upgrading of intensive orchards, modern greenhouses, and processing, storage, and refrigeration facilities. These efforts are expected to help increase the productivity and competitiveness of the horticulture industry, a key contributor to the Uzbekistan economy accounting for 32% of total employment and a significant portion of income in rural areas.
- World Bank approved US$200 million in financing for the Second Rural Enterprise Development Project (REDP).[76] The project aims to support the establishment and expansion of farms and rural enterprises in 10 regions of Uzbekistan, including Tashkent, Syrdarya, Jizzak, Samarkand, Kashkadarya, Surkhandarya, Navoiy, Bukhara, Khorezm, and Karakalpakstan. It aims to create new jobs and provide funding for micro, small, and medium-sized enterprises, and financial institutions in these areas. The project will also focus on measures to stimulate growth in the rural sector and improve access to technology and services for rural entrepreneurs. It aligns with the government''s""Strategy for Agriculture Development of Uzbekistan in 2020-2030. It is designed to provide both financial and non-financial support for rural MSMEs and financial institutions in Uzbekistan.
- Since Uzbekistan joined IFAD in 2011, the organization has approved three lending projects in the horticulture and dairy production sectors (including in-project grants) totalling US$128 million, as well as two regional grant-funded activities.[77] In 2022, IFAD renewed the new Country Strategic Opportunity Program (COSOP) for 2023-2027. The goal of this project is to provide direct support to Uzbekista''s most vulnerable population, dehkan farmers. The

[75] All values in paragraph are based on "Uzbekistan: Horticulture sector gets $198 million additional financing", 26 June 2018, HortiDaily, https://www.hortidaily.com/article/6044260/uzbekistan-horticulture-sector-gets-198-million-additional-financing

[76] Farmers in Uzbekistan to Get Better Access to Finance, With World Bank Support, 23 March 2022, World Bank, https://www.worldbank.org/en/news/press-release/2022/03/22/farmers-in-uzbekistan-to-get-better-access-to-finance-with-world-bank-support

[77] IFAD is first IFI to provide loan financing to horticulture and dairy in Uzbekistan, 24 February 2022, IFAD, https://ioe.ifad.org/en/w/ifad-is-first-ifi-to-provide-loan-financing-to-horticulture-and-dairy-in-uzbekistan

program exceeds US$600 million, including resources and co-financing from IFAD.[78] COSOP will use partnership and development coordination to implement transformative investment programs, support policy, and engage the private sector to create jobs. Youth will make up 30% of the direct beneficiaries, with a focus on rural entrepreneurship and equal access to digital technologies.The European Union (EU) has signed a financing agreement with GOU to provide a €40m (US$49m) grant budget support and complementary assistance to reform the countr''s agri-food sector[79]. The funds will be used to modernize public services and boost the production and export of high-value agri-food products in Central Asia. The EU is the main provider of grant funding to the agriculture sector in Uzbekistan, and the funding will be used to complement and facilitate large investments through loans, which aims to strengthen public services for farms and agribusinesses, improve access to information, innovation and knowledge, digitize the sector, reform training and education systems and invest in agri-logistics infrastructure and services. Reforms in the sector will encourage the production of other agriculture products, such as horticulture products, and will also help to protect natural resources and improve the livelihoods of people in rural areas.

- The United States Agency for International Development (USAID), as part of its agribusiness development activities, has established the"'Agribusiness Development Fun"' to strengthen the agricultural value chain, increase sales, create new jobs, and access new, high-value, markets in Uzbekistan. The Fund aims to support qualified/compliant agribusiness enterprises, especially those owned by women and youth and those that employ women and youth. The initiative is part of USAI''s five-year agribusiness development effort in partnership with the Ministry of Agriculture of Uzbekistan. The project is seeking concept papers requesting funding from the Agribusiness Development Fund ranging from UZS 100,000,000 to UZS 300,000,000.[80] The Project plans to select 10 applicants for co-investment as part of this announcement. The USAID Agribusiness Development Activity focuses on increasing the competitiveness of agribusinesses by introducing new technologies and management practices, empowering women, and youth to obtain skilled jobs within agribusinesses and launch their own agribusinesses and link agricultural educational institutions with the private sector.

[78]Uzbekistan and IFAD renew strategic partnership to address global challenges including food supply, 25 October 2022, IFAD, https://www.ifad.org/fr/web/latest/-/uzbekistan-and-ifad-renew-strategic-partnership-to-address-global-challenges-including-food-supply

[79] European Union provides 40 million EUR as Budget support to Agri-food Sector of Uzbekistan, 11 March 2020, Delegation of the European Union to Uzbekistan, https://www.eeas.europa.eu/delegations/uzbekistan/european-union-provides-40-million-eur-budget-support-agri-food-sector_en

[80] Grants for Domestic Private Enterprises to boost Agribusiness Development in Uzbekistan, 16 July 2021, https://www2.fundsforngos.org/latest-funds-for-ngos/grants-for-domestic-private-enterprises-to-boost-agribusiness-development-in-uzbekistan/

- The USAID Agricultural Value Chains Activity in Uzbekistan project was primarily aimed at supporting 510 organizations and businesses in the fruit and vegetable production, processing, cold storage, and exporting sectors in Uzbekistan.[81] Through this project, USAID allocated US$23 million in private sector investment to improve the quality and volume of agricultural production and post-harvest handling, facilitate market linkages, and link educational institutions with private sector demand to support the growth and success of these businesses. The project also provided over 100,000 hours of training and facilitated the emergence of 75 new consulting service providers, specifically targeting and supporting farmers in Uzbekistan.

2.4 Capacity Building

During the Diagnostic Study, the Consultant met with several public agencies. We observed several knowledge and skills gaps. These observations are in line with previous research and observations in the sector:

- Mostly there is a good knowledge of the sector and mechanisms in the national agencies in Tashkent, however, there is limited knowledge and skills in the regions and rayons of the country.
- Regional hokimiyats usually don't have a good understanding of the strategic goals in agricultural sector of Uzbekistan, and rather execute the instructions coming from the country's central governance.
- Limited knowledge of PPP mechanisms and best practices
- Limited capacity for tender documentation in PPP
- Limited capacity and skills for business planning, financial modelling
- Poor knowledge of legislation and laws in some of the agencies, and especially in regions.
- Gaps in the legislation lead to knowledge gaps.
- Lack of knowledge of export procedures and requirements.
- Application of international standards in sanitary services in agricultural production is limited
- Capacity need of modern cultivation and production of agricultural products
- Lack of knowledge of innovations applied in agriculture
- Lack of understanding of market rules in the sector
- Non-transparent, inconsistent financing in agriculture

[81] Uzbekistan—USAID Agricultural Value Chains Activity (Uzbekistan AVC), 2015-2020, DAI, https://www.dai.com/our-work/projects/uzbekistan-usaid-agricultural-value-chain-activity-uzbekistan-uzbekistan-avc

- Limited knowledge of effective land allocation
- Poor understanding of green products and green economy
- Lack of knowledge of which regions and land areas demonstrate higher productivity for particular cultures, fruits and vegetables
- Poor knowledge and application of compliance principles
- Limited knowledge of international standards for food security and requirements of developed countries for imported food products
- Lack of knowledge of storage and warehousing international standards
- Poor planning of water, energy and other resources crucial for the agricultural sector
- Limited application of governance principles for successful staff management and project implementation
- Absence of the national R&D facilities in agriculture sector
- Limited access to available information and/or limited number of actors for information dissemination in recent developments in agriculture
- Low education level of main stakeholders in agriculture, farmers, students, stemming from low knowledge base in education facilities.

Capacity building activities will be based on the selected topics above and ensure the participants receive knowledge and practical application of modern solutions in these areas.

3 Diagnostic of the existing gaps and opportunities

As the GOU is in the process of reforming the sector, there are still several gaps and challenges common across all industries in agriculture. In this section we present the feedback received from the private sector and a high-level review of the legal and regulatory base to identify common blockages for a greater PSP.

3.1 Feedback from the private sector

As a part of this diagnostic, we have interviewed several private sector players with current business operations in the agriculture sector in Uzbekistan. The table below summarizes the key issues the respondents identified as the constraints they face in their day-to-day operations (see Appendix A for the list of interviewed private sector participants).

The underlying themes that the respondents brought up during the interviews have to do with ineffective policies and decision-making at the different government levels. A common bottleneck identified by the respondents is the continued state intervention at different angles of the agriculture supply chain: from decisions on what to grow, what seeds to use and how much fertilizer to use to the decisions affecting large agro-clusters and private farms with regards to transfer of irrigation assets and facilities for rehabilitation and maintenance under PPP framework. In an overly regulated environment, business owners may feel restricted and unable to take decisions they think are more optimal for their business and which maximize their profit.

The respondents see risks in the outdated legislative base that can be open to misinterpretation as well as in new policies and regulations that are sometimes reversed or not applied as intended. It is not unusual that investors perceive a changing policy environment with elements of unchecked bureaucratic discretion as riskier and more uncertain than one which is stable and well-enforced in law.

The businesses who are familiar with Uzbekistan and know the “old” ways report less risk perception than foreign investors who are newcomers. Foreign investors reported they would more likely go to court in case of a dispute which takes more time and resources from their primary business focus. Disputes in question are related to informal requests or actions by state bodies, such as decisions on land use, fertilizers, pricing, volumes of production and sale, - all of which are based on arbitrary decision making rather than on business interests and profit optimization.

Table 3.1: Key constraints in agricultural sector based on the interviews conducted with private sector

Constraint	Description
Land is saline and needs additional drainage	Land productivity and crop choice is limited due to the high level of soil salinity. Reducing salinity levels can open up opportunities for growing more crops that are higher value (e.g., soya beans are very

Constraint	Description
	sensitive to salt; corn is more sensitive to salt than cotton but can offer 3 times the profit to producers). Farmers need international experts to improve land productivity, and access to the required fertilizers together with addition drainage.
Inefficient land allocation	State decisions on land allocation and use are often made without any consideration of market opportunities, profitability, or income generation opportunities. Further, frequent cotton-wheat rotations deplete soil quality in the long-term.
High losses in the water irrigation system and low water availability	There are high levels of loss in distribution of water to the districts and to the fields, largely because of underinvestment in O&M in the canal system and pumping over many years. As the state can't get the water to the farmer efficiently, the farmers are reluctant to pay charges for what they consider poor service. Further, the authorities can't always measure how much water is lost until it reaches a field, so the measurements and billing are not accurate, again, leading to the reluctance of consumers to pay
Storage facilities for wheat result in high spoilage and physical loss	According to a respondent involved in a wheat cluster, the state-owned and administered storage facilities do not meet modern standards (storage is on the cold surface rather than in silos) and result in high physical losses.
State land used inefficiently with little opportunity for private sector to rent it and optimize the use	Private sector participants observe widespread inefficient use of land but have no access to it. They suggest such land should be transferred to the interested private player with transfer of land rent agreement. There are loss making land areas, however, the state still does not provide access to such land. Private sector participants want to have right to buy rent contracts for such land and utilise it more efficiently.
Land regulations need improvement	When purchasing farmland, the area of land of farm facilities is transferred to the new owner, however,

Constraint	Description
	the fields area for harvesting is transferred to a local hokimiyat. The hokimiyat announces e-auction for this land and the new owner has to buy it for higher price.
Poor sanitary services	State budget for sanitary service authorities was cut, and now there is poor support. Farmers don't have enough knowledge and qualification to fight pests and illnesses and end up losing harvest.
Government directives intended to achieve food security disrupt the market and land productivity	The GOU orders to grow potatoes for food security purposes, and local governments use both mountainous areas and productive flat fields. This GOU practice results in lower land productivity in the next season. Similarly, on instruction of local government, farmers sowed soybeans between the rows of cotton which resulted in low harvest of both products. Overall, state intervention in decision-making often does not achieve the intended results or does not anticipate fully the unintended adverse consequences.
Underdeveloped seed production	The GOU buys cotton seeds from China that provide harvest one time. Each new harvest requires buying new seeds.
Cluster system works inconsistently	The cluster system works inconsistently. There are successful clusters, and clusters that harvest cotton for short-term profit without further processing. This leads to a missed opportunity for production of the value-added goods.
PPP projects for irrigation are not well implemented	To date, there were many irrigation PPP projects implemented in Uzbekistan, however, in many cases farmers do not agree to pay for water as service. This is because there was no policy for payment for irrigation water. As a result, private partners in PPPs face challenges in collecting user fees and repaying the investments they made in modernizing the network.
Farmers have no freedom to choose to whom to sell their products	Farmers are required to work with specific clusters based on the orders of local regional/rayon authorities.
Farmers can change price for products on their own	Prices for farmer's products are not regulated, and farmers that have more power change sales prices

Constraint	Description
	on their own. This brings to unstable costs for processing plants. Farmers need to be educated on general market rules for working with processors to establish long-term relations and contracts, rather than provide overpriced raw products.
No stability for raw products supply	The processing and production sides do not have a stable supply of raw products. E.g., farmers provide different volumes of milk/meat during different periods making supply unpredictable and leaving spare capacity at processing sites.
Financing by commercial banks is not transparent	There are four banks that provide state subsidies and loans to agricultural sector in Uzbekistan. According to the respondents, these banks adopted lending policies that are not very business friendly. For example, to receive a loan, Agrobank requires borrowers to transfer all their business accounts to an Agrobank branch, even the accounts of non-agricultural companies of the borrower. This requirement disincentivizes some private players from using the available financing and subsidized rates. Further, the banks provide loans for only 35% of collateral value limiting the maximum amount to be borrowed and invested.
Subsidy programs are executed poorly	The GOU announces subsidies to the agricultural sector; however, the farmers and producers do not receive them in many cases. They are not properly informed in availability of subsidies, and corruption is stated to be in place.
Frequent changes and reversals of state policies do not provide peace of mind	The GOU significantly decreased subsidies for cattle farms having seen fast statistical growth in the subsector. However, this was because farmers started showing their real volumes instead of made-up numbers.
Legislative acts are too regulative and restrictive	Directives and Decrees are issued on an annual basis; however, some are overly regulative and do not take into account market conditions. Further, the execution is not always properly monitored and often gives lower-level state bodies discretion to misuse their power and apply regulations in a way that does not maximize the benefits as intended.

Constraint	Description
Some legislative provisions need an update to better reflect the current state of the sector and the GOU's ambitions vis-à-vis the transition to market principles	There are some outdated legislative provisions that should be revised. For example, the term "breeding farm" has been changed to "breeding stock" in most post-Soviet countries, but not in Uzbekistan, opening loopholes and avenues for misinterpretation and misuse. The application of breeding farm means all stock of the farm is breeding, however, this may not be a reality. Additionally, farmers are mostly not familiar with the "breeding stock" that divides the stock to the breeds and gives an understanding of which breed is the best to produce the specific milk-processed products.
Delayed state decisions can harm the private sector	During the Covid19 pandemic, products under some customs codes were prohibited for export. After the pandemic ended, the relevant GOU agency has not lifted restrictions on all products, with some still being on the list of export restrictions (e.g., meat processing products under code 1602). The producers suffer as the result and lose potential clients and profit (for example, meat processing plants receive requests from potential clients from Kazakhstan and other neighboring countries, however, are unable to export).
Lack of qualified human resources in the sector and lack of knowledge of modern techniques and methods	Jobs in agriculture are not considered to be prestigious and are low-paid – hence do not attract a lot of interest from young people. Recent graduates of agricultural universities are not adequately prepared to meet the demand of the private sector, in terms of knowledge, skills, and practical experience. This creates an issue of labor shortage of educated professionals. The existing experts tend to be older and not acquainted with the new research and improved methods in agriculture. Some respondents mentioned they faced difficulties in recruiting specialists, with one respondent having to bring an American or European specialists and pay very high fees for their services.
Farmers are conservative and have high resistance to change	Although the respondents (cluster heads) tried to suggest technologies to increase efficiency of farms, the farmers are resistant to change and do not adopt new technologies and methods.

3.2 Recommendations to improve PSP/PPP regulatory and institutional framework

Consultations with the private sector and a review of past studies demonstrate that the regulations do not always translate to practice as originally designed and intended. This is sometimes the result of the lack of capability and understanding at the lower levels of implementation. Regional governments do not always receive the required level of explanation of the purpose of a particular decree or regulation and act by inertia using old methods which are based on the system of state direction.

Globally, jurisdictions which successfully introduced genuine competition in agriculture have erased prohibitive norms and reduced state interference giving the private sector a high degree of freedom to choose what to grow, how, and what to do with their harvests. These markets gradually transferred to market principles.

Currently, a number of existing legal documents in Uzbekistan are restrictive and are not well defined, creating opportunities for misinterpretation not in favor of the private sector. For example[82],

Table 3.2: Example of legal clauses that are not good practice for facilitating market principles in agriculture

Reference article	Comment
Article 5 of the Law on Farming obliges farms to ensure crop yields are not lower than the normative yield established by law	This regulation is an example of administrative control rather than providing freedom to private players.
Articles 457-460 of the Civil Code require farmers to hand over agricultural products to agricultural processors by signing a compulsory contracting agreement	This requirement contradicts the mechanics of real market relations, i.e., providing the freedom to buy and sell agricultural products on market terms.
Article 10 of the Law on Farming obliges ensuring efficient and rational use of land[83]	However, "efficient and rational use of land" is a subjective term. Farmers may invest in low value crops to increase land productivity or plant high value crops based on long-term plans. The Law of Farming does not take this into account, and by this, disincentivizes farmers to behave as landowners and adopt long-term use strategies that maximize the potential of the land over a long term.

[82] Streamlining and simplifying the obligations of farmers. ASK Briefing: October 8, 2021

[83] Law of the Republic of Uzbekistan on Farming, Article 10. The procedure for granting land to farms, 26 August 2004, https://faolex.fao.org/docs/pdf/uzb70917.pdf

Reference article	Comment
Article 17 of the Law on Farming obliges the farmer to plant seeds on the land from the first year of lease	However, farming practices may require the farmer not to use the land for a year or more to increase land productivity or for other purposes. Once again, this regulation goes against a good practice of formalizing the rights and terms of farmers and landowners in a lease agreement, rather than in law.
Article 17 of the Law on Farming requires farmers to supply the state with the agricultural products in the established volumes in accordance with the concluded agreements	This regulation limits the freedom to choose whom to sell their products to and with whom to enter contracts (including the government).
Article 17 of the Law on Farming obliges the farmer to comply with environmental requirements and other environmental regulations	However, environmental legislation in Uzbekistan is not in line with best international practice.
Article 17 of the Law on Farming requires to improve land reclamation, maintain, and increase its productivity, and to allocate funds for these purposes in the business plan	This obligation is not necessary if the requirements exist and are clearly regulated. If a business plan is required to apply for a lease, then the minimum requirements for it may include a commitment to demonstrate how the land sustainability is ensured.
Article 17 of the Law on Farming obliges the farmers to use water in accordance with the contract for water consumption, taking measures to save water, targeted and rational use of water resources	This does not consider irrigation necessity for particular types of crops. This obligation needs to be removed and replaced by a clear legal framework defining good agricultural and environmental practices (which also includes water management).
Article 17 of the Law on Farming also requires the farmer to ensure the protection of agricultural plants from pests, diseases and weed	However, there are no clear phytosanitary regulations and measures for the use of pesticides and fertilizers. Additionally, there is no effective system for registering pesticides and licensing pesticide sellers in the country. This leaves room for corruption, and farmers are less protected under such regulation. Any and all clauses that allow a broad interpretation should be specified and an effective mechanism should be created.
Article 22 of the Law on Dehkan Farms requires that dehkan should ensure the protection of the interests of dehkan farms and their members and the realization of their rights	These obligations are unclear and lack specific provisions. Such a broad wording creates the risk of interpretation against the interests of farmers.
Article 23 of the Law on Dehkan Farms obliges dehkans to participate directly in the activities of the dehkan farm	This provision implies that the dehkan households are to support the agriculture activities themselves without external support of hired labor. This regulation is prohibitive and does not align with market principles whereby a farmer can choose to involve the most profitable labor force.

Some further examples of problematic provisions are:

- There are no private property rights for the land[84]. This is the main principle of the national legislation which directly affects the agriculture system in the country and its further development.
- The Land Code of the Republic of Uzbekistan (Article 23) clarifies that only non-agricultural lands can be privatized. If there are no private property rights for agricultural lands, there will be reluctance to invest in such lands by farmers. The idea that the land lease agreement held by a farmer can be terminated by the state anytime is the main obstacle why the banks and other finance institutions are not very interested in crediting the farmers. In such circumstances, the optimal economic solution for farmers is to intensify the output from their land plot by extensive use of herbicides, pesticides, and other special chemical products. As a result, there is overuse, degradation of the meliorative conditions of the land plots with collateral damage to the environment.
- The Law "On water and water consumption" of the Republic of Uzbekistan confirms (Article 3) that the water is a state property. There is no mechanism of the cost calculation of the water for irrigation purposes in the Law. There is a water consumption tax used for irrigation purposes. Due to the almost ubiquitous absence of the water flow meters, farmers pay for the water mainly based on the consumption norms considering the size of their land plot used or leased. This approach is not accurate and makes the water a semi-free resource and leads to inefficient consumption. Inefficient water consumption in the dry and semi-dry areas, which are a major part of the entire territory of the country, consequently, will have severe effects on the environment and health of the population. The Aral Sea tragedy lessons must be considered.
- The Tax Code of the Republic of Uzbekistan (Article 57) defines agricultural producers as legal entities (i) who use for the production at least 80% of their own raw products from the overall volume processed, and (ii) who operate appropriate land plots if it is needed for their agricultural production. Moreover, industrially processed agricultural products are not recognized as agriculture production. The income tax rate applicable to agriculture producers is 0%. Notwithstanding the minimum income tax rate, businesses working in the agriculture sector are not able to take the benefit from it due to stringent requirements in order to be recognized as an agricultural producer.

While this TA and this deliverable are not diving deep in the study of regulatory and legal gaps that may be creating blockages in the GOU's pursuit to transition the agriculture sector to market-based principles, the overall impression is that there is room for revision and update of unconducive regulations. The GOU should strive to align its regulatory framework broadly to follow the market-based principles in regulating relations between the players in the sector. That is, allow for more decision-making freedom and minimize state control and intervention. This can be done, for example, by eliminating articles that regulate what can be (and should be) decided contractually

[84] According to Article 55 of the Constitution of the Republic of Uzbekistan "The land, …, the water, … and other natural resources are the national wealth, shall be rationally used and are protected by the State".

between the parties. Similarly, revising regulations and eliminating those that are restrictive. In the next phase of this TA, it will be important to engage with public sector agencies and staff at different departments and levels to identify how the decisions are made at higher levels and how they are transmitted to the level of implementation at more local/regional levels. A diagnostic of institutional capacity would provide more visibility on possible gaps and blockages in the process of translating new legislation to practice and applying it as was intended by policy and law makers. Identifying gaps would in turn allow to develop targeted trainings and capacity building activities.

Further, a detailed legal and regulatory review is out of scope in this TA, however, would be a beneficial exercise for the GOU, especially with the technical support of donors and IFI partners.

3.3 Remaining constraints for PSP

Despite the GOU's efforts to simplify the legislative framework and to transition the sector to market-based principles, some issues remain and hinder a greater PSP in agriculture in Uzbekistan. While there are several types of challenges as reported in various studies and analyses, in this diagnostic study we focused on the barriers that undermine the appetite of the private sector to come in and invest in pre- and post-production supply chain infrastructure. In day-to-day operations, we can identify gaps with respect to inadequate infrastructure and value-chain issues that contribute to a suboptimal operating environment for the private sector, for example, gaps in R&D, agro-services provision, lack of financing options, issues with the logistics (physical loss of produce during storage and transport, inadequate marketing infrastructure, multiple intermediaries, etc.) and post-production infrastructure and links. However, we do not delve in detail into each single factor that needs improvement, instead we explore what we find to be the key constraints presenting material risks to potential investors in the supply chain.

In Uzbekistan, as in other countries, the factors that typically keep private investors from doing more in the agricultural supply chain fall into three main categories:

- Rules and regulations that restrict business operations;
- Pricing distortions – artificial price interventions make some investments unviable and increase risk for investment even if it is profitable;
- Insecure and unreliable operating environment – frequent changes in government actions and operational decisions create risks and disincentivize businesses to enter a market.

In its study on Uzbekistan[85], USAID also found[86] that the country needs to adopt best practice, specifically a) provide consistent enabling policies, and 2) reduce barriers to, and incentivize, investment to better encourage businesses to invest and/or diversify investments as well as to

[85] Uzbekistan's horticultural sector specifically but this is true across other sub-sectors in agriculture.

[86] USAID. 2020. Agricultural Value Chains. Activity in Uzbekistan. Final Report. https://pdf.usaid.gov/pdf_docs/PA00X611.pdf (accessed January 2023)

mitigate risks for investors. We take these recommendations to diagnose the main constraints for PSP in Uzbekistan in the following sub-sections.

3.3.1 Rules and regulations that restrict business operations

Agricultural sector is overregulated

Agricultural sector in Uzbekistan is one of the most regulated by the GOU. Every year, MOA issues a decree [87] that regulates allocation of 4.5 mln ha of irrigated land by category of products (cotton, wheat, types of vegetables and fruits). The Decree regulates the volume of agricultural products in the country, and farmers are allowed to cultivate only the specified products on the particular land areas.

Land is provided to farmers under a land lease agreement for 49 years, however, the purpose of land use is regulated under the agreement. Farmers of larger land plots[88] mostly cultivate cotton and wheat, while other farmers and dehkans mostly cultivate fruits and vegetables. They sell products to the cotton and horticulture clusters. The clusters are controlled by the local governments, and according to interviews with private sector players, they often offer an unfair price and/or admit the cotton as a second-rate grade or dirty. This reduces the incentives to increase efficiency of cultivation as although the farmer provides higher quality of cotton, he/she is paid the same price per kilogram as all other farmers in the same cluster. As farmers are not allowed to use the land for other purposes, they do not receive ownership of land and are not incentivized to increase land fertility for long-term effectiveness.

The resource and inputs market are also regulated by local administrations. Farmers buy agricultural machinery, fertilizers, feed, seeds, fuel and lubricants, and others, from the state-owned monopolists. Prices for some resources are subsidized, however, the available amount of subsidized resources is limited depending on the size of cultivation. Fuel, fertilizers, and seeds are provided only by state-owned companies.[89] Agricultural machinery, fuels and lubricants materials, fertilizers, feed, seeds, biological and chemical plant protection products, etc. are supplied to farmers by state monopoly companies. Prices for some inputs are often subsidized. The amount of resources that can be purchased for more than low (subsidized) prices is limited and determined by the sown area of cotton and wheat and their expected yields. Farmers can receive fuel, fertilizers, and seeds only from the state-owned companies operating in the area where they are located. There is no competition between resource providers, which leads to lower quality, uncompetitive pricing, and limited options.

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[87] "On the approval of the Regulation on the procedure for the rational placement of agricultural crops, compliance with the land balance, improving the liability of farms and officials for violation of the placement of agricultural crops, the accounting of the sale of products, and ensure the fulfillment of contractual obligations". Available: https://lex.uz/en/docs/3897377?ONDATE=28.07.2021

[88] Roughly 85% of the agricultural land is cultivated by large farms, while the remaining area is cultivated by nearly five million small dehkan and household units. Large farms produce largely cotton and wheat as part of the state order system, with an average plot size of 100 ha. The dehkans' small plots are often not registered (informal) and have an average size of 0.3 ha. Smaller households cultivate largely higher-value horticulture and livestock products.

[89] Interviews with farmers and private investor

Land rights regulation

Farmers are required to use land "efficiently" or "rationally" according to the national legislation[90], however, there is no clear definition of these terms. This creates room for subjective judgment, undermining the farmer's secure right to land use. In the past local governments (hokimiyats) used this loophole to use these terms to confiscate land from long-term leases.

GOU made a number of changes in land regulation to make the process of land allocation more transparent and fairer, however, there were still gaps that allowed local governments (hokimiyats) apply old system approaches and exercise control over land leases. According to the interviews conducted with the private sector, hokimiyats could confiscate land and terminate leasing contracts based on discretionary decisions. A recent Presidential Decree[91] specifically targets the ad hoc decisions (often unfair and corrupt according to some respondents) by hokimiayts with respect to land allocation.

According to the Decree, the power of local government bodies relating to managing land relations, as well as the right to make decisions, orders or other types of documents, are cancelled. Hokimiyats will no longer be able to directly allocate land plots, provide for use, reserve for subsequent allocation, fix, provide land for improvement or other disposal of land plots. An exception is made only for allocating land plots for state organizations. In addition, hokimiyats will not be able to establish, recognize, change, cancel rights to land plots, transfer irrigated lands to the category of rain-fed land or to another category, and transfer rain-fed agricultural land to another category of land, as well as provide land for collective gardening, viticulture and melon growing, farming. Moreover, hokimiyats are deprived of the authority to establish investment obligations in relation to privatized land plots or other obligations that limit the free disposal of private property. These changes are expected to protect the rights of the landowners and lease holders and stimulate them to invest in the long-term land productivity and improve harvest yields.[92]

3.3.2 Pricing distortions

GOU sets procurement prices for cotton well below market export prices. Given black market exchange rate, cotton price in Uzbekistan floated around 30% of the potential export price between 2000 and 2016. In 2017, GOU decreased the price gap, while for 2018 the price was 37% lower than the export price.[93]

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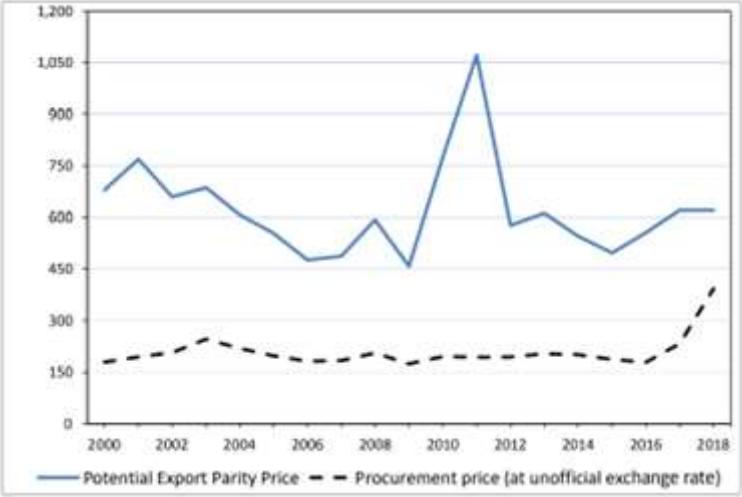
[90] ASK Briefing, Streamlining and simplifying the obligations of farmers, 8 October 2021

[91] Decree of the President "On measures to ensure equality and transparency in land relations, reliable protection of land rights and their transformation into a market asset." dated 1 August 2022

[92] According to the Decree, the Ministry of Finance was instructed to prepare a procedure providing full or partial compensation for the costs of buying out land plots through an electronic online auction to individuals subject to special social protection and those whose land plots were withdrawn for state and public needs by the local GOUs. The Republican Council headed by the General Prosecutor was also created to detect and prevent violations of land legislation and recent changes. Bodies of the Agency for Cadastre now have the right to apply directly to the court in case of misuse of land plots. All procedures related to the selection and approval of land plots are put to an electronic online auction and open tender to ensure transparency

[93] Recent changes in Uzbekistan's cotton procurement: Implications and reform agenda ahead, December 2018, Nodir Djanibekov, and Martin Petrick

Figure 3.1: Procurement and potential border prices of cotton, constant 2016 US$/t



The continuous gap between export and producer prices results in GOU budget to benefit from the difference rather than farmers. This leads to a limited interest of the private sector in the cotton business. There is a need for market level pricing for cotton in the country. This will motivate farmers to increase productivity and yields and invest in technologies. Higher profitability will allow farmers to provide higher wages, including cotton pickers, and make the sector more attractive for the labor force. Additionally, market pricing is a key to attracting private investments in ginning, increasing farm incomes and stimulating productivity growth.

In 2020[94], GOU announced the termination of the system of public procurement for production of wheat.[95] The respective resolution canceled the state targets production and procurement, as well as public procurement prices for farmers, starting from 2021. Due to the COVID-19 pandemic, which negatively affected food security of Uzbekistan, the implementation of this reform was delayed by at least a year.

The abolition of the public procurement system complements the liberalization of bread prices in 2018 and the liberalization of the wheat flour price in 2019. Instead of public procurement (in the amount of 3.2 million tons in 2020) there will be state stocks of grain (in the amount of 1.7 million tons in 2021), which will replace state procurement. A GOU decision of April 13, 2020 established a temporary procedure providing sale price of flour on the basis of direct contracts to all types of

[94] Resolution of the President of Uzbekistan No. 4634

[95] Assessing Uzbekistan's Transition, Country Economic Memorandum, Ivailo Izvorski, Arman Vatyan, Eskender Trushin, Husein Abdul-Hamid, Nicolo Dalvit, Maksudjon Safarov, Mariana Iootty Marina Novikova, Martin Melecky, Mohirjon Ahmedov Natalia Manuilova, Sergiy Zorya, Vinayak Nagaraj, 2021, World Bank

consumers. In accordance with the current legislation, prices for products (vegetables, fruits, sugar, butter, pasta, chicken meat, etc.) are not regulated by the state.[96]

3.3.3 Insecure and unreliable operating environment – frequent changes in government actions

Lack of contractual protection

The Ministry of Justice, as part of the "Fermerga Madad" (Support to farmers) campaign, studied the most frequent cases of violation of the interests of farmers.[97] The study showed 156 thousand errors and shortcomings in contractual relations between farmers and purchasing, supply and service companies. In 565 cases, a land lease agreement was not concluded with the farmers, and in 794 cases a copy of the land lease agreement was not provided to the farmers. This allowed local hokimiyats to confiscate land plot from farmer and was evidence of no protection of the farmer.

The cotton farmer typically has contracting agreements for the sale of products, contracts with more than 20 enterprises and organizations for the purchase of fertilizers, fuel, plant protection products and other goods, for loans, mechanization, and other services. However, the study showed that in most cases, procurement, supply, and service enterprises use their monopoly position, and sometimes with the intervention of government authorities, they act contrary to the interests of farmers. In 34,861 cases, contracts between manufacturers, service providers and farmers were concluded late, and 48,396 contracts were not registered with the territorial departments of agriculture. Often farmers are asked to sign empty contract forms without a full understanding of the terms and rights. Having no choice and limited education and protection, farmers sign the contracts. Of the more than 10 thousand farmers who took part in a social survey to determine the level of freedom and equality in contractual relations, 70% said that most contracts were signed in an unfilled form (blank forms), and 5% said that contracts were not signed at all. Moreover, in 7531 cases products grown by farmers using a monopoly position were taken away without concluding a contract.

According to the study, 36.4% of the interviewed farmers responded they experience an excessive number of various meetings and instructions, 32.6% - the impossibility of concluding independent agreements with contractors, 19.6% - interference in agrotechnical activities and 11.4% - a large number of checks.

While the Ministry of Justice took actions to address the problems identified, GOU could work in parallel and strengthen the institutional capacity and execution in regions and rayons to ensure compliance with the legislation, and importantly, enforce the real protection of farmers and the private sector players.

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[96] Who sets prices in the markets: response of the Antimonopoly Committee, 2021, Suriya Magdeeva, Darakchi.uz

97 Lack of contracts, monopolies, debt clusters. The Ministry of Justice voiced the problems of farmers, 25 August 2021, Gazeta.uz, https://www.gazeta.uz/ru/2021/08/25/farmers/

Subsidy programs boosted the sector development, however, were terminated too early

GOU launched subsidy programs in the agricultural sector to stimulate sector development. Farmers received subsidized loans for cotton and wheat production and water irrigation. In 2021, GOU approved the provision of subsidized loans for vegetable production. In 2019, it terminated the provision of payments for growing cotton on soiled land. Dehkans, who did not have access to any support programs before, began having access to subsidy programs.

The benefits and support measures for the livestock industry were also approved. On 8 February 2022, President Shavkat Mirziyoyev signed a resolution aimed at developing animal husbandry in Uzbekistan. The document prescribes to increase subsidies for VAT-paying farms raising large and small cattle by two times. Until 31 December 2023, subsidies for 1 kg of live weight of cattle sold for meat (beef, lamb) increased from 2,000 to 4,000 soums. For 1 liter of milk, instead of 200 soums, 400 soums is paid. In addition, with the introduction of rain and drip irrigation on areas used for fodder crops, livestock farms receive 8 million soums per hectare. Up to 20% of the cost of hydroponic forage equipment is also covered. The maximum amount of compensation is 100 million soums. Agricultural machinery for sowing, collecting, and harvesting fodder manufactured no more than 5 years ago, components and spare parts for it, are exempt from customs duties and recycling fees until March 1, 2025. In addition, the state (through the Agricultural Support Fund) partially covers the costs of agricultural machinery purchased on credit or on lease. A portion of interest payments exceeding 10% is covered.

Support measures are also planned to develop cooperation between enterprises in the meat and dairy industry and households. In 2022-2023, the supply of livestock to citizens by at least one meat and dairy enterprise in each district, processing and sale of their products is organized. Companies that have established cooperation with households in the production of meat and milk receive a lease of land for fodder crops with the condition of supplying fodder to the population. Such enterprises receive subsidized interest rate on loans for livestock projects (up to 20 billion soums), which exceeds the main rate of the Central Bank by no more than 8%. These loans are issued for the construction of livestock complexes, the purchase of breeding stock, the production and processing of livestock products. In addition, the companies have access to loans from the funds of international organizations involved in animal husbandry. The term of the loan wis 10 years with a grace period of 3 years.

The support programs required the loan recipient to report on production results. Motivated by access to subsidies, the farmers started reporting actual production volumes to the GOU, which was not done before in the grey economy to avoid tax payments. In two years the GOU treated the results as an actual boost in production volumes and took the decision to significantly decrease value of subsidies for the cattle breeders and milk producers in 2022. However, interviews reveal that the program almost does not provide subsidies and was terminated too early, as farmers are getting back to the grey economy habits continuing to report lower production volumes to the GOU.

Dialogue between state and the private sector is being developed, however, is still very limited

The European Union project ASK (Agriculture Support and Knowledge) with the support of the Ministry of Agriculture of the Republic of Uzbekistan created a platform for ongoing agricultural reforms and for a dialogue between state organizations and private sector. The dialogue took place at the AKIS Center for Agricultural Knowledge, Innovation and Services in the Tashkent region in

October 2021. The agricultural specialists, beneficiaries of previous agricultural lending programs, researchers from regional agricultural research institutes, farmers, gardeners, and livestock breeders participated at the event. The purpose was to discuss the existing constraints and possible solutions. These was conducted in Fergana, Navoi, Samarkand and Kashkadarya regions. The platform for public-private dialogue was planned to be held quarterly at the regional and republican levels.

The GOU organises and conducts dialogues and individual consultations with the private sector participants; however, this practice is still limited. The events are not regular, and the feedback provided by the private sector is not properly analysed and acted upon. Additionally, large producers often do not participate at such events having perception that the events do not make a real change.

Public-private sector dialogue needs a practical application and be supported on a regular basis. E.g., during interviews, we revealed that private producers of meat and its sub-products have a restriction for export of the products, however, they don't know the reason for this. The reason for restriction is the lack of meat and meat products for internal consumption in the country, however, this is not communicated to the producers. State officials are used to restrict "according to the government decision", however, mostly do not communicate the reasons to the private sector stakeholders and the parties involved in the industry. This results in a limited dialogue between the parties and a limited trust from the private sector to cooperate with the government and provide constructive feedback.

3.3.4 Infrastructure and skills adequacy

Electricity reforms are in place, but still can't provide a stable power supply

Energy supply remains a significant constraint to the effective development of the agricultural sector in Uzbekistan. Today, about 20% of total energy supply is consumed by the agricultural sector.[98] There are issues in diversification of electricity supply sources and availability of energy at farms. In addition, the local state authorities in regions control the power supply and can cut it off based on own decisions. As an example, in October 2022, 268 greenhouses at 700 ha plot were turned off from gas during a cold snap. The estimated loss was 70 thousand tons of crops, or US$30 million of export value. After a high-level official intervened, the supply of power was restored.[99] According to the research,[100] due to insufficiency and unavailability of power, more than 30% of melon cultivation, horticulture and viticulture products does not reach the consumer.

Institutional gaps in agricultural value chain cause sector underdevelopment

EU Ask Facility conducted the Tashkent Regional Agri-food Assessment and Planning Initiative in May 2022 to assess the performance of existing agri-food value-chains in the region and services provided. According to this assessment, there are institution gaps in value chain in Tashkent region.

[98] Uzbekistan Ministry of Energy, https://minenergy.uz/ru

[99] https://www.gazeta.uz/ru/2022/10/28/greenhouses/

[100] A. Radjabov, "Problems and prospects of the development of technology for the use of renewable energy in agriculture." Materials of the International conference "Prospects for the development of renewable energy sources in Uzbekistan", Tashkent. March 28-29, (2018)

The Consultant conducted interviews with the farmers in Fergana, that confirm presence of these gaps in the region also.

The major gap is the lack of institutional management capacity and inter-sectoral systemic linkages. Farmers do not know the currently provided extension and research services. E.g., according to the USAID 2022 survey in Tashkent region, most farmers surveyed state that they receive agriculture-related knowledge from the internet, other producers, or TV. Only 2% of the respondents replied that they obtained knowledge from state support services and professional mentors. There is a lack of professional skills, and the specialists have very limited experience. Additionally, there is a lack of young specialists in research institutes with 4% of the national in the research institutes are under 30 years old. The specialists have very limited access to updated knowledge in agriculture, and, therefore, they mainly use skills, the science and concepts that were prevalent before.

Wrong application of mineral fertilizer due to the lack of agrochemical mapping and the lack of necessary laboratory equipment for complex analysis leads to farming inefficiencies and limited land productivity. A lack of proper and up-to-date equipment, tools and machinery in relevant research institutes and service providers lead to a low educational level of agricultural scientists and inaccurate results of the research.

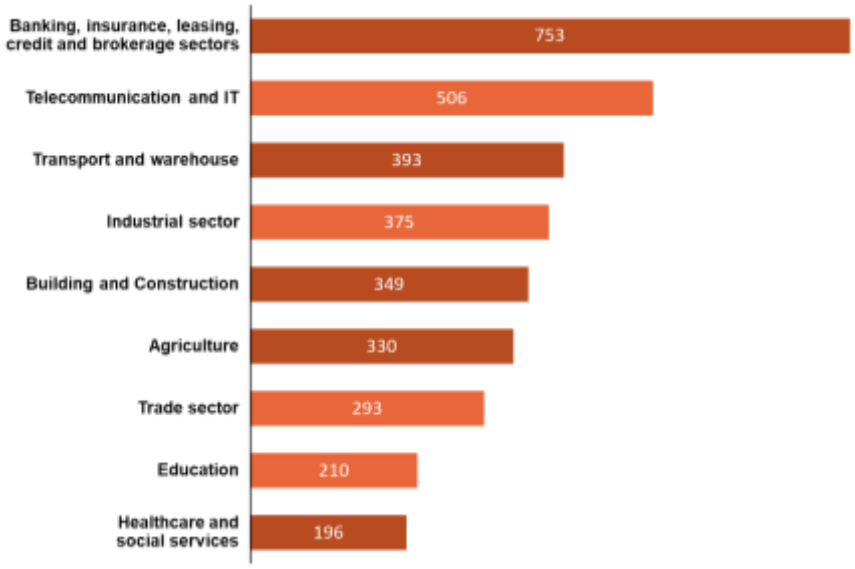
According to the assessment, there is no appropriate control and monitoring of the certification mechanism. E.g., certificates issued by the institutes in the agricultural sector do not meet pedigree farm standards. In addition, there is limited progress in research and development in the agricultural sector in the country, e.g., no new breed/line of animals has been developed during the last 30 years.

Lack of professional workforce and knowledge base result in application of outdated traditional cultivation methods

The system of knowledge and innovation in agriculture AKIS in Uzbekistan was developed by MoA approved by Presidential decree dated of February 3, 2021 No. UP-6159 "On further improvement of the system of knowledge and innovation, and provision of modern services in agriculture." The AKIS Center is a new platform for a wide range of agricultural services to farmers, dehkan farms, clusters, owners of household plots. AKIS establishes cooperation of local farmers and clusters with advanced foreign research institutions, introduces new scientific developments, innovations and digital technologies, coordinates research activities of all types of state scientific and higher education institutions in the field of agriculture. However, interviews conducted with farmers and private sector participants revealed that there are still constraints in production technologies applied and knowledge of the workforce.

There is a lack of educational institutions that offer professions in agricultural sector. And those institutions that do offer degrees in agriculture (i.e., the Tashkent State Agriculture University and the Tashkent Institute of Engineers of Irrigation and Mechanisation of Agriculture) do not produce graduates who take up jobs in agriculture. We understand this happens because of the lower industry-wide pay. The graduates from agriculture universities end up working in other sectors that offer better wages and more attractive career prospects. Average salary in agricultural sector is significantly lower than in other sectors of the economy as the figure below shows.

Figure 3.2: Average salary in Uzbekistan by industry, 2021, US$



Source: Committee of Statistics of the Republic of Uzbekistan, stat.uz

There are limited agro-professional and advisory services available to farmers. According to an interview with a private company in Fergana region, the only learning source for local farmers available is through a local private consulting company ("Fruit House Organics") that provides consulting services and trainings to fruit farmers. There are limited trainings offered by the government.

Unable to find quality professionals locally, private players sometimes invite professional agronomists and irrigation specialists from abroad, pay high salary rates for this, and conduct related trainings to local farmers. However, the farmers are conservative and mostly do not apply the recommendations to practice. According to our interviews, farmers lack trust both in the government and the private sector (such as clusters) and often try to act in their own interest even when this means not complying with contractual terms. We learned about an example from a private player who contracted a land lease contact for production of paprika products. The private player provided seeds for paprika to farmers, however, the farmers sold the harvest at local bazaars and only offered the leftovers to the private producer. The private player gave up the project. Another respondent in the milk industry offered another example of farmers being reluctant to change traditional methods - farmers who produce 15L of milk per cow a resisted to change their traditional approach that could increase milking productivity to up to 30L and more a day.

4 Cotton

Cotton is a strategic crop for Uzbekistan and its major export commodity. Uzbekistan is a significant cotton grower, ranking 8th in the world in terms of cotton production.[101] Cotton production has traditionally been one of the key industries in Uzbekistan, characterized by a significant state presence in all steps of the value chain. The state presence meant strict rules imposed on the farmers: the state specified the purpose of land use, established production quotas, and bough all cotton from domestic producers at fixed procurement prices that were below export parity prices, and producers were obliged to sell their cotton exclusively through official channels.

Not all state directives generated the most socially and economically beneficial outcomes. For example, cotton production is water and labor intensive; it is also of relatively low value if exported as raw product. Prior to reforms, cotton farmers didn't have much room for optimizing production and generating high profits.

The GOU started to liberalize the cotton market in 2020[102] with an objective to reduce cotton cultivation area in favor of higher value crops, increase cotton yields, and increase exports of higher value cotton products (e.g., textiles) away from cheaper raw cotton exports. Thus, the country targets to increase exports of ready-to-wear garments to US$20 billion by 2030.[103]

As of 2020, 73 cotton-textile clusters operate in Uzbekistan comprising 73% of the country's cotton production. A cluster is a group of enterprises that unites market participants in the value chain (farmers, processors, exporters) to consolidate production and post-harvest services to improve efficiency and economies of scale. The GOU's main objective for establishing clusters in Uzbekistan was to introduce modern market relations, create new jobs, introduce advanced agricultural technologies, improve competitiveness of products, and increase the volumes of production of finished goods and export volumes. GOU provides several incentives to attract investors to cotton agro-clusters. For example, GOU provides tax, customs and land benefits to foreign companies working through clusters to stimulate private investments and vertical integration in textile and clothing. However, the incentive mechanism in Uzbekistan is ad hoc. Each project is subject to a separate decision by the President or the Cabinet of Ministers. The IMF has recommended moving away from this practice of 'granting' incentives towards the provision of targeted subsidies from the budget.

The Commonwealth of Independent States (CIS) countries are the main importers of textiles from Uzbekistan; however, Russia and China are the key importers of Uzbek yarn and textile. Recently, GOU signed an agreement with the European Union (went into force in June 2017), which reduced the tariff for Uzbek textile goods. An agreement between Uzbekistan and Georgia on lowering shipping charges on railways opened improved access to Turkey and European markets.

[101] Data for 2021/2022. Statista. https://www.statista.com/statistics/263055/cotton-production-worldwide-by-top-countries/ (accessed December 2022)

[102] Decree of the President "On measures to widely introduce market principles in the cotton sector". March 2020

[103] Cotton and Products Update, Caglar Erdogan, 2020

Despite the ongoing efforts to facilitate market relations, there is still a degree of state presence and direction in the sector. For example, producers can buy seeds from the state only.[104] The state defines the price at which the farmers should sell cotton to clusters, often lower than the market price. Informally, some hokimiyats set output expectations on the producers even though there is no more production quota. Further, officially farmers are given freedom to sell cotton to any cluster, but in reality, there are cases when local administrative officials restrict farmers from selling cotton to the clusters outside their region.[105]

Farmers are generally not interested to improve land productivity as they are not given ownership rights to the land, they cannot choose seeds, fertilizers, according to the interviews with farmers the price for cotton is fixed by GOU, and in some cases by local hokimiyat, and they are not allowed to change crops cultivated even if the purpose is to improve the quality of soil. Additionally, there is degradation of land due to the decades of cotton-wheat rotation, and a deficit of water, which makes farmers invest in their own water supply at high cost or wait in long lines for water supply.

5 Wheat

Uzbekistan produced 6.0 million tons of wheat in 2021/2022. The main regions of grain production are located in the southern part of the country due to higher rainfall – Kashkadarya, Samarkand, Jizzakh, Ferghana, Tashkent, and Surkhandarya. The harvested area for grains is estimated at 1.4 million ha in 2021.[106] The GOU has committed to reduce the growing area of wheat in favor of high value horticulture products. With that, the focus shifted to improving the yields.

Domestic wheat production doesn't meet the domestic demand – only about 78% percent can be supplied with locally grown wheat.[107] As such, Uzbekistan continues to be net importer of wheat with almost all imported wheat coming from Kazakhstan – over 90%. In 2020, the country's import of wheat was worth US$598 million. The key reason why Uzbekistan imports a significant volume of wheat is the low baking quality of local wheat. The country's historical land tenure policies focused on yields (quantity) rather than quality. Hence, this policy did not promote diversification of wheat varieties and production of better-quality wheat.

GOU announced that from 2021 it would reduce the volumes of wheat purchased through the state order system with a gradual transition to market rules. However, to date, the GOU retains control over the grain market to ensure stable prices and the availability of the crop it considers as a staple.

The state continues to participate in regulating wheat production and supply chain. Almost all areas assigned for cotton production are linked to private textile companies that facilitate raw cotton production and process cotton into higher value products such as yarn and textiles. The state

[104] Seed Development Center under the Ministry of Agriculture

[105] Expert interview

[106] Uzbekistan is adopting a new wheat trading system, AgFlow, 2022

[107] Production is estimated at 8.5 million tons in 2022/23, which meets about 78% of domestic demand. USDA

decides on the purchase price for wheat instead of letting the market settle the price. Thus, in 2022, the state decided to double the purchase price for wheat.[108] Recently, the state authorities were instructed to conduct the registration of farmers and grain-growing clusters, assign brokers to clusters, train cluster employees for the exchange trading. This was initiated because farmers have mostly been working without formal registration and did not use financial reporting. GOU is formalizing and creating transparency of business activities in agriculture to better account for the scale and needs of the players, and target support measures more effectively.

There are several constraints preventing a more active role of the private sector in wheat production and processing. According to some studies, the farmers involved in wheat production, as well as cotton producers, are not properly protected by the state. According to the study conducted by the Ministry of Justice, as part of the "Fermerga Madad" (Support to farmers) campaign, grain clusters did not pay 12 billion soums for the delivered grain to 859 farms in the Tashkent region, 4.2 billion soums in Mubarek district, 3.9 billion soums in Angorsk district, and 3.7 billion soums in Kasbinsky district. Moreover, more than 40% of the interviewed farmers said that they were forced to transfer grain in excess of the amount specified in the contract.

Additionally, we have interviewed several farmers cultivating wheat and private sector players with current business operations in the agriculture sector in Uzbekistan. One of the key issues the respondents identified as the constraints they face in their day-to-day operations is poor storage facilities for wheat which lead to high spoilage and physical loss. According to a respondent involved in a wheat cluster, the state-owned and administered storage facilities do not meet modern standards (storage is on the cold surface rather than in silos) and result in high physical losses.

Wheat producers also stated there are poor sanitary services. The state budget for sanitary services was cut while farmers don't have enough knowledge and qualifications to fight pests and illnesses and end up losing harvest.

The wheat industry also faces an issue related to soil fertility. The reason for the decline in soil fertility over the years is the lack of nutrients in the soil, as well as the fact that after harvesting wheat, the remains of stubble are not introduced into the soil but are burned. In Uzbekistan the amount of humus in the soil in most areas under crops is well below the standard (about 0.7-1.0%). In addition, the number of mobile forms of phosphorus and potassium in the soil is also not presented everywhere in sufficient quantities. Instead of the required 90-110 kg per hectare, only 45-50 kg of phosphorus fertilizers are applied, and instead of 60-80 kg of potash fertilizers - 15-25 kg is applied. This leads to lower yields and nutrients-deficient soil for the next growing seasons.[109]

[108] From 1.55 million soums/ton in 2021 to 3 million soums/ton in 2022. "Uzbekistan is adopting a new wheat trading system", AgFlow, 2022

[109] The Ministry of Agriculture is working to develop solutions to increase soil fertility (humus content). Starting from 2022, it is introducing a new crop rotation on 50,000 hectares of inefficient grain fields - grain + alfalfa-cotton. The remaining stubble after harvesting will not be burned but plowed into the soil.

6 Fruits and vegetables

Thanks to the GOU's agricultural reforms supporting the shift from cotton and wheat to orchards and vineyards, Uzbekistan's horticultural products are fast becoming the second largest agricultural export commodity group, after cotton. Horticultural export revenues have more than tripled since 2006.

Uzbekistan ranks among the top ten countries in the world in the export of apricots, plums, grapes, nuts, cabbage, and other fruits and vegetables. Today, Uzbekistan exports more than 180 types of fruits and vegetables (and products made from them) to more than eighty countries. In 2021, Uzbekistan produced more than 15.6 million tons of fruits and vegetables.[110] Of the 10.9 million tons of vegetables produced in 2021, dehkans produced about 60%, and private large established farms – the remainder. Of the 2021 fruits and berries harvest of 2.85 million tons, 1.57 million tons (or, 55%) were grown by dehkans, and 1.2 million tons (42%) by private large farms. Between 2016 and 2021, vegetable production increased by 6.5% in volume from 10,184 thousand tons to 10,850 thousand tons, while fruits production increased by 9.2% from 2,613 thousand tons to 2,853 tons in the same period.

In terms of export, in 2021, the share of fruits and vegetables in total exports amounted to 5.8%.[111] The main export markets for fruit and vegetable products are in the Russian Federation, Kazakhstan, Kyrgyzstan, and China. In January-June 2022, the share of fruits and vegetables in total exports amounted to 4.5% and was 821 thousand tons in physical terms. The growth rate compared to the same period in 2021 amounted to 11.6%. The main export markets for fruits and vegetables remained Russia (36.3%), Kazakhstan (24.5%), China (9.8%), Pakistan (4.9%), and Kyrgyzstan (4.8%).

The largest share in the export of fruit and vegetable products is occupied by grapes (including dried raisins) - 10.9%, tomatoes - 9.4%, mung bean - 9.1%, cherries - 7.4%, cabbage - 7.2%, onions - 5, 2%, peaches - 4.0%, melons and watermelons - 3.6%.

The GOU is actively supporting the production of horticulture and greenhouse farming in the country. The Action Strategy for 2017-2021 listed investment in horticulture value chains and the conversion of the land previously used for cotton and cereal crop production to horticulture crops as priority areas for the development. In this vein, GOI established[112] the Agency for the Development of Horticulture and Greenhouse Management under the Ministry of Agriculture with relevant departments and sectors at the regional and district levels. The Agency's key responsibility is to provide support to the growing areas of intensive orchards and greenhouses using modern resource-saving technologies, including drip and rain irrigation, and develop a system of cooperation and a cluster form, including the entire production chain from harvesting to sales of fruit products.

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[110] Production of the main types of agricultural and fishery products, January-December 2021, Agro.uz, https://www.agro.uz/wp-content/uploads/2022/02/viloyatlar_va_toifalar_kesimida_2021_yilda_ishlab_chiqarilgan_mahsulot.doc

[111] All data based on Goskomstat data.

112 Established by the Decree of the President of the Republic of Uzbekistan "On measures for the further development of horticulture and greenhouse farming in the Republic of Uzbekistan" issued on March 20, 2019.

The Agency established the Fund for the Development of Horticulture and Greenhouse Farming to finance implementation of comprehensive targeted programs aimed at the sustainable development of horticulture and greenhouse farming. Additionally, the fund subsidizes costs for installation of water-saving irrigation technologies based on drip and rain irrigation for new gardens and greenhouses. Further, the State Fund for Supporting the Development of Entrepreneurship under GOU provides guarantees to small businesses for the creation of intensive gardens and greenhouses on loans from commercial banks in the amount of up to 50% inclusive of the loan amount, but not more than 5 billion soums.

As of April 2022, there are about 6.5 thousand hectares of greenhouses in Uzbekistan[113], including 1.1 thousand hectares (17% from total) are hydroponic and 4.9 thousand hectares (83% from total) are soil-based greenhouses. In 2021, 271 thousand tons of products were produced in the greenhouses of Uzbekistan, including 167 thousand tons of tomatoes, i.e., 62% of the total greenhouse production. In 2022 it was planned to produce 342 thousand tons of products in greenhouses, including 199 thousand tons were tomatoes, i.e., 58% of the total greenhouse production. The main part of the greenhouse's products is grown in the Bukhara, Khorezm, Samarkand and Tashkent regions.

Greenhouses in Uzbekistan operate based on modern technologies to produce vegetables. To reduce the consumption of fertilizers and irrigation water in greenhouses, drip irrigation, remote control and hydroponic cultivation are used. This brings yield increase by 30% compared to the traditional method, and the amount of water and fertilizer consumed is reduced by 30–40%.

In 2021, GOU approved a total of US$100 million to be allocated to financing greenhouses.[114] This includes allocation of US$40 million from the Fund for Reconstruction and Development of Uzbekistan (FRDU) to finance greenhouse complexes and greenhouses in household plots. At the expense of these funds, loans are issued to small and family businesses to build modern greenhouses ranging from 10 to 50 acres. The term of the loan is up to 7 years, and interest is paid at main rate of the Central Bank of Uzbekistan (currently 14%). Additionally, US$60 million is allocated to finance building greenhouses in the Surkhandarya region. According to the Decree of the President of August 23, 2021 on the promotion of small business and family entrepreneurship in the Surkhandarya region, the Fund for Reconstruction and Development allocates funds of U$10 million to finance greenhouses for lemon production.

The trend of growth in horticulture production and export is expected to continue in the future as the GOU has been improving the conditions in this sub-sector, including lifting a number of constraining export barriers - all exports used to be regulated and facilitated through the state agency UzAgroExports until 2017 when GOU dissolved the agency allowing individual entrepreneurs to export without complicate bureaucratic licensing and export procedures. The GOU reformed

[113] Uzbekistan: in 2022 production of heating products is planned to increase by 26% 22 April 2022, EastFruit, https://east-fruit.com/novosti/uzbekistan-v-2022-godu-proizvodstvo-teplichnoy-produktsii-planiruetsya-uvelichit-na-26-video/

[114] Uzbekistan will allocate $100 million to finance projects for modern and modern buildings, 25 August 2022, EastFruit, https://east-fruit.com/novosti/uzbekistan-napravit-100-mln-na-finansirovanie-proektov-po-sozdaniyu-sovremennykh-teplits/

complex export legislation including eliminating the need for 100% pre-payment, bank guarantees and insurance policies, and removing minimum export price regulations.[115] As the result, more private interest and investment flowed into horticulture, including in greenhouses (for example, between January and November 2021, 398 modern greenhouses with a total area of 797 hectares were built in Uzbekistan[116]).

However, the surge of exports and new players in the horticulture export market created a new set of challenges. Particularly, because of the product quality and limited use of processing and packaging technologies, most of Uzbekistan's fruit and vegetable exports end up in cheap, wholesale regional markets (e.g., Russia and Kazakhstan), where products sell two to three times lower than the average world price[117]. The surplus on the market drove the already low prices even lower. Meanwhile, higher value markets remain unexploited. Tapping on them requires changes in supply management – including understanding the market demands, investing in pre- and post-harvest processes, including better seeds, drip-irrigation technologies, handling, sorting, storing, packaging, etc.

However, the capacity of post-harvest handling is still not sufficient and only a small proportion of products is processed - of the 20 million tons of horticultural output in 2016, only 15% was processed; 20% of fruits are processed, and 11.3% of vegetables are processed. Out of 146 food and vegetable clusters in the country, 48 clusters have processing plants, 27 clusters have sorting and packaging plants, 18 clusters have drying plants, and 7 clusters have plants for freezing of products by the shock method, and 126 clusters have simple and freezing storage facilities with a capacity of 265.7 thousand tons.

Storage facilities are properly established only by some companies, while most fruit and vegetables producers face 30-40% losses due to incorrect storage and lack of knowledge. For example, fruits are recommended to be precooled (not frozen or cooled, but precooled[118]), when the temperature of fruit is slowly decreasing after it is collected from the garden. After this, the fruits are packaged and transferred to the storage refrigerator or truck at the recommended temperature inside depending on the type of fruit. This increases the storage duration of the fruits. However, most farmers and dehkans are not familiar with these technologies of pre-export, and use outdated methods of storage, that results in spoiled products. Uzbekistan should invest in training farmers, dehkans and agronomists to build capacity to grow and keep fruits and vegetables in modern pre-export and export practices.

Keeping fruit and vegetables in cold storage allows to sell them for better prices when demand rises. Storage and processing facilities for fruits and vegetables can contribute to the prevention of

[115] USAID. 2020. Agricultural Value Chains. Activity in Uzbekistan. Final Report. https://pdf.usaid.gov/pdf_docs/PA00X611.pdf (accessed January 2023)

[116] The total amount of investments in their construction amounted to 2.3 trillion soums (US$212.4 million).

[117] USAID. 2020. Agricultural Value Chains. Activity in Uzbekistan. Final Report. https://pdf.usaid.gov/pdf_docs/PA00X611.pdf (accessed January 2023)

[118] Cool storage refers to the storage of produce after production and initial post-production handling. Cooling may take place on farms, at production facilities, at collection/grading centers or at processing facilities. Precooling of products prior to cooling is necessary in order to achieve desired temperature reductions faster than direct integration into storage and to increase a storage duration.

seasonal price increases, the uninterrupted supply agricultural products to the population, the expansion of exports of goods, and the basic reduction in spoilage. Recognizing the need for post-production facilities, the total storage capacity of fruits and vegetables increased to 832,000 tons (equivalent to 5.3% of the total volume of fruits and vegetables grown in 2021). Currently, as of the end of 2022, there are 1,832 refrigerated warehouses in the country with a total capacity of 991,332 tons.

Further, another constraint faced by the private sector in agriculture is poor sanitary control from the state authorities. According to the interviews, around 90% of the gardens and fields are not inspected properly. Additionally, dehkans cultivate and grow fruits and vegetables on informally rented land from the farmers and refuse to provide contour data of the fields for sanitary check, that in turn does not allow private companies to ensure the production of high-quality products. Phytosanitary inspection often comes at pre-export stage when the products are already at storage, but they mostly do not perform preventive measures at the growing stage of the production, resulting in rejection of some of the output at the pre-export stage.

An issue reported by different analyses point that Uzbekistan's growers do not fully capitalize on the country's favorable climate by continuing using traditional growing and post-harvest methods as well as using traditional varieties of crops. Thus, Uzbekistan's dried fruits are processed using traditional technologies, which results in lower quality and food safety compared to using modern technologies (high-value processed fruits and vegetables have a longer shelf-life, can be sold at higher prices, and are easier to transport, given transportation is one of the key export challenges for products from Uzbekistan).

Failing to cater to high-value international markets and the changing tastes of consumers, the country does not maximize its export potential (this is a case with table grapes[119] and lemons[120], for example). For example, while Uzbekistan is one of the largest producers and exporters of table grapes in the world, and while the global table grape trade continues to grow dynamically (by an average of 3.6% annually), Uzbekistan's export of grapes is on decline. The reason why Uzbekistan is losing volumes is largely due to the failure to understand global industry trends and the popular grape varieties among consumers, which don't grow in Uzbekistan. Another issue is the post-harvest handling of horticultural products. USAID-funded Uzbekistan Agricultural Value Chain (AVC) Activity project[121] found that value added processing for export is largely missing resulting in quality and food safety issues substantially below those produced with modern practices.

The same project identified several practice and infrastructure related blockages constraining the continued development of the export potential:

[119] See EastFruit. "Ranking of leading table grapes varieties in Uzbekistan gives no hope for export expansion". https://east-fruit.com/en/news/the-popularity-of-table-grape-varieties-in-uzbekistan-jeopardizes-the-sector/ (accessed December 2022)

[120] See EastFruit. "Lemon crisis in Tajikistan and Uzbekistan – local lemons are not in demand, while imports are growing!" https://east-fruit.com/en/news/lemon-crisis-in-tajikistan-and-uzbekistan-local-lemons-are-not-in-demand-while-imports-are-growing/ (accessed December 2022)

[121] USAID. 2020. Agricultural Value Chains. Activity in Uzbekistan. Final Report. https://pdf.usaid.gov/pdf_docs/PA00X611.pdf (accessed January 2023)

- Uzbekistan's slow and unmechanized post-harvest handling practices prevent horticultural producers and exporters from reaching new markets, due to both short shelf life, limiting feasible transportation distances and limited adherence to food safety standards;
- Due in part to inadequate post-harvest, pre-cooling, and storage techniques, Uzbekistan's horticultural exports are sold at prices sometimes 2-3 times lower than similar products from developed export markets;
- Transportation is one of the most significant barriers to increasing horticultural exports, especially for fresh fruits. Air travel is for the most part prohibitively expensive. Potential solution – creation of marketing and logistics centers, cost sharing transportation options; adoption of packing technologies that reduce labor and transport costs;
- GOU policy efforts, when implemented frequently, reduce willingness to make long-term investments in technologies requiring multiple years to recoup investment – e.g., drip irrigation, infrastructure upgrades for international standards certifications, etc. The role of consistent policy is important to encourage investment and create a low-risk investment environment in the longer term;
- Most Uzbek businesses in the horticultural sector have limited visibility into the demands and preferences of the end buyers, the international consumer;
- Uzbekistan's horticultural sector lacks a sufficient supply of local specialists in internationally accepted standards; lack of investments on-site to be able to qualify to meet international quality and food safety standards, which would allow to sell produce to global markets at premium prices;
- Misapplication of chemical inputs (fertilizers) and poor management of pest and disease. This sometimes yields fresh produce with high trace chemicals, reducing market opportunities. Persistent pests and disease lead to high crop loss;
- Water shortage;
- Financing available to entrepreneurs for expansion or modernization; new investments.

Given the high importance the GOU has placed on the development of export potential of the horticulture sector, several agencies have or are providing technical assistance support in this area (nice projects funded by the EU, World Bank, ADB, JICA, and USAID – see Appendix B for more details). They broadly aim to support the GOU-led reforms in the sector, particularly the GOU's "Strategy for Agriculture Development of Uzbekistan in 2020-2030", and its long-term objective of to develop a competitive, market and export-oriented agri-food sector. The agencies' work is complementary and addresses a single specific, or multiple challenges as those identified above.

7 Meat and dairy

Animal husbandry is an important contributor to agricultural output, accounting for 40% of the country's agriculture output in 2021. In the past five years, national livestock production increased by 21% and poultry increased by 1.5 times. Over 80% of livestock is owned by dehkan farms despite

their small size (dehkan farms use less than 15% of arable land)[122]. The distribution of livestock production depends on proximity to population centres and agro-ecological zones. Dairy production sites are located in irrigated areas close to urban centres, and beef production sites are mostly located in low mountain pastures. The production of cattle and sheep/goats has increased from 674 and 138 in 2000 to 1,869 and 381 thousand tons of liveweight in 2020, while bovine milk production has increased from 3,612 to 11,000 thousand tons.[123]

The livestock industry is characterized by the historical domination of cattle breeding and sheep breeding, and other types having much less presence. Cattle raised include Black-motley, Red steppe, Bushuev, Schwitz, Santa-Cruz, and Kazakh white-headed. GOU targeted to maintain the number of livestock, although it had negative effects on productivity. The number of all types of livestock held by large agricultural enterprises has fallen, while the number of livestock held by household farms has increased. The second type of the most frequently owned livestock is sheep and goats. Dehkan households produce more than 94% of beef/mutton/chicken, 95.6% of milk, 85.4% of wool.[124] The demand for livestock feed in the country is estimated at 120 million tons, but only 47 million tons were produced in 2018.[125]

The key meat sources in Uzbekistan are cattle, sheep and goats, chicken, horse. Most red meat is produced from cattle. 94% of domestic meat is produced by dehkhan farms in 2019. Since 1991 Uzbekistan restricted meat exports to guarantee self-sufficiency. In 2017, GOU lifted restrictions for meat export and producers could export meat products, however, meat and meat products exports was prohibited from 2020.

The dairy sector is the key livestock sub sector in Uzbekistan, comprising about 45% to livestock GDP in 2016.[126] The small family producers and dehkan farms sustain the dairy component. About 95% of the milk produced in 2016-2019 was provided by the smallholder dehkan farms.[127]

The GOU policy targets to increase the number of livestock to ensure domestic employment and reliable food supply. However, due to the internal shortage of meat in the country, the GOU prohibits the export of meat and meat products, which limits the market for processing companies.

Dairy farms are mostly small, have low productivity. In some cases, a farm yields only a few liters of milk per day. Consumers in Uzbekistan buy processed milk and raw milk in rural areas and supermarkets.

There are many livestock farms, and the quality of Uzbek meat is generally high. Government policy was to increase the number of livestock to ensure employment and food supply. However, due to

[122] Uzbekistan: a report on livestock and the provision of veterinary services, Robinson, 2020
[123] The production of crop and livestock products in all categories of farms in the Republic of Uzbekistan, https://stat.uz/en/official-statistics/agriculture
[124] Volume of products (services) of agriculture, forestry and fisheries by region, https://stat.uz/en/official-statistics/agriculture
[125] Measures identified for further development of agricultural sectors, 13 November 2019, UzDaily, http://www.uzdaily.uz/en/post/53019
[126] Djanibekov N, van Assche K, Bobojonov I & Lamers JPA (2012) Farm Restructuring and Land Consolidation in Uzbekistan: New Farms with Old Barriers, Europe-Asia Studies
[127] Uzbekistan: a report on livestock and the provision of veterinary services, Romagnoli S, Faustino A, Adilov S, Arney D, Israilov Z, Guidi A, Paluanov B, Yulchiev J, Hasanov S, 2020

the internal shortage of meat in the country, the Government prohibits the export of meat and meat products, which limits the market for processing companies only in Uzbekistan.

Dairy wholesale and logistics are usually handled by the dairy producers themselves. An efficient wholesaling system has not yet been developed, and dairy companies work with farmers directly to obtain the right product quality and reliability of sourcing.

State support in the field of animal husbandry is mainly provided through preferential loans to producers of livestock products and tax benefits to processors of these products. All over the country there are veterinary stations which provide vaccination, treatment and artificial insemination of cattle to farms and dehkan farms. At the same time, these procedures are often related to the need to incur additional costs for these activities. Artificial insemination uses a small number of agricultural producers.

According to interviews with the meat and dairy producers, there is no stability for raw products supply. The processing and production sides do not have a stable supply of raw products. E.g., farmers provide different volumes of milk/meat during different periods making supply unpredictable and leaving spare capacity at processing sites.

GOU significantly reduced state subsidies for cattle farms having seen fast statistical growth in the subsector. However, this was because farmers started showing their real volumes instead of made-up numbers. Frequent changes and reversals of state policies do not provide peace of mind.

The sector's output growth is somewhat restricted due to the "stickiness" of traditional methods used by the producers. The farmers are conservative and have high resistance to change. Although the respondents (agro-cluster heads) tried to suggest technologies to increase efficiency of farms, the farmers are resistant to change and do not adopt new technologies and methods.

According to industry experts, the growth of dairy herd productivity can be facilitated by the following solutions:

- Optimization of the process of growing, collecting, storing and rational use of feed.
- Improving the technology of growing fodder crops, increasing their yield and quality, using, where possible, scientifically based crop rotations. This will improve the quality of feed.
- Revision of the diet of animals. The diet should be balanced coarse, juicy and concentrated feed. Often the right diet is enough to increase productivity.
- Compliance with the technology of dairy farming. Sometimes cows are simply "over milked". Veterinarians said that they had to observe cows at 430 and even at 470 days of lactation, while normally the period should not exceed 280-320 days. On the other hand, the dry period is sometimes prolonged. This reduces the productivity of cows.
- The cycle "Dry period-pregnancy-birth of a calf-lactation" should be strictly observed, and deadlines should be met. Then productivity will be higher. According to normal practice a cow should go through 45-60 days of dry period and 280-320 days of lactation. This increases productivity.
- Increasing awareness of products, services, and professionals in an industry can also help improve productivity.

- Effective feed additives, veterinary preparations, and the services of a qualified veterinarian can increase the productivity of dairy livestock.
- Microclimate. It is important to avoid exposing animals to extremely high temperatures, significant temperature fluctuations, dampness and other factors that can inhibit bodily functions and harm the health of cows.
- Prevention of parasitic and infectious diseases. Healthy, untreated animals are always more productive.
- Artificial insemination, reproduction and rearing of young animals. Breed improvement and proper rearing of young cows is one of the ways to increase productivity.

Additional constraints include the milk yield of cows in farms is slightly higher than in households, but still is lower than a normal genetic level of production. Dairy cows are milked by hand when the number of animals is less than 5. Animal slaughter is organized mainly in the backyard by the household members themselves for sheep/goats, or by guest butchers for bulls. Meat, eggs and milk are usually refrigerated before being used or sold. Dehkan farms are poorly organized. There is no cooperation in the production, processing and marketing of milk/meat and eggs. Live animals are sold directly on the farms themselves or transported by trucks for sale in the regional livestock markets. If farmers sell milk to collectors, in most cases they do not set prices themselves, but are forced to accept prices set by milk collectors.

As noted earlier, dehkan farms grow livestock mainly not for the market, but for their own needs and produce livestock products for their own consumption. Fifty-two percent of dehkan farms sell cattle, including 20% of dehkans sell bulls. For specialized farms, this figure is 78% and 54%, respectively. This indicates a relatively low involvement of farmers in market relations. Most of the livestock products are sold at regional markets and wholesalers, both farms and dehkan farms. Only a few enter the regional market. Dehkans often refer to wholesalers as milk collectors who come to the villages and collect the produced products for resale.

Generally, there is a need to build stronger market relations in the meat and dairy market. This will help protect farmers and provide better conditions for development and business growth.

8 Water Resources Management

8.1 Overview of the sector and recent reforms

The current state and operations of the water resource management sector presents real challenges to the agriculture sector. There are acute problems related to the lack of water resources, the demand for which is increasing due to the population growth and economic expansion. With an increasing water demand by industrial sector and urban areas, the pressure on water use in agriculture will be exacerbated, with the water deficit projected to increase from about 2 billion m3 to 11–13 billion m3 before 2050.[128]

The shortage of water resources is intensified by Uzbekistan's high dependence on the supplies from neighbouring countries[129], as well as problems related to the inefficient use of irrigation water and water allocation approach, high salinity of soil, high energy intensity of pumping (pumping is required for about 60% of irrigated land because of the high-relief topography), suboptimal pricing mechanisms, delayed modernization and rehabilitation of infrastructure. Taking these factors together, the reliability and availability of irrigation water supply is a significant issue in the agriculture sector which consumes about 90% of the available water resource in the country.[130]

Many of the above issues stem from institutional and technological constraints that were unaddressed over many years. Technological problems in the use of water resources are associated primarily with outdated and worn-out infrastructure. Over 45% of irrigated land in Uzbekistan requires pumped water supply which is mostly supplied by old and inefficient pumps that consume 20% of the country's electricity and a high proportion of agricultural subsidy budget (in 2017, over 60% of the budget of MAWR was allocated to paying for electricity to power pumping stations).[131] Losses arising from the outdated irrigation systems and their poor management have been estimated at about US$1.7 billion annually[132], or 8% of GDP.[133] Only 6% of the irrigated area is considered to be using modern technologies.[134]

The deterioration of irrigation systems and hydraulic structures that have been in operation for decades, and the high energy intensity and low productivity of technological equipment and structures lead to significant water losses and high costs of delivery to consumers. Sixty-six percent

[128] World Bank. 2010. Climate Change and Agriculture Country Note. Washington, DC.

[129] Decree of the President of Uzbekistan of Approval of the concept of development of water management sector of the Republic of Uzbekistan for 2020-2030, https://water.gov.uz/en/posts/1545735855/396

[130] The remaining water used by municipal areas (4.5%), industry (1.4%), fisheries (1.2%), thermal power (0.5%), and other sectors (about 1.0%).

[131] World Bank. PAD on a proposed credit for the Ferhgana Valley Water Resources Management Project – Phase II. June 2017. https://documents1.worldbank.org/curated/en/980471499047339716/pdf/Uzbekistan-Feghana-PAD-06122017.pdf (accessed November 2022)

[132] ADB. 2019. Country Partnership Strategy: Uzbekistan, 2019–2023—Supporting Economic Transformation. Manila

[133] ADB. Climate Adaptive Water Resources Management in the Aral Sea Basin Sector Project: Report and Recommendation of the President. August 2022. https://www.adb.org/projects/documents/uzb-53120-001-rrp (accessed January 2023)

[134] Ibid.

of trunk and inter-farm and 21% of local canals of the country do not have anti-filtration coatings, that is, they pass in the earthen canal. Forty-four percent of trunk and inter-farm and 42% of local canals require repairs and restoration, and 16% of trunk and inter-farm and 10% of local canals require reconstruction. The technical condition of 70% of the tray networks is assessed as unsatisfactory. As a result, water losses in irrigation networks account for 35-40%.[135] More than 60% of pumping equipment controlled by MoWR have exceeded their useful life and require modernization.[136] Further, O&M of the networks is not optimal due to budget limitations. About 70% of the allocated O&M funds are used to cover energy costs with only 2.9% allocated for maintenance and rehabilitation.[137]

Institutional background and recent reforms in the water sector

Major reforms in the water sector in Uzbekistan started in 2003 with the passing of Decree No. 320 of the Cabinet Ministers of Uzbekistan on Improvement in the Organization of Water Resources Management.[138] The reform created a multilevel water management system consisting of the basin irrigation system authorities (BISA), irrigation system authorities (ISA), and water consumers associations (WCA). The objective was to strengthen institutional capacity, improve allocation of water management functions to ensure rational use of water resources for the needs of agricultural and other sectors.

A new wave of reforms in water sector started under President Mirziyoyev with the launch of the Action Strategy on five priority areas of country's development for 2017-2021. Three new Basin Administrations of Irrigation Systems (BAIS), and Rayon Irrigation Departments (RIDs) were created in each of administrative district of the country. The purpose was to reinforce the horizontal connection between water management, agriculture, and the local administration at district level. RIDs were established with an objective to improve 1) water demand estimation based on crop structure data, 2) maintenance of the irrigation network in districts (rayons) from 2019, 3) monitoring of water use, and 4) stakeholders' involvement to improve water productivity. Additionally, over 1500 WCAs existing in the country were transformed into 158 within each district. This was done with an objective to simplify water management and accountability.

Further in 2017, GOU developed five priority directions[139] for the country's development for the period 2017-2021, one of which is the water sector. The priority areas in the water sector are the introduction of modern water-saving technologies, and adoption of measures to mitigate the negative impact of global climate change.

[135] Decree of the President of Uzbekistan of Approval of the concept of development of water management sector of the Republic of Uzbekistan for 2020-2030, https://water.gov.uz/en/posts/1545735855/396

136 All statistical data is from the Decree of the President of the Republic of Uzbekistan on approval of the Concept of Development of Water Management Sector of the Republic of Uzbekistan for 2020-2030

[137] ADB. Climate Adaptive Water Resources Management in the Aral Sea Basin Sector Project: Report and Recommendation of the President. August 2022. https://www.adb.org/projects/documents/uzb-53120-001-rrp (accessed January 2023)

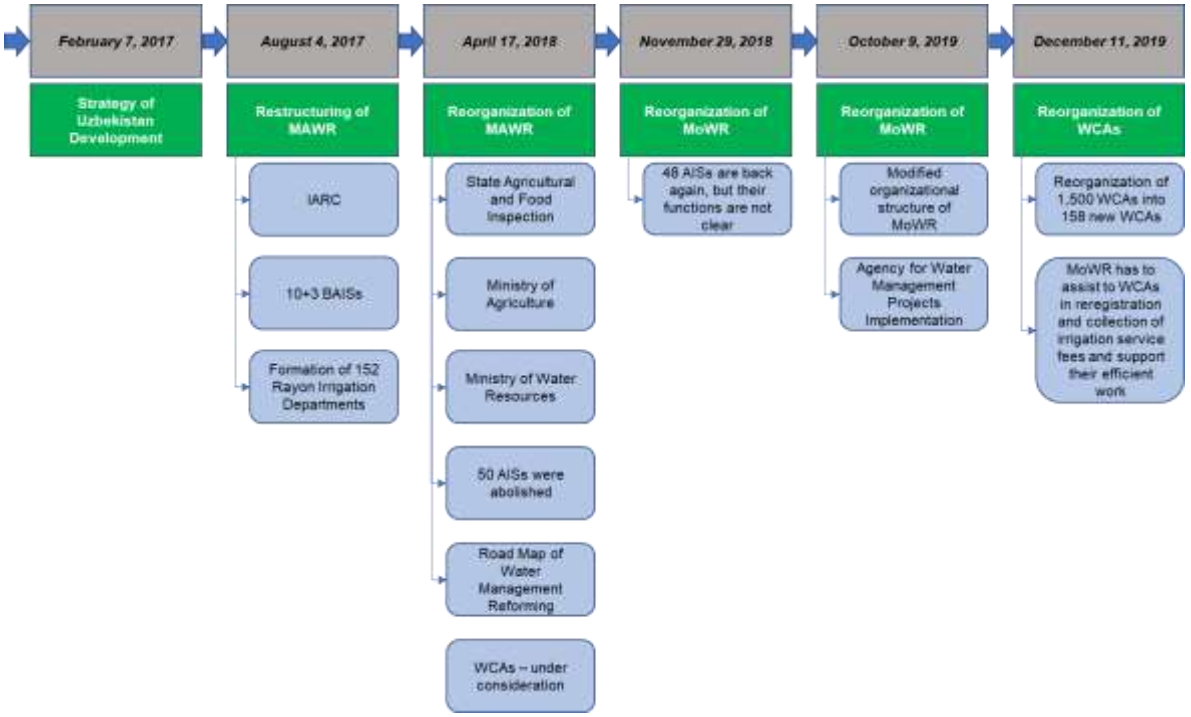
[138] Djumaboev, K.; Hamidov, A.; Anarbekov, O.; Gafurov, Z.; Tussupova, K. Impact of institutional change on irrigation management: A case study from southern Uzbekistan. Water 2017

[139] Action Strategy

In February 2018, the Ministry of Water Resources and the Ministry of Agriculture split into two institutions.[140] The Ministry of Water Resources (MoWR) was tasked with implementing the unified national policy in water resources management, operation of water infrastructure, and coordination of activities for rational use and protection of water resources. MoWR developed the Road Map on Reforming Water Management System which led to abolishment of 50 Administration of Irrigation Systems (AIS), which were sub-units of BAIS. The AIS were re-established in November 2018, to restore the link between the BAIS, RID, and WCA.

The flow of water reforms in Uzbekistan during 2017-2019 is summarized in the figure below.

Figure 8.1: Overview of institutional changes in water sector of Uzbekistan, 2017-2019



Source: Uzbekistn's National Strategy for water management and development of irrigation, 2021-2023, Vadim Sokolov, [insert note or delete 'text entry field' and paragraph]

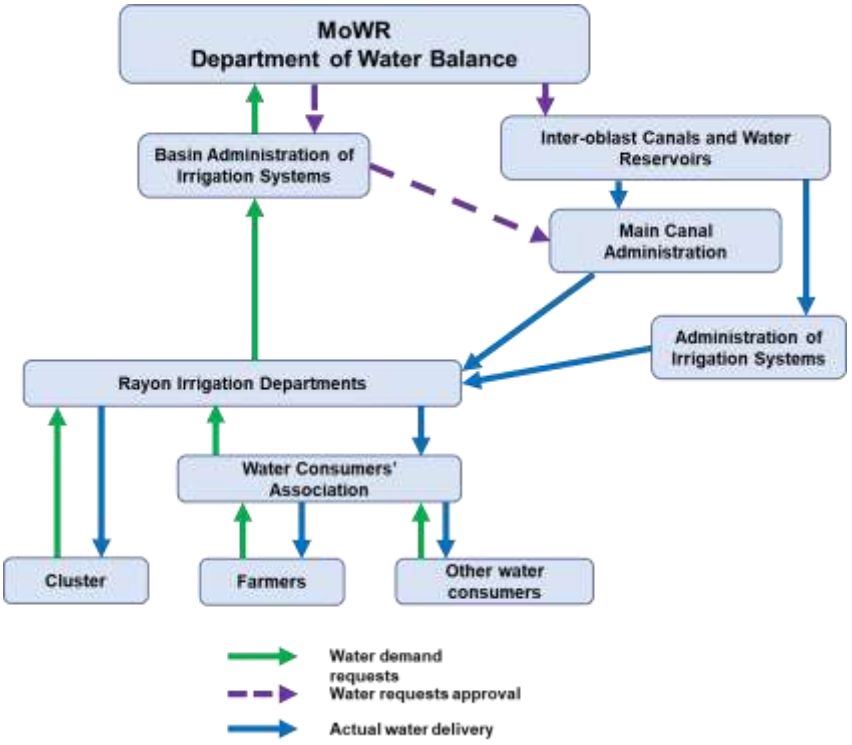
Figure 8.2 below shows the key elements of water supply management in Uzbekistan. MoWR implements a single policy for the whole country on water resources management and operates water infrastructure, and at the regional level, these responsibilities are assigned to BAIS authorities.

[140] In accordance with the Decree of the President of the Republic of Uzbekistan № UP-5418 from 17.04.2018 "On measures to radically improve the system of public management of agriculture and water resources"; Government of Uzbekistan. 2018. Decree of The Presidents No 5330 of 12.02. 2018 On Changes in Agriculture and Water Resources Management System of the Republic of Uzbekistan. Tashkent; Government of Uzbekistan. 2018. Presidential Decree No. UP-3672 of 17.04.2018 On Measures for Organization of the Activities of the Ministry of Water Resources. Tashkent.

The irrigation system authorities are responsible for operating and maintaining the main interdistrict canals. District irrigation departments are responsible for water allocation planning and operation and maintenance (O&M) of the interfarm canals. WCAs are responsible for O&M of secondary and tertiary canals, collection of irrigation service fees (ISFs) from water users, maintaining, rehabilitating and improving irrigation and drainage system in the WCA operational area, ensuring reliable water distribution among farmers, and monitoring water use based on the agreed-upon delivery schedule. Farmers manage the on-farm networks.[141]

The allocation of responsibilities for water resources among the different state bodies sometimes leads to inefficient coordination between these state bodies. In fact, the Water Concept identified a lack of coordination between the state agencies at different levels as an obstacle to be addressed.

Figure 8.2: Key elements of current water demand and supply management in Uzbekistan



Source: Uzbekistan's national strategy on water management and development of irrigation 2021-2023, Vadim Sokolov, Head of Agency of IFAS. 2021

The list of state bodies involved in water management in Uzbekistan and their prime responsibilities and functions is shown in the table below.

[141] ADB. Climate Adaptive Water Resources Management in the Aral Sea Basin Sector Project: Report and Recommendation of the President. August 2022. https://www.adb.org/projects/documents/uzb-53120-001-rrp (accessed January 2023)

Table 8.1: Water management agencies and their main functions

Agency	Main responsibility
The Cabinet of Ministers	Responsible for development of water sector reforms and regulation
Ministry of Water Resources (MoWR)	Responsible for investing in irrigation and drainage infrastructure, their operation and management
Basin Irrigation System Administrations	Territorial branches of MOWR responsible for implementation of a single policy on water use and regulation in a particular river basin
District irrigation departments	Departments under MoWR responsible for water allocation planning and operation and maintenance (O&M) of the interfarm canals[142]
Water Consumers Associations	Responsible for O&M of secondary and tertiary canals and collection of irrigation service fees from water users. Also responsible for the O&M of selected interfarm canals under contract with district irrigation departments.
State Committee for Geology and Mineral Resources	Responsible for coordination and provision of geological exploration of water reserves;
State Inspectorate for Supervision of Geological Subsoil Research, Safety in Industry, Mining and Public Utilities Sector	Responsible for implementation of state control to ensure compliance with the legislative and normative requirements in use and protection of the subsoil in geological exploration and minerals extraction (including fresh, mineral, thermal and industrial groundwater)
Local government authorities	Responsible for water management and allocation in local districts (*rayons*) and cities
State Committee on Ecology and Environmental Protection	Responsible for ensuring compliance with ecology and environmental requirements in accordance with the legislation
Ministry of Health	Responsible for implementation of a state policy in the field of public health protection, including water consumption of population.

The latest part of the reforms was the Decree of the President of the Republic of Uzbekistan, dated July 10, 2020 "On the approval of the concept of the development of the water sector of the Republic of Uzbekistan for 2020-2030"[143] (hereinafter, "Water Concept"). The Water Concept presented the goals, objectives, and priorities to develop the water sector with medium and long-

[142] IRRIGATION AND DRAINAGE IN REPUBLIC OF UZBEKISTAN HISTORY AND MODERN STATE, Ministry of Water Resources of the Republic of Uzbekistan, National Committee on Irrigation and Drainage, 2020, https://icid-ciid.org/icid_data_web/UzNCID_book_web_en.pdf

[143] Decree of the President of the Republic of Uzbekistan № UP-6024 "On the approval of the concept of the development of the water sector of the Republic of Uzbekistan for 2020-2030, dated July 10, 2020.

term potential. It identified four key constraints in water management that directly affect agricultural sector, which are:

- Decreasing water availability due to climate change;
- Inefficient use of water in agriculture;
- Outdated irrigation systems and hydraulic structures;
- Lack of qualified personnel and research in water management.

To address these key constraints, the Water Concept targets the water sector development to be focused on the following priority areas - a combination of regulatory, management and service delivery aspects:

- Adoption of market principles, improving water sector regulation and financing mechanisms
- Improving water policy and water management mechanisms
- Infrastructure modernization and development of service delivery in water sector
- Strengthening professional, research and innovative capacity in water sector.

More specifically, the Water Concept assigned KPIs to responsible agencies to:

- Increase the efficiency of irrigation systems
- Decrease irrigated lands with poor water supply from 560 to 190 thousand hectares;
- Decrease saline irrigated land areas by 226 thousand hectares;
- Decrease annual electricity consumption volume by MoWR pumping stations by 25%;
- Install “Smart Water” devices at irrigation systems;
- Automate water management processes at 100 key water structures;
- Increase water saving technologies application at up to 2 million ha, including 600 thousand ha of drip irrigated land;
- Implement 50 PPPs in the water sector, including projects on installation of water pumps.

A number of initiatives are underway to achieve the KPIs. To promote application of water-saving irrigation technologies, including drip and sprinkler irrigation[144], the GOU launched incentive programs for farmers in 2019. The GOU provides subsidies for drip irrigation and other water saving technologies in the cotton, horticulture, and livestock production areas through low-interest loans to farmers for 3 years. In 2019 water-saving irrigation was applied on approximately 37,769 ha.[145] GOU also introduced Agricultural Clusters with private ownership with an objective to attract private investment and apply the best practices in water management in agriculture.

[144] Decree No. 4499 of the President of the Republic of Uzbekistan

[145] Compared to 76,200 ha during 2013–2019 of drip irrigation applied

According to a report of the Deputy Minister of Water Resources, a number of activities are underway to achieve the KPIs defined in the Water Concept, including in collaboration and technical assistance with bi- and multilateral organizations. For example:

- Introduction of water-saving and digital technologies, the implementation of irrigation measures, laser land leveling, as well as the implementation of agrotechnical measures, that led to water savings;
- Introduction of water-saving technologies on 170,000 hectares, including drip irrigation on 140,000 hectares of cotton lands, as well as sprinkling and discrete irrigation;
- Putting 141 ha of land back into agricultural use;
- Installation of devices for online monitoring of water consumption at the pumping stations, and replacement of pumps and electric motors with energy-saving ones.
- There are 5 ongoing investment projects with the participation of the World Bank, the Asian Development Bank, the Islamic Development Bank, the Saudi Development Fund and JICA in the Republic of Karakalpakstan, Bukhara, Kashkadarya, Surkhandarya, Andijan, Fergana and Namangan regions. The projects worth US$52 million are for construction and reconstruction of a number of canals, hydraulic structures, and vertical wells;
- Information system "Monitoring of the ameliorative state of irrigated lands" was developed with the financial support of the Swiss Agency for Development and Cooperation; and others.

Lack of qualified personnel and innovation and research in water management

Another constraint identified in the Water Concept is a lack of qualified personnel in the state water management authorities. Although, there are high level academic institutions training specialists in agriculture, like the Tashkent Institute of Irrigation and Agricultural Mechanization Engineers (TIIAME), its laboratory and research facilities cannot be considered modern and require upgrades. Further, water management professions are not considered prestigious among young people due to low salary level and limited development prospectives and hence, do not attract much interest.

Research and development in water management and irrigation is insufficient. Research areas like GIS technology, water saving irrigation systems, water facilities engineering solutions and design engineering, development of water consumption algorithms, and water accounting are not yet commonly tapped on.

8.1.1 Pricing mechanisms in water supply

There is a water consumption tax used for irrigation purposes. Due to the almost ubiquitous absence of the water flow meters, farmers pay for the water mainly based on the consumption norms considering the size of their land plot used or leased. This approach is not accurate and makes the water a semi-free resource and leads to inefficient consumption. Inefficient water consumption in the dry and semi-dry areas, which are a major part of the entire territory of the country, consequently, will have severe effects on the environment and health of the population.

The Strategy for Water Sector Development in Uzbekistan for 2020-2030 introduced the principle of payment for water delivery in agriculture as a framework for the transition of the water sector to market economy. The main principle of this transition is achieving cost recovery (fully or partially) by water users, rather than the GOU. This is expected to be achieved through tariff setting, such that the tariff level stimulates water saving (that is, smart and efficient water usage), and that the tariffs are determined based on the average cost of delivering water, which in turn takes into account the cost of electricity for transportation, and maintenance and operation of canals and other supporting infrastructure. The introduction of mechanisms of paid services for water delivery in agriculture is carried out in stages, linking with the implementation of the agrarian reform. To create the basis for a functioning system of irrigation water cost recovery, the prerequisite is for the consumers to be willing and able to pay for the water delivered. At the same time, when setting tariffs, it is necessary to identify the limit beyond which the user will refuse to pay. This will depend on the additional benefit that the user receives if the water is delivered on time and in full. The remainder can be subsidised from the budget on a per cubic metre basis for each cubic metre of water received. A particular issue in this area is the lack of paid water service for many years, meaning that farmers received irrigation water free of charge and may be unwilling to change this practice. This is an important consideration when it comes to considering irrigation projects with private sector participation, where financing needs to be repaid, commonly through user charges (we discuss this in Section 7). It is estimated that the collection of irrigation service fees by WCAs is only about 40%–50%.[146]

8.1.2 Private sector participation in water sector

One of the priorities in the Water Concept is attracting PSP to the water and irrigation. The main purpose of using PPP procurement is to attract private sector investment and reduce budget expenditures. In accordance with the 2022-2026 National Development Strategy, 53 projects in the water management sector are planned to be implemented. So far, 10 has reached the project documentation stage, 20 has been conceptualized, and feasibility studies are being prepared for the rest of the projects.[147]

Interviews with local agricultural market players and farmers show that while there are many PPPs, most of them take a form of transfer of old infrastructure to agricultural clusters and farms on almost involuntary basis, and local players agree to invest in PPPs “not to spoil relations” with the state organizations. Hence, the approach to the PPP procurement does not exactly align with the cornerstone of competitive pressure in procurement and choosing the best provider on best terms. Additionally, private participants face difficulties in recovering investment because there is resistance from farmers to pay for water because payment for irrigation is a novel concept for the majority of consumers (irrigation water used to be free of charge).

[146] International Water Management Institute. 2020. Transaction technical assistance studies of Jondor and Babatag command areas.

[147] Public-Private Partnership Development Agency under Ministry of Finance of the Republic of Uzbekistan. Information on the public-private partnership projects in the water management sector. 2022. https://www.pppda.uz/en/5433.

9 Opportunities for PSP/PPP development in Uzbekistan and potential PSP projects

Engagements with the private sector players as well as the research conducted within the diagnostic study helped identify the areas where real opportunities for PSP lie. Below we present high level conceptual ideas for projects with PSP that can theoretically be structured in a way that would attract private sector interest and bring in efficiencies and the required investments into the value-adding supply chains.

According to the findings, the main untapped opportunities for PSP lie in creating more greenfield value-added services and infrastructure, particularly processing, storage, logistics and transportation. However, to unlock these PSP opportunities, the investment climate needs to be made more favorable, particularly because investments in infrastructure and logistics are typically long-term, high capital value commitments. Considering that the private sector faces a high level of uncertainty and an unpredictable policy environment, long term investment is risky and improbable. A PPP arrangement could be a workable solution in an uncertain investment environment as it can contractually assure the private investor that the government counterpart would cooperate in a consistent manner and facilitate a favorable operating environment for the project. The government counterpart, bound by the PPP contract, would share the project risks, and would therefore be incentivized in the success of the project, and in avoiding the penalties for breaking the contract terms. Further, inability of investors to take volume risks at the initial stage of market development would have prevented them from investing in greenfield projects altogether, however, in a PPP arrangement, the government can contractually underwrite some volume risk (for example, by providing minimum demand guarantees for several years until demand becomes predictable) and hence facilitate private investment.

The PPP project concepts described below were developed with the level of specificity that allows for a wide application across the country – the concepts can be applied to multiple sites and regions in Uzbekistan and can be replicated through multiple projects and may eventually be scaled up into an investment program. At this stage, we do not consider the best locations, project scope or scale for implementing these project concepts. These specific details are important for the overall design and will impact the viability and success of the projects and, therefore, will be carefully studied and discussed with the stakeholders at a later stage. That said, in conversations with private sector-led clusters, we identified potential interest in PPPs in irrigation in Jizzakh, and potentially in wheat storage. The private sector response to the project concepts will be as useful and necessary as the consultations with the GOU to understand and balance both parties' perspectives and preferences.

With regards to the water sector, the project concept considers that investments in improving irrigation systems are not sufficiently attractive and viable for private investors and will therefore require provision of government support and de-risking measures.

More detailed business cases will be developed in the next stage of this technical assistance in close consultation with GOU stakeholders and ADB.

9.1 Wheat logistics

The wheat supply chain still experiences a high presence of state control and regulation. Due to the national food security issues, the GOU strives for the country to be self-sufficient with the domestic production of wheat. Currently, Uzbekistan is a net importer of wheat, predominantly importing from Kazakhstan (about 20% of its domestic demand). As the GOU is reducing wheat growing areas in favor of horticulture, there is an increased importance to increase yields for wheat as well as reduce spoilage during post-harvest handling to be able to meet domestic demand for the grain.

Currently, there is a significant shortage of modern wheat storage, and the spoilage of wheat is high. Because of outdated methods for storage and low-quality structures used, spoilage and production losses in warehousing can reach 30% (however, this number widely ranges and it not likely to be reported accurately). According to a private sector respondent, wheat is typically stored in warehouses on cold ground rather than in grain silos with appropriate air circulation and climate control (which is a common wheat storage method elsewhere, e.g., in Europe and the US).

There is a real need and opportunity for improved grain handling and storage in Uzbekistan and can lead to a significant increase in profit for producers and a reduction in logistics costs. However, the private sector hasn't entered this space because of the embedded risks, which it cannot control or extinguish on its own.

In an inconsistent policy and investment environment where the private sector faces risks, including from procurement pricing, shifting policies, and bureaucratic discretion (as well as some practical risks such as harvest volumes (security and reliability of volume), and farmers' loyalty in case of clusters), a PPP contract can materially shield the private investor from the main risks and in turn allow GOU to mobilize more long-term private interest and investment.

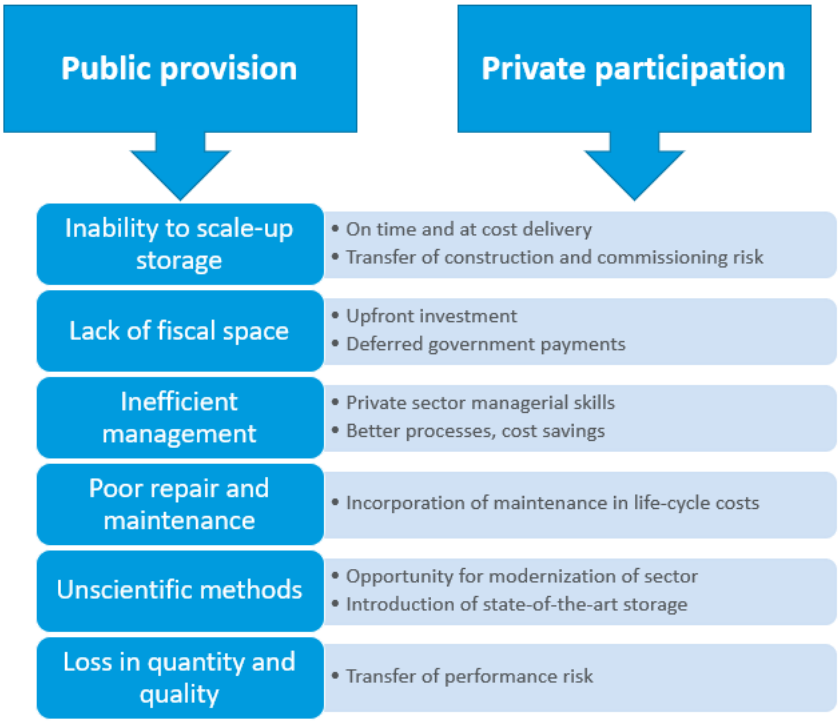
A PPP structure, like DBFO (Design-Build-Finance-Operate) can be a good solution both for the GOU and the private partner. On one hand, GOU can continue controlling the strategic production of wheat and exercise control over the supply chain, while on the other hand, it can allow the private operator to bring efficiency and investment in improved post-harvest facilities and handling activities – through contractual obligations. For the private partner, a PPP arrangement would provide the necessary level of certainty that over the PPP term the government partner would comply with the contract terms, or, in case of incompliance would compensate the private sector. Importantly, in the context of a changing regulatory and policy environment in agriculture and in the wheat industry, the private sector would be insured from any impact arising from policy changes as those risks could be shifted to the government counterpart.

As the investor may be uncertain about filling the full capacity of storage facilities with wheat supplied by farmers, it is also possible the private partner may require GOU to underwrite in the initial years the guaranteed volume until the demand grows and becomes more reliable. This can be done, for example, by the government guaranteeing a minimum demand for storage – a standard risk mitigation mechanism for PPP contracts. Under this mechanism, when the actual demand in a particular year falls below the minimum threshold, the government would compensate the difference to the private operator.

Besides providing certainty to the private sector, there are real efficiency benefits of private sector provision of grain storage services compared to the public sector provision, as shown in the figure

below. Additionally, private sector participation can also promote measures to reduce post-harvest losses at farmgate level. For example, the private operator can support farmers to implement better post-harvest practices (to reduce the processing/cleaning work that it needs to undertake before silo storage).

Figure 9.1: Rationale for PPP in Storage



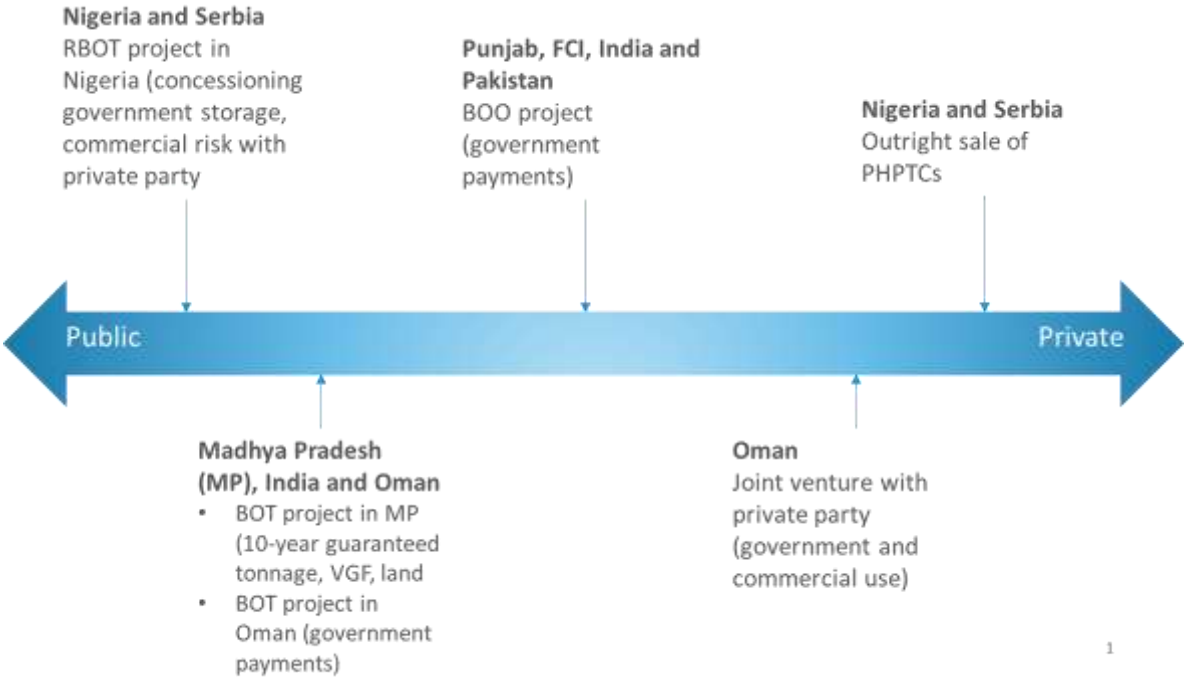
Source: Adapted from World Bank. Global Trends in Public-Private Partnerships in Grain Storage. 2014. https://olc.worldbank.org/system/files/PPP%20in%20Grain%20Storage-%20Combined%20ppt%20July%2029%20webinar.pdf

In a PPP arrangement, the private partner would be responsible for designing, building, financing, and maintaining and operating the storage facilities and, possibly, offering transportation services from farms to storage, and possibly long-distance transportation to dedicated railway facilities, as relevant. The PPP contract can have additional requirements relating to connecting infrastructure and logistics. To achieve economies of scale, the private operator may need to operate multiple facilities, or to operate a big project size facility.

Dealing with bureaucratic procedures in construction and utilities can be burdensome in every country, and Uzbekistan is no exception. To reduce the risk of cost overruns and project delays due to long permitting and approvals procedures, and thereby further de-risk the project, the role of GOU could extend to helping to facilitate the allocation of land plots and various building permits for the construction sites. GOU may also need to help the private party arrange connection to power, water and other utilities.

As a next step in developing this project concept, it will be important to understand any legal limitations for PSP in the sector. A consultation with GOU will be needed to understand pricing arrangements and possible payment mechanism for the services provided by the private sector (for example, will the private sector be required to transfer the facilities back to the government at the end of the PPP term). It will also be worth studying the experience in other countries and their PPP models, for example, PPPs in grain logistics in India, Oman, Philippines, Serbia.

Figure 9.2: Global PPP Models



Source: Adapted from World Bank. Global Trends in Public-Private Partnerships in Grain Storage. 2014. https://olc.worldbank.org/system/files/PPP%20in%20Grain%20Storage-%20Combined%20ppt%20July%2029%20webinar.pdf

9.2 Value addition services: processing, storage, and transportation

Uzbekistan's slow and unmechanized post-harvest handling practices prevent many producers and exporters from reaching new markets, due to both short shelf life, limiting feasible transportation distances and limited adherence to food safety standards. According to some estimates, post-harvest losses account for 30% of agricultural production loss in Uzbekistan.[148] Meanwhile, improving post-harvest handling (including processing, and packaging) can considerably extend product shelf life and allow to transport crops to more distant markets. However, only a small proportion of agricultural output is processed in the country - of the 20 million tons of horticultural output in 2016, only 15% was processed; 20% of fruits are processed, 11.3% of vegetables and 16% of meat and dairy products are processed. There is significant opportunity for improved value addition from increased processing and exports of both fresh and processed products.

Regional agro-logistics hubs that serve as central aggregation facilities for processing, modern storage, and export could help streamline logistics, improve volume and quality of products, enable year-round retail sale of products, improve efficiency and economies of scale, and provide support and services for export to the existing markets but also help meet the higher standards and certification requirements of new high-value markets, including the EU.

Horticulture

As Uzbekistan is supporting diversification away from cotton to horticulture products, ADB and other donors and IFIs have been supporting the GOU in its efforts. An ongoing ADB-funded project, Horticulture Value Chain Development[149], aims to support the GOU in creating agro-logistic centers (ALCs) that consolidate production and post-harvest services. The project is expected to finance three ALCs in Andijan, Samarkand, and Tashkent based on international best practices. These include services and facilities like trading, storage, processing, safety certification, customs clearance, transport, shipping, marketing advisory, trade finance, and commercial banking.

The implementation structure of the ALCs in the ADB-funded project supposes the establishment of ALC management companies that are state limited liability companies. A PPP project in logistics can effectively complement and extend the work done within the ADB's Horticulture Value Chain Development project, borrowing and building on the findings and work done so far. The PPP project will, however, engage a private operator, possibly in a DBFOM modality.

The first PPP project in this space could comprise, initially, a modern facility operating in all seasons; it could be for sorting, packaging, and cold storage. Additional services that could add significant value include safety and phytosanitary inspections, international certification, and export-related services like customs clearance. A logistics and export hub conveniently co-located nearby would extend the services to transportation to export destinations, as well as marketing and fostering

[148] USAID. 2020. Agricultural Value Chains. Activity in Uzbekistan. Final Report. https://pdf.usaid.gov/pdf_docs/PA00X611.pdf (accessed January 2023)

[149] ADB. Uzbekistan: Horticulture Value Chain Infrastructure Project. https://www.adb.org/projects/51041-002/main (accessed December 2022)

partnerships with new customers. A logistics/export hub could be a separate PPP project or can be incorporated into the scope of a single agro-logistic center.

Selecting project structure

The type of facility and services for be provided could be selected based on multi-criteria assessment, using criteria such as proximity to farmers, extent of transportation linkages, availability of enabling infrastructure such as roads and electricity networks.

This project concept will need to be tested through market sounding with potential investors, producers, and exporters to find out:

- Whether the legal/regulatory framework exist for a particular type of PPP
- Whether currently there is sufficient capacity for cold and dry storage warehousing, and packaging of specific horticulture products to meet the demand for year-round supply domestically and for export
- Whether there is sufficient demand for such facilities and sufficient volumes of produce to be supplied (to achieve stability of the supply), hence impact on financial viability of proposed project
- Whether there is willingness to pay for using such facilities
- Whether there are gaps in specific activities/services that would be attractive (e.g., transportation, certification, etc.) and whether it is necessary to co-locate a transportation hub in close proximity
- Whether there are particular regions in the country where there is unmet demand for processing and logistics facilities
- Whether there is availability of cheap and long-term financing for investors.

These and other questions would be important to ask during market sounding to determine the level of attractiveness and viability of such a project. In markets with limited presence of PSP, the investors will likely be uncomfortable to take the demand risk and even finance risk, but would be happy to take on design, construction, and O&M risk. Feedback from investors will hence dictate the structure of the PPP and risk allocation, as well as help identify the support that will be required from the GOU.

While there are multiple options and combination of services that could be provided by an agro-logistics center, there are common features of the role of the private and public sector partner. The public sector can help facilitate availability of land and permits for the construction of the facilities. During the operations, the public sector can facilitate government services such as customs and sanitary inspections to assist the private operator. The private operator will be responsible for designing, financing, building, and operating the facilities according to the KPIs specified in the contract.

Investors will likely be uncomfortable to take the demand risk, so GOU may be required to underwrite the investment volume in the initial years of the project to de-risk it. That is, the GOU

would provide an availability payment for a specified number of years until the demand grows consistently and reliably for the private operator to be comfortable with taking the demand risk. Providing proper de-risking measures in the pilot demonstration projects would be beneficial for GOU to signal to the investor community that long-term contracts with GOU are feasible and in fact provide good opportunities and returns. Successful PPPs in logistics can significantly strengthen the trust and credibility of GOU as a public sector partner and Uzbekistan as a destination for new private investment in agriculture.

Next steps

Engagements with GOU stakeholders will provide key insights with regards to the overall support of the project concept, identify the likely implementing agency for a PPP, identify key bottlenecks. Consultation with the relevant public agency will be required to understand whether it can provide guarantees and other types of support measures to de-risk the projects, or if any change in the legislation may be required. For example, PPP procurement models, such as Design, Build, Finance, and O&M, typically depend on the ability to use an availability-based payment funding model and GOU being able to manage such contracts. These critical aspects will need to be checked in the detailed pre-feasibility analysis.

9.3 Irrigation and water resource management

While the need for investment in improving irrigation is high, GOU does not have sufficient fiscal space for the required upgrade program, and the user fees alone cannot cover the investment costs, either. Further, investments in improving irrigation systems are not sufficiently attractive and viable for private investors. Under the current circumstances the only way to get the private sector to invest is to have GOU pay for the provision of services through availability payments. The availability payment PPP model can help harness private sector operational capability through incentives built into the PPP contract while also leveraging public funds together with private finance.

For the country's substantial need in improving irrigation systems, the availability payment PPP is well-suited to deliver the investment required quickly. This contract model mobilizes private finance to cover upfront capital costs and breaks the cost to the government into manageable and predictable amounts over time. Availability payment PPPs assume that the investor will cover project costs, including initial and further repairs, and routine maintenance, during the whole PPP period. However, since the investor will not likely be able to recover the costs through irrigation fees, subject to key performance indicators (KPIs) stated in the PPP agreement, the investor will be remunerated through availability payments that should cover all costs, including a reasonable rate of return on capital.

As availability payment PPPs are based on strict KPI-based performance requirements, the private partner must maintain the system at the contractual standard and make required repairs. If the private partner fails to perform, it will be penalized for non-fulfillment of operational maintenance criteria, ensuring that these savings will be passed on to GOU.

Another benefit of the availability payment-based PPP is that they allow GOU to postpone public side expenditures on these projects. Therefore, with the same available funding, GOU will have more cash available to repair and maintain other irrigation systems in other districts.

GOU can attract the private sector to upgrade and operate irrigation infrastructure in segments. Possible PPP project scope could include activities such as replacement of energy inefficient pumps by more efficient ones. The investment cost for replacing old pumps can then be recovered through energy saving measures. The energy saved from irrigation can be sold by the energy distribution company to industrial or other consumers. GOU would collect fees from the users and may consider creating a ring-fenced account where funds from the energy saving will be deposited. The GOU would then pay the private party availability payment in exchange for providing services and infrastructure to the well-specified standards. Such an approach will be possible if the Ministry of Water Resources agrees to pay for the electricity calculated based on the energy baseline for the duration of the contract. This amount will be higher than the actual energy consumption. Additionally, a methodology for measuring and verifying energy efficiency should be developed in regulatory documents or in the relevant contracts.

As a next step in testing this project concept, it would be important to understand whether APs are possible in Uzbekistan, and whether ring-fencing accounts is possible.

10 Next Steps

The Diagnostic Study revealed there are two avenues that can help the GOU progress its efforts in bringing more PSP in agriculture.

First, the ministries and regional governments identified in this report appear to have limited experience and knowledge in identifying PPP opportunities, structuring PPPs, and implementing them (see section 2.4 for the list of the identified gaps). Against this background, there is a need for a tailored comprehensive training course for selected public sector staff on the key principles of PPP procurement and attracting private investors in agriculture. The development and delivery of the training course, along with a training package, and a PPP/PSP toolkit will be useful to some government agencies have limited exposure and expertise with regards to the cycle of structuring and implementing PPPs and when it comes to identifying PSP opportunities. The development and delivery of the training course, along with a training package, and a PPP/PSP toolkit will be useful to:

- Identify, evaluate, procure potential PPPs and manage ongoing PPP projects in agriculture and irrigation, evaluate, procure, manage ongoing PPP;
- Improve decision making in PPP/PPP assessment and implementation; and
- Strengthen the public sector's knowledge of PSP/PPP project.

Second, despite a number of gaps in the sector and in the respective evolving framework, there are real opportunities to attract the private sector to particular areas in the supply chain, as discussed in Section 9 above.

Given the above findings, the Consultant proposes that the next phases in this TA should focus on two activities: 1) capacity building of relevant public sector agencies, and 2) pre-feasibility assessment of pilot PSP/PPP projects.

Further to the capacity building activities around the general principles of the PPP model, the Consultant believes there is high merit in adding customized training around the identified project concepts. That is, having agreed with the public stakeholders on the pilot PPPs in agriculture, the relevant agencies and staff could be involved in a practical real-life development of project structure, risk allocation, and other key elements of PPP project development.

10.1 Capacity Building

The objective of the capacity building and training would be to strengthen the knowledge and skill set of the ministries and regional officials to implement PPP projects in agriculture and irrigation. The development of a comprehensive capacity-building program should meet the needs of the public sector and be based on case studies and practical application. It should therefore be preceded by the identification of the key knowledge/skill gaps and topics to be appropriately addressed in the course, as well as a review of the relevant ongoing and/or completed projects both in Uzbekistan and globally. This can be achieved through surveys and personal interviews with the relevant stakeholders, as well as analysis of the projects to be showcased for the training purposes The effectiveness of the training will largely depend on the ease with which the trainees are able to

master the training materials, as well as the opportunity to apply the acquired knowledge and skills in practice under the professional guidance and advice of a qualified trainer. This can be achieved through a combination of a well-configured, user-friendly learning management platform containing the training materials to provide the necessary knowledge framework and understanding, face-to-face workshops to discuss case studies and address the relevant issues and concerns, and a simulation session to provide hands-on experience in developing a PSP/PPP project. This approach will not only prepare the trainees for independent project preparation but will also ensure a better understanding of the practical mechanics behind the decision-making processes and the different stages of the PPP process and equip them with a set of practical skills to enhance their performance.

Capacity building and training materials

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The Consultant will create a capacity building plan which will include the following details:

- *Scope of the plan*, which presents a list of relevant topics based on gaps identified;
- *Potential delivery methods*, which discusses two potential methods to conduct the training: online or in-person. The Consultant believes an in-person course would be more convenient. However, online delivery is still a valid option in case there are travel restrictions or health concerns related to COVID-19. The choice of the training duration will depend on the quantity of participants and topics selected for discussion;
- *Potential participants*, which discusses potential representatives from the ministries and regions participating in the course. These can be experts from the governmental bodies and involving entities in finance and planning and investment. The Consultant believes a diverse composition is crucial, particularly when participants engage in group discussions or exercises. By having such specialists, the Consultant can obtain valuable insights into the current status and challenges in deploying projects with private engagement. Based on the TOR, the Consultant expects at least 60 participants from the ministries and provincial municipalities in the training course; and
- *Performance indicators*, which proposes potential indices to measure the impact and efficiency of the training.

The Consultant understands that the learning objectives should be:

- *Attainable*: the trainees will acquire the needed skills by mastering the theoretical knowledge before applying it in practice during the workshops and the simulation session;
- *Actionable*: the materials will include the analysis of the relevant case studies and address the actual issues and concerns and engage the trainees in applying their knowledge and skills in a simulated real-life environment; and
- *Measurable:* the learning outcomes will be evaluated at the course completion using a specifically designed survey to collect feedback that will be summarised in a feedback report.

Training materials for this course will include three components:

- *An online course on a learning management platform* – to enable trainees to master the training materials by provide the necessary knowledge framework and understanding;
- *Face-to-face workshops* – to discuss case studies and address the relevant issues and concerns, and a simulation session; and
- *A face-to-face simulation session* – to provide hands-on experience in developing a PSP/PPP project.

To ensure an effective knowledge and skill acquisition, the Consultant proposes the following training delivery strategies:

- *Active trainees' involvement* ensured by self-study of the course materials on the learning management platform with self-check tests, chats and discussion forums combined with participation in face-to-face workshops with the qualified trainer;
- *Immersive experience of the simulation session* enabling the trainees to apply the acquired knowledge and skills in a real-life scenario.

Potential topics for trainings

Based on the findings in the Diagnostic Study, we can conclude that both foundational modules and more specific PPP-related topics need to be delivered.

- Foundational modules – these could include the overview of PPP, legal and regulatory and contractual aspects of PPP projects. Following modules would include project structuring, risk allocation, project management, financial structuring, fiscal risks and consideration, bid evaluation, and others.
- Specific modules – these would include the introduction to the identified PPP project concepts and the specifics of structuring, and managing such a PPP project.

PSP/PPP toolkit

In addition to the capacity building training course, a PSP/PPP toolkit should be developed for the agriculture and irrigation sectors to provide the line government agencies with an easily accessible and clear framework to enhance their decision-making capacity in the early stages of the PPP project cycle. As the number of PPPs is likely to increase in the future, the reference guide can be a useful tool for identifying and monitoring PPPs. The toolkit can provide practical, actionable guidance for projects involving the private sector that are not necessarily PPPs.

The contents of the toolkit can include the following sections:

- *Setting PSP policy and strategy,* which provides the criteria for policy makers to consider PSP options in the agriculture sector;
- *Overview of the PSP projects implementation process,* which describes the project implementation process according to the existing legal and regulatory framework;
- *Step 1: Identify problem areas,* which explains the identification stage where policy makers decide on the current needs and the potential PSP projects to address such demand;
- *Step 2: Assess financial viability,* which explains methods to assess the financial viability of potential projects and decide on subsidies and private investments (if necessary);
- *Step 3: Choose between public and private procurement,* which explains the analytical process to justify the rationale of attracting private sector;
- *Step 4: Assess the project's viability,* which explains methods to assess a project's technical, legal, and socio-environmental aspects;
- *Step 5: Select a procurement structure,* which explains how to select a suitable structure to address problems (e.g., by developing the risk allocation and remuneration mechanism);
- *Step 6: Procurement,* which explains the procurement procedures and techniques to select the optimal options; and
- *Step 7: Contract management,* which provides information regarding activities and methods to manage a contract.

10.2 Concept notes (Pre-feasibility studies)

The immediate next step and objective is to confirm the project concepts identified in Section 9 above in consultation with the ADB and GOU stakeholders. The project concepts were designed based on the findings of this study; however, more specifics are required to advance the project ideas. Those specific details include the locations, appropriate scale of projects, as well as the GOU willingness and ability to provide de-risking measures, such as guarantees.

After the concepts receive support, the next step will be to expand the concepts to detailed business cases, specifying their scope, location as consulted with the stakeholders, as well as confirming feasibility.

Working with the public sector, it will also be important to determine if there are any legal impediments or restrictions that may need to be overcome to enable the implementation of the projects. For example, PPP procurement models, such as Design, Build, Finance, and O&M, typically depend on the ability to use an availability-based payment funding model and GOU being able to manage such contracts. These critical aspects will need to be confirmed.

Engagements with GOU stakeholders will also help identify the likely implementing agency for a PPP, what type of guarantees are available and what government ministry provides them. The latter will be critical to developing the structure of the project and the risk sharing matrix. Further, the public sector will help define the locations for the pilots.

The pre-feasibility studies will not be complete and accurate without market feedback from potential investors. Thus, the next step would be testing the project concepts with the potential private sector parties and identifying major concerns, risks, and requirements they have from the government to de-risk the projects and make the investment attractive and possible.

Appendix A: Market sounding

In preparing this diagnostic, we received insights and information on current situation in the agricultural sector of Uzbekistan while conducted interviews with the private sector players who run active businesses in the sector.

The Consultant conducted interviews with the private sector participants that run companies in:

- Cotton, textile
- Wheat
- Meat and milk processing
- Poultry production
- Fresh fruits and vegetables exporting
- Fruits processing.

The interviews were conducted around the following questions:

- What are the key activities of the company? How does the company cooperate with the farmers and the government?
- What are key barriers and constraints in their business?
- Is a land lease a part of their business? What are constraints do they face working with land and within related regulations?
- Is irrigation a part of their business? What is the feedback on the current irrigation system? What actions are taken to improve irrigation?
- Do local authorities/hokimiyats influence their businesses? How?
- What are the key incentives and subsidies they receive from the government?
- What is the current value chain in their business?
- What are regulative and legislative constraints?
- What are financing sources for their businesses and how do they assess the effectiveness of the financing mechanisms?
- How would they assess the availability of human resources and educated personnel in the agricultural sector?
- What are the export countries for their products? What stops them from exporting to the developed countries?
- What are opportunities they see for agricultural development in Uzbekistan?
- What, in their opinion, should be done to increase private sector participation in the agricultural sector?

The Consultant also interviewed 7 farmers together with the head of the farmers' council in Fergana region.

The interviews were conducted around the following questions:

- What are the key activities of the farmers? What type of crops do they cultivate? To whom do they sell the products?
- What are key barriers and constraints in their farming?
- What methods are used to collect ripe products?
- Where do they buy fertilizers, seeds? Do they acquire equipment?
- What are the key incentives and subsidies they receive from the government?
- What kind of support they need from the government?
- What are the key incentives and subsidies they receive from the government?
- What are regulative and legislative constraints? Did they face situation when local authorities violate rules and farmers' rights?
- What are opportunities they see for agricultural development in Uzbekistan?
- What changes are required to improve agricultural sector and private sector participation?

Appendix B: Parallel assignments in the sector

Table 10.1: Uzbekistan: Agrifood Sector Development Partner Projects

#	Project title	US$ (million)	Grant/ Credit	Development Partner	Government Partner	Implementing Agency	Start date	End date
TOTAL ONGOING PROJECTS (US$4,000 million)								
(A) Irrigation and drainage projects (US$1,137.6 million)								
1	Sustainable management of water resources in rural areas in Uzbekistan (Component III)	2.26	Grant	EU	MoWR	GIZ-led Consortium	2016	2020
2a	Amu Bukhara Irrigation System Rehabilitation	215.00	Credit	ADB	MoWR	MoA (former UZAIFSA)	2014	2021
2b	Amu Bukhara Irrigation System Rehabilitation	113	Credit	JICA	MoWR	MoWR	2015	2025
3	Improvement of Water Resources management in Surkhandarya Region	89.60	Credit	IsDB	MoWR	MoWR	2015	2020
4	South Karakalpakstan Water Resource Management Improvement Project	214.00	Credit	WB	MoWR	MoWR (former UZAIFSA)	2016	2022
5	Fergana Valley Water Resource Management Project 2	145.00	Credit	WB	MoWR	MoWR (former UZAIFSA)	2017	2024
		16.70	Grant	EU		MoWR (former UZAIFSA)		
6	Water Services and Institutional Support Programme in Uzbekistan, Phase 1	281.8	Credit	EIB	MoWR	EIB/ MoWR (former UZAIFSA)	2019	2028
		12.68	Grant	EU		EIB/ MoWR (former UZAIFSA)		
(B) Horticulture related projects (US$1,467.1 million)								
1	Sustainable Development in Rural Areas of Uzbekistan	11.11	Grant	EU	MoA	GIZ-led Consortium	2015	2020
2	Horticulture Value Chain Development Project	150.00	Credit	WB	MoA	MoA (former UZAIFSA)	2015	2023

#	Project title	US$ (million)	Grant/ Credit	Development Partner	Government Partner	Implementing Agency	Start date	End date
		25.00	Grant	EU		MoA (former UZAIFSA)		
4	Climate adaptation and mitigation program for the Aral Sea Basin	14.00	Credit	WB	MoA	MoA (former UZAIFSA)	2017	2020
5	Horticulture Sector Value Chain Infrastructure Project	197.00	Credit	ADB	MoA	MoA (former UZAIFSA)	2019	2022
6	Horticulture Development Project, Phase II	500.00	Credit	WB	MoA	MoA (former UZAIFSA)	2018	2022
7	Horticulture Value Chain Development Project	352.00	Credit	ADB	MoA	MoA (former UZAIFSA)	2017	2021
8	Horticulture Value Chain Promotion Project	218.00	Credit	JICA	MoA	MoA (former UZAIFSA)	2015	2025
9	Agricultural Value Chains Activity in Uzbekistan		Credit	USAID	MoA	MoA	2015	2020
(C) Livestock related projects (US$510.6 million)								
1	Dairy Value Chain Development Programme*	23.88	Credit/Grant	IFAD	MoA	SLDVC (former UZAIFSA)	2016	2022
2	Livestock Sector Development Project	150.00	Credit	WB	MoA	SLDVC (former UZAIFSA)	2018	2022
		17.26	Grant	EU		SLDVC (former UZAIFSA)		
3	Livestock Value Chain Development Project	150.00	Credit	ADB	MoA	SLDVC (former UZAIFSA)	2019	2025
4	Livestock Sector Development Project*	169.50	Credit	AFD	MoA	SLDVC (former UZAIFSA)	2017	2021
5	Establishment of a Network on Priority Livestock Diseases in Central Asia (PLDCA)	0.42	Grant	FAO	SLDVC	SLDVC (former UZAIFSA)	2019	2021
(D) Other agrifood related projects (US$836.4 million)								
1	Sustainable Cotton Supply Chain Development in Uzbekistan	5.00	Grant	IFC	Uzpakhtasanoatexport	IFC	2017	2023
2	Sustainable Forest Management in Mountain and Valley Areas in Uzbekistan	3.60	Grant	FAO/GEF	MoA	MoA	2016	2021

#	Project title	US$ (million)	Grant/ Credit	Development Partner	Government Partner	Implementing Agency	Start date	End date
3	Agriculture Diversification and Modernization Project	46.50	Credit	IFAD	MoA	MoA (former UZAIFSA)	2018	2022
4	Ecosystem-based land management and conservation of ecosystem at the lower course of the Amu Darya River	2.38	Grant	German Govt	MoA	GIZ	2017	2020
5	Technical Assistance to the Ministry of Agriculture	0.69	Grant	EU	MoA	Linpico/Landell Mills	2020	2020
6	EU Budget Support for Agriculture	39.29	Grant	EU	MoA / Coordination Council	MoF/MoA	2020	2024
	EU Budget Support for Agriculture complementary technical assistance	8.33	Grant			MoA		
7	Skills Development for Employability in Rural Areas	11.43	Grant	EU	MoA, MoLR, MoHSE	UNESCO	2020	2023
8	Improved Public Service Delivery and Enhanced Governance in Rural Uzbekistan	11.67	Grant	EU	Min of Local Government	UNDP	2019	2024
9	Supporting the Implementation of Inclusive Agricultural Policies	0.10	Grant	FAO	MoA	FAO	2020	2021
10	National Overview and Strategy for the Aquaculture Sector and the Fish Value Chain	0.25	Grant	FAO	MoA/SLDVC	FAO	2019	2021
11	Support for Sustainable Development of Beekeeping	0.34	Grant	FAO	MoA/SLDVC	FAO	2019	2021
12	Strengthening the Administrative System to Manage and Maintain Sustainable Geographical Indications	0.10	Grant	FAO	MoA	FAO	2019	2020
13	Support for the Production and Management of Rice Crops	0.10	Grant	FAO	MoA	FAO	2020	2022
14	Strengthening the Capacity of Price and Market Information and Policy Monitoring Systems in Response to COVID-19 and Other Shocks	0.42	Grant	FAO	MoA	FAO	2020	2022

#	Project title	US$ (million)	Grant/ Credit	Development Partner	Government Partner	Implementing Agency	Start date	End date
15	Sustainable Natural Resource Use and Forest Management in Key Mountainous Areas Important for Globally Significant Biodiversity	6.21	Grant	GEF	MoA	UNDP	2017	2022
16	Ferghana Valley Rural Enterprise Development Project	200.00	Credit	WB	MoA	MoA (former UZAIFSA)	2019	2024
17	Agriculture Modernization Project	500.00	Credit	WB	MoA	MoA (former UZAIFSA)	2020	2026
(E) Other Regional Agrifood related projects (US$49.1 million)								
1	Competitiveness, Trade and Jobs (CTJ)	24.00	Grant	USAID	MoFA/MoA	DAI Global	2016	2021
2	Smart Waters	10.00	Grant	USAID	MoWR	CAREC	2015	2020
3	Integrated natural resources management in drought-prone & salt-affected agricultural production systems in Central Asia & Turkey	10.98	Grant	FAO/GEF	MoA/Uzhydromet	MoWR/Uzhydromet	2016	2021
4	"D-TEX"- Digitalization of supply chains in the textile industry in Central Asia	1.29	Grant	EU	MoA	Uzbekistan Digital Commercial Association	2019	2023
5	Resource Efficiency in Agri-food Production and Processing (REAP)	2.82	Grant	EU	MoA	Regional Environmental Center for Central Asia Association	2020	2024
6	Project for Improvement of Locust Management (Phase II)	7.55	Grant	JICA/Japanese Govt	MoA	FAO	2020	2025
7	Smart Farming for the Future Generation	3.41	Grant	Korean Govt	MoA	FAO	2020	2024
8	Sustainability and Value Added in the Cotton Economy	3.57	Grant	German Govt	MoA	GIZ	2019	2023
9	Ecologically-Oriented Development of the Aral Sea Region	9.60	Grant	German Govt	MoA	GIZ	2020	2024
10	Capacity Building for Sustainable Fisheries and Aquaculture Management in Central Asia – FishCAP	1.00	Grant	Turkish Govt	MoA	FAO	2020	2022

#	Project title	US$ (million)	Grant/ Credit	Development Partner	Government Partner	Implementing Agency	Start date	End date
11	Reduction of Food Loss and Waste in the SEC Countries	0.50	Grant	Turkish Govt	MoA	FAO	2019	2021
12	Strengthening regional collaboration and national capacities for the management of wheat rust diseases	1.07	Grant	Turkish Govt	MoA	FAO	2020	2024

Source: World Bank estimates using data from the European Union Agricultural Budget Support Project, December 2020.

Appendix C: International Experience

Many countries and territories facilitated reforms to encourage PSP in agriculture and have since realized the benefits of private sector engagement and investment. Examples from other countries can demonstrate valuable lessons and practical steps that Uzbekistan can study to make domestic environment for PSP more conducive. The Consultant studied the experience of several countries which can demonstrate pathways to encouraging a greater PSP in agriculture. In particular, the following initiatives proved to be successful:

- Investment in supportive infrastructure, transport, and logistics;
- Establishment of effective state institutions to meet the needs of the market participants;
- Simplifying regulations and improving business climate, as well as getting rid of overregulation and distortive state interference;
- Simplifying taxation regime;
- Ensuring customs services support doing business and promoting exports; simplifying procedures at customs and reducing associated costs;
- Provision of the state subsidies as a continuous support of the agricultural market participants before the market is ready to continue operating without the state support;
- Provision of incentives to market participants to stimulate sector development;
- Establishment of cooperation and agreements with the target sales markets to ensure export of agricultural products as well compliance with these markets's sanitary and food safety standards;
- Application of innovations, modern technologies, and digitalization.

Agricultural reforms in Ukraine

Reforming agriculture in Ukraine was one of the main directions in the country's economic transformation in the past decade. Although one-fourth of the world's fertile black earth is located on the territory of Ukraine, historically the country has not been able to take advantage of all the natural and agricultural riches and advantages and had a poorly developed agricultural market.[150]

One of the key constraints on the development of Ukraine's agricultural sector was the official moratorium on the sale of agricultural land, which went into effect in 2002 and only finished in 2020 after the country's parliament voted to reform the farmland and abolish the moratorium. As a result, about 7 million Ukrainian landowners were legally allowed to manage the land as they wished.

[150] Ukraine can feed the world, Roman Leshenko, Minister of Agrarian Policy of Ukraine, 2021

Lifting of the moratorium was only the first step towards reforming the agricultural sector in Ukraine. Agribusiness in Ukraine was provided with affordable financing through the instruments developed by the National Bank of Ukraine. In particular, farmers were given access to credit facilities at competitive rates for the modernization of agricultural machinery and for the purchase of seeds and fertilizers of high quality. In addition, small and medium-sized farms could receive support from the Agricultural Loan Partial Guarantee Fund, established by the government.

In terms of infrastructure, transport, logistics, and export, Ukraine adopted legislative framework aimed at incentivizing PPPs and concessions to improve infrastructure, increase export potential, including river transport reforms, and the country's ability to transport large volumes, including value-added agricultural products to the world markets.

From 2019, the government of Ukraine put in place a series of regulations and strategies to make the environment more conducive to private sector investment, for example:

- Developed a strategy for attracting private investment in agriculture;
- Signed the Association Agreement with the European Union;
- Developed Irrigation and Drainage Strategy in Ukraine for the period up to 2030;
- Extended support measures to small and medium sized producers, including the general area payments for land used for farming purposes at UAH 3 000 per hectare but not exceeding UAH 60 000 (US$2,321) per farm, and the payments for other small and medium sized farms in amount of UAH 12 000 per farm member and UAH 40 000 per farm.
- The Ministry of Economic Development, Trade and Agriculture of Ukraine substantially increased the volume of subsidies to agricultural producers in 2019, totaling US$168 million compared to just US$12 million in 2016.
- Provided for partial compensation of the cost for construction or reconstruction of grain storage and grain processing capacities.
- Provided partial compensation of loans and interest rate support for the purchase of agricultural land (however, legal sale and purchase of agricultural land in the country is not possible).

A lot has been done in the grain sector which is the most significant crop in Ukraine. As of 2019–2020, Ukraine was the second largest exporter of grain after the United States. In 2020, Ukraine produced grain for US$9.6 billion, which made up 40% of all foreign exchange earnings in the country.

In October 2019, the Ministry of Economic Development, Trade and Agriculture and key associations of grain exporters of Ukraine signed the Memorandum of Understanding (MoU) on grain exports. It aims to provide mechanisms for interaction of grain market participants, the exchange of data on grain export prospects, and monitor grain market. In contrast to earlier signed memorandums, the 2019-2020 Memorandum did not provide annexes defining recommended volumes of grain exports. Instead, grain market participants started meeting on a monthly basis to exchange information on the grain market and export situation.

In 1998, Ukraine replaced twelve taxes for agricultural producers to one Single Tax, which is a percentage of agricultural land value (adjusted to the general consumer price index). Ukraine also conducted transformation of customs procedures and reduced customs offices from 26 to 16 across the country. Additionally, the Export Promotion Office was established to assist exporters to access new markets, and provide support to foreign importers. The Export Credit Agency established in 2018 facilitated Ukraine in transition from exported of raw materials to supplier of value added goods and services.

Active cooperation with the foreign markets to enhance export activities was supported with the European Union (EU) and Ukraine signed the Deep and Comprehensive Free Trade Area (DCFTA). EU opened tariff rate quotas for duty-free imports from Ukraine for grain, meat, milk products, sugar, and granted free access for the other agri-food products. Forty percent of agriculture-related import duties decreased to zero after the agreement entered into force, and half of import duties were planned to be eliminated during seven to ten years of transition period. About 10% of tariff lines preserved non-zero tariffs, including products such as dairy and eggs, sugar, feeding stuff for animals, animal oils and fats, and miscellaneous edible products. Ukraine also signed the Free Trade Agreements with the European Free Trade Association, the Commonwealth of Independent States, bilateral agreements with each member of the Commonwealth of Independent States, and the Free Trade Agreements with Canada and Israel.

The main barrier for trade integration remains Ukraine's difficulty in complying with EU food safety, veterinary and phytosanitary requirements. In line with these, in 2016 Ukraine approved the "Comprehensive Strategy of Implementing Legislation on Sanitary and Phytosanitary Measures" to harmonize Ukraine's Sanitary and Phytosanitary legislation with the EU requirements.

Ukrainian government provided financial support to the agricultural sector, including the partial costs compensation for agricultural machinery and equipment, providing preferential credits, the compensation of advisory services to farmers, and the single tax regime. Support measures for livestock producers included interest rate support for livestock husbandry and breeding, the partial costs compensation for construction and reconstruction of animal farms and complexes, per head payments to agricultural enterprises for cows, and to rural households for young cattle, and a partial compensation for purchasing high breeding animals, semen and embryos. For crops, the state continued providing seed cost compensation, and compensations for different on-farm investments and debt repayments. Additionally, the Ukraine discontinued support by unpaid VAT for agricultural producers within the accumulated VAT system and provided "Development Subsidy" until 2018.

Agricultural development in Kazakhstan

Despite the decline in the contribution of agriculture to the economy of Kazakhstan, it remains an important sector in the country's economic development, accounting for about 4% of GDP and 15% of total employment. About 75% of the country's land is suitable for agricultural production, but today only 30% is involved in agriculture. The country is also among the top 10 world's largest grain exporters. The country's main crops are wheat, barley, cotton, and rice, with wheat exports being the main source of foreign exchange.

Kazakhstan focused its agricultural development on import substitution and development of value-added exports, primarily in the beef production sector. To achieve these goals, Kazakhstan's agricultural legislation has been modified. The State Programme 2021 has put emphasis on developing and supporting individual household plots and small farms, cooperatives of agricultural producers and services and infrastructure that support agriculture. In addition, some subsidies for inputs, including seeds, fertilizers and pesticides, were increased.

The government changed the system of compulsory crop insurance into a system of voluntary insurance. This process was aimed at expanding the crop and livestock insurance markets in the country, with half of the insurance premiums being subsidized from the state budget. Additionally, the change demonstrated GOK's willingness to decrease state control over the sector.

With its huge potential in agricultural production and vast agricultural areas, Kazakhstan provides full support to farmers at all stages of agricultural production, from enterprise establishment to product export. Thus, during the establishment phase, the state introduced various forms of taxation with reduced tax rates, and tax exemptions for farmers from a number of other taxes.

The modern state program for the development of the agro-industrial complex of Kazakhstan for 2017-2022, being the basis of the agricultural policy of Kazakhstan, placed great emphasis on the development and support of individual household and small farms, cooperatives of agricultural producers, as well as the development of agricultural infrastructure. The main changes were amendments to agricultural legislation and shifting the focus of investment support to priority areas, continuation of the organizational reform of KazAgroHolding (agro-industrial complex support institute, which implements the state policy for the development of the agro-industrial complex of Kazakhstan by ensuring the effective management of investment assets in the agro-industrial complex), focus on bringing land into productive use, drawing up a land cadastre, land valuation, preparation of significant changes in land taxation, including an increase in taxes for unused land.

There is a steady trend of investment in the fixed capital of agriculture. Thus, the volume of investments in fixed capital of agriculture increased by 33.3%, in food production increased by 3.1%. In 2021, the sown area of all agricultural crops amounted to 22.9 million hectares, which is 343.3 thousand hectares more than in 2020. Of these, grains and legumes - 16.0 million hectares (more by 236.9 thousand hectares), including wheat - 12.9 million hectares (more by 749.9 thousand hectares). In 2021, according to the akimats of the regions, the application of mineral fertilizers amounted to 626.5 thousand tons, or 24% of the scientific need. Last year, 28.6 billion tenge was allocated to subsidize the cost of purchased fertilizers , which made it possible to reduce the price of 493.8 thousand tons of mineral fertilizers (79% of the purchase volume). At the end of 2021, in the field of meat and milk processing, production growth amounted to 109.4% and 101.9%, respectively, which shows good growth rates. The production of meat and dairy products reached 774.4 billion tenge (in 2020 - 684.5 billion tenge). Under the program for subsidizing the costs of dairy processing enterprises, more than 100 enterprises received subsidies in the amount of 10 billion tenge. As a result of the implementation of the program, the provision of the domestic market for butter at the expense of domestic production increased from 65% in 2014 to 100% in 2021. The state also increased the volume of subsidies for agricultural producers for the purchase of seeds, fertilizers and pesticides.

The State Commission for Economic Modernisation intervenes in grain purchases to support domestic producer prices. At the same time, there is a stabilisation of consumer prices for 29 commodities. Purchases are made after the harvest at market prices and commodities are stored and released at below-market prices later in the year.

Investment subsidies, along with concessional credit through multiple channels, are a powerful tool to support agriculture. Several lending agencies provide loans at reduced interest rates under the auspices of the state-owned KazAgro Holding. Along with agricultural producers, food industry enterprises use preferential loans and leasing machinery and equipment from credit agencies of KazAgro Holding. The system of subsidizing agriculture is also accompanied by the use of modern information technologies, which have led to the simplification, facilitation of control and increase in the transparency and efficiency of state support for agriculture. For example, the availability of electronic subsidy payments applies to most subsidy programs so that all loan and lease applicants can apply electronically. Within the framework of preferential financing, a program "Made in Kazakhstan" was launched in 2020 for agricultural producers, who are lessees of equipment produced in Kazakhstan. The leasing terms include an interest rate of 6% per annum for up to 10 years with a preferential payment period of up to one year. In addition, Kazakhstan is implementing a new cryptocurrency "BidayCoin," which will greatly facilitate the payment process for traders, and which will be linked to other payments, such as for subsidized fuel, fertilizers, insurance, and other services.

An important change in the subsidizing process is the amendments to the methodology for calculating the regional distribution of payments for subsidizing agriculture. Starting from 2020, the regional distribution of payments is calculated based on the region's share in the gross agricultural output, and not its share in the population. In order to control the direct use of funds for certain purposes of agriculture, and not in other sectors, minimum expenditures for supporting agriculture will be established.

The Law on Agribusiness Regulation, signed by the President in October 2019, allows the use of space monitoring results to identify unused land and return it to state ownership. The new digital agricultural land cadastre stores 6.5 million inputs on land plots, including soil, geobotanical and agricultural land.

In 2020, the unified land tax was amended and all income received by a farmer from the sale of agricultural products will be subject to the unified land tax at a rate of 0.5% of sales revenue for the calendar year. Previously, the unified land tax was calculated based on the appraised value of land plots leased or owned and was not linked to the turnover from the sale of agricultural products. Small business farmers are exempt from the single land tax until 2023.

In 2020, the Ministry of Agriculture has completed soil maps for 26 million ha, geobotanical maps for 25 million ha and agricultural maps for 6.5 million ha (or 3% of agricultural land). In 2021-22, the coverage will be increased to 40 million ha for soil and geobotanical maps and 33.2 million ha for agricultural maps. As part of the State Programme for the Development of the Agro-industrial Complex of the Republic of Kazakhstan for 2022-26, it is planned to transfer all prepared maps into digital form.

In its efforts to transform the sector, Kazakhstan invites the expertise from IFIs and international experts. For example, recently, the World Bank approved a loan in the amount of US$500 million to support the implementation of the State Program to improve veterinary services and animal recording systems, expand the service delivery model focused on farmers, and improve agro-environmental policies in the sector. The funds are allocated through the Program for Results financial tool mechanism, which designates the allocation of funds based achieving defined outcomes. Thus, one of the defined targets is to until 2025, ensure about 20,000 small and medium-sized farms are connected to export value chains.

In 2021 the GOK launched a comprehensive 274 billion tenge (US$663 million) program to modernize the irrigation system in the country, including the rehabilitation of 6,785 km of canals, 4 reservoirs, 4 waterworks, 239 vertical drainage wells and 23,000 other hydraulic structures. The expected effect of this project is an increase in the total irrigated area by 500,000 ha in Almaty, Zhambyl, Turkestan, Kyzylorda and Aktobe regions.

The structure of NAO's subsidiaries, the National Centre for Agricultural Research and Education, was transformed in 2020 to make it more flexible to meet business needs. Twenty-two extension centres have been established and permanent advisory centres have been set up. Work is also underway to ensure sufficient funding for agricultural science. Funding of 50.4 billion tenge ($122 million) has been approved to develop 36 S&T programmes in 10 priority areas of research (crop production, livestock, veterinary medicine, processing of agricultural raw materials, etc.) over the next three years.

To stimulate innovative development, the introduction of new technologies in agriculture and increase labor productivity, from 2020 the Ministry of Agriculture subsidizes 80% of farmers' costs for the purchase of services from Kazakh research organizations. In addition, 49 "smart" farms were created, and an electronic trading platform is being created for the sale of agricultural products.

Example from China

Since 2016, China’s government has embraced PPPs as one of the crucial steps to open up and modernize the agriculture sector via the injection of private capital into various sectors, including land quality, crop and livestock protection, and infrastructure development. The goal of such practices is to promote supply-side structural reform and “sustainable and healthy” development in agriculture.[151] By 2020, the country generates nearly US$912 billion in gross value of agricultural production based on PPP procurement framework (in 2004-2006 constant prices), despite witnessing a 1.49% setback in that year due to the negative impact of COVID-19.[152]

[151] Reuters Staff. China to promote public-private partnerships in agriculture. Reuters. 2016. https://www.reuters.com/article/china-farm-funding-idUSL4N1EE1PD

[152] Knoema. China – Gross value of agricultural production based on PPP in constant prices of 2004 – 2006. 2022. https://knoema.com/atlas/China/topics/Agriculture/Value-of-Agricultural-Production-Gross-Production-Value-Constant-2004-2006-1000-Idollar/Gross-value-of-agricultural-production-based-on-PPP

PPPs were signed in the sustainable maize production to achieve dual benefits of national food security and environmental sustainability. The PPP model brought the public sector the benefits of complementary skills, research, knowledge, and strategies for a more efficient maize production and processing in the country.

The PPP scheme increased yield potential by 17% in four major maize-growing areas, while reducing nitrogen losses by 33.4% compared to smallholder farms. By 2019, PPPs resulted in a 19% drop in greenhouse gas emissions, a 26% drop in soil acidification, and 21.5% of eutrophication of water bodies. With PPPs, the net ecosystem budget increased by US$277 per hectare.[153]

Another prominent example is the PPP model applied in agricultural irrigation infrastructure in rural areas, particularly in Nujiang River Valley. The private entities were responsible for building and investing in pumping stations. They benefited from charging water fees or utilizing transferred farmlands. Although it is challenging to define the success due to the diverse nature of the studied regions, the sector potential is likely to improve thanks to the PPP mechanism in irrigation and drought adaptation, particularly in remote regions.[154]

Example from Vietnam

Vietnam's Ministry of Agriculture and Rural Development and agribusinesses have initiated PPP models for sustainable agricultural development to connect industrial actors and collaborate to develop a value chain of key agricultural products. The model has later been institutionalized into the Partnership for Sustainable Agricultural in Vietnam with task forces for coffee, tea, vegetables, seafood, rice, pepper, livestock, and agrochemicals. Through a decade of operation, the PPP task forces have developed environmentally-friendly and sustainable farming models that also improved farmer incomes.

Both Vietnam and China have supported the PSP in agriculture by adjusting policies, public investment, and administrative processes to inject more market principles to the supply side. Both countries witnessed an average annual sector growth of 4% during the initial sectoral reform in 1990-2000.

These two examples of agricultural transition can offer six valuable lessons for Uzbekistan when deploying a sectoral transformation. First, the likelihood of transformation is higher once land tenure and tradable use rights are ensured. In Vietnam, the state-order systems with production targets were eradicated permitting land users to enjoy long-term leases up to 50 years. Rice farmers in China, meanwhile, receive subsidies as a compensation from the government for maintaining

[153] Xingbang Wang et al. Public-private partnership model for intensive maize production in China: A synergistic strategy for food security and ecosystem economic budget. Food and Energy Security. 2021. https://www.researchgate.net/publication/353483333_Public-private_partnership_model_for_intensive_maize_production_in_China_A_synergistic_strategy_for_food_security_and_ecosystem_economic_budget

[154] Yanbo Li et al. Success Factors of Irrigation Projects Based on A "Public-Private Partnership" Model in A Mountainous Area: A Case Study in the Nujiang River Valley, China. Sustainability; Basel. Volume 11. Issue 23. 2019. https://www.mdpi.com/2071-1050/11/23/6799

production of less-profitable produces. Land rentals also support consolidation and transfer of land to efficient users.

Second, agrarian transitions and broader structural reforms are sequenced to gradually improve prerequisite institutional reforms to be implemented. Reforms first occur in rural areas with pilot projects that are rigorously evaluated to circumvent political resistance against reforms via smaller-scale successes. If these schemes are unsuccessful, they can be classified as a failed trial and not a policy error.

Third, the decentralization of responsibilities to local and provincial governments is powerful while still enabling the transformation within a central strategic policy framework. This permits local governments to acquire growing responsibilities on policies, fiscal resources, and investment approvals. Both China and Vietnam have encouraged their subordinate regions to apply reform efforts, and successful ones subsequently become official policies.

Fourth, the removal of market distortions is imperative if prices of products are below the average global level. For China, policy makers highlight the price incentives and sustainment of increases in agricultural productivity to support farmers. Vietnam, meanwhile, focused on the provision of agricultural public services to support farmers rather than direct subsidies.

Fifth, investment in core agricultural projects is vital, particularly in irrigation and drainage assets in remote regions. These amount to 0.3- 0.5% of agricultural GDP, compared to 0.04% for Uzbekistan by 2019. Such investments have generated localized and fertile inputs so that farmers can engage in multiple crops within a year and keep the area sown throughout the year.

Finally, the inclusion of small farms (averaging at less than one hectare) in agri-food value chains is imperative by matching grants and credit lines to achieve economies of scale and reduce transaction costs. With their heavy dependence on smaller farmers, these practices help China achieve land consolidation and both horizontal and vertical coordination.

Appendix D: State financing

Figure D.1: Subsidy Scheme of Fund

Stages	*Activities to be implemented*	Deadlines	Responsible Entities
Stage I	An agricultural enterprise submits an application to a leasing organization or a commercial bank for the purchase of agricultural machinery on a leasing or credit basis.	Permanently	Agricultural enterprise
Stage II	A leasing organization or a commercial bank considers an application submitted by an agricultural enterprise for the purchase of agricultural machinery on a leasing or credit basis.	3 banking business days	Leasing organization or commercial banks
Stage III	In the case of a positive conclusion of a leasing organization or a commercial bank, an agricultural enterprise is provided with a leasing or a loan for the purchase of agricultural machinery on the terms of a leasing or a loan.	1 banking day after receiving the conclusion	Leasing organization or commercial banks
Stage IV	A leasing organization or a commercial bank submits an application to the Fund for the allocation of a subsidy to an agricultural enterprise for leasing or a loan in the amount of 10% of the amount of the lease or loan reimbursement.	By the 20th day of the month following the reporting period	Leasing organization or commercial banks
Stage V	The Fund allocates a subsidy to a leasing company or a commercial bank to cover 10% of the leasing or credit allocated to an agricultural enterprise for the purchase of agricultural machinery on a leasing or credit basis.	On time, in the master agreement	Fund

Thus, JSC "Agrobank", "NBU", and "Hamkorbank" which provide the most explicit instructions regarding applying process for loan and its terms have following loans.

Table D.1: Available loans

Bank	*Loan description*	*Term of loan*	*Grace period*	*Interest rate*	*Loan amount*
JSC "National Bank of Uzbekistan"	**Loan to Replenish Working Capital** This loan is intended to replenish working capital of enterprises cultivating fruits and vegetables that have signed a trilateral agreement with the Khokimiyats, the Ministry of Agriculture of the Republic of Uzbekistan.	not more than 18 months	not more than 6 months	23% per annum	N/M
	Loan to Purchase Fixed Assets This loan is intended to purchase fixed assets, including refrigeration warehouse and greenhouse equipment.	not more than 7 years	not more than 24 months	23% per annum *In foreign currency through the credit line of foreign banks and international financial institutions* *7.99% per annum*	The amount depends on producing capacity of the fruit and vegetable cluster, financial viability of the project and the cost of contract concluded by the cluster.
	Credits provided in the national currency, in cash The purchase of agricultural products to business entities (legal entities) engaged in the export of agricultural products and included	no more than 90 days	not available	23% per annum	It is set based on the indicators specified in the business plan of exporting business entities that

Bank	*Loan description*	*Term of loan*	*Grace period*	*Interest rate*	*Loan amount*
	to the list formed by the regional departments of the Ministry of Investment and Foreign Trade of the Republic of Uzbekistan if they have no overdue debts on previously issued loans, as well as problems with repayment of previously received credits. The regional departments of the Ministry of Investment and Foreign Trade of the Republic of Uzbekistan must provide guarantee letters to the bank for each credit application of a business entity, the exporter.				include an actual forecast of cash flows sufficient for repayment of the credit after deducting all mandatory expenses over the next 3 months, as well as based on the export contracts with a sales volume established by the business plan.
JSC "Agrobank"	**For the development of viticulture and winemaking** Organization of projects for the proposal of new vineyards and reconstruction (modernization) consistently; financing projects for the production of alcoholic beverages from grapes, berries and fruits; financial support for the activities of	7 years	3 years	based on the market situation;	determined based on the requirements of the bank's credit policy;

Bank	*Loan description*	*Term of loan*	*Grace period*	*Interest rate*	*Loan amount*
	producers of alcoholic products.				
	Lending to farmers, farms and "Tomorqa xizmati" LLC For enterprises that grow, process and export fruits and vegetables and grape products Purpose of the loan: To replenish working capital	for 12 months in the form of a revolver, (The schedule is determined on the basis of a business plan, repayment for at least the last 3 months), the amortized part of the loan is redistributed within 9 months)	1 year	23,99%	In the amount not exceeding 3 (three) times the average 1 (one) monthly turnover for the last 6 months (for companies with regular income for the last 2 months).
	For the development of fruit and vegetable production Soft loans for the construction of greenhouses, seedlings of vegetables and fruits, gourds, the purchase of irrigation equipment (pumps, artesian, wells, etc.), etc.	N/M	N/M	N/M	N/M
	Financing the implementation of drip irrigation technologies Interest on loans for the construction,	Up to 3 years	6 months	in agreement with the client, based on the cost of bank services.	business plan and contract for the sale of inventory items provided by

Bank	*Loan description*	*Term of loan*	*Grace period*	*Interest rate*	*Loan amount*
	reconstruction and purchase of a drip irrigation system for cotton producers by a commercial bank is provided in the amount of 10%, not exceeding 20 million soums per 1 hectare of land and is covered by the State Fund for Supporting Business Development under the Cabinet of Ministers of the Republic of Uzbekistan. Purpose of the loan: purchase and installation of drip irrigation for agricultural enterprises growing raw cotton. **Subsidies from the state budget:** From the state budget, producers of raw cotton will be provided with a subsidy in the amount of 8 million soums for each hectare of cotton sown area in order to introduce drip irrigation technologies.				the Customer in the amount (15-20 million soums per 1 hectare of land).
	For the protection of plants Purpose of the loan: Organization of laboratories; Acquisition of equipment and	3 years	From 3 to 6 months	Preferential loans are provided at interest rates The State Entrepreneurship Support Fund compensates the	N/M

Bank	*Loan description*	*Term of loan*	*Grace period*	*Interest rate*	*Loan amount*
	equipment for existing laboratories; Strengthening the material and technical base; Acquisition or renovation of plant protection laboratory building and biolaboratories; For working capital; For other expenses related to the protection and maintenance of plants. **Business entities receiving loans** Entrepreneurs engaged in the production and maintenance of plants to combat pests, diseases and weeds, as well as those wishing to start their activities anew (biological laboratories, plant protection laboratories, plant clinics, veterinary pharmacies, plant protection services, etc.).			interest on the loan: * the loan amount is 10 billion soums, the cost of interest payments on loans provided in the national currency, the interest rate of which does not exceed 1.75 times the main rate of the Central Bank, in an amount exceeding the main rate of the Central Bank, but not more than 7 percentage points; * the equivalent of 10 billion for loans issued in foreign currency, not exceeding 30% of the interest rate set by commercial banks, but not more than 3 percentage points.	
JSC "Hamkor Bank"	**Agroloan**	5 years	Up to 2 years	On the basis of an agreement	Up to 25% of the authorized capital of the bank

Loan “For the development of fruit and vegetable production” issued for 12 months at 23,99% interest rate for up to US $100 thousand provided by Agro Bank requires to submit a recommendation letter of the regional council of farmers, dehkan farms and homestead owners.[2]

List of Government organizations involved in food processing and packaging sectors, procurements, and export opportunities in Uzbekistan (web sites):

- Ministry of Investments, Industry and Trade of Uzbekistan
- ITECA Exhibitions Uzbekistan
- Chamber of Commerce and Industry of Uzbekistan
- Government Portal of the Republic of Uzbekistan, gov.uz
- Ministry of Economy and Finance of Uzbekistan
- Ministry of Agriculture of Uzbekistan
- State Committee for Veterinary Medicine and Livestock Development of Uzbekistan under the Ministry of Agriculture of Uzbekistan .

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