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Report No: PAD4421

INTERNATIONAL DEVELOPMENT ASSOCIATION

PROJECT APPRAISAL DOCUMENT
ON A
PROPOSED GRANT

IN THE AMOUNT OF SDR 40.4 MILLION
(US\$58.0 MILLION EQUIVALENT)

TO THE

REPUBLIC OF TAJIKISTAN

FOR A

STRENGTHENING RESILIENCE OF THE AGRICULTURE SECTOR PROJECT

May 26, 2021

Agriculture and Food Global Practice
Europe and Central Asia Region

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CURRENCY EQUIVALENTS

(Exchange Rate Effective { April 30, 2021})

Currency Unit = Tajik Somoni (TJS)

TJS 11.3 = US\$1

US\$ 1.44 = SDR 1

FISCAL YEAR

January 1 - December 31

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ABBREVIATIONS AND ACRONYMS

ACP	Agriculture Commercialization Project
ADB	Asian Development Bank
ALCs	Agri Logistical Centers
CFS	Committee for Food Security
CPF	Country Partnership Framework
CSA	Climate Smart Agriculture
DPs	Development Partners
ECO	Economic Cooperation Organization
EU	European Union
ESF	Environmental and Social Framework
FAO	Food and Agriculture Organization of the United Nations
FM	Financial Management
GBAO	Gorno-Badakhshan Autonomous Region
GDP	Gross Domestic Product
GHG	Greenhouse Gas
GoT	Government of Tajikistan
ICT	Information and Communication Technology
IDA	International Development Association
ISTA	International Seed Testing Association
L2TS	Listening to Tajikistan Survey
MoA	Ministry of Agriculture
M&E	Monitoring and Evaluation
MTDP	(State Program for) Medium-Term Development of the Republic of Tajikistan 2021-2025
NAIP	National Investment Plan for Food and Nutrition Security and Sustainable Agricultural Development, Ministry of Agriculture
NDS	National Development Strategy 2015-2030
PDO	Project Development Objective
PIU	Project Implementation Unit
POM	Project Operations Manual
PSC	Project Steering Committee
PTC	Project Technical Committee
REDP	Rural Economic Development Project
RF	Results Framework
RRS	Region of Republican Subordination
R&D	Research and Development
SOE	Statement of Expenditure
SOEs	State Owned Enterprises
SRASP	Strengthening Resilience of the Agriculture Sector Project
TA	Technical Assistance
TAAS	Tajikistan Academy of Agricultural Sciences
TAU	Tajik Agrarian University
WBG	World Bank Group
WDC	Wholesale Distribution Centre
WFP	World Food Program

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DATASHEET

BASIC INFORMATION

Country(ies)	Project Name	
Tajikistan	Strengthening Resilience of the Agriculture Sector Project	
Project ID	Financing Instrument	Environmental and Social Risk Classification
P175952	Investment Project Financing	Substantial

Financing & Implementation Modalities

<input type="checkbox"/> Multiphase Programmatic Approach (MPA)	<input type="checkbox"/> Contingent Emergency Response Component (CERC)
<input type="checkbox"/> Series of Projects (SOP)	<input type="checkbox"/> Fragile State(s)
<input type="checkbox"/> Performance-Based Conditions (PBCs)	<input type="checkbox"/> Small State(s)
<input type="checkbox"/> Financial Intermediaries (FI)	<input type="checkbox"/> Fragile within a non-fragile Country
<input type="checkbox"/> Project-Based Guarantee	<input type="checkbox"/> Conflict
<input type="checkbox"/> Deferred Drawdown	<input type="checkbox"/> Responding to Natural or Man-made Disaster
<input type="checkbox"/> Alternate Procurement Arrangements (APA)	<input type="checkbox"/> Hands-on Enhanced Implementation Support (HEIS)

Expected Approval Date	Expected Closing Date
18-Jun-2021	30-Jun-2027

Bank/IFC Collaboration

No

Proposed Development Objective(s)

The development objective of the proposed project is to strengthen the foundations for a more resilient agricultural sector in Tajikistan.

Components

Component Name	Cost (US\$, millions)
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Strengthening seed, seedling and planting material systems	27.70
Support investments in Agri-Logistical Centers (ALCs) for horticulture value chains	14.00
Strengthen public capacity for crises prevention and management	13.30
Project management and coordination	3.00

Organizations

Borrower: Republic of Tajikistan
 Implementing Agency: Ministry of Agriculture

PROJECT FINANCING DATA (US\$, Millions)

SUMMARY

Total Project Cost	58.00
Total Financing	58.00
of which IBRD/IDA	58.00
Financing Gap	0.00

DETAILS

World Bank Group Financing

International Development Association (IDA)	58.00
IDA Grant	58.00

IDA Resources (in US\$, Millions)

	Credit Amount	Grant Amount	Guarantee Amount	Total Amount
Tajikistan	0.00	58.00	0.00	58.00
National PBA	0.00	58.00	0.00	58.00
Total	0.00	58.00	0.00	58.00

Expected Disbursements (in US\$, Millions)



WB Fiscal Year	2021	2022	2023	2024	2025	2026	2027
Annual	0.00	5.00	10.00	13.00	14.00	9.00	7.00
Cumulative	0.00	5.00	15.00	28.00	42.00	51.00	58.00

INSTITUTIONAL DATA

Practice Area (Lead) Contributing Practice Areas

Agriculture and Food

Water

Climate Change and Disaster Screening

This operation has been screened for short and long-term climate change and disaster risks

SYSTEMATIC OPERATIONS RISK-RATING TOOL (SORT)

Risk Category	Rating
1. Political and Governance	● Moderate
2. Macroeconomic	● Moderate
3. Sector Strategies and Policies	● Moderate
4. Technical Design of Project or Program	● Moderate
5. Institutional Capacity for Implementation and Sustainability	● Moderate
6. Fiduciary	● Moderate
7. Environment and Social	● Substantial
8. Stakeholders	● Moderate
9. Other	● Moderate
10. Overall	● Moderate



COMPLIANCE

Policy

Does the project depart from the CPF in content or in other significant respects?

[] Yes [✓] No

Does the project require any waivers of Bank policies?

[] Yes [✓] No

Environmental and Social Standards Relevance Given its Context at the Time of Appraisal

E & S Standards	Relevance
Assessment and Management of Environmental and Social Risks and Impacts	Relevant
Stakeholder Engagement and Information Disclosure	Relevant
Labor and Working Conditions	Relevant
Resource Efficiency and Pollution Prevention and Management	Relevant
Community Health and Safety	Relevant
Land Acquisition, Restrictions on Land Use and Involuntary Resettlement	Relevant
Biodiversity Conservation and Sustainable Management of Living Natural Resources	Relevant
Indigenous Peoples/Sub-Saharan African Historically Underserved Traditional Local Communities	Not Currently Relevant
Cultural Heritage	Not Currently Relevant
Financial Intermediaries	Not Currently Relevant

NOTE: For further information regarding the World Bank's due diligence assessment of the Project's potential environmental and social risks and impacts, please refer to the Project's Appraisal Environmental and Social Review Summary (ESRS).

Legal Covenants

Sections and Description



No later than two (2) months from the Effective Date, the Project Implementation Unit shall adapt the accounting software for managing the accounting, budgeting and financial reporting of the Project and install appropriate accounting software at the regional offices (Schedule 2, Section I of the Financing Agreement).

Sections and Description

The Recipient shall ensure that the project is implemented in accordance with the Environmental and Social Commitment Plan, in a manner acceptable to the International Development Association (Schedule 2, Section I of the Financing Agreement).

Sections and Description

The MoA shall establish, not later than three (3) months from Effective Date, and thereafter maintain throughout the Project implementation, two regional Project offices, in Sughd and in Khatlon regions, both with a structure, functions, responsibilities, and adequate staff, all as further described in the Project Operations Manual and acceptable to the International Development Association (Schedule 2, Section I of the Financing Agreement).

Sections and Description

The MoA shall establish, not later than three (3) months from Effective Date, and thereafter maintain throughout the Project implementation a Project Steering Committee with composition and terms of reference acceptable to the International Development Association, to be chaired by the Deputy Prime Minister, which role shall be to provide strategic advice, ensure smooth coordination between various public entities engaged in the Project implementation and help in identifying key issues that need to be brought to the attention of the Government and facilitate their resolution (Schedule 2, Section I of the Financing Agreement).

Sections and Description

The MoA shall establish, not later than three (3) months from Effective Date, and thereafter maintain throughout the Project implementation a Project Technical Committee with composition and terms of reference acceptable to the International Development Association, to be chaired by the Deputy Minister of Agriculture, which role shall be to provide technical advice to the Project Implementation Unit on the quality of implementation reports and special studies, guidelines, documentation of best practices, and monitoring and evaluation reports (Schedule 2, Section I of the Financing Agreement).

Conditions

Type	Financing source	Description
Effectiveness	IBRD/IDA	<p>The Recipient has established the Project Implementation Unit with staff, resources and terms of reference acceptable to the International Development Association.</p>
Type Effectiveness	Financing source IBRD/IDA	<p>The Recipient, through the Ministry of Agriculture, has adopted the Project Operations Manual satisfactory to the International Development Association.</p>



The World Bank

Strengthening Resilience of the Agriculture Sector Project (P175952)



I. STRATEGIC CONTEXT

A. Country Context

1. **Despite notable achievements in economic development and poverty reduction over the last decade, Tajikistan remains a low-income International Development Association (IDA) country with a large proportion of the population vulnerable to poverty and shocks.** Tajikistan is a landlocked country, bordering with Afghanistan, China, the Kyrgyz Republic, and Uzbekistan, with a population of 9.3 million, of which 73 percent live in rural areas. Over the past decade, Tajikistan has made a steady progress in reducing poverty and growing its economy. Between 2000 and 2018, the poverty rate fell from 83 percent to 27 percent, while the economy grew at an average rate of 7 percent per year. Yet, the country continues to face many challenges. It is the most vulnerable country in Central Asia and exposed to adverse recurrent impacts from external shocks, seasonal food insecurity, and climate change. From 1992 to 2016, natural disasters alone estimated to have caused economic losses exceeding US\$1.8 billion or US\$72 million annually, affecting almost 7 million people. Limited economic and social opportunities and poverty have contributed to substantial labor migration overseas.

2. **Even before the COVID-19 pandemic, Tajikistan faced a challenging economic outlook due to large fiscal and external imbalances.** Remittances, the Somoni-denominated value of which has fluctuated between one-quarter and one-half of GDP in recent years, play an important role. Fiscal revenues, heavily reliant on import-related value added taxes, have fluctuated considerably as well. For instance, following the economic crisis in Russia in 2014, Tajikistan went through a cumulative 45 percent decline of both remittances and imports. Private investments are low, at 4 percent of GDP. The financial sector is still recovering from the 2014 crisis and excessive directed and subsidized lending by banks, which triggered the 2016 bailout estimated at 6 percent of GDP. The losses of state-owned enterprises (SOEs) are additional sources of fiscal pressures. Tajikistan remains at high risk of debt distress, with total public and publicly guaranteed debt estimated at 53 percent of GDP in 2020.¹

3. **The COVID-19 pandemic has led to a sharp slowdown of the economy in 2020 and has been particularly hard on the poor.** It has largely wiped out the income and poverty reduction gains achieved in the past couple of years. The economy experienced its slowest growth since 1997, because of the partial lockdown due to the pandemic and associated disruptions in migrant remittances and trade activities. Migrant remittances fell by 15 percent on a year-to-year basis by mid-2020, according to Tajik authorities.² The plunge in foreign earnings slashed household consumption and fiscal revenues. Among the sectors, the hospitality and tourism industry are the most hit by the pandemic. The authorities estimate the damage to the economy at US\$2 billion,³ including from the reduction in GDP growth from the projected 7.0 percent at the beginning of the year to the actual 4.5 percent in 2020. Food price inflation exceeded the non-food inflation by 6 percentage points, which hit the poor the hardest. According to the World Bank's Listening to Tajikistan Survey (L2TS), at the peak of the pandemic, two out of five households reported to have reduced their consumption of food, far beyond the reported levels in 2019. This negative food consumption trend continued into 2021. The average retail wheat flour prices in Somoni were 38 percent higher in 2020 than in 2016-2019, while the average retail potatoes prices were 47 percent higher during the same period. Food prices spiked in April-May 2020, dropping after that, and increasing again in November and December 2020.⁴ In January 2021, the latest month for which the data is available, the prices of wheat flour and potatoes stayed high, while the latter even increased by 15 percent compared to November-December 2020.

4. **Tajikistan exhibits food insecurity and malnutrition, which COVID-19 crisis has worsened.** Nationally, stunting among children under five years of age declined 2 percentage points per year over a period of six years, from 26 percent

¹ World Bank and International Monetary Fund assessment.

² Russian estimates show a decline of 40 percent for the same period.

³ The speech of the President of Tajikistan at the 75th Session of the UN General Assembly held in September 2020.

⁴ World Bank staff estimate using the FAO GIEWS data.



in 2011 to 17 percent in 2017 (the latest data available). With the annual population growth rate of 2.5 percent, however, the current rate of decline is insufficient to meet the global World Health Assembly 2025 target of a 40 percent reduction in the number of children under five who are stunted. Seasonal and year-on-year increases of food prices, which affect food security and nutritional outcomes negatively, have been traced to irregular remittances and irregular food production due to lack of affordable, good-quality seeds, pest/locust invasions, and climate-related shocks.⁵ The latest State of Food Security and Nutrition in the World report reveals that 29 to 42 percent of households in Tajikistan cannot afford a nutrient adequate diet.⁶

5. Climate change is a key threat to Tajikistan's development, especially agriculture. Farming is significantly affected by climate change due to the high vulnerability of its natural environment and its low adaptive capacity. In addition to rising average temperature and loss of glaciers, Tajikistan suffers from more frequent droughts and strong winds, which have a large impact on water availability, crop yields, and pasture productivity.⁷ Climate change is expected to reduce the average yields of grains by 15 percent and vegetables and fruits by 9-11 percent during 2015-2050,⁸ and to cause changes in pest profiles, including the arrival of new pests.⁹ The projected rise in average global temperatures of up to two degrees centigrade by 2050 will catalyze glacial and early snow melts, changing the seasonality of runoffs and affecting the stability of water supplies. Exposure to drought, for which Tajikistan is ranked 8th in the world, followed by high risk for earthquakes, wildfire,¹⁰ and flood exposures (and associated hazards such as landslides), and relative low levels of coping capacity render the country exposed to relatively high disaster risk, ranked 64th out of 191 countries in the INFORM 2019 Index for Risk Management.¹¹ Moreover, Tajikistan, together with its neighboring Central Asian countries, is highly affected by annual transboundary locust plagues, causing Tajikistan an annual loss of crop and pastureland output estimated at US\$10-15 million. Increased drought frequency, catastrophic flooding because of glacier lake outbursts, destabilization of mountain slopes, and more frequent landslides will produce economic losses, and will affect key variables such as viability of ecosystems, health impacts, productivity of labor, and the yield of crops. This will pose risks to the population, and hamper the ability of communities to fight poverty, especially since the poorest and most marginalized groups are expected to be disproportionately affected by the projected impacts of climate change. Adverse effects of climate change will be compounded by the projected 6.7 percent population growth during the 21st century.¹²

6. Fiscal space has decreased during 2020, making it more difficult for the authorities to respond to the continued COVID-19 crisis. The budget revenues contracted by 15 percent, to which the Government of Tajikistan (GoT) responded with a corresponding contraction in expenditures. This left the fiscal deficit at 2.3 percent of GDP. With support from the International Monetary Fund's (IMF) Rapid Credit Facility (plus debt relief) and the Asian Development Bank's (ADB) budget support, Tajikistan amended its 2020 state budget in mid-summer, providing additional fiscal space for increased healthcare expenditures. The GoT rolled out a nationwide targeted social assistance program, providing eligible families with a modest one-off financial assistance, while providing tax reliefs to the private sector, increasing public-sector wages

⁵ FAO, IFAD, UNICEF, WFP and WHO. 2020. The State of Food Security and Nutrition in the World 2020. Transforming food systems for affordable healthy diets. Rome, FAO.

⁶ A nutrient adequate diet provides adequate calories (per the energy sufficient diet above), and relevant nutrient intake values of 23 macro- and micronutrient through a balanced mix of carbohydrates, protein, fat, essential vitamins and minerals within the upper and lower bounds needed to prevent deficiencies and avoid toxicity. FAO, IFAD, UNICEF, WFP and WHO. 2020. The State of Food Security and Nutrition in the World 2020. Transforming food systems for affordable healthy diets. Rome, FAO.

⁷ Khakimov, P., J. Aliev, T. Thomas, J. Ilyasov, and S. Dunston. 2020. *Climate Change Effects on Agriculture and Food Security in Tajikistan*. Silk Road: A Journal of Eurasia Development 2(1): 89-112.

⁸ Khakimov P., J. Aliev, T. Thomas, J. Ilyasov, and S. Dunston. 2020. Climate Change Effects on Agriculture and Food Security in Tajikistan. *Silk Road: A Journal of Eurasian Development* 2(1). p.89–112. doi: <https://doi.org/10.16997/srjad.33>

⁹ Asian Development Bank (ADB) and World Bank. 2021. Climate Risk Country Profile Tajikistan. (draft).

¹⁰ <https://thinkhazard.org/en/report/239-tajikistan>

¹¹ ADB and World Bank. 2021. Climate Risk Country Profile Tajikistan. (draft).

¹² ADB. 2014. *Country Partnership Strategy: Tajikistan, 2016-2020*. Manila.



and pensions, postponing tariff increases for electricity and municipal water, and allocating emergency funds for buying and distributing seeds to farmers. Altogether, the GoT allocated close to 3 percent of GDP (or US\$220 million) for COVID-19-related expenditures.

7. **To help mitigate the impact of the COVID-19 crisis on the economy and people, the World Bank Group (WBG) has supported the GoT through technical and financial assistance.** The support included the Emergency COVID-19 (Coronavirus) Project, provision of emergency cash transfers using the targeted social assistance program, regular monitoring of the situation based on high-frequency L2T survey covering the issues of household wellbeing, and information system via SMS-dissemination to population with key health messages under the Mobile Engagement project. This support was underpinned by the WBG Approach Paper “Saving Lives, Scaling-up Impact and Getting Back on Track” (the “WBG Approach Paper” hereafter). The proposed project is also part of the WBG’s response to COVID-19 in Tajikistan.

B. Sectoral and Institutional Context

8. **Agriculture is an important sector of Tajikistan’s economy.** In 2020, it constituted 23 percent of the country’s GDP, 19 percent of export, and 61 percent of total employment. Agriculture grew annually by an average of 6.4 percent between 2010 and 2019, exceeding the average agricultural growth in Kazakhstan (2.7 percent), the Kyrgyz Republic (1.9 percent), and Uzbekistan (4.7 percent) during the same period.¹³ Yet, it has largely remained subsistent and underdeveloped characterized by low labor productivity and use of traditional low-yielding technologies. Most farmers are small in scale and not well integrated in the agrifood value chains. Food processing and input supply sectors are also small and fragmented, contributing to large food and farm input imports. Tajikistan imports about 75 percent of food consumed and over 50 percent of the value of agricultural inputs such as seeds, seedlings, animal breeds, fertilizers, and farm machinery, with most of these inputs not adapted to various agroecological zones of Tajikistan. More than 70 percent of agricultural value addition is generated by crops and the rest by livestock. Crop production is confined primarily to river valleys, where 68 percent of the crop land is dependent on irrigation. Arable land is in short supply, accounting for 20 percent of agricultural land (equivalent to 980,000 ha), which puts a premium on sustainable intensification (i.e. higher yields) needed to produce larger volumes of more nutritious foods. Approximately, 86 percent of the arable land area is accounted for by ten crops, including wheat (31 percent), cotton (22 percent), barley (9 percent), potato (6 percent), apples (5 percent), grapes (4 percent), onions (3 percent), and watermelon, maize and tomatoes (each 2 percent).¹⁴

9. **Agriculture is one of the largest employers, including of women.** Although exact figures vary with some sources saying that the share of female employment in agriculture was 59.6 percent in 2020,¹⁵ and others estimating that anywhere between 31 percent and 85.5 percent of women are active in the sector, women are such an integral part of Tajikistan’s agricultural labor force, that the term “feminization or womenization of agriculture” is used to describe the sector that men exit either for migration or for non-farm opportunities.¹⁶ Family and collective *dekhān* farms are the most common type of agricultural enterprise in Tajikistan: they are privately-owned commercial farms that are managed by a head. Women managers are few (only 13 percent in 2014), but they have been increasing in numbers mainly due to GoT and development partners’ efforts to increase women’s involvement in *dekhān* farming.¹⁷ The gender barriers to women’s leadership of *dekhān* farms have not been studied in detail, and there is a lack of clear gender dis-aggregated data to aid in identifying barriers to gender equality, but barriers are reported to most likely include reasons such as limited access to: information; productive resources; training, agricultural knowledge, and other public services; as well as services related to agri-logistics such as sorting, cooling, storage, and packaging of agricultural products.¹⁸ Formal female

¹³ The World Bank staff estimate using the World Development Indicators database.

¹⁴ FAOSTAT.

¹⁵ World Bank. World Development Indicators (WDI). Accessed on 29 November 2020.

¹⁶ USAID. 2014. *AgTCA Tajikistan: Agricultural Technology Commercialization Assessment*. USAID Enabling Agricultural Trade project.

¹⁷ FAO, 2016. National Gender Profile of Agricultural and Rural Livelihoods – Tajikistan.

¹⁸ FAO, 2016. National Gender Profile of Agricultural and Rural Livelihoods – Tajikistan.



entrepreneurship is low,¹⁹ but data on women's formal engagement is widely considered to be underestimating the real number of women who engage in entrepreneurial activities at micro and informal levels.²⁰

10. Crop production, the major generator of agricultural value addition, has become more diversified over time, but its potential for enhancing food security and nutrition remains underutilized. Tajikistan's main crops remain wheat and cotton, as in old times, but their relative importance has declined over time. The cotton growing area dropped from 32 percent of the total in 2005 to 22 percent in 2018, while the wheat growing area declined from 35 percent in 2005 to 31 percent in 2018. The horticulture growing area, on the other hand, which consists of potatoes, vegetables, fruits, melons, and grapes, increased from 18 percent in 2005 to 30 percent in 2018, which represents a significant increase. Land area under permanent crops (fruits and nuts) also expanded, from 115,000 ha in 1995 to 151,000 ha in 2018. The shift towards more balanced land use and production of higher value crops has been occurring in Tajikistan much earlier than in the neighboring Uzbekistan, which started to shift land away from cotton to horticulture only in 2017. Agricultural diversification in Tajikistan has been also supported by the growing attention to value chain development, extending beyond only agricultural production, and recently to the export orientation. Several donor-supported projects include activities along the entire agrifood value chains, reflecting the GoT's intention to promote inclusion of small farmers into modern value chains and export. Creation of productive partnerships between lead agribusiness/processing firms and farm groups (or agricultural clusters) has also begun, albeit slowly, paving the way for building competitive and sustainable value chains so much needed to serve domestic market and penetrate to international ones.²¹ Yet, the quantity and quality of Tajik horticulture produce remain low, and infrastructure for cold storage,²² sorting, grading, and processing (i.e. agri-logistical services) is still rudimentary. Thus, even when production of fruits and vegetables grows, there are no facilities for storing and post-harvest handling of these perishable products, so their supply is short and highly seasonal. Horticultural export is small, about 5 percent of total agrifood export in 2020, reflecting weak horizontal and vertical coordination among small farmers and exporters, as well as insufficient public investments in agri-logistic infrastructure, adaptation of seedlings to various agroecological zones and access to finance for horticulture investments.

11. Notwithstanding its small share in export, the agricultural diversification has been good for farmers and for the economy. In addition to increasing farm incomes, higher horticulture production and its processing tend to create many jobs and contributes to nutrition security. In neighboring Uzbekistan, for example, a one-million-US dollar investment in horticulture value chains (e.g. in intensive orchards, greenhouses, processing, and storage) is estimated to have created 40-50 jobs, with more than half of them occupied by women.²³ Private investment amounting to US\$58,000 in drying, processing and packaging of fruits in Tajikistan's Sughd free economic zone is projected to create 40 permanent jobs.²⁴ Horticulture value chains, especially export-oriented ones, have shown to have a great power to create many better-paid jobs, which are difficult to automatize, offering a long-term job solution for a country such as Tajikistan, where good jobs so far have been in a large deficit. Accelerating crop diversification, therefore, offers an opportunity to stimulate creation

¹⁹ For example, from 2006 to 2012, a total of 210 female entrepreneurs received grants through the Committee on Women and Family Affairs financed by the state budget. (Source: FAO, 2016. National Gender Profile of Agricultural and Rural Livelihoods – Tajikistan.)

²⁰ FAO, 2016. National Gender Profile of Agricultural and Rural Livelihoods – Tajikistan.

²¹ World Bank. 2020. Central Asia's Horticulture Sector — Capitalizing on New Export Opportunities in Chinese and Russian Markets. Washington, D.C.

²² In 2015, the International Finance Corporation (IFC) estimated that a refrigerated warehouse capacity could service only 6 percent of produced fruits and vegetables. Although increased in recent years (during 2015-2019, 188 new storage facilities were constructed with a total capacity of 224,000 tons), the refrigerated warehouse capacity in Tajikistan in 2018 was only 0.1 million m³ or 0.041 m³ per urban resident, according to the Global Cold Chain Alliance's 2018 Global Cold Chain Capacity Report. In Uzbekistan, for comparison, it was 0.385 m³ per urban resident in 2018, increasing from 0.102 m³ per urban resident in 2014.

²³ World Bank. 2020. Uzbekistan's Agrifood Job Diagnostic. Washington, D.C.

²⁴ Donai Almos investment. The article on East Fruits platform accessed on November 1, 2020.



of sustainable jobs and inclusion.

12. Looking forward, the Tajik export promotion and agricultural diversification strategy should build on a strong comparative advantage of the country's horticulture and the growing investments along horticulture value chains. The medium-run export potential of horticulture products is estimated at US\$32.6 million,²⁵ which is 3.3 times more than the actual export in 2018. The early season for Tajik fruits is one of the characteristics that can foster competitiveness. Relative low labor and electricity costs is another such characteristic. In addition, favorable climatic conditions with long growing period and numerous sunny days result in special flavor and high sugar content. Right public investments to harnessing this potential for value chain development (e.g., farm productivity, productive partnerships) and trade facilitation (e.g., agri-logistics, green corridors for perishable products, single window for export-import operations) and crowding in private sector investments are critical to turn comparative advantages into economic competitiveness. Many of these investments are already occurring and growing. The GoT has been investing in green corridors at the border posts for the export of perishable fruits and vegetables and in the single window services for export-import operations, crowding in private sector investments in greenhouses and fruit orchards. Investments in agri-logistical services, which are critical for making perishable fruits and vegetables longer available for domestic market, export competitiveness, and for reducing waste and losses as found in the recent World Bank analysis,²⁶ are, however, still lacking, calling for more proactive support from the government to accelerate such investments. Moreover, focusing on horticulture has the potential to generate significant climate co-benefits through *inter alia* the adoption of climate-resilient (drought tolerant) crop varieties by farmers, crop diversification for increased production of higher value and nutrient-rich horticulture products, and climate-smart practices that improve soil health, reduce water needs, and reduce land degradation. Growing fruit trees also mitigates greenhouse gas (GHG) emissions through carbon sequestration. Shifting towards more diversified production increases the resilience to climate shocks; reduces the occurrence, hence impact, of diseases and insect pests; and has the potential to significantly increase farm income thereby increasing farm investments in more drought-resistant seeds, precision agriculture, and other climate-smart farm practices; and requires fewer fertilizers.

13. Lack of availability of seeds, seedlings, and planting materials, in sufficient quantity and quality, is one of the critical issues affecting the agricultural sector in Tajikistan, compromising agricultural productivity, which was amplified by the COVID-19 crisis. Primary inputs' supply is from farmers' own resources. Deficit in supply is the highest for horticulture and fodder crops but is also severe for cotton, potatoes, and wheat, imposing unsuitable replacement rates. Seed and seedling supply systems have made discrete progress with donor support but are still incomplete.²⁷ Most donor projects provide direct extension support to farmers on multiplying and adopting seeds and seedlings, but they do little to make more seeds for food staples available on the market and assure their quality. As a result, farmers in many parts of the country do not have access to high-quality seeds, seedlings, and planting materials. The local capacity to generate new varieties and planting materials remains low. Some agricultural research institutes and universities engage in seed production, but this includes mainly maintaining "super elite, pre-basic or original" and "elite or basic" seeds.²⁸ Even

²⁵ World Bank. 2020. Central Asia's Horticulture Sector — Capitalizing on New Export Opportunities in Chinese and Russian Markets. Washington, D.C.

²⁶ World Bank. 2020. Central Asia's Horticulture Sector — Capitalizing on New Export Opportunities in Chinese and Russian Markets. Washington, D.C.

²⁷ Previous attempts to address the shortage of seeds, seedlings and planting materials, including those undertaken by the Food and Agriculture Organization (FAO) of the United Nations (UN), Swedish International Development Cooperation Agency (SIDA), and Austrian-supported programs targeted only certain segments of the seed, seedling and planting materials value chain and hence fell short of developing a vibrant seed, seedling, and planting material sector.

²⁸ "Super Elite" (also referred to as "Pre-basic" or "Original" in some government documents) are seeds, seedlings and planting material that represent the main characteristics of the variety and are free from pathogens and infectious diseases. These are used by the breeder in developing new varieties or maintaining existing ones. They are generally only maintained by the breeder or breeding organization. Upon registration of the variety it is officially listed in the "Register of Commercial Varieties". "Elite" are seeds (also referred to as "Basic"



though there is a mandate to monitor seed quality and relevant public procedures have been established, lack of budgetary resources and weak human capacity to do so have resulted in only 60 percent of the seed production facilities producing seeds of acceptable quality. The capacity to test new varieties of crops for their adaptation to soils and climate in the country is also lacking, and in general the regular testing of new varieties, whether domestically developed or imported, is not conducted. Private seed farms and nurseries focus on importation of hybrid varieties of vegetable seeds and planting materials for fruit orchards, and not investing in research and development (R&D) of local varieties or adaptation of imported seeds to the agroecological richness of Tajikistan. The availability of high-quality commercial seeds for wheat and potatoes, two main food staple crops, is low, necessitating the importation of foundation seeds into Tajikistan for further multiplication.²⁹

14. COVID-19 exposed the weakness of the public sector on early warning and response. Real time sector monitoring and agricultural production outlook are not effectively produced, catching the authorities off-guard in their response to emergencies. Farmers receive neither much of agricultural market or agrometeorological information nor timely early warning about pests and locust outbreaks. During outbreaks, for example, locust attacks destroyed pasturelands and a wide range of cultivated crops. It is estimated that total annual damage for the country caused by locusts can vary from US\$10 million to US\$15 million.³⁰ However, the overall impact is more devastating as annual locust and other pest attacks curtail severely the livelihoods of the poorest segments of the Tajik society. Other agricultural services such as soil testing have also remained in short supply and are often delivered by donor projects without or with little government participation, and with limited coordination between the DPs and the GoT. Human and infrastructural capacity of most agricultural public institutions remains weak, a result of their chronic past underfinancing. Public spending on agricultural research and development (R&D) in Tajikistan, for example, was 0.05 percent of agricultural gross output in 2019, which was ten times lower than other developing countries with successful agricultural performance spent for this purpose.³¹ Higher income countries spend on average 1.5-2.0 percent of the agricultural gross output on agricultural R&D programs.³²

15. COVID-19 has also exposed other weaknesses of Tajik agriculture and has had a large adverse impact on food security and nutrition. The impact on agricultural production in 2020 was moderated by the fact that farm inputs for the main planting in spring were procured by farmers before the COVID-19 outbreak. Second planting in the summer was supported by the emergency distribution of seeds and other inputs from GoT and donors. As a result of this and favorable weather conditions, the agriculture sector grew by 8.8 percent in 2020. However, the adverse impact on the 2021 agricultural production is anticipated to be much larger. High-quality seeds are in short supply and their prices are rising, fueled by the higher regional demand: the access to seeds remains the highest concern of farmers and the authorities for the 2021 planting season and beyond. Already in the summer of 2020, Tajik farmers had to pay 10 percent more for ammonium nitrate and 57 percent more for superphosphate fertilizers than in the summer of 2019, and the global recovery may lead to even higher fertilizer prices on global markets. The small fiscal space of the GoT has become even smaller in the aftermath of COVID-19 crisis, reducing the likelihood of another emergency input distribution and improved generation and delivery of agricultural services without external assistance. During the COVID-19 pandemic, the GoT did not have real-time information on food stocks or the structure of actual cropping areas of subsequent planting campaigns to take timely and effective crisis response measures, exacerbating the adverse impact of declined purchasing power of

in some government documents), seedlings and planting material propagated directly from “Super Elite” material and would include that propagated using any method including in vitro techniques, buds and cuttings. This material would be developed by the variety owner or a contractor and used by operators to produce “Certified” material. These definitions are taken from an English translation of the “Seed Law of Tajikistan.”

²⁹ In 2020, for example, the FAO procured 100 tons of imported foundation potato seeds for their multiplication through the state seed farms and farm cooperatives.

³⁰ FAO TCP-TAJ-3806, 2020.

³¹ World Bank. forthcoming. Tajikistan: Agricultural Sector and Public Expenditure Review. Washington, D.C.

³² World Bank Group. 2019. Harvesting Prosperity: Technology and Productivity Growth in Agriculture. Washington, D.C.



the population as a result of lost jobs and remittances on food and nutrition security. The weak capacity of the public institutions for helping farmers maximize returns from using costlier seeds and fertilizers through, for example, soil testing or provision of agrometeorological information prevented a scale-up of public services to farmers affected by the crisis. And, when horticulture produce generated by Tajik farmers could not be exported, due to travel restrictions and lower purchasing power of consumers in importing countries, a lack of sufficient and adequate infrastructure for storage and post-harvest handling exposed the weaknesses of agrifood value chains in the country.

16. **The GoT has recently prepared two strategic documents on development of agriculture and food and nutrition security in Tajikistan,³³ which are adjusted to the realities of the post-COVID-19 era to provide a framework to strengthen resiliency, inclusiveness and sustainability of the agriculture sector.** The draft State Program for Medium-Term Development of the Republic of Tajikistan (MTDP) 2021-2025 emphasizes the need for improved capacity of agricultural public institutions to increase resilience and sustainability of the agriculture sector, including for ensuring a better response to climate change and other shocks in the future. The draft National Investment Plan for Food and Nutrition Security and Sustainable Agricultural Development (NAIP) 2021-2030 for the Republic of Tajikistan recognizes that preparedness of farmers and the GoT to the COVID-19 crisis could have been better and emphasizes investments in knowledge and innovations, delivery of agricultural services, agri-logistical infrastructure, and integrated seed sector development among priorities to “build back better” for averting or at least reducing impacts of future shocks on the agriculture sector and food and nutrition security.

17. **The Ministry of Agriculture (MoA), which needs to implement most reforms and investment programs identified in the MTDP and NAIP, itself requires strengthening and modernization.** Its structure and capacity have been designed on directing production of strategic crops such as cotton and wheat and monitoring the achievement of production targets. Generation and delivery of many public services such as research, extension, crop protection and locust control, market information system, real time data collection or seed development and quality control have been constrained by the underinvestment in human capacity and physical infrastructure, exposed by COVID-19, which in turn created momentum for changing this situation. Institutional strengthening of the MoA will need to focus on: (i) strengthening technical departments in line with new strategic priorities and requirements; (ii) building competencies of public staff for better service delivery and early warning and crisis management; and (iii) enhancing collaboration with donors for better coordination and leadership in implementation of the recipient- and donor-executed projects, and with other public institutions (i.e. Committee of Food Security, State Committee of Land Management and Geodesy, Agency for Meteorology and other relevant ministries and departments) for more integrated approach in designing and implementing agricultural public policies and investments.

C. Relevance to Higher Level Objectives

18. **The proposed project, Strengthening Resilience of the Agriculture Sector Project (SRASP), is consistent with the GoT strategic documents, which guide agriculture development and food/nutrition security in the post-COVID-19 era, and it will support their implementation.** The MTDP 2021-2025 and the NAIP 2021-2030 emphasize the importance of strengthening resilience of the agriculture sector to prepare it for delivering better in the less predictable future. Both strategic documents call for investments in knowledge and innovations, delivery of agricultural services, logistical infrastructure, and integrated seed sector development. The SRASP is designed to help implement these priorities.

19. **The SRASP is aligned with the Country Program Adjustment responding to COVID-19 (Annex 2) and main WBG strategic documents.** The current WBG’s engagement in Tajikistan is guided by the FY19-FY23 Country Partnership Framework (CPF) (Report Number 135875-TJ, discussed by the Board of Directors on May 9, 2019), which is built on three focus areas: (i) human capital and resilience; (ii) public institutions and sustainability; and (iii) private-sector growth and

³³ These documents are expected to be approved during the first part of 2021.



market creation. The proposed project was not part of the initially agreed CPF pipeline, but the COVID-19 crisis triggered the CPF adjustment to provide a fast and flexible response to the crisis in line with the WBG Approach Paper (Saving Lives, Scaling up Impacts, and Getting Back on Track) with focus on human capital and resilience. The proposed project was the only new project included in the CPF adjustment for Tajikistan and it is aligned with Pillar 3 “Save livelihoods, preserve jobs, and ensure more sustainable business growth and job creation,” and with Pillar 4 “Strengthen policies, institutions and investments for resilient, inclusive and sustainable growth” of the WBG Approach Paper. Specifically, for example, rapid delivery of imported foundation seeds for multiplication under the proposed project will support a direct response to COVID-19 with quick benefits for farm livelihoods and agriculture jobs in line with Pillar 3, while improving the enabling environment and strengthening R&D, seed and seedling production, multiplication, and quality control supported by the project will have a longer-term institution building objective to improve future access of farmers to high-quality seeds and seedlings, in line with Pillar 4.

20. **The proposed project will complement other World Bank and donor-financed agricultural projects to leverage its impact on higher level objectives such as agricultural growth, food and nutrition security, job creation, and poverty reduction.** Strengthened capacity of public and private sector institutions in the area of seed and seedling sector development, agri-logistics, crop protection and locust control, and provision of agriculture-related climate information envisaged for support under the proposed project will be beneficial for implementation of the World Bank’s supported Agriculture Commercialization Project (ACP), which promotes increased productivity, competitiveness, and inclusion of smallholders in dairy, fruit, and vegetable value chains, and for the Rural Economic Development Project (REDP), which supports dairy value chains and productive partnerships and agro-tourism in the Khatlon and Sughd regions, and the Region of Republican Subordination (RRS). It will be also beneficial for projects of other donors, in particular Agha Khan Foundation (seeds, extension services), the Food and Agriculture Organization (FAO) of the United Nations (seeds, crop protection, locust control, agrometeorology), and the World Food Program (agrometeorology). The World Bank analysis shows that during 2016-2020, most donor funds for Tajikistan’s agriculture were allocated to directly support farm communities and farm cooperatives, value chain development, mechanization and advisory services, and pasture management, while very little was allocated to strengthen agricultural public institutions.³⁴ The SRASP will fill this gap. During implementation, the project will continue to coordinate closely with donors and other Bank projects to ensure complementarity.

21. **The SRASP follows the Maximizing Finance for Development (MFD) approach.** The project design is underpinned by discussions with various stakeholders about the roles of public and private sectors in generating and delivering the selected agricultural services and in correcting market failures. The project will finance public functions, such as R&D and a wide-spread locust and other pest surveillance and eradication, which cannot be executed by private sector. Furthermore, the project will strategically crowd in private sector investments by strengthening the capacity of private seed multiplication farms and nurseries, delegating the operation and management of agri-logistical centers to private operators and strengthening their capacity, and reducing the cost of investments for farmers, the largest representatives of the private sector in Tajikistan, through provision of improved soil testing, agrometeorological information, crop protection, and locust eradication services.

22. **The SRASP will support the “building back better” approach towards recovery from the COVID19 pandemic, and is anchored in the principles of Green, Resilient and Inclusive Development (GRID) critical for green transition.** The crisis has shown the importance of balancing investments in the capacity for detecting and responding to crises with investments in long-term agricultural development. Public spending on agricultural R&D is extremely low, explaining the low technology generation and adoption and consequently low productivity of Tajik agriculture. Spending more on agricultural R&D is high priority for future investments. Too little is also spent on seed/seedling sector development,

³⁴ World Bank. forthcoming. Tajikistan: Agricultural Sector and Public Expenditure Review. Washington, D.C.



phytosanitary measures, agri-logistics, and digital agriculture, and on strengthening public institutions, including their human capital, to respond to short-term volatilities and crises such as COVID-19, which needs to be reversed going forward. The proposed project is responding to these needs through, amongst others, investing in no regret capacity to promote climate-smart agriculture (CSA), monitor natural capital (land) use, enhance natural disaster and climate resilience, and promote just transition by focusing on service delivery to smallholder farmers, including women.

II. PROJECT DESCRIPTION

A. Project Development Objective

PDO Statement

23. The development objective of the proposed project is to strengthen the foundations for a more resilient agricultural sector in Tajikistan.

PDO Level Indicators

24. For the purpose of this project, foundations for a more resilient agriculture sector refer to the availability of public agricultural services, including improved seeds, seedlings, and planting materials; agri-logistical services; agrometeorological information; soil testing; locust control and crop protection. Success of the project will be monitored against achievement of the following **key results indicators**:

- (i) Certified seeds, seedlings, and planting materials sold commercially (Percentage) (Outcome 1)
- (ii) Clients benefiting from ALC services (Percentage) (Outcome 2)
- (iii) Female clients benefiting from ALC services for at least one year (Percentage) (Outcome 3)
- (iv) Database for timely and effective information for crisis management available (Yes/ No) (Outcome 4)

25. **The project aims to support the GoT in successfully transitioning to a sustainable, more productive, climate-resilient, and inclusive model of agricultural sector growth.** The proposed project will help to: (i) increase the availability of improved seeds, seedlings, and planting materials that are climate resilient, affordable, farmer-preferred and well adapted to the different agro-ecological conditions of Tajikistan; (ii) provide access to agri-logistic services of farmers and agri-businesses; and (iii) strengthen the crisis management, i.e. early warning, preparedness and response capacity of selected public institutions. All activities related to human resource development and capacity building will include topics on understanding climate change better and frameworks, tools, and techniques to facilitate designing and implementing climate adaptation and mitigation approaches. All infrastructure, including office and laboratory buildings, and storage facilities, constructed and/or rehabilitated by the project, will be encouraged to utilize energy-efficient and climate-resilient materials and designs. The proposed project aims to thereby strengthen the foundations for more resilient agriculture sector, which will in turn help improve food security and nutrition and accelerate agricultural diversification. It will also contribute to the development of a viable sector of private micro, small and medium enterprises in rural areas and generate employment opportunities, including for women in regions with few legal alternatives. Annex 3 contains a detailed project description.



B. Project Components

Component 1: Strengthening seed, seedling, and planting material systems (US\$27.7 million)

26. This component will support the development of viable seed, seedling, and planting material systems to ensure the availability of improved, locally adapted, market oriented, farmer-preferred, and climate resilient seeds, seedlings and planting materials for priority crops,³⁵ and in sufficient quantity and acceptable quality. Advances in seed, seedling and planting material technology are one of the most important channels for improving productivity in agriculture. The GoT recognizes the crucial role of improved seeds, seedlings, and planting materials in achieving not only agriculture production and productivity goals, but also broader development goals, such as food and nutrition security and climate resilience. The availability of improved seeds, seedlings, and planting materials, in sufficient quality and acceptable quality, contributes to enhanced and efficient use of other inputs, including water, fertilizers, pesticides, and insecticides. This component has four subcomponents, including improving the enabling environment necessary for the development of viable seed, seedling and planting material systems; research and development; multiplication; and quality assurance of the production and distribution of high-quality seeds, seedlings and planting materials. The subcomponents are designed in a way to combine a rapid response to the urgent needs of farmers for better seeds (by importing foundation seeds and multiplying them on seed farms for commercial sale) with a gradual strengthening of long-term capacity of both public and private seed sector institutions to increase the availability of seeds, seedlings, and planting materials that are better adjusted to local agroecological conditions and of higher quality.

27. **Subcomponent 1.1 Enabling environment (US\$0.3 million).** The objective of this subcomponent is to improve the policy and legal framework of the seed, seedling, and planting material systems. Over the years, Tajikistan has made substantial progress in moving towards a market economy through provision of a sound policy and regulatory framework for seed and seedling industry development. It developed several legal provisions and key policies that have been ratified by the National Parliament of Tajikistan (Majlisi Milli). It also developed strategies and programs, which detailed road maps for the country's short- and long-term development of the subsectors. However, some legislative pieces and policies did not cover all aspects of the subsectors, while others that were issued have not been fully implemented owing to resource and capacity limitations. Still some others have not been harmonized with regional and international standards³⁶, limiting the country's standing and capacity to compete in the agriculture market at regional and global levels. Tajikistan is not yet a member of international organizations regulating the seed trade. This makes foreign seed companies reluctant to introduce their improved varieties and enter the domestic seed market. Reviews of the seed sector in Tajikistan have concluded that there still exist policy and legislation gaps and the need for harmonization of the national policy and legislative framework with regional and international standards. The project intends to inter alia support the review of existing legislation and policies to identify policy and legislation gaps and implementation challenges. The subcomponent will address these gaps by supporting the formulation (including enacting new and revising existing), implementation, and harmonization of policies and legislation. It will also support Tajikistan's membership in international organizations and capacity building of personnel involved in the formulation of policies and legislation.

28. The main areas of support include: (a) support for the review and development of policies and legislation, including: (i) conducting assessment of the existing policies and legislation, (ii) identifying policy and legislation gaps and implementation challenges, (iii) developing legislation and policies, including harmonization with regional and international standards; and (b) provision of technical assistance for the MoA in the development of policies as well as strategies and development programs.

29. **Subcomponent 1.2 Research and development (US\$5.0 million).** The objective of this subcomponent is to

³⁵ Priority crops as identified by GoT include wheat, cotton, potatoes, grapes, onions, apples, and cherries.

³⁶ Required under the Order on Seed Quality Control and Certification 2010 No.132.



strengthen the capacity of national agricultural R&D institutions, starting from the very low initial level, so that they are engaged in: (i) the development of new technologies; (ii) adaptation of technologies to local social and environmental conditions and to changing circumstances over time (e.g., co-evolution of pests and diseases, degradation of water and land resources and climate change manifestations); (iii) transfer of on-the shelf technologies to end users; and (iv) support to variety maintenance (maintenance breeding). Currently, research institutes and universities are largely incapable of supporting meaningful research programs as they generally lack the necessary research facilities, including laboratories, greenhouses, and farming and irrigation infrastructure. Research institutions also lack qualified researchers, specialists, and technicians with the capacity to fully support the research needs of the seed, seedling, and planting material subsectors. Variety maintenance (maintenance breeding) and multiplication of early generation seeds are also not well organized, leading to a shortage of foundation seeds for further multiplication by public and private seed farms. The weak R&D is further compounded with the private sector not having the capacity nor the capability to undertake major R&D activities in Tajikistan.

30. The subcomponent will support building the capacity of research institutions, including: (i) physical capacity building, including research infrastructure,³⁷ and (ii) human resource development, including on CSA. The support will target research institutions associated with the Tajikistan Academy of Agricultural Sciences (TAAS)³⁸ and the Tajik Agrarian University (TAU)³⁹ and build their physical and human capacity in order for them to engage in the development of market- and farmer-preferred, locally adapted, climate resilient and affordable technologies and in variety maintenance. Research programs of the institutions will focus on the generation and/or adaptation of improved agro-ecological zone-specific CSA technologies. Emphasis will be given to the development and adaptation of climate-resilient crop varieties (including nutrient-rich crops, such as horticulture); varieties tolerant to low moisture or drought, insect pests and higher temperatures. Emphasis will also be given to climate-smart farming practices for a range of agricultural products, including on CSA practices that lead to GHG emission reduction. The subcomponent will also support research institutions in maintenance breeding (variety maintenance) and in the multiplication of early generation high-quality seeds, seedlings, and planting materials accessible to downstream stakeholders for commercial multiplication and distribution.

31. The main areas of support include: (a) human capacity development, including conducting assessment of the capacity and capability of selected R&D institutions; and provision of training for researchers, specialists and technical assistants on topics including CSA;⁴⁰ (b) physical capacity building, including: (i) provision of office furniture, IT and laboratory equipment, mobility and farm machinery; (ii) construction of new and/or rehabilitation of existing office and laboratory buildings and greenhouses;⁴¹ and (iii) rehabilitation of existing research infrastructure, including irrigation facilities; and (c) operating expenses for, inter alia, supervision and monitoring of field activities supported by the project.

32. **Subcomponent 1.3 Multiplication of seeds, seedlings, and planting materials (US\$19.2 million).** The objective of this subcomponent is to build the capacity of public and private seed farms and nurseries involved in the multiplication of seeds, seedlings, and planting materials.⁴² Public seed farms and nurseries will receive physical and human capacity building while private seed farms and nurseries will benefit from human capacity building, including technical assistance. In Tajikistan, multiplication of seeds, seedlings, and planting materials is largely the domain of the private sector, including

³⁷ Investments in climate proof and energy efficient infrastructure will be pursued.

³⁸ Institutions of Tajikistan Academy of Agricultural Sciences include the Pamir Scientific Center for Agriculture; Farming Institute; Institute of Horticulture, Viticulture, and Vegetable Growing; National Center for Genetic Resources; and the Scientific Center for Innovative Technologies and Agricultural Mechanization.

³⁹ Scientific Research Institute of Biotechnology of the Tajik Agrarian University named after Shirinsho Shotemur.

⁴⁰ Training activities will be informed by needs assessment.

⁴¹ Investments in climate proof and energy efficient infrastructure will be pursued.

⁴² Certified seeds derived from registered varieties are categorised as being “Original Seed” (or the original breeder’s seed and also referred to as “Super Elite”), “Elite Seed” (seed used by seed producers to produce commercially available seed used by farmers which may include hybrid or F1 seed).



private seed farms and nurseries and cooperative seed farms and nurseries, the former constituting more than 98 percent of the share. Facilities operated either by TAU or research institutes associated with TAAS⁴³ are also involved in seed and seedling multiplication. Currently, there are 90 private seed farms and nurseries that are involved in the multiplication of seeds and seedlings in Tajikistan. While multiplication of seeds, seedlings and planting materials is largely unrestricted, the GoT provides recommendations on regions and optimal conditions and quality requirements based on crop type and available resources. The GoT also ensures quality of the seeds, seedlings and planting materials multiplied by seed farms and nurseries, including inspection and certification. The infrastructure of TAAS operated seed farms and nurseries is in a state of disrepair and dilapidated. Most seed production facilities and nurseries are poorly equipped necessitating investments in storage facilities, seed cleaning and processing equipment, and farm machinery. Private seed farms and nurseries lack the necessary technical knowledge and skill of growing seeds and seedlings thereby requiring investments in human capital. The project will strive to identify female seed, seedling and planting material growers and multipliers to benefit from the project, including building their capacity. The project support to enhance the multiplication of seeds, seedlings, and planting materials will consider climate and pest-resiliency and will be aligned with different agro-ecological zones. The farms will be selected for inclusion in the project based on selection criteria that will be included in the POM to ensure transparency of the process.

33. This subcomponent will have two focus areas: (i) physical and human capacity building of seed farms and nurseries for enhanced seeds, seedlings and planting materials multiplication, including on CSA; and (ii) purchase of super elite and elite seeds and seedlings for commercial multiplication by seed farms and nurseries. The physical and human capacity building support to multiplication will be guided by policies, procedures and regulations that ensure compliance to quality standards through among others high-quality inspection and certification, which will be provided by the public sector. The purchase of seeds, seedlings and planting materials, which will help seed producers and nurseries meet their immediate needs of accessing high quality material for commercial production, pending the longer-term benefits associated with R&D focus of subcomponent 1.2, will also be guided by compliance to quality and standards, which will be provided by the public sector. The GoT will be responsible for the purchase of elite and super elite seeds and seedlings and their subsequent distribution to seed farms and nurseries using the established procedure.

34. The main areas of support include: (a) human capacity building, including conducting assessment of the capacity and capability of seed farms, nurseries and associated stakeholders and provision of training for technicians and other associated personnel⁴⁴; (b) physical capacity building, including: (i) construction and/or rehabilitation of storage facilities,⁴⁵ office and laboratory buildings, greenhouses, and rehabilitation of existing irrigation facilities⁴⁶; and (ii) procurement of office furniture, field and laboratory equipment, vehicles and farm machinery; and (c) operating expenses for, inter alia, supervision and monitoring of field activities supported by the project. The subcomponent will also support the purchase of elite and superelite seeds of high value, locally adapted varieties of GoT identified priority crops, including potato, wheat, maize, cotton, and other crops for commercial multiplication by seed farms and nurseries, and ultimately their distribution to end users.

35. **Subcomponent 1.4 Quality assurance (US\$3.2 million).** The objective of this subcomponent is to build the capacity of institutions and entities involved in quality assurance of seeds, seedlings and planting materials that are produced (or imported) and sold in Tajikistan. The mandate of ensuring the quality and standards as well as inspection and certification of seeds, seedlings and planting materials produced, multiplied, and sold is that of the GoT, particularly the MoA. Currently, there is no sufficient monitoring of seeds, seedlings and planting materials quality and standards with

⁴³ This role is mainly for production of “Original Seed” also referred to as breeder’s seed or super elite seed, and elite seed.

⁴⁴ Training activities will be informed by needs assessment.

⁴⁵ Investments in storage facilities will be designed with an objective, among others, to reduce exposure of products to extreme weather conditions.

⁴⁶ Investments in climate proof and energy efficient infrastructure will be pursued.



the constraint being deteriorated facilities, and insufficient expertise and capacity with the different varieties and crop types to undertake any certification. Whilst there are laboratories, including the Central Seed Laboratory that in the past was ISTA accredited, and those associated with TAJIKSTANDARD⁴⁷ including that of the CFS, in addition to other regional seed testing laboratories, they have insufficient capacity, technical capability, equipment, and technologies to undertake large-scale testing. As such, while most seed and planting material produced and sold in Tajikistan may have originally been derived from certified seed and material of registered varieties, however, as a result of poor production techniques and insufficient quality monitoring, their varietal purity has not been maintained due to capacity and capability inadequacies of the quality assurance services. This subcomponent will have two focus areas: (i) physical capacity building of quality assurance testing facilities, including laboratories,⁴⁸ and (ii) human capacity building.

36. The main areas of support include: (a) physical capacity building, including: (i) construction of new and/or rehabilitation of existing office and laboratory buildings; and (ii) procurement of office furniture, field, laboratory, IT and associated equipment, farm machinery and vehicles; (b) human capacity building, including conducting assessment of the capacity and capability of institutions and entities involved in quality assurance of seeds, seedlings and planting materials and provision of training for researchers, technicians and other personnel associated with quality assurance;⁴⁹ and (c) operating expenses for, inter alia, supervision and monitoring of field activities supported by the project.

Component 2: Support investments in Agri-Logistical Centers (ALCs)⁵⁰ for horticulture value chains (US\$14.0 million)

37. This component will support investments in ALCs to improve competitiveness of horticulture value chains and access to markets (e.g. domestic retail chains and export). The investments in ALCs will help build resilient food systems, promote agricultural diversification, ensure better market linkages, quality, and food safety standards, reduce food loss/waste, and initiate the development of an efficient distribution system network in Tajikistan. ALCs were identified by the World Bank⁵¹ and the IFC⁵² diagnostics as a missing, yet critical, element to provide incentives for increasing the competitiveness and further development of horticulture value chains in Tajikistan. The ACP is already supporting the value chains of apples, pears, apricots, lemons, tomatoes, and cucumbers that could potentially benefit from the ALC services to be provided. The in-depth feasibility study and market assessment to identify potential traded volumes of agriculture products, main functions, and business models for the management of ALCs, will encompass consultation, including discussions with vulnerable (small, young) producers as well as women farmers and other users to elicit the demand for ALC functions.

38. **Subcomponent 2.1: Support the establishment and operation of ALCs (US\$13.7 million).** The sub-component will support the establishment of tentatively three ALCs located in Khatlon, Sughd, and Dushanbe regions, where horticulture production is concentrated, to support primary collection, quality and food safety standards enforcement for local horticulture production and its access to high value outlets. The ALCs will be relatively small in size, with up to US\$4 million investment each,⁵³ reflecting the small market size in Tajikistan and the need for a gradual buildup of the integrated

⁴⁷ Bert Popping, 2019. Back-to-Office Report TCP-TAJ-3702-C2.

⁴⁸ Investments in climate proof and energy efficient infrastructure will be pursued.

⁴⁹ Training activities will be informed by needs assessment.

⁵⁰ Construction will be climate proof and energy efficient.

⁵¹ World Bank. 2020. Central Asia's Horticulture Sector — Capitalizing on New Export Opportunities in Chinese and Russian Markets. Washington, D.C.

⁵² In 2015, the IFC had the project to attract private sector investments in refrigerated warehouses/ALCs in Tajikistan, which were identified by market participants as a critical investment for horticulture sector development. The plan was to expand the refrigerated warehouse capacity by 16,700 tons with the investment of US\$26.8 million. The private sector, however, showed little interest in financing capital investment costs, but expressed interest to engage in operation and management of ALCs if they would be established.

⁵³ In Uzbekistan, for comparison, the estimated investment cost of ALC near Tashkent, being established with the support of the ADB project, is US\$60 million. The smaller ALCs in Bukhara and Khorezm regions, to be established with the support of the World Bank project, will cost US\$35 million each.



ALC network in Tajikistan. The ALCs in Khatlon and Sughd regions will be designed to provide services mainly for facilitating exports, while the ALC near Dushanbe will be largely servicing the capital of the country with 700,000 consumers. Streamlined processing ALC platforms, including improved and new storage facilities, will reduce the risk of food losses and waste. Availability of ALC services will also trigger more private investments in horticulture, including fruit orchards, which in turn will contribute to the climate mitigation and job creation. Specifically, the sub-component will support: (i) preparation of feasibility studies, business plans, environmental and social impact assessments, detailed designs and construction supervision plans; (ii) civil works for the construction of the ALCs; (iii) construction supervision; and (iv) provision of equipment for operation of the ALCs—pre-cooling, sorting, grading and packing lines as well as cold storage units and an operational management software. The facilities are expected to be built on state-owned land and will be owned by the State. The ALCs are expected to be managed through a public delegation service contract to a private operator (Tajikistan has a legislation in place for concession agreements and other kinds of private-public partnerships). In case that such arrangement may not be feasible selectively, these would be operated by a public entity (see Annex 3 for more details).

39. Subcomponent 2.2: Capacity building for operation and management of ALCs and awareness raising (US\$0.3 million). The subcomponent will support provision of training⁵⁴ for: (i) management staff of ALCs for operation and management of ALCs; and (ii) MoA on future scale-up of investments needed for an integrated and sustainable food distribution networks organized around ALCs.

Component 3: Strengthen public capacity for crises prevention and management (US\$13.3 million)

40. This component will strengthen the capacity⁵⁵ of relevant public institutions on agricultural crises prevention and management, focusing on selected programs, which can significantly enhance resiliency of agricultural sector. It will enhance the public capacity, thereby allowing institutions to have an early estimate of agricultural production and crop yields, determine potential food shortages, and identify crises and take early preparedness and response actions. It will also support climate adaptation and mitigation measures, generating substantial climate co-benefits. Priority areas for strengthening include: (i) real-time monitoring of agricultural production and agrometeorology; (ii) soil testing for improved soil fertility management and precision agriculture; and (iii) crop protection and locust control. The component will consist of the following three subcomponents.

41. Subcomponent 3.1: Real-time monitoring of agricultural production, land use, and agrometeorology (US\$5.7 million). The objective of this subcomponent is to improve information base and data analysis capacity for effective policy making to ensure more resilient and sustainable development of agriculture. Currently, the MoA receives information on crop planting areas or impact of droughts and floods on crop growing areas and yields that is not timely, sufficiently disaggregated and accurate for policy decisions and with significant delays. The emphasis under the project will be on collecting critical data on a regular and timely basis on land use and agricultural production using digital technologies and turning that data into a basis for real-time policy actions, including crisis preparedness and response. This subcomponent will have three focus areas: (i) creating a system for regular data collection on agricultural land use/planting decisions using the unified database and protocols for data collection at *jamoat*,⁵⁶ district, and regional levels; (ii) collecting information about crop vegetation and impacts of climate hazards on agricultural production by using remote sensing technologies; and (iii) building capacity at the institutional level on agricultural production forecasting and early warning that will lead to policy decisions helping with farmers' climate adaptation.

42. This subcomponent will also support generation of real-time agrometeorological information. Informed advisories, alerts and robust early warning systems are essential for farmers and rural dwellers to prepare for and adapt

⁵⁴ Training activities will be informed by needs assessment.

⁵⁵ All training activities under this Component will be informed by needs assessment.

⁵⁶ A *jamoat* is a third-level administrative division, similar to a commune or municipality.



to changes in climate. The project will support two focus areas in this regard: (i) increasing capacity of MoA to collect and analyze location-specific weather information, in collaboration with the Agency for Meteorology; and (ii) providing early warning and timely diagnoses for farmers, which will address the currently delayed and inaccurate agrometeorological information provision, building on the FAO/European Union (EU) pilot in Tajikistan.⁵⁷ Agrometeorological applications can benefit farmers by helping them better manage their practices, such as pruning and thinning out; aiding in the selection of sowing dates for optimum crop yield; helping reduce losses of applied chemicals and fertilizers; helping them avoid fertilizer and chemical sprays when rain is forecast or when wind speed is high; monitoring soil moisture and guiding irrigation supply; predicting times of harvest; and serving as an early warning system regarding outbreaks of pests and diseases, helping farmers better monitor their phytosanitary treatments. The project will pay attention to channelling information through technologies that are accessible also to women farmers and agri-entrepreneurs.

43. Main elements of support under this subcomponent include: (a) creating a system for regular data collection on agricultural land use/planting decisions, including: (i) development of protocols and manuals for data collection in the unified database; and (ii) establishment of new agrometeorological stations and ICT infrastructure to receive and process data;⁵⁸ (b) collecting information about crop vegetation and impacts of climate hazards on agricultural production, including procurement of goods and equipment for remote sensing and field data collection and monitoring; (c) building capacity at the institutional level on agricultural production forecasting and early warning that will lead to policy decisions helping with farmers' climate adaptation, including through provision of training;⁵⁹ (d) increasing capacity of MoA, the Agency for Meteorology, and the Committee of Emergency Situations and Civil Defence to collect and analyse location-specific weather information, harmonize and integrate data collection, including through provision of trainings;⁶⁰ (e) providing early warning and timely diagnoses and other agrometeorological information materials for farmers and development of information distribution channels; and (f) operating expenses for, *inter alia*, supervision and monitoring of field activities supported by the project.

44. **Subcomponent 3.2: Soil fertility management (US\$3.1 million).** The objective of this subcomponent is to increase farmers' awareness of their soils, water and biohazards, and success in replacing blanket recommendations with soil test-based recommendations and adoption of climate-smart farming practices (*i.e.* precision agriculture). This will entail generation of fertilizer use recommendations tailored to specific needs of agro-ecological zones of the country and ensure more efficient use of increasingly expensive fertilizers by farmers. This subcomponent will have three focus areas: (i) enhancing land productivity through improved soil fertility and soil health and addressing land degradation; (ii) building capacity of MoA, TAAS, TAU, and other public institutions on climate-smart practices that lead to reduction in greenhouse gas (GHG) emissions and fertilizer use; and (iii) creating the foundation for effective use of innovative remote digital soil scanning and testing in the future.

45. Main elements of support under this subcomponent include: (a) enhancing land productivity through improved soil fertility and soil health and addressing land degradation. This will include: (i) soil and water testing laboratory infrastructure development, *inter alia*: conducting civil works for buildings,⁶¹ provision of equipment, ICT, and software; (ii) establishment and strengthening of a network of central reference and regional laboratories; (iii) improving guidelines/manuals for soil testing and fertilizer use; (b) building capacity of MoA, TAAS, TAU, and other public institutions

⁵⁷ The project "Strengthening Institutions and Capacity of the Ministry of Agriculture and State Veterinary Inspection Service for Policy Formulation" financed by the EU and implemented by the FAO supported the successful introduction of several agrometeorological stations in Tursunzade, Kanibadam and Balkhi in 2019-2020, which could be scaled up by SRASP.

⁵⁸ Investment in climate proof and energy efficient infrastructure will be pursued.

⁵⁹ Training will be based on needs assessment.

⁶⁰ Training will be based on needs assessment.

⁶¹ Investment in laboratory facilities will be designed with an objective, among others, to use climate-proof and energy efficient materials and reduce exposure to extreme weather conditions.



on climate-smart practices, including through provision of training;⁶² (c) creating the foundation for effective use of innovative remote digital soil scanning and testing in the future, including promotion of field-based soil testing equipment among farmers, and (d) operating expenses for, inter alia, conducting soil testing, soil mapping, and awareness raising among farmers.

46. **Subcomponent 3.3: Crop protection and locust control (US\$4.5 million).** The objective of this subcomponent is to strengthen capacity of crop protection and locust control agencies⁶³ to provide public-nature crop protection services to the farmers against pests in an environmentally sustainable manner. Warmer temperatures are favourable to pests; and potential climate change-induced threats to Tajikistan include the arrival of new pests and diseases.⁶⁴ There will be two focus areas of this subcomponent: (i) investing in broad-scale control measures of locust and other pests; and (ii) investing in human capacity of the public institutions responsible for crop protection and locust control. Tajik farmers incur significant losses from frequent pests, and especially locust invasions, augmented by climate change. Three out of the four provinces of the country are regularly affected by locust infestations, mainly due to the Moroccan Locust. During the past ten years, the locust surveillance area amounted to some 500,000 ha and the area of annual anti-locust treatments ranged from 60,000 ha to 140,000 ha. The scale of this issue has expanded and occurs along almost 4,000 km of borders with the neighbouring countries, including Afghanistan with little, if any, locust control. During outbreaks, locust attacks destroy pasturelands and a wide range of cultivated crops, with the annual loss estimated at US\$10-15 million. The real impact is more devastating as the annual locust attacks curtail severely the livelihoods of the poorest segments of the Tajik society. The public sector has a large role to play in delivering services to help farmers reduce these losses, including through better monitoring, prevention, and response.

47. Main elements of support under this subcomponent include: (a) investing in broad-scale control measures to control the locusts, damages and losses, including: (i) upgrading crop protection laboratory infrastructure, including civil works for buildings⁶⁵ and procurement of equipment and laboratory reagents; (ii) improving technical capacity of the crop protection and locust control units, including provision of chemicals, goods, and equipment, to deliver services and strengthen field surveillance; (iii) operating expenses for, inter alia, pest/locust surveillance and monitoring; and (iv) field and office equipment and critical supplies for experts, scientists, and farmers; and (b) investing in human capacity to apply the control measures, including provision of training⁶⁶: (i) for crop protection and locust control agencies on climate smart agriculture and integrated pest management; and (ii) for experts, scientists, and farmers in natural resource management.

Component 4: Project management and coordination (US\$3.0 million)

48. The objective of this component is to support project management, coordination, M&E, and implementation of Environmental and Social Framework (ESF) instruments and fiduciary aspects of the project. These functions will be undertaken by a project implementation unit (PIU) to be established under the auspices of the MoA. The PIU will also manage the project's grievance redress mechanism (GRM) and citizen engagement activities. Enhanced engagement and outreach activities will improve the outcomes of the project. Component 1 will carry out beneficiary satisfaction surveys (using scorecards and other feedback mechanisms) annually. Components 2 and 3 and the project will also conduct ex

⁶² Training will be based on needs assessment.

⁶³ The project will complement and fill the gaps of the second phase of the regional program on locust management implemented by FAO and financed by the Government of Japan, which started in December 2020. This five-year project will provide support for improving locust management through regional cooperation and strengthening of technical capacities on a wide range of topics, including for the operational use of the Automated System for Data Collection and national Geographical Information System, allowing collection and analysis of standardized field locust data.

⁶⁴ ADB and World Bank. 2021. Climate Risk Country Profile Tajikistan. (draft).

⁶⁵ Investment in laboratory facilities will be designed with an objective, among others, to use climate-proof and energy efficient materials and reduce exposure to extreme weather conditions.

⁶⁶ Training will be based on needs assessment.



ante inclusive group discussions to elicit the demand for ALC functions, and for public sector agricultural information and delivery mechanisms, with emphasis on group discussions with vulnerable (small, young) producers as well as women-farmers and other users. These will be organized annually as participatory social monitoring activities with the objective to engage with stakeholders. The PIU will be staffed with the required specialists, including fiduciary and ESF. Activities to be financed under this component include: (i) procurement, financial management, environmental and social risk management, citizen engagement, monitoring and evaluation, and reporting; project related audits; and (ii) training and operating costs for the project.

49. The breakdown of the project costs by component/subcomponent and the source of funds is presented in Table 1.

Table 1: Project costs and financing (US\$ million equivalent)

Components	Total
Component 1: Strengthening seed, seedling, and planting material systems	27.7
1.1: Enabling Environment	0.3
1.2: Research and development	5.0
1.3: Multiplication of seeds, seedlings, and planting materials	19.2
1.4: Quality assurance	3.2
Component 2: Support investments in ALCs for horticulture value chains	14.0
2.1: Support the establishment and operation of ALCs	13.7
2.2: Capacity building for operation and management of ALCs and awareness raising	0.3
Component 3: Strengthen public capacity for crises prevention and management	13.3
3.1: Real-time monitoring of agricultural production, land use, and agrometeorology	5.7
3.2: Soil fertility management	3.1
3.3: Crop protection and locust control	4.5
Component 4. Project management and coordination	3.0
TOTAL	58.0

C. Project Beneficiaries

50. **Primary beneficiaries.** The project's primary beneficiaries are farmers, both smallholders and larger farms, agribusinesses, and exporters. They will receive more and better seeds, seedlings, and planting materials. They will also benefit from ALC services, soil testing, locust control, and agrometeorological information. Primary beneficiaries will also be the staff of public institutions, from agricultural researchers and extension officers to the staff working in various MoA departments and agencies and in the local government as well as private seed farms and nurseries.

51. **Geographic focus and selection criteria.** The project will be open to beneficiaries across the country (components 1 and 3), while the ALCs supported under Component 2 will be located one each in Khatlon, Sughd, and Dushanbe regions selected for their agro-ecological potential, horticultural production patterns, export opportunities (the case for Khatlon and Sughd), and proximity to major urban market (in the case of Dushanbe). The sub-sectoral focus of the ALCs will be on horticulture.

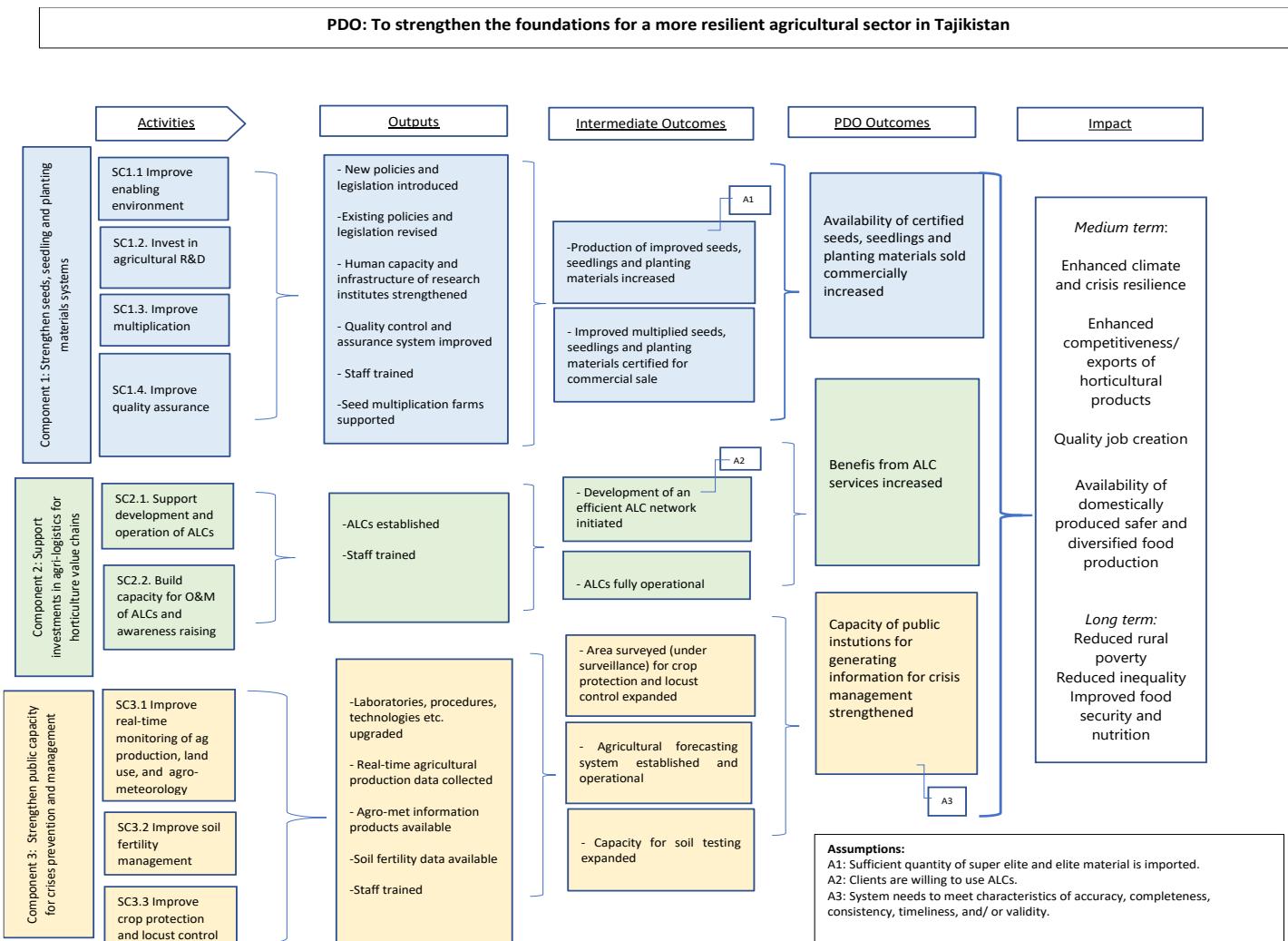
D. Results Chain

52. The project's Theory of Change (Figure 1) is built on the problem statement that the agriculture sector is vulnerable to climate change and crises like COVID-19 hence not resilient; farmers and agribusinesses operate in an environment characterized by limited access to improved seeds, seedlings and plating materials, and little capital investment, which are not conducive for the development of competitive high-value horticultural value chains. The project



focuses, therefore, on three main areas of support: (i) establishing systems of seeds, seedlings and planting materials; (ii) promoting the development of market-led, high-value horticulture value chains through the establishment of ALCs; and (iii) strengthening early warning and response systems. These three main areas of support are for the purpose of this project, the foundations for a more resilient agriculture sector. The expected PDO level outcomes feed into achieving goals set by the GoT and meet the WBG goals.

Figure 1: Project's Theory of Change



E. Rationale for Bank Involvement and Role of Partners

53. **The SRASP marks an important point in the engagement of the World Bank in the agricultural sector of Tajikistan.** The WB participated in the drafting of the country's NAIP, having led an agricultural public expenditure review as Tajikistan emerges from the first year of the COVID-19 pandemic. The NAIP is informed by a comprehensive analytical work on developments (constraints and strengths) in the Tajik agricultural sector.⁶⁷ COVID-19 exposed and amplified underlying structural vulnerabilities that are long overdue for addressing, and the proposed project is deliberately aiming

⁶⁷ World Bank. forthcoming. Tajikistan: Agricultural Sector and Public Expenditure Review. Washington, D.C.



to do so. The SRASP also builds on the operational experience of the currently ongoing ACP and REDP.

54. **The range and complexity of public and private sector issues to be addressed under the SRASP require high-level expertise.** The WBG has extensive experience internationally, and specifically in the Central Asia region and in Tajikistan in supporting different agents of the agriculture sector, enhancing competitiveness and market integration, and strengthening agricultural public-sector institutions. The latter is a unique contribution by the WB as interventions of other Development Partners (DPs) tend to focus only on the private sector activities. The SRASP also incorporates the MFD approach as described in Section I.V.

F. Lessons Learned and Reflected in the Project Design

55. **Project preparation has benefitted from the implementation experience of several similar projects and analytical work in countries of Central Asia.** Previous programs supported by DPs have also highlighted development needs for the seed, seedlings, and plant material sector, but have addressed them by largely focusing on the demand side, including training farmers and improving their access to quality seed. This has been the case for wheat and barley as well as through emergency seed programs, for example for potatoes. Other programs, also largely funded by DPs, tried to address the supply side by, for example, supporting the establishment of seed laboratories, recommending policies on standards for seed support and access to organizations in support of international standards. Interventions were in line with the GoT's program for the sector but were limited in their scope as they did not address deficiencies in public sector capacity. Consequently, long-term benefits from previous efforts have been largely lost due to mainly the inability of the public sector to maintain momentum by providing the required and necessary level of support, including in terms of policy and legal provisions, R&D, and public services to seed, seeding, and planting material producers and farmers. Whilst some private sector stakeholders, seed distributors, and other suppliers of seed and agriculture supplies have tried to fill the gaps with respect to supply and technical support, they tend to limit their services to their clients and not to the sector as a whole. This lack of sustainability of both the local and internationally funded initiatives and weak public institutions in the sector have been well documented as early as since 2007.⁶⁸ The design of the current project draws lessons from these initiatives and tries to bridge the critical gap of weak institutional development by strengthening public institutions for enhanced resilience, better service delivery, and crisis prevention and management.

56. **Designing functional ALCs requires attention to initial assessment of agrifood sector operators and a precise analysis of food distribution systems.** International best practices in the development of ALCs highlight different key factors for a successful implementation: (i) accurate knowledge of food distribution organization at the regional and national levels; (ii) capacity to design and provide services responding to the operators' needs, future users of the centers; (iii) ability to phase the project to secure the investment; and (iv) quality of the technical assistance to support the start-up of operational activities. The design of ALCs will be underpinned by international experience in operation and management of ALCs such as those in France, Italy, Spain, and North Macedonia as well as experiences in the region, including Uzbekistan and Kazakhstan.

57. **The design of Component 3 builds on the lessons learned from other ongoing and recently completed DP projects.** Agricultural production forecasting, to be supported by SRASP, will be informed by the pilot modelling of the agricultural production forecast currently supported by ACP. The SRASP's agrometeorological activities will be informed by the lessons learned from the FAO/EU agrometeorological project, which showed that agrometeorological stations could provide a lot of useful information but making this information useful for farmers requires investment in preparation and dissemination of various information products. Locust control activities, to be supported by SRASP, will improve ongoing work at national and Central Asia level supported by the regional FAO project on locust surveillance and eradication. In general, where feasible, the SRASP will seek strategic partnerships with DPs to exploit complementarities and avoid

⁶⁸ SIDA Country Report 2006 for Tajikistan, March 2007, Section for Development Cooperation in Dushanbe.



duplication.

III. IMPLEMENTATION ARRANGEMENTS

A. Institutional and Implementation Arrangements

58. **The primary implementing agency for the project will be MoA.** The MoA will be the lead implementing agency (IA) with the overall responsibility for coordinating all aspects of the project, including contributions by the different relevant ministries and agencies participating in the project's implementation. The main responsibilities of the MoA will include project oversight, coordination, planning, technical support, financial management, procurement support, citizen engagement, ESF instruments compliance, and monitoring and evaluation (M&E). The MoA will be accountable for authorizing and verifying all project transactions and will work closely with the World Bank's Task Team during project implementation.

59. The MoA will be supported by a project implementation unit (PIU), which is already established, and will be staffed with additional expertise. Since the existing PIU is currently subordinated to the GoT, actions will be taken to transfer the PIU under the jurisdiction of MoA. The PIU will support the MoA in the implementation of the project. In addition to the PIU in Dushanbe, the MoA will also establish two affiliate (branch) offices - one in Sughd and one in Khatlon, that will report directly to the PIU in Dushanbe. The PIU and affiliate (branch) offices will be staffed, equipped, and strengthened to support project management and coordination. They will be responsible for facilitating day-to-day implementation of the project in close collaboration with other implementing institutions at national, regional, and local levels. They will also be responsible for following up fiduciary and ESF aspects of the project implementation and provision of support to the implementing institutions.

60. The implementation of the SRASP will also be supported by a Project Steering Committee (PSCPCC) and a Project Technical Committee (PTC) that will play oversight and technical support roles, respectively, to project implementation. The SRASP will use the existing PSC established for the ACP, which it will supplement with additional members, as deemed necessary, by drawing from institutions involved in project implementation. The PSCPCC, chaired by the Deputy Prime Minister, will provide strategic guidance for project implementation, ensure coordination as well as help identify key issues that need to be brought to the attention of the GoT and facilitate their resolution. The PTC, chaired by the Deputy Minister of Agriculture, will be responsible for providing technical advice to the PIU on the quality of implementation reports and special studies, guidelines, documentation of best practices, and M&E reports.

61. The implementation of the SRASP will also be supported by FAO. They will be involved in implementing capacity building and technical assistance-related activities identified under components 1 and 3. FAO has strong experience and capacity to deliver technical assistance and consultancy services and to identify, recruit, and supervise subcontractors for supporting the implementation of these activities. FAO is also currently running technical assistance projects in Tajikistan, including on seed multiplication and quality assurance, digital agriculture, agrometeorology, crop production, and locust control. As a result, FAO has developed Tajikistan-specific experience, knowledge, and networks, which could be highly valuable for the SRASP. Beneficiaries of the capacity building and technical assistance-related activities include staff of MoA, CFS, TAU, TAAS, research institutions, seed farms, and seed and soil laboratories. The MoA will contract directly with FAO using single source selection. The details of institutional and implementation arrangements and support plan are provided in Annex 1.

B. Results Monitoring and Evaluation Arrangements

62. **The project will support the PIU to develop and implement the M&E system and framework to monitor progress**



toward PDO and intermediate indicators. It will comprise both regular quantitative data collection with periodic qualitative surveys on key thematic areas. The project will carry out beneficiary satisfaction surveys (using scorecards and other feedback mechanisms), and it will also conduct ex ante inclusive group discussions to elicit the demand for activities and delivery mechanisms (as described above), with emphasis on group discussions with vulnerable (small, young) producers as well as women farmers and other users. These will be organized annually as participatory social monitoring activities with the objective to engage with stakeholders. The M&E system will be designed in such a way as to link technical and financial data regarding project implementation, so that it serves to establish a project Management Information System (MIS).

63. **The PIU will be responsible for overall M&E of project outputs and impact, as well as the development and monitoring of annual work plans.** A full-time M&E specialist will be appointed for leading the results measurement, with guidance from WB, and for compiling M&E data for consolidation into project progress reports. M&E capacity building under Component 4 will facilitate understanding of gender dimensions and inequalities in the sector. The project will provide technical assistance to encourage MoA to introduce the measurement of gender indicators in their M&E system. Indicatively, these could include the development of specific mixed-methods to track gender (surveys, focus groups, specific evaluations), gender-specific evaluations, and use of diagnostics to recognize gender-specific constraints or opportunities and design policy interventions which could address these problems. The M&E system will include baseline, mid-term, and end of project surveys and studies (e.g. income and job impacts) to be carried out by independent specialists that will be recruited under the proposed Project. Semi-annual joint implementation support missions with representatives from WB and GoT will ensure compliance with legal covenants and implementation progress. A mid-term review will be undertaken three years after project effectiveness to review progress and, if necessary, adjust project design. An Implementation Completion and Results Report will be prepared by GoT and by WB within six months after the project closes to assess achievements.

64. **The implementation and supervision strategy for this project will build on the most recent advances in the field of “smart supervision.”** The project will collaborate with the World Bank’s Geo-Enabling Monitoring and Support (GEMS) initiative⁶⁹ to establish an online platform consisting of a cloud-based database, a web portal, and mobile data collection applications based on the Kobo ToolBox – an open-source software that enables the collection and reporting of real-time data to facilitate project monitoring and supervision.

C. Sustainability

65. **The SRASP’s sustainability is reinforced by GoT’s strong ownership of the project.** The project follows the request to support the implementation of the GoT’s plan known as “Prevention and Reducing the National Economy’s Exposure to Potential Risks of COVID-19”. The Plan aims at ensuring food and nutrition security, building resilient livelihoods and institutions, and creating jobs. The project targets the provision of seeds, seedlings, planting materials, which is included in the action Plan prepared by MoA entitled “Action Plan for the implementation of joint initiatives agreed within the framework of Partnership between the MoA Tajikistan and DPs, March, 2020”. The proposed project supports these activities and follows an integrated approach of including a mix of investments in capacity building of public agricultural services, and in infrastructure, including ALCs that help the development of horticultural value chains thereby ensuring long-term sustainable outcomes. During implementation, the Bank will work closely with the Government to ensure a mechanism to provide the necessary budget to sustain these investments beyond the life of the project.

66. **The project’s sustainability is also reinforced by the GoT’s commitment to invest in capacity building.** The project follows a holistic and systematic capacity building approach. The SRASP strengthens public institutions for better service delivery and crisis prevention and management. It also builds the capability (enhancing knowledge and skill) of personnel

⁶⁹ <https://www.worldbank.org/en/topic/land/brief/geospatial-technology-and-information-for-development>



in various public and private institutions for better and improved leadership, organizational, managerial, financial, and technical capabilities. These will contribute to increased and enhanced capacity of public institutions and personnel, which will in turn improve resilience and ensure sustainability. Technical sustainability of infrastructure investments, including ALCs, will be ensured through provision of relevant knowledge and skill enhancing trainings and hands-on technical assistance to personnel involved in the operation and management of infrastructure. Future management staff will be trained and equipped with the knowledge and skill of how to operate and manage infrastructure, how to ensure quality during construction of infrastructure; and how to prepare for future investments in infrastructure, including network of ALCs and food distribution centers. Environmental sustainability will also be ensured since activities under SRASP will continue to be screened through the ESF. In addition, explicit activities such as support activities which improve soil fertility will contribute positively to the environment by conserving soil and water and adaptive capacity during a changing climate.

IV. PROJECT APPRAISAL SUMMARY

A. Technical, Economic and Financial Analysis

67. **Technical:** Technical design of project activities reflects the need for strengthening the resilience of the agriculture sector and increasing production and export competitiveness of the growing horticulture sector. The design is supported by international experience, lessons learned from implementing the two ongoing WB projects (ACP and REDP), and consultations with research and academia, private sector, and DPs in Tajikistan. Design of project activities under the development of resilient seeds, seedlings and planting materials systems follows the globally accepted value chain approach in identifying key challenges and constraints and addressing them effectively. The SRASP also builds on experiences gained and lessons learned from projects that supported the sector by other DPs in Tajikistan, including SIDA, USAID, EU, and FAO. The experience with developing the medium-size ALCs will generate lessons for future scale up of the initiative nation-wide. Design of activities under the public capacity for crises prevention and management is based on the need for boosting/strengthening MoA's and other relevant public institutions' capacity in early warning, preparedness and response to shocks/crises like climate change, flooding, locust, and the COVID-19 global pandemic.

68. **Economic and financial analyses:** Economic benefits of the project will be a result of: (i) the improved access to better seed, seedling, and planting materials; (ii) production techniques and improved resilience to external shocks; and (iii) improved agri-logistic services supported by the project on national level. An investment horizon of 20 years is used in the analysis to account for phasing and gestation period of the proposed interventions. The Economic Net Present Value, discounted at 6 percent, is estimated at US\$136 million. The Economic Rate of Return is estimated at 18.6 percent (see Annex 4 for details).

69. **Shadow price of carbon.** An ex-ante assessment of the impact of the project on the net GHG emission was undertaken using the FAO Ex-Act tool. The project shows a total balance of 768,793 tons of CO₂-equivalent for the economic lifetime, which means that the project will have a positive carbon sequestration balance. The overall carbon benefit is estimated to range between US\$17 million in the low shadow price of carbon scenario to US\$34 million in the high shadow price of carbon scenario. Incorporation of this benefit into the economic analysis increases the Economic Rate of Return by 1.4 percent and 2.8 percent, respectively.

70. **Climate co-benefits.** In 2015 Tajikistan submitted its Intended Nationally Determined Contribution (INDC) to the UN Framework Convention on Climate Change⁷⁰, where the country emphasized the existing and future climate

⁷⁰ <https://www4.unfccc.int/sites/ndcstaging/PublishedDocuments/Tajikistan%20First/INDC-TJK%20final%20ENG.pdf> Accessed on 07 February 2021.



vulnerabilities for agriculture, in addition to explicitly including agriculture in its proposed adaptation as well as mitigation strategies, policies, programs, and measures. Nationally proposed measures and actions for adaptation to climate change in agriculture are closely related to mitigation measures, and they include: modernization of the hydrometeorological services and improvement of the process of serving the needs of the economy and of the citizens; implementation of the Medium-Term Development Programme of the Republic of Tajikistan for the period 2016-2020, and the Agriculture Reform Programme of the Republic of Tajikistan for 2012-2020 (amongst others); risk reduction of natural disasters, promotion and diversification of renewable energy sources and reduction of energy losses; as well as modernization, introduction and transfer of new technologies, and dissemination of knowledge and experience on climate change at various levels. The INDC makes an explicit point on the potential for climate change adaptation and mitigation goals to be met “subject to new substantial international funding.”

71. **The SRASP is expected to generate significant climate co-benefits by promoting a range of activities** that will: (i) enhance the adaptation capacity of farming systems in the project area. This will be achieved through inter alia the availability of climate-resilient (drought tolerant) crop varieties for farmers. Project activities will also (ii) mitigate GHG emissions through carbon sequestration by growing fruit trees. Specifically, the project's Component 1 will support increasing the supply of seeds, seedlings and planting materials aiming at climate and pest-resiliency and alignment with different agro-ecological zones, and technologies adapted to local social and environmental conditions and to changing circumstances over time (e.g., co-evolution of pests and diseases, degradation of water and land resources and climate change manifestations). Expected focus areas for support include research on agro-ecological zone-specific CSA technologies, increasing climate resilience of the agriculture sector, and increase in the supply of improved agricultural technologies (including variety breeding). Improvement of agricultural technologies will pay attention to development of climate-resilient crop varieties and climate-smart farming practices for a range of agricultural products. The project's Component 2 will reduce food losses and waste and increase resilience through ALCs' streamlined processing platforms, including improved and new storage facilities, will reduce the risk of losses due to climate, and increase resilience. Component 3 will enhance the public capacity, thereby allowing institutions to have an early estimate of agricultural production and crop yields, determine potential food shortages, and identify crises and take early preparedness and response actions. It will also support climate adaptation and mitigation measures, generating substantial climate co-benefits. Under all components the infrastructure, including buildings, laboratories, offices, storage facilities etc., constructed and rehabilitated by the project, will be encouraged to utilize energy-efficient and climate-resilient materials and designs, and all activities related to human resource development will include topics on understanding climate change better and frameworks, tools and techniques to facilitate designing and implementing climate adaptation and mitigation approaches. The SRASP also includes two climate indicators to track and monitor progress of interventions that contribute towards reducing vulnerability to climate change impacts, specifically Intermediate Results (IR) indicators 'Production of seeds, seedlings and planting materials increased', and 'agricultural forecasting system established and operational'.

72. **Nutrition.** Agriculture can and should deliver more to reduce malnutrition in Tajikistan. The country devotes a lot of land and other productive resources to produce mainly starchy vegetables and cereals that are known as relatively nutrient-poor foods (unless they are of a biofortified variety). Relatedly, the largest share of energy continues to derive from cereals, specifically wheat. The horticulture value chain, as a focus of the SRASP, meets the conditions of being a Nutrition Smart Agriculture activity,⁷¹ because (1) it contributes to improved nutritional outcomes in making available nutrient-rich, diverse and safe foods that are part of a high-quality diet; and (2) it is a proven revenue-generating activity in Tajikistan. Better nutrition will contribute to improving the human capital of Tajikistan's people.

⁷¹ Nutrition Smart Agriculture: When Good Nutrition is Good Business

<https://www.worldbank.org/en/topic/agriculture/publication/nutrition-smart-agriculture-when-good-nutrition-is-good-business>



73. **Gender.** The SRASP will focus on closing the gender gap related to access of market, and information and services related to agri-logistics, such as sorting, cooling, storage, and packaging. It will reach out with information and awareness raising campaigns to women farmers and agri-entrepreneurs (on topics such as services offered, benefits of using ALC services, etc.) through means that are accessible to women to facilitate women's use of ALCs services. For example, given the low penetration of mobile telephony in rural areas, and especially for women,⁷² the project can explore disseminating information through television, as 96 percent of rural households own one.⁷³ The project will prepare a Gender Action Plan (GAP) that will be an integral part of investments and will ensure that the project is able to serve women's needs by including the actions to facilitate women's access to ALCs. The project will have one result indicator to monitor actions related to Component 2, specifically PDO level indicator Female clients benefiting from ALC services for at least one year; and it will disaggregate other indicators for gender (specifically Clients satisfied with quality of services provided by ALCs, and Clients who report that the two-way channel for feedback and response works). The ALCs are also expected to provide employment opportunities for rural women, including, but not limited to, processing and sorting personnel - tasks often attractive for women.

74. **Maximizing Finance for Development (MFD).** The project has considered the MFD approach. It has assessed the market failures in the horticulture value chains and proposes public interventions for enhancing private sector investments and solutions to address these market failures. The key identified market failures for the value chains to be supported by the project are: (a) lack of required public investments in agri-logistics and R&D; and (b) inadequate quantity and quality of agricultural inputs (seeds, seedlings, planting materials) to enter high-value (exports) markets. The SRASP will include a spectrum of actions with the potential to increase the space for private sector activity, such as (i) improving the policy and regulatory environment; (ii) supporting essential public goods and services such as strengthening human capital, agricultural services, and public infrastructure (ALCs) contributing to enhance market access; and (iii) directly building the capacity of private sector seed producers and nurseries in the multiplication of seed, seedlings and planting material recognizing that the public sector is rightly responsible for the R&D and quality assurance, but the private sector is better suited to lead commercial multiplication.

75. **Citizen engagement will take place through multiple channels.** The SRASP will support citizen engagement through: (i) the use of feedback generated through intermediate and outcome results indicators that measure client satisfaction with services provided under the project; and (ii) the grievance redress mechanism (GRM) to be established by the project. Specific citizen engagement mechanisms will include beneficiary perceptions surveys at mid-term and end of the project; use of consultations, local information desks, and grievance redress mechanisms to receive ongoing feedback from the population (beneficiaries, project-affected persons, general public, etc.) on the activities of the project. The proposed project activities that concern direct interventions at farmer and service provision levels will be designed and implemented based on gender-representative consultations with direct beneficiaries and other stakeholders, and feedback incorporated to strengthen technical aspects and facilitate implementation. To strengthen civic engagement further, a systematic feedback mechanism will become part of the regular project monitoring activities, and GRM will be set up and made known to all stakeholders. Project beneficiaries will be informed regarding actions taken on their feedback through the participatory social monitoring activities conducted through affiliate PIUs. These approaches will complement and enhance more traditional forms of monitoring. The project will incorporate beneficiary feedback indicators in the results framework to measure beneficiaries' satisfaction with the project supported services and institutional support, specifically Clients who report that the two-way channel for feedback and response works, and

⁷² Only 54 percent of women own a mobile phone, with mobile phone ownership much lower in rural areas (48 percent) than in urban areas (71 percent). Source: Statistical Agency under the President of the Republic of Tajikistan, Ministry of Health - MOH/Tajikistan, and ICF. 2018. Tajikistan Demographic and Health Survey 2017. Dushanbe, Tajikistan: SA/Tajikistan, MOH/Tajikistan, and ICF. Available at <http://dhsprogram.com/pubs/pdf/FR341/FR341.pdf>.

⁷³ FAO, 2016. National Gender Profile of Agricultural and Rural Livelihoods – Tajikistan.



Participatory social monitoring activities organized through affiliate (branch) PIU offices social specialists.

B. Fiduciary

76. **Financial Management:** The FM arrangements at the existing PIU are adequate to implement the project and meet the minimum requirements of the Bank's Policy and Directive on Investment Project Financing. To strengthen FM performance and prepare the MoA for project implementation, the PIU will take the following actions to be implemented by project effectiveness and within 60 days after project effectiveness: (i) the 1C accounting software shall be adapted for project accounting, budgeting and reporting and also installed at the newly created affiliate (branch) offices. The accounting system shall have inbuilt controls to ensure data security, integrity and reliability, and the functionality of automatic generation of interim unaudited financial report (IFRs) and SOEs; (ii) the FM chapter of the POM shall be developed to guide staff in daily project FM operations, including description of the MoA internal control role over the FM functions in PIU and its affiliate (branch) offices; and (iii) the FM Specialist and Disbursement Specialist shall be hired as part of the PIU and at affiliate (branch) level to provide daily support to the PIU Chief Accountant, who is overall responsible for all financial aspects of the project.

77. The residual financial management risk under the project is currently assessed as Moderate. The FM risk is rated as such due to MOA's PIU experience and capacities gained during implementation of donor-funded projects and the scope of FM, which is typical for the agricultural sector. The expenditures are straightforward; and existing FM arrangements at the PIU are adequate and reliable to implement the project. The strengths that provide a basis for reliance on the Project's financial management system include: (i) the experience of the FM/accounting staff in the Bank-financed projects; (ii) overall adequate internal control and filing systems in place; (iii) the audits of the Bank-financed project implemented by the MOA through the PIU were acceptable to the Bank; and (iv) the IFRs on the Bank-financed project implemented were received on time and in general found to be acceptable to the Bank. Under the ACP, the PIU submits quarterly IFRs on time and they are satisfactory to the World Bank. The project audit report for Calendar Year 2019 was submitted by extended due date -September 30,2020. The auditor, Baker Tilly Klitou and Partners SRL Moldova, has issued modified opinion on the project financial statements. The modification is made due to the inability to verify correctness of cash balances in Tojprombank accounts as of December 31,2019. Under ongoing ACP, project funds remain inaccessible in DA account in Tojprombank (TPB) in amount of US\$237,334.74. Due to TPB bankruptcy, the PIU has no access to its bank accounts. Based on recent discussions with the MOF, it was mentioned that the recovery of project funds shall be completed as soon as possible to make funds available for the project's use, as meanwhile, the funds cannot be used for the purposes intended in accordance with the Financing Agreement. The MOF committed to resolve the issue with frozen accounts under Tajikistan portfolio, as several projects accounts opened at the TPB were affected. The audit report and the accompanying project financial statements were found to be acceptable to the World Bank.

78. With regard to the FM Covenants to be included in the Disbursement and Financial Information Letter (DFIL), the following should be noted: (i) IFR formats have been agreed with the MoA and will be submitted to the World Bank within 45 days after the end of the calendar quarter; and (ii) the project's audited financial statements are to be submitted to the Bank within six months after the end of the audit period. The project will receive disbursements from the World Bank through, direct payments, reimbursements, and commitments e.g. letters of credit. In application of section 5.2 of the Disbursement Guidelines for Investment Project Financing, the use of a Designated Account is not permitted under this new operation due to the recipient's failure to refund undocumented advances to Designated Accounts within two months after the disbursement deadline date under three recently closed projects. The detailed disbursement arrangements will be provided in the DFIL.

79. **Procurement:** Procurement under the project will be governed by the World Bank's Procurement Regulations for IPF Borrowers (Fourth Edition November 2020) (Procurement Regulations) and will also be subject to the Bank's Anti-Corruption Guidelines (dated July 2016). The procurement approach, procurement risks, arrangements and procurement



plan for the project duration recommended by the Borrower will be presented in the Project Procurement Strategy for Development (PPSD). The PPSD has been prepared by the Borrower with the support of the Bank's team. The PPSD, which also includes the Procurement Plan will be updated during project implementation to reflect any substantial changes in procurement approaches and methods to meet the actual project needs.

80. The MoA has overall management capabilities, established fiduciary arrangements and extended experience with implementation of the donor funded projects in the agriculture sector. However, the MoA has no experience with the applicable procurement regulations; has limited contract monitoring and management skills and insufficient existing capacity to handle the increasing volume of procurement activities in the proposed project. The key issues and risks concerning procurement include: (i) Limited existing capacity to develop technical part of procurement documents; (ii) Procurement and implementation delays due to formalized internal review/approval procedures and the need to coordinate procurement process with multiple project implementation partners; (iii) Quality issues during execution of civil works. Given the above risks, the following risk mitigation measures are proposed: (i) Involvement of qualified technical experts to provide quality inputs to procurement documents and decisions; (ii) Development of procurement chapter of the POM and monitoring its implementation, including adherence to the agreed timeline; (iii) Strengthening quality assurance of civil works system; and (iv) Continues monitoring of contracts implementation (quality, time and cost). With these mitigation measures implemented, the residual procurement risk is assessed as Moderate.

C. Legal Operational Policies

	Triggered?
Projects on International Waterways OP 7.50	Yes
Projects in Disputed Areas OP 7.60	No

81. Operational Policy 7.50 is applicable to this project because the project supports minor rehabilitation and alterations of existing irrigation schemes in selected public research institutions and seed farms, which are already consuming water from the two main transboundary rivers Syr Darya and Amu Darya and their tributaries shared by Tajikistan with Afghanistan, Turkmenistan, Uzbekistan, Kyrgyz Republic, and Kazakhstan. The project activities will not adversely affect the quantity or quality of the water flowing to other riparians, and the project will not be affected by other riparians' possible water use. The exception to the notification requirement was approved by the World Bank's ECA Regional Vice President on March 21, 2021.

D. Environmental and Social

82. The environmental and social risks are both rated Substantial, making the overall E&S risk rating Substantial. The project recognizes the following Environmental and Social Standards as relevant: ESS 1 – Assessment and Management of Environmental and Social Risks and Impacts; ESS 2 – Labor and Working Conditions; ESS 3 – Resource Efficiency, and Pollution Prevention and Management; ESS 4 – Community Health and Safety; ESS 5 – Land Acquisition, Restriction on Land Use and Involuntary Resettlement; ESS 6 – Biodiversity Conservation and Sustainable Management of Living Natural Resources; and ESS 10 – Stakeholder Engagement and Information Disclosure.

83. The project is expected to result in overall positive impacts as the interventions will improve livelihoods and local knowledge. Adverse environmental and social impacts, if any, and the risks therefrom, are expected to be limited in duration and mitigable. While the planned activities involve well-defined pest management or moderate to small scale



construction, the overall project objective of intensifying agricultural and particularly horticultural production leaves open the possibility of the need for larger scale pest management needs and pesticide use. Both Components 1 and 3 involve the potential for pesticide use in different sub-projects that are, individually, expected to be well defined and mitigable with properly prepared and implemented pest management plans. There are potential works under all three Components that are limited primarily to the rehabilitation of existing facilities and installation of new systems – though, in a few cases, the construction of moderate sized buildings could be required. Works related risks are likely to occur during the construction phase (occupational health and safety hazards, generation of solid waste, air pollution and noise, disruption of traffic, etc.) and are easily managed and mitigated.

84. The project's success depends upon not only on the development of appropriate farmer friendly technologies (which includes knowledge, skills and management practices) but also how well they are disseminated country wide. Technology development and dissemination needs to be effective and inclusive, reaching out to the nook and corners of the country as well as different sub sections of the farming community including marginal/ small farmer households, women and other vulnerable sections. So one of the key challenges for the project will be to ensure 'inclusion'. However, exclusion may happen due to differentials in: (i) geography – given the vast expanse of the farming community and that some of the terrain is mountainous and remote, on the Afghanistan border, it is likely that some areas may not be covered by the project; (ii) scale of farming – large and richer elite farmers may receive preferential treatment; (iii) absorption capacity - technologies developed may be more friendly to large farmers; and (iv) administrative expediency and economy in reaching out to the 'elites' vis-à-vis huge social intermediation efforts required to reach out to small and marginal farmers across the country. The risk of exclusion can be addressed to a large extent through a well-crafted Stakeholder Engagement Plan (SEP) supplemented with community mobilization plan and an effective IEC campaign. Inclusion/exclusion apart, there could be some risks related to involuntary resettlement as civil construction could require 'lands'. While the project is expecting that the GoT will make available lands, due diligence is required to ensure that there are no resultant physical, and/ or economic displacements. Risks related to this will need to be avoided or reduced or if involuntary acquisition is inevitable, then, it will have to be addressed.

85. The project is taking a framework approach because the details about the investments and their exact locations (could be located anywhere across the country) are not known and most of which will not become known until after implementation begins. The following instruments were prepared and disclosed on April 23, 2021: (i) Environmental and Social Management Framework (ESMF); (ii) Resettlement Policy Framework (RPF); (iii) Stakeholder Engagement Plan (SEP); and (iv) Labor Management Procedures (LMP). The ESMF was prepared and disclosed on May 4, 2021. It assesses current pest management practices and recommend areas for improvement; provide guidelines for assessing project activities; and, where necessary, preparing and implementing the project specific Pest Management Plan (PMP) and the site-specific Environmental and Social Impact Assessments/Environmental and Social Management Plans (ESIA/ESMPs). The RPF likewise indicates when site specific Resettlement Action Plans (RAPs) will be required.

V. GRIEVANCE REDRESS SERVICES

86. Communities and individuals who believe that they are adversely affected by a World Bank (WB) supported project may submit complaints to existing project-level grievance redress mechanisms or the WB's Grievance Redress Service (GRS). The GRS ensures that complaints received are promptly reviewed to address project-related concerns. Project affected communities and individuals may submit their complaint to the WB's independent Inspection Panel which determines whether harm occurred, or could occur, as a result of WB non-compliance with its policies and procedures. Complaints may be submitted at any time after concerns have been brought directly to the World Bank's attention, and Bank Management has been given an opportunity to respond. For information on how to submit complaints to the World Bank's corporate Grievance Redress Service (GRS), please visit <http://www.worldbank.org/en/projects-operations/products-and-services/grievance-redress-service>. For information on how to submit complaints to the World



Bank Inspection Panel, please visit www.inspectionpanel.org.

VI. KEY RISKS

87. The risks will be reassessed and adjusted if needed during implementation. At appraisal, the overall residual project risk is assessed as Moderate, with the following key risks:

- (i) **Political and governance.** Moderate. This emanates from managing, administering, and implementing project activities in an environment characterized by low levels of transparency, accountability, and participation; as well as the limited recourse to anti-corruption and fiduciary regulations, which exist but are not fully enforced. Within the SRASP, mitigation measures will include establishing and retaining PIU at a central GoT agency (MoA) that will assume responsibility for the project as a whole and thus help to address potential political and governance challenges. The PIU, supported by PSC and PTC, will help to set up a mechanism for transparent planning, implementation and monitoring and supervision of project activities. The Project Operations Manual, GRM, and feedback mechanisms that measure client participation and satisfaction with services provided under the project (Citizen Engagement) will also be used to mitigate risks associated with governance. Civil Society Organizations (CSOs) such as the Tajik Seed Association (TSA) will be actively involved in the project to improve transparency, reduce reliance on government and help build beneficiary capacity. Their involvement includes such responsibilities as beneficiary awareness programs, participation in implementation and supervision of project activities, beneficiary selection, and beneficiary capacity building. The World Bank will provide close supervision to ensure compliance with World Bank fiduciary requirements and anti-corruption guidelines.
- (ii) **Macroeconomic.** Moderate. The macroeconomic risk is assessed as Moderate. Tajikistan is a low-income country whose economy is largely agrarian and highly dependent on remittances from migrants. Remittances are largely used to finance the purchase of agricultural inputs, including seeds, fertilizer, machinery, and food. Limited economic and social opportunities and poverty have contributed to substantial labor migration overseas thereby reducing remittances significantly. The COVID-19 pandemic worsened the situation by wiping out the income and poverty reduction gains achieved over the past couple of years thereby amplifying economic risks. To mitigate some of the macroeconomic risks, the project will invest in the procurement of elite and super elite seeds that will be multiplied and distributed to farmers for improved food and nutrition security situation in the short run. The project will also invest in agricultural public goods that will enhance the resilience of the agricultural sector as well as respond to future crises.
- (iii) **Institutional Capacity for Implementation and Sustainability.** Moderate. Institutional capacity for implementation and sustainability risk is assessed as Moderate because public institutions to be supported by the project were severely underfinanced in the past, which significantly weakened their capacity and capability. Some of the SRASP-supported institutions will require new knowledge and skills. The risk is amplified by reliance on donors to finance many agricultural public goods. The risk will be mitigated by: (i) building on the strong ownership of the MoA to the SRASP to carry out a dialogue with the Ministry of Finance on increasing public expenditures on agriculture over the medium run; (ii) making a thorough preparation of investments in public institutions' infrastructure under SRASP and limiting their amounts to minimize future needs in operations and management budgets; (iii) allocating a sufficient budget under SRASP for attracting global experts to strengthen knowledge and skills of the staff of public institutions; (iv) strengthening the capacity of agricultural public institutions and a legal basis for sustainable delivery of agricultural public



services in the future during the project implementation; and (v) partnering with FAO and other donors to support more resilient and sustainable agriculture sector.

(iv) **Environmental and Social risks.** Substantial. The overall environmental and social risk is assessed as Substantial due to high country ESF risks and the country-wide nature of the project, which is more difficult to manage than location-specific activities. The project will finance moderate to small-scale constructions. Both Components 1 and 3 involve the potential for pesticide use in different sub-projects, but that use is expected to be well defined and mitigable with proper pest management plans. There are potential works under all three Components that are limited to rehabilitation of existing facilities and installation of new systems – though, in a few cases, the construction of moderate size buildings could be required. Works-related risks are likely to occur during the construction phase (occupational health and safety hazards, generation of solid waste, air pollution and noise, disruption of traffic, etc.), but they can be effectively managed and mitigated.

(v) **Other risks.** Moderate. The other, COVID-related risk is rated as Moderate, but it could become Substantial in case of the delayed vaccination and the slow economic recovery. Tajikistan's economy, like most other countries, is heavily hit by the COVID-19 pandemic. The COVID-19 situation remains unpredictable as elsewhere and it may even escalate quickly with some smaller hotspots. This uncertainty could delay the project disbursement, including due to the reluctance of international consultants to be recruited by the project to travel to Tajikistan. The COVID situation will, however, be continuously and closely monitored to assess its impact on project implementation. The SRASP is expected to become effective in early 2022 and the first two years of project implementation will be devoted to design of specific investments (technical specification, procurement, preparations). The civil works in most cases will start in 2023-2024, which means that contractors will be able to engage in mobilizing contractors and consultants since by then the COVID situation is most likely to stabilize. The SRASP will plan and conduct various public activities and consultations to consider the risk of potential subsequent waves of disease and design mitigation measures.

**VII. RESULTS FRAMEWORK AND MONITORING****Results Framework****COUNTRY:** Tajikistan**Strengthening Resilience of the Agriculture Sector Project****Project Development Objectives(s)**

The development objective of the proposed project is to strengthen the foundations for a more resilient agricultural sector in Tajikistan.

Project Development Objective Indicators

Indicator Name	PBC	Baseline	Intermediate Targets	End Target
			1	
Strengthen the foundations for resilient agricultural sector				
Certified seeds, seedlings and planting materials sold commercially (Percentage)		0.00	40.00	75.00
Support investments in agri-logistics				
Clients benefiting from ALC services (Percentage)		0.00	15.00	30.00
Female clients benefiting from ALC services for at least one year (Percentage)		0.00	10.00	35.00
Strengthen public capacity for crisis management				
Database for timely and effective information for crisis management available (Yes/No)		No	Yes	Yes



Intermediate Results Indicators by Components

Indicator Name	PBC	Baseline	Intermediate Targets	End Target
			1	
Strengthen seed, seedling and planting material systems				
Production of improved seeds, seedlings and planting materials (Percentage)		0.00	30.00	60.00
Improved multiplied seeds, seedlings and planting materials certified for commercial sale (Percentage)		40.00	45.00	65.00
Number of seed multiplication farms supported by the project (Number)		0.00	23.00	50.00
Support investments in agro-logistical centers for horticulture value chains				
Number of ALCs fully operational (Number)		0.00	1.00	3.00
Clients satisfied with quality of services provided by ALCs (Percentage)		0.00	20.00	70.00
Clients who report that the two-way channel for feedback and response works (Percentage)		0.00	20.00	70.00
Strengthen public capacity for crises prevention and management				
Area surveyed (under surveillance) for crop protection and locust control (Percentage)		0.00	15.00	25.00
Agricultural forecasting system is established and operational (Yes/No)		No	No	Yes
Capacity for soil testing expanded (Number)		30.00	80.00	180.00



Monitoring & Evaluation Plan: PDO Indicators					
Indicator Name	Definition/Description	Frequency	Datasource	Methodology for Data Collection	Responsibility for Data Collection
Certified seeds, seedlings and planting materials sold commercially	Share of the produced certified seeds, seedlings and planting materials that are sold commercially.	Annual	Survey	Project survey	PIU
Clients benefiting from ALC services	ALC services could include sorting, cooling, storage, packing and logistics facilities. Clients include those farmers, agribusinesses etc. who use the ALCs as percentage of all farmers and agribusiness residing in the ALCs' catchment area to be identified through feasibility study.	Annual	ALC operating company	Project survey and data of ALC operating company	PIU
Female clients benefiting from ALC services for at least one year	ALC services could include sorting, cooling, storage, packing and logistics facilities. Female clients include those women farmers, women-owned or - managed agribusinesses etc. who use the ALCs as percentage of all farmers and agribusiness residing in the ALCs' catchment area.	Annual	ALC operating company	Project survey and data of ALC operating company	PIU



Database for timely and effective information for crisis management available	Crisis management comprises early warning, preparedness and response. Database includes, at minimum, information on planted areas by crop and district, agricultural production forecast, farm land use, and major soil types in each agro-ecological zone that would need to meet characteristics of accuracy, completeness , consistency, timeliness, and/ or validity.	Bi-Annual	Report	Project report	PIU	

Monitoring & Evaluation Plan: Intermediate Results Indicators

Indicator Name	Definition/Description	Frequency	Datasource	Methodology for Data Collection	Responsibility for Data Collection
Production of improved seeds, seedlings and planting materials	Proposed climate indicator. Farming is significantly affected by climate change due to the high vulnerability of its natural environment and its low adaptive	Annual	Research institutes, seed farms, and other organizations	Report	PIU



	capacity. In addition to rising average temperature and loss of glaciers, Tajikistan suffers from more frequent droughts and strong winds, which have a large impact on crop yields, amongst others. The project will invest in availability of climate-resilient and drought-resilient seeds, seedlings and planting materials. The indicator will be disaggregated for (1) major crops, and (2) early generation/ foundation and commercial seeds, seedlings and planting materials.				
Improved multiplied seeds, seedlings and planting materials certified for commercial sale	Share of produced multiplied seeds, seedlings and planting materials certified by responsible entity for commercial sale.	Annual	Ministry of Agriculture, Committee on Food Security	Report	PIU
Number of seed multiplication farms supported by the project	Indicator measures how many public and private seed farms and nurseries involved in the multiplication of seeds, seedlings, and planting materials are supported by the project.	Annual	Ministry of Agriculture, Committee on Food Security	Report	PIU



Number of ALCs fully operational	A fully operational ALC is defined as providing any services such as sorting, cooling, storage, packing and logistics facilities.	Semi-Annual	ALC operating company	Report	PIU
Clients satisfied with quality of services provided by ALCs	Proposed Citizen Engagement indicator. ALC operational activities could include sorting, cooling, storage, and packing and logistics facilities. ALC “catchment area” will be identified through feasibility study. Clients include those farmers, agribusinesses etc. who use the ALCs. Clients will identify ALC services that are important to them, and will rate their satisfaction with identified service(s). Indicator will be disaggregated for gender.	Midterm review; Endline	Survey	Independent impact evaluation	PIU
Clients who report that the two-way channel for feedback and response works	Proposed Citizen Engagement indicator. Indicator will be disaggregated for gender.	Annual	Report	Participatory social monitoring activities organized through regional PIU offices' social specialists	PIU
Area surveyed (under surveillance) for crop protection and locust control	The area surveyed for crop protection and locust control.	Bi-annual	State organization for crop	Report	PIU



			protection and chemicals, State expedition for locust control		
Agricultural forecasting system is established and operational	Proposed climate indicator. Tajikistan suffers under adverse events and outbreaks that are only amplified by climate change. Moreover they often take farmers and the authorities by surprise. Real time sector monitoring and agricultural production outlook are not yet effectively generated, catching the authorities off-guard in their response to emergencies. This activity aims to establish the database with agricultural land use, yield forecast, and production/ vegetation index fluctuations to make timely and accurate estimates of agricultural production. Increasing the availability and access to such information is	Annual	MoA	Report	PIU



	expected to increase resilience to shocks.				
Capacity for soil testing expanded	Capacity will be measured by the number of soil samples tests to be conducted by soil testing laboratories supported by the project on a daily basis.	Annual	Research institute for soil fertility, TAAS, agrochemical laboratory of TAU, agrochemical stations	Report	PIU

**ANNEX 1: Implementation Arrangements and Support Plan**

1. The implementation of the SRASP will rely on existing GoT structures and the MoA will be the lead implementing agency. The implementation of SRASP will build on institutional arrangements and implementation mechanisms already established for the ACP and those that will be established as new. It will be implemented in all regions/oblasts of Tajikistan, including at national, regional, and local/district levels involving relevant government institutions but also the private sector as and when it is deemed necessary.

2. **The MoA.** The MoA will have overall responsibility for coordinating all aspects of the project, including contributions by the different relevant ministries and agencies participating in the project's implementation. The main responsibilities of the MoA will include project oversight, coordination, planning, technical support, financial management, procurement support and monitoring and evaluation. The MoA will be accountable for authorizing and verifying all project transactions and will work closely with the WB's Task Team during project implementation. To fulfill its responsibilities, the MoA will use the institutional mechanisms established for the implementation of ACP, including the ACP implementation Unit (ACP-PIU) and PSC and establish others as deemed necessary.

3. **Project Steering Committee (PSC).** As in ACP, the project's oversight and strategic direction will be performed by a PSC. This is important since project implementation involves a number of institutions, including those that were not part of the ACP. The PSC will ensure coordination and effective and enhanced project implementation. In this regard, the project will use the PSC established for the ACP with additional members, as deemed necessary, by drawing from institutions involved in project implementation.

4. The PSC, chaired by the Deputy Prime Minister, will provide strategic guidance for project implementation, ensure coordination as well as help identify key issues that need to be brought to the attention of the GoT and facilitate their resolution. It shall have the following broad responsibilities: (i) establish policy guidelines and provide overall oversight and strategic guidance; (ii) review of project's progress towards the PDO; (iii) review and approve the Annual Work Plans and Budgets (AWP&Bs) submitted by the PIU; (iv) review and approve annual implementation performance report prepared by the PIU and oversee the implementation of corrective actions; and (v) ensure inter-ministerial coordination, harmonization and alignment among donors. The PSC will meet bi-annually focusing on review and approval of annual work plans and budget and monitoring of project performance based on annual and bi-annual reports. The membership, terms of reference, duties and responsibilities, frequency of meetings as well as modalities of the PSC will be detailed in the Project Operations Manual (POM).

5. **Project Implementation Unit (PIU).** The MoA and PSC will be supported by a PIU. The PIU will be responsible for project management and coordination, including following the day-to-day project implementation, leveraging existing staff. The ACP-PIU will be newly staffed to address the expanded project scope. Two affiliate (branch) offices, in addition to the PIU in Dushanbe, will be established, specifically one office in the north (Sughd) and one in the south (Khatlon). The PIU and affiliate (branch) offices will ensure: (i) the overall management and coordination of the project; (ii) the annual planning and the preparation of consolidated AWP&Bs and progress reports; (iii) the follow-up and reporting on project implementation, including the M&E and learning, the supervision and monitoring of the activities and the evaluation of project impacts; (iv) the fiduciary management and reporting (financial management and procurement); (v) the liaison and coordination with other stakeholders; (vi) ESF compliance, including social and environment; and (vii) the overall knowledge management, and the strategic staff capacity-building and mobilization. The composition of PIU staff, including specialization, responsibility, salary scale and benefits and incentives e.g. annual and sick leave etc. will be detailed in the POM.



6. **Project Technical Committee (PTC).** The PSC will be assisted by a project technical committee (PTC) to be established by drawing technical experts from various entities involved in project implementation. The PTC, chaired by the Deputy Minister of Agriculture, will be responsible for providing technical advice to the PIU on the quality of implementation reports and special studies, guidelines, documentation of best practices, and M&E reports. More specifically, the PTC will be responsible for: (i) reviewing, providing recommendations and advise on improving the AWP&Bs submitted by the PIU; (ii) providing technical advisory services on implementation modalities; (iii) providing institutional capacity building to the PIU and to relevant implementation entities; and (iv) reviewing and analyzing all documents prepared under the project's responsibilities providing recommendations and advising on improvement. The PTC will meet quarterly focusing on reviewing the technical aspect of annual plans and monitoring reports. The membership, terms of reference, duties and responsibilities and frequency of meetings of the PTC will be detailed in the POM.

7. **Technical Assistance:** Effective implementation of capacity building and technical-assistance-related activities identified under components 1 and 3 requires specialized technical knowledge and experience. It also requires coordination and supervision capacities on behalf of the MOA, which it currently lacks. FAO has strong experience and capacity to deliver technical assistance and consultancy services and to identify, recruit, and supervise subcontractors for supporting the implementation of these activities. Technically, FAO is currently running well-performing technical assistance projects in Tajikistan, including on seed multiplication and quality enhancement, digital agriculture, agrometeorology, crop production, and locust control. As a result, FAO has Tajikistan-specific experience, knowledge, and networks, which could be highly valuable for the SRASP. Organizationally, FAO has the delivery management skills required to deliver the assignment within the specified timeframe. This includes the proven ability to mobilize enough staff resources, organize efficient task management processes and engage additional emergency capacity as required to ensure timely delivery of the deliverables. Methodologically, FAO has the process management capability to coordinate and deliver the assignment given its experience. FAO's competencies span across research, analysis and outreach that will be required for this assignment. FAO is the only service provider in the country that is equipped technically, methodologically, geographically, and organizationally to perform expected tasks within the project's timeframe. MOA will contract FAO directly through a single source selection to ensure timely and effective implementation of capacity building and technical assistance-related activities.

8. FAO's contract could cover the following capacity building and technical-assistance areas: (i) support for improving seed policies and legislation; (ii) update seed quality standards, aligning them with regional and international standards; (iii) training MOA and Food Security Committee staff on seed industry development; (iv) support the introduction and adaptation of improved technologies and best practices on seed farms and nurseries; (v) supervision and monitoring of seed and seeding production on seed farms and nurseries; (vi) awareness raising campaign with farmers on improved seeds and seedlings; (vi) design and establishment of database for real-time agricultural sector monitoring and agricultural production forecasting; (vii) development of information products using agrometeorological information and mechanisms to disseminate them to farmers; (viii) support for improvement of methodologies for testing various soil types and preparation of agro-technological maps; (ix) capacity building on crop protection and locust control; (x) preparation of technical specifications for specialized equipment and farm machinery on seeds, real-time monitoring, soil testing, and crop protection; and (xi) other areas as to be agreed between the MoA and the FAO.

9. **Planning and Implementation.** The project will follow an annual work plan and budget (AWP&B) preparation, review and approval and implementation process. The preparation of the AWP&B will be consultative involving all implementation agencies while the primary responsibility of preparing investment proposals to be financed by the project and their implementation is that of the responsible institution. The MoA, as a lead IA will have the responsibility of leading the preparation and implementation of strategic investments e.g. feasibility studies etc. in close collaboration with relevant institutions. Annual plans for activities related to coordination and management of the project (e.g. M&E,



fiduciary, etc.) will be prepared and implemented by the PIU. The AWP&B, after going through technical review by the PTC, will be reviewed and approved by the PSC in one of the bi-annual PSC meetings. The AWP&B preparation process with eligible project activities and indications of the type of investment and when appropriate expected contribution of both project and beneficiaries will be provided in the POM.

10. **Donor Coordination.** Donor coordination will take place within the Donor Coordination Committee (DCC) and especially with the Agriculture and Land Working Group (AGL) in Tajikistan, which is already active and functioning. When needed and appropriate, Development Partners (DPs) financing agricultural development projects in Tajikistan may be invited to participate in PSC and PTC meetings. As has been the case thus far, the World Bank task team will continue to participate in and contribute to the DCC AGL meetings as well as engage with the DPs and exchange information on project implementation status and implementation support missions.

11. **Project Operations Manual (POM).** Before effectiveness, the PDT will prepare a POM, which will detail the institutional arrangements and the implementation mechanisms of the project, including the project coordination mechanisms, the project's oversight, the planning and implementation of project activities, the monitoring and evaluation and the learning aspects. The POM will also detail the mechanism and procedures for the development, operation, and management of the ALCs. It will also summarize the ESF Management Issues, and the procurement and financial management aspect of the project. The preparation of the POM has already been started.

12. **Implementations Support Plan.** The strategy for supporting project implementation will focus on successfully mitigating the risks identified at various levels and supporting the risk mitigation measures proposed in the SORT and will consist of: (i) implementation support missions (ISMs); (ii) mid-term review (MTR); (iii) other complementary reviews (OCRs); and (iv) implementation completion review (ICR), all carried out jointly with the GoT. It will also consist of technical assistance (TA) in areas of weaknesses and where new approaches/procedures may be introduced.

ISMs: Semi-annual implementation support missions will be conducted jointly by the World Bank Task Team and GoT to review overall SRASP implementation performance and progress towards achievement of the PDO. In the first year of implementation, the ISMs will focus more on technical issues, later focusing more on routine progress monitoring, trouble shooting and results framework-based assessments. In all ISMs, DPs will be consulted to ensure coordination between complementary operations.

MTR: An MTR will be carried out mid-way in the implementation phase. It will include a comprehensive assessment of the progress in achieving SRASP objectives as laid out in the results framework. The MTR will also serve as a platform for revisiting design issues that may require adjustments to ensure satisfactory achievement of the project's objective.

OCRs: These include analytical, advisory and knowledge sharing activities. Each year, the World Bank and GoT will consider the need for OCRs and/or third-party reviews. Such reviews will be planned for over and above the semi-annual ISMs.

ICR: At the close of the project, the GoT and the World Bank will carry out separate implementation completion reviews to assess the success of the Project and draw lessons from its implementation.

Technical Assistance: Implementation support will include technical support from the World Bank task teams on critical aspects, particularly in terms of ensuring proper financial management and procurement and, given that the use environmental and social standards (ESSs) is new, in terms of follow-up on environmental and social development issues. The objective of the technical support will be to help the project teams to internalize good practices, and to resolve implementation bottlenecks as they are identified during ISMs.

13. The implementation support and oversight missions (ISMs, OCRs, ICRs and TAs) will have the combined aim of reviewing the quality of implementation, providing solutions to implementation problems, and assessing likelihood of



achieving the PDO. More specifically, they will: (i) review component-wise implementation progress (through its results chain); (ii) provide solutions to implementation problems as they arise; (iii) review with the PIU the next six months action plan and disbursement; (iv) review the fiduciary aspects, including disbursement and procurement; (v) verify compliance of project activities with the World Bank's Environmental and Social Standards (ESSs); (vi) review case studies and survey results to measure results indicators to determine progress towards the PDO against the targets set within the results framework and the quality of implementation; and (vii) review the quality of capacity building activities, which are crucial for an effective implementation of the project. The missions will combine comprehensive field visits and field-based focus group discussions to highlight implementation issues, pick up on implementation lessons emerging and share mission recommendations, including agreements on way forward actions. They will also include reviews of quarterly/annual progress reports and reports of various studies that may be commissioned.

14. *Technical Rigor:* The World Bank task team will comprise team members with appropriate technical skills and experience commensurate with SRASP requirements. The World Bank task team members are in large part based in Country Offices. The World Bank will, however, periodically draw on international experience, particularly from the FAO Investment Centre to complement the in-country staff on ALCs.

15. *Focus of Support:* The implementation support missions will be on a semi-annual basis complemented by technical missions and regular short visits by individual specialists to follow up on specific thematic issues as needed.

16. *Fiduciary Reviews and Support:* The World Bank will provide risk-based implementation support on FM and procurement arrangements. During the implementation support missions, the project FM specialist based in the country office will review the FM systems, including capacity for continued adequacy, evaluating the quality of the budgets and implementing agencies' adherence thereto, reviewing the cycle of transaction recording until the final end of report generation, evaluating the internal control environment including the internal audit function, reviewing interim financial reports (IFRs) and/or annual Financial Statements, follow up on ageing of the advance to the Designated Account, follow up on both internal and external audit reports and periodically assess the project's compliance with the FM manual as well as the financial agreement. The FM risk for the SRASP is rated Moderate and after each implementation support mission, the risk will be measured and re-evaluated. Supervision will be carried out in coordination with GoT and will include:

- a. On-site visits to the various project institutions at all levels, including PIU. These visits will include a review of controls and the overall operation of the FM system, review of internal audit, selected transaction reviews, and sample verification of existence and ownership of assets,
- b. Reviews of IFRs and follow-up on actions needed, and
- c. Review of Audit Reports and Management Letters, and follow-up on actions needed.

17. On the procurement front, the Bank will provide implementation support to the client through a combination of prior and post reviews, procurement training to project staff and relevant implementing agencies, and periodic assessment of the project's compliance with the procurement manual. Additionally, procurement specialists will participate in semi-annual implementation support missions to visit the field and carry out post review of procurement actions. Implementation support missions will be geared towards: (a) reviewing procurement documents; (b) providing detailed guidance on the World Bank's Procurement Guidelines; and (c) monitoring procurement progress against the detailed Procurement Plan.

18. *Environmental and Social Standards:* The World Bank ESF team consisting of social and environmental specialists will guide the project teams in applying the agreed ESF instruments; and will review compliance during implementation support missions.



ANNEX 2: Country Program Adjustment responding to the COVID-19

1. **The World Bank Group's engagement in Tajikistan is guided by the Country Partnership Framework (CPF, May 2019) for the period FY19–FY23.** The CPF is built on three focus areas, viz., (i) Human Capital and Resilience, (ii) Public Institutions and Sustainability, and (iii) Private-Sector Growth and Market Creation. The Implementation Note under the IDA18 Risk Mitigation Regime has been built into the overarching strategy, and a complementing Country Gender Assessment/Action Plan has been approved in June 2020, which is supporting gender equality across four priority areas (improving human endowments, removing constraints to employment and barriers to women's ownership and control of assets, and enhancing women's agency and voice).

Impact of the COVID-19 pandemic on the country and Government response

2. **The COVID-19 pandemic has amplified development challenges, accentuating existing weaknesses in health, social protection, and overall macro-fiscal stability.** Tajikistan has been experiencing its slowest economic growth in two decades, reflecting the partial lockdown and associated disruptions in migrant remittances and trade activities. Remittance dependent, the significant decline in migrants' transfers contracted household consumption, contributing to lower fiscal revenues and the national currency's trend depreciation. The consistent pressure on the exchange rate occurred despite an almost 1 percent improvement in the trade account (imports declined by 6 percent during 2020, while exports increased by almost 20 percent, partially from the sale of gold reserves). In 2020, the budgetary expenditure increased by 7.5 percent and the inflation was 8 percent. The GoT succeeded in expanding the fiscal space to allow for an increase in spending on healthcare by 44 percent. With the 5 percent increase in budgetary revenues (-2.6 percent for tax revenues), the fiscal deficit in 2020 represented 3.3 percent of GDP. With support from the IMF's Rapid Credit Facility (plus debt relief) and the ADB's budget support, Tajikistan amended its 2020 state budget in mid-summer, providing additional fiscal space for increased healthcare expenditures. The Government rolled out nationwide the targeted social assistance program, providing eligible families with a modest one-off financial assistance, while providing tax reliefs to the private sector, increasing public-sector wages and pensions, and postponing tariff increases for electricity and municipal water. The GoT allocated 4.7 percent of GDP for expenditure on social security and welfare.

3. **Contrary to other countries in Central Asia Region, Tajikistan has implemented only a partial lockdown in response to COVID-19 cases.** Instead, it sought to block the virus' entrance from other countries by closing international air traffic and land borders, leaving open only railway routes for cargo, with most travel restrictions were maintained (there are a few restricted flights). Following the first official COVID-19 case confirmation on April 30, 2020, the GoT introduced a partial lockdown, covering mainly schools and non-essential services. The partial lockdown has since been lifted. The authorities have left open Government offices, banks, and other public facilities, while requiring face masks.

WBG support for responding to the crisis

4. In response to the combined demand and supply-side shock to the economy, posing considerable risks to income and food security to the poorest segments of the population, the WBG is providing a fast and flexible response to the crisis. In these efforts, the WBG collaborates closely with the GoT and other development partners. Adjustments have been made in line with the three focus areas of the CPF and the WBG Approach Paper "*Saving Lives, Scaling-up Impact and Getting Back on Track*", with a focus on human capital and resilience:

- *To save lives*, the World Bank has added the US\$11.3-million *Tajikistan Emergency COVID-19 Project* (TEC-19, P173765), financed under the World Bank's *COVID-19 Strategic Preparedness and Response Program* from the World Bank's *Fast Track COVID-19 Facility*. The project aims at preparing and responding to the COVID-19 pandemic in Tajikistan. Two *Additional Finance* operations, totaling US\$21.2 million, were approved in February 2021 (TEC-19 AF1, P175168, and TEC-19 AF2, P176216) for, respectively, COVID-19 vaccines and to



strengthen the intensive care capacity and multi-sectoral response planning/community preparedness. A further additional financing is foreseen for COVID-19 vaccines. Under the *Second Phase of the Central Asia Roads Link Program* (CARs-2, P145634), more than US\$2 million in cost savings was re-allocated for: (i) the procurement and distribution of personal protective equipment; (ii) disinfectants for front-line workers; and (iii) express test kits for transport operators, including foreign lorry drivers, to ensure safe and smooth movement of people and goods via road transport.

- To protect the poor and vulnerable, the TEC-19 and TEC-19 AF2 comprise additional components to provide for temporary social assistance for vulnerable (food-insecure) households, using the nationwide TSA system. Under the *Public Utility Financial Recovery Program for Results* (PUFR, P168211), the World Bank discussed and agreed on a postponement of tariff increase to 2021 and decided to expand the scope of the “Improvement of Power Tariff Setting and Mitigation of Social Impacts on the Poor” (P167384) to, inter alia, evaluate the direct poverty impacts of electricity tariff increases and help to mitigate the impact of tariff increases on vulnerable consumers. The World Bank provides support in efforts to introduce a lifeline electricity subsidy scheme for residential consumers.
- To save livelihoods, preserve jobs, and ensure more sustainable business growth and job creation, the World Bank is moving towards the implementation of the three projects under the Risk Resilience Program financed by the IDA18 Risk Mitigation Regime (P168052, P168326, and P170132), which has become even more critical in the COVID-19 context. In addition, it has identified two sectors that promise the highest impact on private-sector development and job creation, viz., digital transformation (with a strong focus on the trust fund-supported preparation of the *Tajikistan Digital CASA Program* (P171382) and agriculture and food processing.
- To strengthen policies, institutions and investments for resilient, inclusive, and sustainable growth, the World Bank is placing considerable focus on strengthening the overarching institutional superstructure in the strategic energy sector under PUFR; and support for comprehensive tax reform, through a US\$50 million *Tax Reform Project* (P171892, under preparation). This tax reform aims at achieving the twin objectives of domestic revenue mobilization and private-sector development by (i) replacing tax collection targets with the maximization of voluntary tax compliance as principal objective for the tax authorities; and (ii) defining an effective, streamlined process of agreeing on, recording, and monitoring tax exemptions and incentives. In these trust fund-supported activities, the single most important obstacle to private enterprises and the economy’s increased export orientation will be addressed to lay the foundation for a strong post crisis recovery. In addition, the *Higher Education Project* (P148291) will be restructured to re-allocate US\$1 million in savings to build system capacity for distance learning in universities.

Selectivity, Complementarity, Partnerships

5. **The above plans for portfolio restructuring and new lending have been discussed with the GoT and shared with the other main development partners, through the Development Coordination Council (chaired by the World Bank).** This collaboration extends to the focus on macro-fiscal stability (budget support, debt suspension, and debt management) with a view to strengthen the focus on effective health and social responses to the COVID-19 pandemic and building the foundation for a dynamic, sustainable, and inclusive post-crisis recovery.



ANNEX 3: Detailed Project Description

1. **The proposed project aims to support the GoT in successfully transitioning to a sustainable, more productive, climate-resilient, and inclusive model of agricultural sector growth.** It will help to: (i) increase the availability of improved seeds, seedlings and planting materials that are climate resilient, affordable, farmer-preferred and well adapted to the different agro-ecological conditions of Tajikistan; (ii) improve the access to improved agri-logistic services of farmers and agri-businesses; and (iii) strengthen the crisis management i.e. early warning, preparedness and response capacity of selected public institutions. All activities related to human resource development and capacity building will include topics on understanding climate change better and frameworks, tools, and techniques to facilitate designing and implementing climate adaptation and mitigation approaches. All infrastructure, including buildings, offices, laboratories, and storage facilities, constructed and/or rehabilitated by the project, will be encouraged to utilize energy-efficient and climate-resilient materials and designs. The proposed project aims to thereby strengthen the resilience of the agriculture sector, improve food security and nutrition, and strengthen the foundation for increasing production and export competitiveness of the growing horticulture sector. It will also contribute to the development of a viable sector of private micro, small and medium enterprises in rural areas and generate employment opportunities in regions with few legal alternatives. The project will have four components, namely three technical and one project management and coordination component.

2. **Component 1: Strengthening seed, seedling, and planting material systems (US\$27.7 million).** This component will support the development of viable seed, seedling and planting material systems to ensure the availability of improved, locally adapted, market-oriented, farmer-preferred, and climate resilient seeds, seedlings and planting materials for priority crops,⁷⁴ and in sufficient quantity. Advances in seed, seedling, and planting material technology are one of the most important means of improving production and productivity in agriculture. The GoT recognizes the crucial role of improved seeds, seedlings, and planting materials in achieving not only agriculture production and productivity goals, but also broader development objectives, such as food and nutrition security and climate resilience. Improved seeds, seedlings and planting materials also contribute to enhanced and efficient use of water, in addition to other direct inputs such as fertilizers, pesticides and insecticides. Farmers' use of improved seeds, seedlings, and planting materials also increases their incomes and ultimately improves their livelihoods. This component has four subcomponents, including improving the enabling environment necessary for the development of viable seed, seedling, and planting material systems; research and development; multiplication; and quality assurance of the production and distribution of high-quality seeds, seedlings and planting materials available.

3. Tajikistan's main crops are cereals (primarily wheat) and cotton. Although cropping patterns have not changed since independence, their relative importance has altered with cereals and legumes increasing, while cotton decreasing. Ten crops take up about 86 percent of total planting area, specifically wheat (31 percent), cotton (22 percent), barley (9 percent), potato (6 percent), apples (5 percent), grapes (4 percent), onions (3 percent), and watermelon, maize and tomatoes (each 2 percent).⁷⁵ Planting areas for both cotton and wheat decreased (by approximately 32 and 20 percent, respectively) in favor of fruit and vegetables cultivation. Increases in wheat and cotton yields have countered a potential drop in production due to the decline in area planted.⁷⁶ Still in 2018, grains (wheat) and starchy vegetables (potatoes) dominated production (in ton) (Figure A3.1), and together with barley, they took over 45 percent of harvested land area (Figure A3.2) in the country (in hectares).

⁷⁴ Priority crops as identified by GOT include wheat, cotton, potatoes, grapes, onions, apples, and cherries.

⁷⁵ Burns, T. 2020. Tajikistan National Investment Plan for the Agriculture Sector Assessment of the Seed and Associated Systems of Tajikistan. October 2020.

⁷⁶ Burns, T. 2020. Tajikistan National Investment Plan for the Agriculture Sector Assessment of the Seed and Associated Systems of Tajikistan. October 2020.



Figure A3.1: Production volume (tons) (2018)

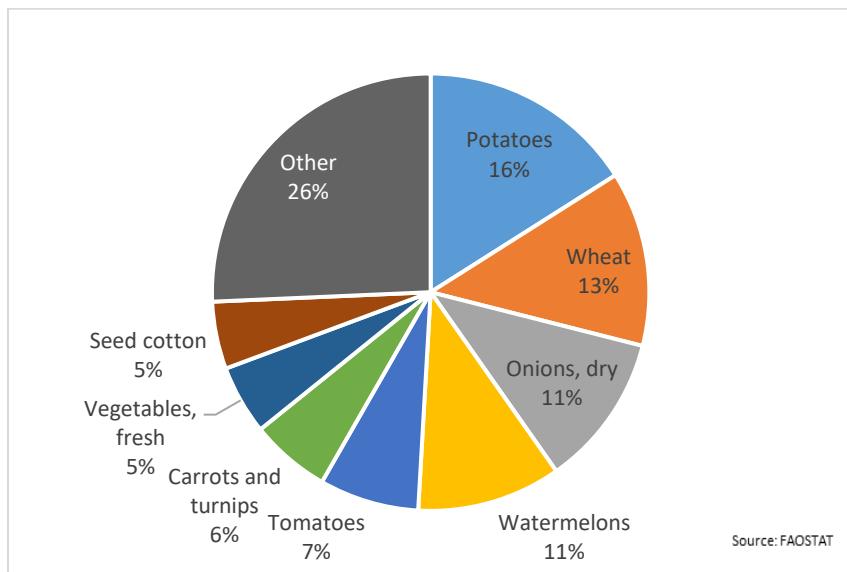
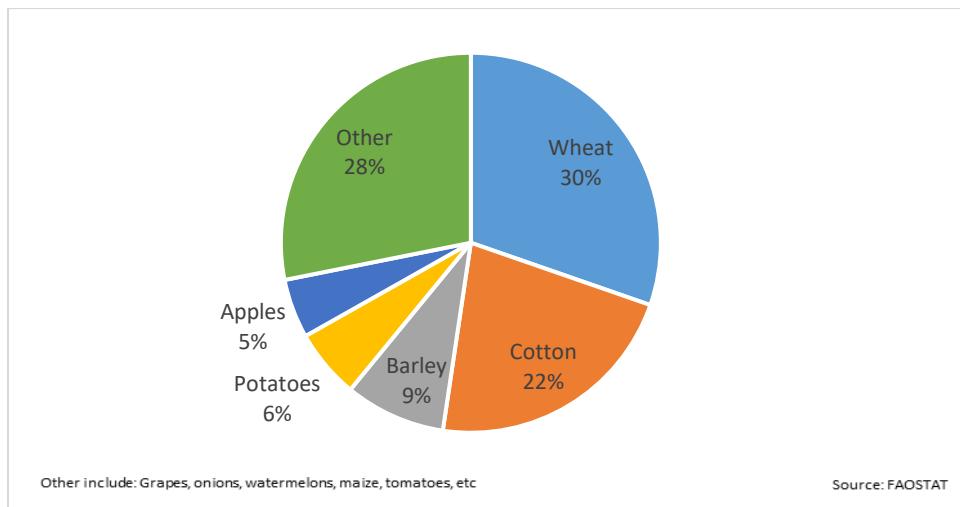


Figure A3.2: Land area (hectares) (2018)



4. Tajikistan imports over 50 percent of all agricultural inputs, including fertilizer, pesticides, agricultural equipment, seed, seedlings, and planting materials. Apart from indirect support measures, including tax exemptions on agricultural machinery, and related equipment, and land tax reductions and electricity subsidies for cotton producers, there is little direct government support for the domestic seed sector.⁷⁷ This pushes the reliance on seed (and seedlings) towards imports. High cost of import forces smallholder farmers to use cheaper, poor quality seeds, seedlings, and planting materials of local cultivars or of previously imported improved varieties, which have lost their vigor and productivity. Additionally, farmers are not well equipped with the knowledge and skills required for the cultivation and processing of many imported varieties.

⁷⁷ Khakimov, P., I. Pawlowski and M. Schmitz. 2014. Measuring Agricultural Support in Tajikistan. Journal of Agricultural Science 6(3).



5. There have been a number of projects that have supported the seed, seeding, and planting material subsector. Two of these projects specifically targeted the seed subsector, but not those of seedlings and planting material, including the project that was funded by SIDA from 2004 to 2010⁷⁸ and the other by the Federal Ministry of Austria from 2012 to 2018. In partnership with the Ministry of Agriculture and the Seed Association of Tajikistan, the project “Improving Access of Small-scale Farmers to High-quality Seed”, financed by SIDA, supported the development of seed policies, and helped in drafting of seed legislation and the establishment of a Plant Variety Protection (PVP) system. It also supported the development of seed testing laboratories in support of ISTA accreditation and the establishment of a seed association. A third project “Sustainable Cotton Subsector Project” financed by ADB had the objective of improving cotton farmers’ access to quality seeds, finance, and market infrastructure had mixed results.⁷⁹ It supported the setting up of operational plant quarantine stations and laboratories capable of issuing plant quarantine certificates. At the completion of the project, these laboratories were capable of issuing plant quarantine certificates, however, they do not have standing at an international level.⁸⁰ The other objective of the ADB project included the construction of a seed cleaning facility in Khatlon which, to date, has never been used on a commercial basis. Reasons for the failure of operation are unclear but appear to include a lack of confidence in its operational potential by local farmers in addition to the establishment of a privately-operated seed cleaning facility in the same area, the fact of which was not anticipated by the project at the time. Other projects have also supported small-scale farmer access to high-quality seed,⁸¹ including of cotton, as well as access to finance and markets,⁸² and have evaluated new varieties of potato aiming to improve the efficiency, resilience, cost-effectiveness, and productivity of its cultivation.⁸³

6. Whilst all projects have largely achieved their primary aims and objectives, few have invested in public agricultural research and development, or strengthened the enabling environment for seeds, seedlings, and planting materials. Even when they have done so, the achievement was limited. As highlighted in the 2015 overview of the seed sector of Tajikistan⁸⁴: “the national seed systems continued to face major challenges due to the inadequacy of policy guidelines, weak infrastructure for seed production and certification, lack of technical know-how and experience in seed marketing and seed enterprise management.” The overview concluded that the following specific issues need to be addressed: (i) formulation of national seed policies to ensure efficient cooperation and co-ordination of stakeholders involved in the seed industry; (ii) improvement and harmonization of legislation with international rules for seed certification, variety testing, plant quarantine and variety protection; (iii) promotion of private seed sector and non-governmental organizations; and (iv) improvement of human and technical capacities of national seed sectors. This component will seek to support these issues, in addition to that of research and development, with a view to sustainability of the seed, seedling and planning material sub-sectors.

7. **Subcomponent 1.1 Enabling environment (US\$0.3 million).** The objective of this subcomponent is to improve the policy and legal framework of the seed, seedling, and planting material systems. Over the years, Tajikistan has developed several legal provisions and key policies that have been ratified by the National Parliament of Tajikistan. It has also developed strategies and programs which detail road maps for the country’s short- and long-term development of the subsectors. However, some legislative pieces and policies are not covering all aspects of the subsectors, while others that have been issued have not been fully implemented owing to resource and capacity limitations. Still some others have not

⁷⁸ SIDA Tajikistan Development Project 2004 – 2010, value US\$6,000,000.

⁷⁹ Tajikistan: Sustainable Cotton Subsector Project (ADB Validation Report), January 2015.

⁸⁰ Not ISTA accredited.

⁸¹ Improved Access of Small-scale Farmers to High-quality Seed (2012 – 2018; Resource partners: Government of Austria, MoA.

⁸² Sustainable Cotton Subsector Project Asian Development Bank (ADB) 2012-2015; Tajikistan: Sustainable Cotton Subsector Project (ADB Validation Report), January 2015.

⁸³ Regional programs (2005 – 2019) supported by the International Potato Center and the USAID.

⁸⁴ Seed Sector Development in Countries of the Economic Cooperation Organization.



been harmonized with regional and international standards,⁸⁵ limiting the country's standing and capacity to compete in the agriculture market at regional and global levels. This subcomponent will support the formulation, implementation, and harmonization of policies and legislation, and capacity building.

8. Over the last 15 years, Tajikistan has developed several seed, seedling and planting material legal provisions, which were ratified by the National Parliament of Tajikistan, including the "Law of the Republic of Tajikistan On Seed Sector 2008 No.355", "Law of the Republic of Tajikistan On Nursery 2020 No. 1669", "Order on Seed Quality Control and Certification 2010 No.132", "Governmental Decree No. 595" validating the "Regulation on Committee for Food Security under Government of the Republic of Tajikistan" and the "Law on the Protection of Plant Varieties 2018 No. 1482". Tajikistan also developed key policies, strategies and programs, which detail road maps for the country's short- and long-term development of the seed, seedling, and planting material subsectors. These have included the 2009 Program for the Development of the Seed Sector 2010–2014 (Figure 3), and more recently the draft National Development Strategy (NDS) 2015-2030, both of which set priority areas for development.

9. Despite formulating policies and legislation, reviews have shown that progress in updating and harmonizing them with regional and international standards has been slow, as highlighted by the 2015 Economic Cooperation Organization (ECO) Seed Sector Assessment report.⁸⁶ The report concluded that in Tajikistan there continues to be a need to formulate new seed, seedling and planting material policies and legislation, revise and improve existing legislation and policies and harmonize them with regional and international standards. The assessment further concluded that in situations where policies and legislation existed, they had not been implemented effectively due to lack of resources, which impacted on the quality of seed, seedlings and planting material produced and sold. The project intends to inter alia support the review of existing legislation and policies to identify policy and legislation gaps and implementation challenges.

10. Provisions relating to plant variety protection under the PVP Act are important in terms of incentivizing the development and release of new improved crop varieties. In 2009, Tajikistan submitted a draft of its proposed PVP legislation, which in 2010 the International Union for the Protection of New Varieties of Plants (UPOV) considered and confirmed that it met with their requirements. This was not formally adopted. In 2018 an update to the Law of the Republic of Tajikistan on the Protection of Plant Varieties was adopted by the National Parliament but has yet to be submitted to UPOV in support for full membership. After a period of over a decade, Tajikistan's membership status in UPOV remains on hold, retaining only observer status. Key to an effective PVP system are the incentives it offers to plant breeders and organizations to develop new varieties with the knowledge that returns on their investments are, at least in theory, guaranteed. Results from countries with PVP systems show that introducing the UPOV system contributes to more diverse types of breeders and encourages breeding activity. Results also show that UPOV-based PVP systems lead to the increased availability of new varieties, not just those developed locally but also from other countries.

11. Capacity development is also a key focus of this subcomponent and will be central in promoting the sectors. This will include assisting the client in applying for UPOV membership, a forum for individual countries to interact with others on the international stage, providing for better representation, contact with fellow stakeholders in the seed sector, opportunities for influential debate, representation on policy committees, access to markets through organizations including Organization for Economic Co-operation and Development (OECD) and the World Trade Organization (WTO), as well as access to training for seed professionals on seed related issues and the development of contacts, all for the benefit of Tajikistan and seed and planting material stakeholders.

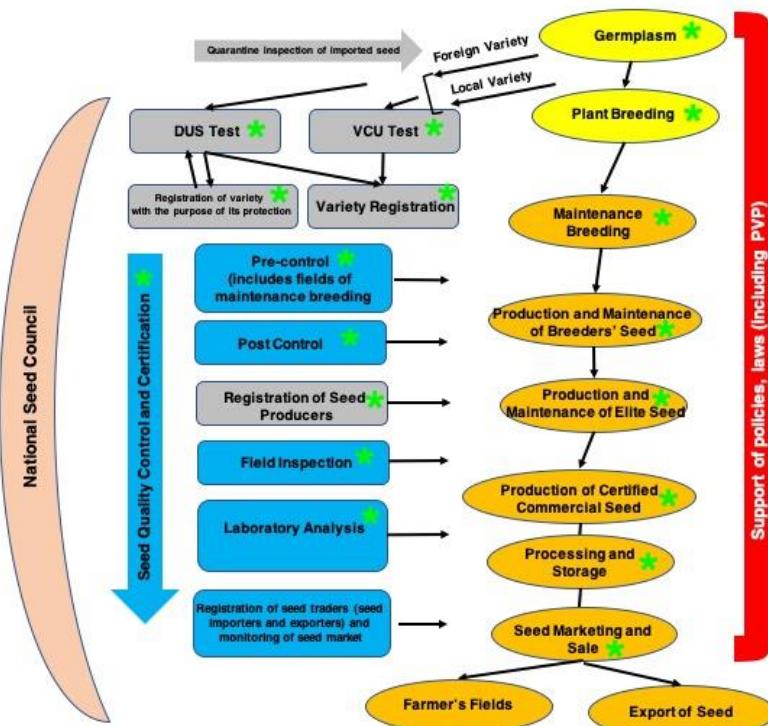
⁸⁵ Required under the Order on Seed Quality Control and Certification 2010 No.132

⁸⁶ Food and Agriculture Organization of the United Nations (FAO)/Turkey Partnership Programme. Other reviews include: FAO, 2021.

The concept of seed sector development of the Republic of Tajikistan for the period till 2030: Seed policy document.



Figure A3.3. Seed chain, stakeholders, and control mechanisms.



(*Program for the Development of the Seed Sector 2010 – 2014, Decree 297, 2009*).

* Indicates those activities to be included in this subcomponent.

12. The main areas of support include: (a) support for the review and development of policies and legislation, including: (i) conducting assessment of the existing legislation, (ii) identifying policy and legislation gaps and implementation challenges, (iii) developing legislation and policies, including harmonization of legislation and policies with regional and international standards; and (b) provision of technical assistance for the MoA in the development of policies as well as strategies and development programs, and (c) operating expenses for, inter alia, supervision and monitoring of field activities supported by the project. Policy guidelines and regulations will be assessed through the lens of removing barriers and increasing incentives for adopting climate solutions and enabling the private sector to take up a more active role in developing local climate products.

13. The implementation of this subcomponent will be led by MoA, with support from and participation of relevant GoT and private sector institutions as well as international and regional bodies. It will review the policies and laws relating to seed, seedlings and planting material, including those associated with variety registration and certification frameworks, the mechanism of variety trials, standards associated with seed, seedlings and planting material and provisions relating to their sale, in addition to the mechanisms relating to the monitoring of standards and promotion of the sectors. FAO will also support implementation of human capacity building and technical-assistance related activities, including planning and undertaking training, and organizing and facilitating experience sharing visits and study tours. Policy guidelines and regulations will be assessed through the lens of removing barriers and increasing incentives for adopting climate solutions and enabling the private sector to take up a more active role in developing local climate products.

14. **Subcomponent 1.2 Research and development (US\$5.0 million).** The objective of this subcomponent is to build the capacity of national agricultural R&D institutions to develop new technologies as well as to adapt existing, on-the-shelf



technologies to local social and environmental conditions and to changing circumstances over time (e.g., co-evolution of pests and diseases, degradation of water and land resources and climate change manifestations). The role of GoT research institutes and universities in Tajikistan is to participate in basic research, supporting the development of institutional crops such as cotton, wheat and other cereals, in addition to crops such as grapes, fruit and nut trees which are mainly propagated via seedlings and whose breeding periods are in excess of 10 years. Traditionally, this has also extended to regionally popular crops such as melons and watermelons. However, currently there are no major breeding programs on any crops with the exception of those in collaboration with international institutes and universities which provide resources and activities to the majority of the program. In these cases, local institute and university involvement is largely restricted to field trials and is largely due to the lack of funding in support of resources, facilities, and staff, a situation that has existed since independence. As a stakeholder in the support and development of the seed and seedling sectors, research institutes and universities are poorly equipped. There are no laboratory nor greenhouse facilities to facilitate basic technical support in farming technologies, greenhouse cultivation, produce storage, plant pathology, soil chemistry, entomology, plant tissue culture, nor molecular biology. Some institutes and universities have contacts with overseas collaborators for these functions, but these are few and limited. Technology inputs and support, especially for the cultivation of vegetables in greenhouses, produce storage, rely solely on the private sector through individual farmers, imported agriculture supplies and local distributors and retailers. Research institutions also lack researchers, specialists, and technicians with the capacity to fully support the research needs of the seed, seedling, and planting material.

15. Currently there are no known major private sector R&D activities based in Tajikistan. Seedling and seed producers and farmers don't undertake any significant R&D activities. With the exception of open pollinated varieties of melons, watermelons and tomatoes, the majority of vegetable seeds are of hybrid varieties imported from The Netherlands and China,⁸⁷ in the case of vegetable seeds worth US\$380,000, maize from China worth US\$114,000, and seed potato from Germany and Russia worth US\$30,000. Planting material too are imported and in 2019 over four million dollars of seedlings were imported, the majority from Italy, Belgium, Germany, The Netherlands, and Serbia.

16. This subcomponent will have two focus areas: (i) physical capacity building;⁸⁸ and (ii) human resource capacity building, including on CSA. These initiatives will target research institutions associated with TAAS⁸⁹ and TAU⁹⁰ and support their capacity to develop market- and farmer-preferred, locally adapted, climate resilient and affordable crop varieties and supporting technologies. Emphasis will be given to the development and adaptation of climate-resilient crop varieties (including of nutrient-rich crops, such as horticulture); of varieties tolerant to low moisture or drought, and tolerant to higher temperatures to minimize the consequences of climate change; and of climate-smart farming practices for a range of agricultural products, including on climate-smart practices that lead to GHG emission reduction. Moreover, the sub-component will support the multiplication of early generation high-quality seed, seedlings, and planting material accessible to downstream stakeholders for commercial multiplication and distribution. Main elements of support under this subcomponent include: (a) human capacity building, including conducting assessment of the capacity and capability of selected R&D institutions; and provision of training for researchers, specialists and technical assistants on topics including CSA;⁹¹ (b) physical capacity building, including: (i) provision of office furniture, IT and laboratory equipment, mobility and farm machinery; (ii) construction of new and/or rehabilitation of existing office and laboratory buildings and greenhouses;⁹² and (iii) rehabilitation of existing research infrastructure, including irrigation facilities; and (c) operating

⁸⁷ WTO, 2019.

⁸⁸ Investments in climate proof and energy efficient infrastructure will be pursued.

⁸⁹ Institutions of the Tajikistan Academy of Agricultural Sciences include the Pamir Scientific Center for Agriculture, Farming Institute, Institute of Horticulture, Viticulture and Vegetable Growing, National Center for Genetic Resources, and the Scientific Center for Innovative Technologies and Agricultural Mechanization.

⁹⁰ Scientific Research Institute of Biotechnology of the Tajik Agrarian University named after Shirinsho Shotemur.

⁹¹ Training activities will be informed by needs assessment.

⁹² Investments in climate proof and energy efficient infrastructure will be pursued.



expenses for, inter alia, supervision and monitoring of field activities supported by the project.

17. The implementation of this subcomponent will be led by TAAS and TAU. Within the TAAS, five institutes with facilities in 13 locations covering four geographical regions will be the principle participants in the development and selection of new locally adapted crop varieties, in addition to their registration for use in Tajikistan. Their participation will also extend to support for protection under PVP legislation. The institutes include: the Pamir Scientific Center for Agriculture which specializes in higher altitude crops, including potato; the Farming Institute and the Institute of Horticulture, Viticulture and Vegetable Growing, both of which specialize in horticulture and vegetable crops; the National Center for Genetic Resources, which specializes in the maintenance of germplasm; and the Scientific Center for Innovative Technologies and Agricultural Mechanization, which focuses on the development of mechanical technologies related to the propagation and harvesting of crops. Inputs will include minor infrastructure development, including the provision of facilities in support of plant breeding. Critically, support will also incorporate human resource capacity development, including short-term training for researchers, specialists and technical assistants, workshops and knowledge sharing visits.

18. Within the TAU, the Shirinsho Shotemur Scientific Research Institute of Biotechnology will be the principle focus having a history of in vitro and in vivo propagation of a number of crops, including potato. It is led by a director and a team of 15 specialists. However, due to lack of financial support over the last 40 years, the quality standards of its facilities, including buildings and equipment, have lapsed and as such it has not been in a position to fulfil its research and development stakeholder role in the seed, seedling and planting material subsectors. Inputs will include infrastructure development⁹³ providing office furniture, IT and laboratory equipment, mobility and farm machinery crop cultivation, construction of new office and laboratory buildings, and the development and rehabilitation of research irrigation, greenhouses, and associated infrastructure. Importantly, support will also focus on the capacity development of researchers including short-term training, workshops and knowledge sharing visits, including on CSA.

19. **Subcomponent 1.3 Multiplication of seeds, seedlings and planting materials (US\$19.2 million).** The objective of this subcomponent is to build the capacity of entities (seed producers and nurseries) involved in the multiplication of seed, seedlings, and planting material.⁹⁴ In Tajikistan, multiplication of seed, seedlings and planting material is largely the domain of private sector seed producers and nurseries, cooperative seed farms and nurseries, and facilities operated either by TAU or institutes associated with TAAS⁹⁵. While multiplication of seed, seedlings and planting material is largely unrestricted, which opens a market for the distribution of poor-quality farmer-saved material, the GoT provides recommendations on regions and optimal conditions and quality based on crop type and available resources. Most seed production facilities and nurseries are, however, poorly equipped necessitating substantial investments in storage facilities, seed cleaning and processing equipment, farm machinery and human resource development. Ideally, each seed producer and nursery should have their own dedicated facilities or ones operated by commercial operators. From a practical and financial perspective, however, development of TAAS-operated regional centralized facilities accessible to all stakeholders on a fee-for-use basis would be the most practical solution in the short-term, fueling more demand within private-sector stakeholders for more dedicated and specialist facilities. Increasing the supply of seeds, seedlings and planting materials will aim for climate and pest-resiliency and alignment with different agro-ecological zones.

20. The MoA maintains the formal register of seed production and multiplication facilities that includes 90 private seed producers in operation, specifically in Khatlon (42), Sughd (28), the Districts of Republican Subordination (17), and Gorno-Badakhshan Autonomous Region (GBAO) (3); 23 seed farms owned and managed by the TAAS; and four seed farms

⁹³ Investments in climate proof and energy efficient infrastructure will be pursued.

⁹⁴ Certified seed derived from registered varieties are categorised as being “Original Seed” (or the original breeder’s seed and also referred to as “Super Elite”), “Elite Seed” (seed used by seed producers to produce commercially available seed used by farmers which may include hybrid or F1 seed).

⁹⁵ This role is mainly for production of “Original Seed” also referred to as breeder’s seed or super elite seed, and elite seed.



owned and run by cooperatives. This issue of quality has been repeatedly highlighted, including in the “Program for Development of the Seed Sector in the Republic of Tajikistan for 2010-2014”. The report noted that in the case of cotton, “the maintenance of the varieties and seed production is not carried out properly; therefore, seed of low generation is being used. There are over 30 specialized seed farms producing cotton seed, but none is able to produce seed that meets international standards.”⁹⁶ Most seed production facilities and nurseries are poorly equipped necessitating substantial investments in storage facilities, seed cleaning and processing equipment, farm machinery and human resource development.

21. In Tajikistan, all seed, seedlings and planting material produced, multiplied and sold must be through organizations registered as a business, but this is not the norm considering the prevalence of trading of farmer-saved seed, seedlings and planting material, the quality of which is very low. The MoA maintains an informal register of the amount of seed, seedlings and planting material of registered varieties, the primary function of which is to serve as a means of monitoring future demand and potential short falls in production. However, it only includes data from the multiplication facilities it monitors, excluding farmer-saved material and that which is imported. Additionally, the register does not include details as to the quality of the seed. The experience with potato multiplication highlights the need for access to higher quality material. Between 50,000 and 60,000 tons of locally produced reproductive and conditionally reproductive potato seed are used as seed each year. Of this, the majority is multiplied by farmers using vegetative cuttings on small and medium farms, and not commercial producers with access to high quality, disease-free material, and cold storage facilities. Cuttings are generally graded visually and as such the quality is poor and the value low. Similar examples are found with other crops including wheat, rice, and onions as well as with cuttings of grapes, apples, and cherries.

22. This subcomponent will be implemented by a total of 55 seed farms selected by the MoA, including 32 private seed farms and 23 seed farms under the TAAS as well as the five research institutions of TAAS, including the Pamir Scientific Center for Agriculture, the Farming Institute, the Institute of Horticulture, Viticulture and Vegetable Growing and the Scientific Center for Innovative Technologies and Agricultural Mechanization. Private seed farms and nurseries will benefit from human capacity building and technical assistance whereas the 23 seed farms under TAAS as well as the five research institutions will benefit from both physical and human capacity building. FAO will support the implementation of the human capacity building and technical-assistance related activities, including organizing and conducting training, and technical assistance in preparing specifications for seed, laboratory, and field equipment. The MoA will be responsible for the procurement of elite and super elite seeds and their distribution to both private and TAAS associated seed farms using existing procedures. While the private seed farms are responsible for the production of commercial seeds and seedlings, the seed farms under the auspices of the research institutions will be responsible for the multiplication of foundation seeds and seedlings in partnership with private sector seed producers and nurseries who are responsible for the production of commercial seeds, seedling, and planting materials. The project will strive to identify female seed growers and multipliers to benefit from the project.

23. Specifically, this subcomponent will support: (a) human capacity building, conducting assessment of the capacity and capability of seed farms and nurseries and provision of training for technicians and other associated personnel;⁹⁷ (b) physical capacity building, including: (i) construction and/or rehabilitation of storage facilities,⁹⁸ office and laboratory buildings, greenhouses, and rehabilitation of existing irrigation facilities⁹⁹; and (ii) procurement of office furniture, field and laboratory equipment, vehicles and farm machinery; and (c) operating expenses for, inter alia, supervision and monitoring of field activities supported by the project. The subcomponent will also support the purchase of elite and

⁹⁶ English translation of “Program for Development of the Seed Sector in the Republic of Tajikistan for 2010 – 2014”.

⁹⁷ Training activities will be informed by needs assessment.

⁹⁸ Investments in storage facilities will be designed with an objective, among others, to reduce exposure of products to extreme weather conditions.

⁹⁹ Investments in climate proof and energy efficient infrastructure will be pursued.



superelite seeds, seedlings, and planting materials of high value, locally adapted varieties of GoT identified priority crops, including potato, wheat, and cotton for commercial multiplication by seed farms and nurseries, and ultimately their distribution to end users. This will support seed producers and nurseries immediate need to access high quality material for commercial production, pending the longer-term research and development benefits associated with subcomponent 1.2.

24. Subcomponent 1.4 Quality assurance (US\$3.2 million). The objective of this subcomponent is to build the capacity of institutions and entities involved in quality assurance of seed, seedlings and planting material that are produced (or imported) and sold in Tajikistan. Most seed, seedlings and planting material production and marketing in the country are done by the private sector. While seed, seedlings and planting material produced and sold must be quality assured, certified and be of registered varieties, this is not always the case. Further, often the quality of material derived from registered varieties and sold in Tajikistan does not meet the required standards. Standards are generally based on regional trading standards (for CIS countries) developed for the “Interstate Council for Standardization, Metrology and Certification” by the “Federal Agency for Technical Regulation and Metrology of the Russian Federation”. These standards are contained in the “Composite Book of National Standards of the Republic of Tajikistan on Varietal Purity and Seed Quality of Crops”. The MoA is responsible for updating the country standards. Certified seeds derived from the registered varieties are categorized as being “Original Seed” (or the original breeder’s seed), “Elite Seed” (seed used by seed producers to produce commercially available seed), and “Reproduction Seed” (being commercial seed used by farmers which may include hybrid or F1 seed). In determining the purity, the seed standards provide for a sampling procedure, including that of sample sizes. Laws¹⁰⁰ provide that seed sold must be certified and details must be detailed in the labelling of seed containers, pouches, bags. However, this is not strictly enforced. Although there are no specific requirements relating to seed coatings and pelleting, seed lots treated with chemicals or biological agents used as growth enhancements, fungal or insect control must have appropriate inscriptions and accompanying documents defining the procedure for handling such seeds and containing information about possible negative effects on human health and the environment.

25. Whilst there are laboratories, including the Central Seed Laboratory, that in the past was International Seed Testing Association (ISTA)-accredited, and those associated with TAJIKSTANDARD, in addition to other regional seed testing laboratories, they lack the capacity, technical capability, equipment, and technologies to undertake the large-scale testing necessary to support the subsector.¹⁰¹ As such, while most seed and planting material produced and sold in Tajikistan may have originally been derived from certified seed and material of registered varieties, as a result of poor production techniques their varietal purity may not have been maintained nor monitored due to capacity and capability inadequacies of the quality assurance services. This subcomponent will have two focus areas: (i) infrastructure development of quality assurance testing facilities including laboratories;¹⁰² and (ii) human resource capacity development.

26. The principle goal of the quality control and certification system in Tajikistan “is to bring domestic procedures and methods for assessing the varietal and sowing qualities of seeds in accordance with the rules and requirements of international organizations (ISTA, OECD), similar systems of foreign countries and on this basis to create conditions for the effective activity of legal entities and individuals producing, reproducing, processing, certifying, exporting, importing and selling seeds and seedlings on the domestic seed market, as well as for participating in international seed trade.”¹⁰³ There are 12 facilities of the MoA involved in quality control of seeds, seedlings and planting materials. Of these, seven are

¹⁰⁰ Law of the Republic of Tajikistan On Seed Sector No.355.

¹⁰¹ The capacity and crop-based activities of individual facilities will need to be identified with coordination and specialist services provided by the Central Laboratory based in Dushanbe.

¹⁰² Investments in climate proof and energy efficient infrastructure will be pursued.

¹⁰³ English translation quote from Order on Seed Quality Control and Certification 2010 No.132.



currently inoperable due to a total lack of support facilities and equipment. This component will focus on the development of quality assurance testing facilities of the four facilities that are operational, including that of the Central Seed Laboratory located in Dushanbe. The main areas of support include: (a) human capacity building, including conducting assessment of the capacity and capability of institutions and entities involved in quality assurance of seeds, seedlings and planting materials; and provision of training of researchers, technicians and other personnel associated with quality assurance including on CSA¹⁰⁴; (b) physical capacity building,¹⁰⁵ including: (i) construction of new and/or rehabilitation of existing office and laboratory buildings; and (ii) procurement of office furniture, field, laboratory, IT and associated equipment, farm machinery and vehicles; and (c) operating expenses for, inter alia, supervision and monitoring of field activities supported by the project.

27. This subcomponent will be implemented by the Ministry of Agriculture, which is responsible for regulations and orders relating quality control of seed, seedlings, and planting material.^{106, 107} FAO will support the implementation of the human capacity building and technical assistance-related activities, including organizing and conducting training, and technical assistance in preparing specifications for laboratory and field equipment.

28. **Component 2: Support investments in agri-logistical centers for horticulture value chains (US\$14.0 million).** The objective of the component is to support investments in ALCs to enhance horticulture value chains and improve their competitiveness and access to high-end markets (e.g. retail chains and export). Tajik horticulture products are associated with a poor-quality image in terms of food safety and packaging, resulting in a lack of competitiveness of local products on domestic markets and difficulties to reach high-end markets (e.g. retail chains and export). Hence, horticulture products do not respond to the requirements of final high-end buyers which include reliable quality, certification, guarantees on volume, packaging and on time delivery. This context is the consequence of the small holder nature of horticulture production (e.g. 80 percent of apricot production) with a fragmented production involving many intermediaries for aggregation to final destination resulting in high transaction costs. Intermediation penalizes local production in terms of market access and the incapacity of farmers to obtain feedback about the existing market requirements and opportunities. Horticulture production also suffers from poor cold storage facilities and transportation with important consequences on post-harvest lost and seasonal price instability, but also on food safety and quality standards enforcement. Finally, the lack of packaging houses to harmonize the offer, add value to the products and improve logistics for the entire supply chain is key to explain low marketability of domestic products. The ACP is already supporting the value chains of apples, pears, apricots, lemons, tomatoes, and cucumbers that could potentially benefit from the ALC services to be provided. The investments in ALCs help build resilient food systems, promote diversification, and ensure better market linkages, quality, and food safety standards, reduce food loss/waste, and initiate the development of an efficient distribution system network in Tajikistan.

29. Potential retail and export markets will be reachable through the increase of available volumes, improvement of quality and sanitary standards, and development of efficient logistics. Main potential export markets for Tajik horticulture products are Afghanistan, Russia, and China.¹⁰⁸ The products with the most export potential from Tajikistan to China include apricots (dry and fresh), plums (fresh), and grapes (fresh). According to the International Trade Center (ITC) (2018), the export potential of fresh apricots, cherries, and plums is US\$2.3 million annually. However, this potential remains largely unrealized. Additionally, dry fruits, including apricots and plums, offer the most promising export opportunity for

¹⁰⁴ Training activities will be informed by needs assessment.

¹⁰⁵ Investments in climate proof and energy efficient infrastructure will be pursued.

¹⁰⁶ Order on Seed Quality Control and Certification 2010 No.132.

¹⁰⁷ Not including seed and products of GMO, which is provided for under the Law of the Republic of Tajikistan About Biological Safety.

¹⁰⁸ World Bank. 2020. Central Asia's Horticulture Sector — Capitalizing on New Export Opportunities in Chinese and Russian Markets. Washington, D.C.



Tajik exporters. Hence, export potential for dry apricots is estimated at US\$25.1 million and for prunes at US\$5.2 million¹⁰⁹ and has been realized by only 29 percent, on average in 2018. To increase its presence in the Chinese import markets and Russian modern retail, a number of constraints along the selected horticulture value chains in Tajikistan need to be reduced or eliminated through sustained and comprehensive policy support, including post-harvest/marketing level constraints in particular underdeveloped cold chain and storage systems as well as poor agri-logistics. Additionally, unofficial fruit export channels prevent fresh fruit exports from Tajikistan from entering formal retail channels, resulting in lower export value. The component has two focus areas: (i) development of ALCs, and (ii) capacity building.

30. **Subcomponent 2.1: Support the establishment and operation of ALCs (US\$13.7 million).** This subcomponent supports the establishment and operation of tentatively three ALCs in the Khatlon, Sughd, and RRS regions to strengthen primary collection, quality and food safety standards enforcement for local horticulture production and its access to high value outlets. The general locations for these logistics infrastructure investments have been identified based on: (i) proximity of the ALCs to the main horticulture production areas of Tajikistan (Khatlon: 1,470,697 tons of vegetables and 209,694 tons of fruits, Sughd: 561,187 tons of vegetables and 139,395 tons of fruits, RRS: 438,106 tons of vegetables and 101,130 tons of fruits¹¹⁰); (ii) the proximity to Dushanbe, with 700,000 inhabitants the main consumption area of the country; and (iii) a demand analysis based on qualitative interviews with various agri-business operators and a preliminary assessment of storage facilities in the different areas that highlighted a deficit in terms of aggregation, processing and packing facilities. Some potential synergies with on-going project of investments in low scale ALCs in Sughd region (Zarafshan valley) are potentially considered. Main buyers from these ALCs will be retail chains (domestic and international) as well as wholesalers and exporters.

31. The design and construction of the tentatively three ALCs in Khatlon, Sughd and RRS regions will fill a critical gap in cooling, storage, packing and logistics facilities and initiate the development of an integrated network of market/distribution infrastructure in Tajikistan. They will be instrumental for more standardized production and quality management, including sorting and packaging, for domestic and international markets. The integrated cooling and conditioning facility will be technology innovative and can serve as important demonstration for future scale-up. The ALCs could be linked in the medium-term into a national food distribution system organized around a central Wholesale Distribution Center in Dushanbe, providing the facilities and conditions to: (i) improve food safety and quality in compliance with international standards; (ii) enhance competitiveness of the horticulture chain through quality sorting, grading and packaging; (iii) enhance aggregation and horizontal integration of small holders for greater market and price negotiation power; and (iv) create an enabling environment for private investments in the processing and services sectors as quantities and quality becomes more predictable and organized. Streamlined processing platforms, including improved and new storage facilities, will reduce the risk of losses due to climate, and increase resilience.

32. ALCs can take many forms depending on the needs and requirements of a specific region, value chain structures and potential users. They can provide a large range of functionalities, which are particular for each context. The ALCs will be constructed by GoT on state-owned land in a location adapted to their efficient operation. An in-depth feasibility study and market assessment to identify potential traded volumes of agriculture products, main functions, and business model for the management of ALCs as well as potential future operators will be a key success factor for the investment operation. The assessment will encompass also inclusive group discussions to elicit the demand for ALC functions, with emphasis on group discussions with vulnerable (small, young) producers as well as women farmers and other users.

33. The basic preliminary design parameters for each ALC would include: a minimum 10,000 meters² of area, from 3,000 to 5,000 meters² of built facilities, flexible to anticipate an expansion; a handling capacity for 5,000 to 8,000 tons of

¹⁰⁹ ITC 2018.

¹¹⁰ MoA 2020.



fresh and processed fruits and vegetables; (cold) storage capacity; and a multi-functional sorting, grading and packing line.

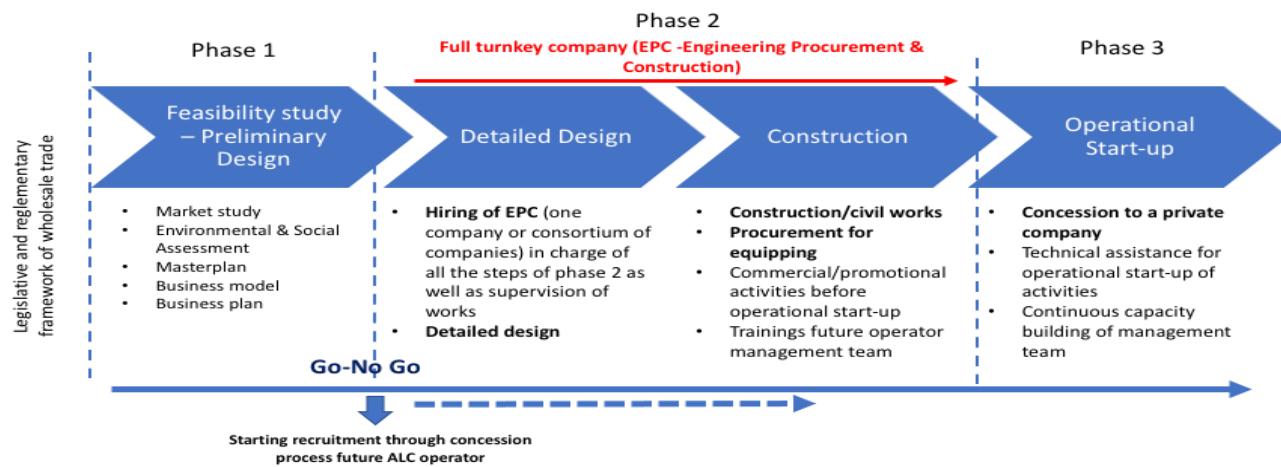
34. The ALC location is critical for its success. Different criteria will be considered in the process of identification of a potential land plot to develop such infrastructure.

- i. *Proximity to production areas with associated storage shortages:* ALC main function is to aggregate larger volumes of agriculture products and propose services of storage for local production. ALC must be easily accessible and close to production areas to reduce transportation costs, reduce post-harvest losses and support the quality of the products. An ALC investment operation should respond to a (cold) storage shortage in the considered area to be fully efficient and actively participate to the reduction of post-harvest losses.
- ii. *Connection to main transportation networks:* ALC plays an important role in regional food logistics, as well as for food products export. They should be located close to main roads/highways and train tracks. The logistics dimension of the location in these cases is critical to attract potential buyers and ease transportation of food products towards final destination (delivery on time).
- iii. *Public land property:* The facilities are expected to be built on public-owned land to facilitate the investment process and reduce the investment costs.
- iv. *Availability of producer organizations and/or agribusinesses (aggregators, agri processors):* The facilities are expected to be a public investment, but the operation and maintenance would usually be contracted out to a private operator (producer organizations or agribusinesses), to ensure the professional and efficient operation of the ALC, the private operator being accountable for performance. The location of the ALC should be selected according to the availability and capacity of potential private operators to manage the ALC in the area.
- v. *Environmental and social impacts:* ALC could create potential environmental and social impacts resulting from their activities in the surroundings areas. The selected site should be far from natural/protected as well as residential areas. A plan for the reduction of environmental and social impacts must be developed.
- vi. *Construction and development constraints:* The identification process of the land plot should take into consideration main constraints for construction and development of the ALC, in particular: proceed with a geotechnical survey, assess the presence of high voltage line and the availability of potential extension areas around the site in case of future development of the activities. *Connection to public networks:* In order to reduce construction cost and guarantee the operational capacity of the facility, the selection of a site already connected to main public networks such as electricity, sewage and water is highly recommended.

35. The main steps for ALCs design are divided in three distinct phases (Figure 4), (i) phase 1: feasibility study, including a market study, Environmental and Social Impact Assessment (ESIA), preliminary design, and the definition of the business model and business plan of each ALC; (ii) phase 2: detailed design, construction, supervision of works, and procurement for equipment, which should be procured to a full turnkey company (EPC – Engineering Procurement & Construction) to ease the process. An additional independent supervision of works could be hired to help the contract manager within the MoA, who will be responsible for the monitoring of EPC work, controlling the respect of schedule/work progress and financial aspects; and (iii) phase 3: operational start-up, with the support of a technical assistance to build capacity and guide operational management of the ALCs in the first year of activity.



Figure A3.4: Main phases for the development of ALCs



36. Different options could be considered for the management and operation of the ALCs:

- Private Operator-Concession arrangement (preferable option).* In this case, an experienced private sector operator could manage ALCs based on a concessional arrangement. This solution would allow the support of an efficient start-up of the activity by sector professionals. In particular, management companies of international/national reputation and experience in agri-logistics management are likely to be interested to in managing some of the ALCs. A market scoping exercise will be conducted early in project implementation to gauge international/national interest in such a model (e.g. phase 1 - feasibility study). Prospective private operators would not be expected to invest equity capital and/or finance the construction and/or equipment of the ALCs but would be solicited and employed because of their expertise and experience in operating such platforms for profit.
- Semi-public Company-Concession arrangement (in case private sector is not interested).* ALCs might be managed by a semi-public company that would operate the site under a concession arrangement with GoT. The following features would be considered: (i) a public authority keeps a strategic control over the activities; and (ii) the managing company supports and manages all the operating costs and, possibly, future investments.

37. A separate international service provider will be contracted during implementation to provide capacity building in operational management aspects for future operator of ALCs. ALC development is a complex operation involving a lot of stakeholders and necessitating a good knowledge of ALC challenges and operational activity. Technical assistance from an international consultant associated to study tours, are crucial to build capacity of future management team and start-up of the operations. Technical support should be tailor-made and start during the construction phase of the project to be pursued during the first year of ALCs operation. Availability of expertise and knowledge, and operational experience will strengthen the successful development of the new ALCs. Additionally, in order to prepare the ground for future investments in a sustainable and integrated food distribution network and the potential investment in a Wholesale Distribution Centre (WDC) in Dushanbe, a set of workshops will be organized with main international Wholesale Distribution Centers operators to share their experiences and different study tours will be planned to visit successful ALCs/WDC projects developed in similar context. Specifically, the sub-component will support: (i) preparation of feasibility studies, business plans, environmental and social impact assessments, detailed designs and construction supervision plans; (ii) civil works for the construction of the ALCs; (iii) construction supervision; and (iv) provision of equipment for



operation of the ALCs— pre-cooling, sorting, grading and packing lines as well as cold storage units and an operational management software.

38. **Subcomponent 2.2: Capacity building for operation and management of ALCs and awareness raising (US\$0.3 million).** The subcomponent will support provision of training¹¹¹ for (i) management staff of ALCs for operation and management of ALCs; and (ii) MoA on future scale-up of investments needed for an integrated and sustainable food distribution networks organized around ALCs.

39. **Component 3: Strengthen public capacity for crises prevention and management (US\$13.3 million).** This component will strengthen the capacity¹¹² of relevant public institutions on agricultural crises prevention and management, focusing on priorities with quick wins, readiness for implementation, and significant impacts. It will enhance the public capacity, thereby allowing institutions to have an early estimate of agricultural production and crop yields, determine potential food shortages, and identify crises and take early preparedness and response actions. It will also support climate adaptation and mitigation measures, generating substantial climate co-benefits. Priority areas for strengthening include: (i) real-time monitoring of agricultural production and agrometeorology; (ii) soil testing for improved soil fertility management and precision agriculture; and (iii) crop protection and locust control. Ex-ante inclusive group discussions to elicit the demand for public sector agricultural information and preferred delivery mechanisms, with emphasis on group discussions with vulnerable (small, young) producers as well as women farmers and other users, will be held. The Component will consist of the following three subcomponents.

40. **Subcomponent 3.1: Real-time monitoring of agricultural production, land use, and agrometeorology (US\$5.7 million).** The objective of this subcomponent is to improve information base and data analysis capacity for effective policy making to ensure more resilient and sustainable development of agriculture. Currently, the MoA receives information on crop planting areas or impact of droughts and floods on crop growing areas and yields that is not sufficiently disaggregated and accurate for policy decisions and with significant delays. The emphasis under the project will be on collecting critical data on a regular and timely basis on land use and agricultural production using digital technologies and turning that data into a basis for real-time policy actions, including crisis preparedness and response. This subcomponent will have three focus areas: (i) creating a system for regular data collection on agricultural land use/planting decisions using the unified database and protocols for data collection at jamoat,¹¹³ district, and regional levels; (ii) collecting information about crop vegetation and impacts of climate hazards on agricultural production by using remote sensing technologies; and (iii) building capacity at the institutional level on agricultural production forecasting and early warning that will lead to policy decisions helping with farmers' climate adaptation.

41. This subcomponent will also support generation of the real-time agrometeorological information. Informed advisories, alerts and robust early warning systems are essential for farmers and rural dwellers to prepare for and adapt to changes in climate. The project will support two focus areas in this regard: (i) increasing capacity of MoA to collect and analyze location-specific weather information, in collaboration with the Agency for Meteorology; and (ii) providing early warning and timely diagnoses for farmers, which will address the currently delayed and inaccurate agrometeorological information provision, building on the FAO/EU pilot in Tajikistan.¹¹⁴ Agrometeorological applications can benefit farmers by helping them better managing their practices, such as pruning and thinning out; aiding in the selection of sowing dates for optimum crop yield; helping reduce losses of applied chemicals and fertilizers; helping them avoid fertilizer and chemical sprays when rain is forecast or when wind speed is high; monitoring soil moisture and guiding irrigation supply;

¹¹¹ Training activities will be informed by needs assessment.

¹¹² All training activities under this Component will be informed by needs assessment.

¹¹³ A *jamoat* is a third-level administrative division, similar to a commune or municipality.

¹¹⁴ The project "Strengthening Institutions and Capacity of the Ministry of Agriculture and State Veterinary Inspection Service for Policy Formulation" financed by the EU and implemented by the FAO supported the successful introduction of several agrometeorological stations in Tursunzade, Kanibadam and Balkhi in 2019-2020, which will be scaled up.



predicting times of harvest; and serving as an early warning system regarding outbreaks of pests and diseases, helping farmers better monitor their phytosanitary treatments.

42. Initial improvements in this area have begun, with the recently started pilot on improving the MoA's agricultural production forecasting's capacity under the ACP. This forecasting will allow to have an early estimate of crop production and crop yields, determine potential food shortages, and take early preparedness and response actions. The ACP has been supporting development of crop models based on two pilot locations – mountainous and flat lands – for three crops: cotton, wheat, and potatoes. During mid-2020, the ACP conducted field surveys in the pilot districts and collected local crop yield data based on farmer recall at field level and district statistics (i.e. agrometeorological data from three weather stations in Tajikistan, assessment of 1,348 fields, and downloading of 280 Sentinel 2 images for 2016-2020 cropping seasons and ten SPOT5 images). The open-source software (ARGIS) used for development of the Land Use Land Cover maps allows a future scale-up of this pilot to the national level. The ACP also supports capacity building of MoA staff to effectively conduct modelling and use its results as well as support the future nation-wide scale up of agriculture production forecasting.

43. The project will build on the experiences gained from the recent pilot financed by the EU and implemented by the FAO under the project "Strengthen Institutions and Capacity of the Ministry of Agriculture and State Veterinary Inspection Service for Policy Formulation." That pilot installed agrometeorological stations in Tursunzade, Kanibadam and Balkhi on *dekhān* farms property, with investment of US\$5,000 each covering about 80 km in total. Meteobot stations, which belong to the toposcale category, are compact weather stations that can be remotely accessed by internet connection. Communication coverage is provided by means of a Global Packet Radio Service card. These automatic agrometeorological stations provide other information as well, including the air temperature at dew point, the sum of growing degree days, potential evapotranspiration, and the number of chilling hours. Because these stations are integrated sensor stations, all sensors are measured in real time, simultaneously. The measurements of the various weather variables are made possible through data loggers developed to fulfil the basic needs of agricultural applications, such as crop growth and diseases models. Three or more of these stations can be combined to form an agrometeorological network, covering certain agricultural regions. The biological information monitored by agrometeorological stations includes phenology, dates of important growth stages, and sum of growing degree days at each growth stage. This information can help consistently monitor crops throughout the plants' lifetime. For monitoring the onset and spread of plant diseases, these stations use crop disease models in phytosanitary programs, which generally are managed by crop protection specialists. In addition, these stations can be used as tools for simple farm-level weather forecasting within a locality.

44. Technical lead in implementation of this subcomponent will be taken by the State Centre for the Staff Capacity Building under MoA. This Centre will collaborate with other ministries and agencies, and with TAAS and TAU to ensure coordination and create complementarities. Main elements of support under this subcomponent include: (a) creating a system for regular data collection on agricultural land use/planting decisions, including: (i) development of protocols and manuals for data collection in the unified database; and (ii) establishment of new agrometeorological stations and ICT infrastructure to receive and process data;¹¹⁵ (b) collecting information about crop vegetation and impacts of climate hazards on agricultural production, including procurement of goods and equipment for remote sensing and field data collection and monitoring; (c) building capacity at the institutional level on agricultural production forecasting and early warning that will lead to policy decisions helping with farmers' climate adaptation, including through provision of training;¹¹⁶ (d) capacity of MoA, TAAS, TAU, the Agency for Meteorology under Committee of Environmental Protection, and the Committee of Emergency Situations and Civil Defence to collect and analyse location-specific weather

¹¹⁵ Investment in climate proof and energy efficient infrastructure will be pursued.

¹¹⁶ Training will be based on needs assessment.



information, harmonize and integrate data collection including through provision of trainings;¹¹⁷ and (e) providing early warning and timely diagnoses and other agrometeorological information materials for farmers and development of information distribution channels and (f) operating expenses for, *inter alia*, supervision and monitoring of field activities supported by the project. FAO will support the implementation of human capacity building and technical-assistance related activities, including organizing and conducting training, and technical assistance in database development and management.

45. **Subcomponent 3.2: Soil fertility management (US\$3.1 million).** The objective of this subcomponent is to increase farmers' awareness of their soils, water and biohazards, and success in replacing blanket recommendations with test-based recommendations and adoption of climate-smart farming practices (*i.e.* precision agriculture). This will entail generation of agro-technology maps and a broader menu of options for farmers tailored to specific needs of agro-ecological zones of the country. This subcomponent will have three focus areas: (i) enhancing land productivity through improved soil fertility and soil health and addressing land degradation; (ii) building capacity of MoA, TAAS, TAU, and other public institutions on climate-smart practices that lead to reduction in GHG emissions and fertilizer use; and (iii) creating the foundation for effective use of innovative remote digital soil scanning and testing in the future.

46. Technical lead in implementation of this subcomponent will be taken by the State Centre for Staff Capacity Building under MoA. This Center will collaborate with the Agency for Hydrometeorology to ensure coordination and create complementarities. Main elements of support under this subcomponent include: (a) enhancing land productivity through improved soil fertility and soil health and addressing land degradation, including: (i) soil and water testing laboratory infrastructure development, *inter alia*: conducting civil works for buildings,¹¹⁸ provision of equipment, ICT, and software; (ii) establishment of a network of central reference and regional laboratories; (iii) improving guidelines/manuals for soil testing and fertilizer use; (b) building capacity of MoA, TAAS, TAU, and other public institutions on climate-smart practices, including through provision of training;¹¹⁹ and (c) creating the foundation for effective use of innovative remote digital soil scanning and testing in the future, including promotion of field-based soil testing equipment among farmers and (d) operating expenses for, *inter alia*, supervision and monitoring of field activities supported by the project. FAO will support the implementation of the human capacity building and technical assistance related activities, including organizing and conducting training, and technical assistance in preparing specifications for laboratory and field equipment.

47. **Subcomponent 3.3: Crop protection and locust control (US\$4.5 million).** The objective of this subcomponent is to strengthen capacity of crop protection and locust control agencies¹²⁰ to provide public-nature plant protection services and help farmers protect against pests in an environmentally sustainable manner. Warmer temperatures are favorable to pests; and potential climate change-induced threats to Tajikistan include the arrival of new pests and diseases. There will be two focus areas of this subcomponent: (i) investing in broad-scale control measures to control the locusts, damages and losses; and (ii) investing in human capacity to apply measures. Tajik farmers incur significant losses from frequent pests, and especially locust invasions, augmented by climate change. Three out of the four provinces of the country are regularly affected by locust infestations, mainly due to the Moroccan Locust. During the past ten years, the locust surveillance area amounted to some 500,000 ha and the area of annual anti-locust treatments ranged from 60,000 ha to 140,000 ha. The scale of this issue has expanded and occurs along almost 4,000 km of borders with the neighboring

¹¹⁷ Training will be based on needs assessment.

¹¹⁸ Investment in laboratory facilities will be designed with an objective, among others, to use climate-proof and energy efficient materials and reduce exposure to extreme weather conditions.

¹¹⁹ Training will be based on needs assessment.

¹²⁰ The project will complement and fill the gaps of the second phase of the regional program on locust management implemented by FAO and financed by the Government of Japan, which started in December 2020. This five-year project will provide support for improving locust management through regional cooperation and strengthening of technical capacities on a wide range of topics, including for the operational use of the Automated System for Data Collection and national Geographical Information System, allowing collection and analysis of standardized field locust data.



countries, including Afghanistan with little, if any, locust control. During outbreaks, locust attacks destroy pasturelands and a wide range of cultivated crops, with the annual loss estimated at US\$10-15 million. The real impact is more devastating as the annual locust attacks curtail severely the livelihoods of the poorest segments of the Tajik society. The public sector has a large role to play in delivering services to help farmers reduce these losses, including through better monitoring, prevention, and response.

48. For locust control, Tajikistan has been benefiting from donor support. Since the first decade of the new millennium, FAO has been assisting the region and the country through an interregional and multi-funded “Programme to improve national and regional locust management in Caucasus and Central Asia”, including technical cooperation projects and a JICA-supported initiative. The second phase of this project just started in December 2020, and is building on the first phase, which started in 2015. This five-year project of US\$7.5 million, from which Tajikistan will receive US\$1.0 million, will provide support for improving locust management through regional cooperation and strengthening of technical capacities on a wide range of topics, including for the operational use of the Automated System for Data Collection and national Geographical Information System named “Caucasus and Central Asia Locust Management System”, allowing collection and analysis of standardized field locust data. The proposed project will fill the gaps to further strengthen the capacity of Tajik authorities to respond to locust invasions.

49. Technical lead in implementation of this subcomponent will be taken by the State Crop Protection Center and the State Locust Control Unit, both under MoA. These agencies will collaborate with TAAS and TAU to ensure coordination and create complementarities. Main elements of support under this subcomponent include: (a) investing in broad-scale control measures to control the locusts, damages and losses, including: (i) upgrading crop protection laboratory infrastructure, including civil works for buildings¹²¹ and procurement of equipment and laboratory reagents; (ii) improving technical capacity of the crop protection and locust control units, including provision of chemicals, goods, and equipment, to deliver services and strengthen field surveillance; (iii) operating expenses for, *inter alia*, supervision and monitoring of field activities supported by the project; and (iv) field and office equipment and critical supplies for experts, scientists, and farmers; and (b) investing in human capacity to apply the control measures, including provision of training¹²²: (i) for crop protection and locust control agencies on climate smart agriculture and integrated pest management; and (ii) for experts, scientists, and farmers in natural resource management. FAO will support the implementation of the human capacity building and technical assistance related activities, including organizing and conducting training, and technical assistance in preparing specifications for laboratory and field equipment.

50. **Component 4: Project management and coordination (US\$3.0 million).** The objective of this component is to support project management, coordination, M&E, and implementation of ESF instruments and fiduciary aspects of the project. These functions will be undertaken by the PIU established under the auspices of the MoA to support the implementation of the SRASP. The PIU will also manage the project's grievance redress mechanism (GRM) and citizen engagement activities. Enhanced engagement and outreach activities will improve the outcomes of the project. Component 1 will carry out beneficiary satisfaction surveys (using scorecards and other feedback mechanisms) annually. Components 2 and 3 and the project will also conduct *ex ante* inclusive group discussions to elicit the demand for ALC functions, and for public sector agricultural information and delivery mechanisms, with emphasis on group discussions with vulnerable (small, young) producers as well as women-farmers and other users. These will be organized annually as participatory social monitoring activities with the objective to engage with stakeholders. The PIU will be staffed with the required specialists, including fiduciary and ESF. Activities to be financed under this component include: Activities to be financed under this component include: (i) procurement, financial management, environmental and social risk management, citizen engagement, monitoring and evaluation, and reporting; project related audits; and (ii) training and

¹²¹ Investment in laboratory facilities will be designed with an objective, among others, to use climate-proof and energy efficient materials and reduce exposure to extreme weather conditions.

¹²² Training will be based on needs assessment.



operating costs for the project.



ANNEX 4: Economic and Financial Analysis and Greenhouse Gas Accounting

1. **Economic and Financial Analysis.** Most of the project activities and interventions will be demand driven, the prevalence of particular crop types will be regulated by market. Therefore, the ex-ante financial cost-benefit analysis of individual investments is only illustrative. Therefore, in order to quantify the benefits deriving from the improved access to better planting materials, production techniques and improved resilience to external shocks, and improved agri-logistic services supported by the project on national level, eight indicative models were developed for the financial and economic analysis. The results of the analysis were then extrapolated to the whole project in order to identify the overall project's economic impact.

2. **Key Assumptions:** Key assumptions are based on the result framework. At the end of the 2021 to 2026 implementation period, according to the three PDO indicators, the overall yields of crops on national level was assumed conservatively to increase from current level by an average of 1.5 percent at a gradual rate due to improved seeds and seedlings (Component 1), whereas the losses in overall agricultural output of crops is assumed to be avoided by 20 percent due to strengthening the early warning, preparedness and response capacity of selected public institutions involved in agricultural production (Component 3). Moreover, three ALCs built in Khatlon, Sughd, and Dushanbe regions will support higher horticulture production.

3. The parameters for the farm models are based on information gathered during the remote project design, in particular from on-going WBG operations and other donor projects in the country. In particular, the information on labor and input requirements for various operations, capital costs, prevailing wages, yields, farm gate and market prices of commodities, input and farm-to-market transport costs were collected. Conservative assumptions were made both for use of inputs and potential outputs and considering the possible risks.

4. Prices for commodities/inputs reflect annual average and those actually paid/received by the farmer and incorporate potential marketing risks. The shadow exchange rate (SER) has been calculated at USD 1 = TJS 12.8. Overall conversion factors (CF) for inputs and outputs vary between 0.81 and 1.14. The following factors were calculated on the basis of import parity price and used to convert financial prices into economic prices: wheat CF = 0.97, meat CF = 1.14, TSP CF = 0.81, urea CF = 1.05. A standard conversion factor of 0.85 has been applied to other inputs and outputs when converting financial prices into economic prices.

5. The farm models show incremental revenues and costs generated by the new investment in improved seeds, seedlings, and planting materials, as well as improvement of technological maps. In each case, the result of the investment translates into increased quantities of produce from primary producers, their improved revenues, and new permanent jobs.

6. The discount rate of 6 percent¹²³ is used in this analysis to assess the viability and robustness of investments, which is the current Opportunity Cost of Capital (OCC) to a beneficiary. The selection criterion for the IRR is to accept all projects for which the IRR is above the opportunity cost of capital. Using the IRR as the measure, the farm and enterprise models' sensitivity to the changes in parameters can be assessed by varying the cost of investments, production costs and revenues.

7. In the financial analysis, such indicators as IRR, NPV, Benefit-cost ratio (BCR) and Return to family and hired labor were calculated. The BCR shows the relationship between the relative costs and benefits of each farm model, expressed in monetary terms. It was calculated using the following formula: $BCR = NPV/MCR+1$, where MCR is the maximum capital

¹²³ The discount rate for the World Bank cost-benefit analysis of the investment projects has recently dropped to 6 percent, from 12 percent used in the past, reflecting the reduction in the long-term interest rates and the acceptability of the smaller rates of return of investments as a result of the lower interest rates.



at risk indicator.

8. All beneficiaries will be working on already existing agricultural land and will have access to improved planting materials available throughout the country.

9. On average 25 percent of the labor costs are family labor, which has an opportunity cost of labor US\$3.5 per day.

10. **Financial analysis.** *Indicative economic activities within the project.* Seven illustrative farm models and one ALC were prepared to demonstrate the financial viability of potential investments. The land plot taken for analysis of crop production models is 1 ha. All farm models show the prospective benefits and rate of return derived from the access to improved seeds, seedlings, and planting materials, as well as training and demonstrations provided by the project. Table A4.1 provides information about key and staple crops produced in the country.

Table A4.1. Cropped area by crop group and producer category (1991 vs. 2013-2019)

		1991	Crop area (hectares)								Share among producing			
			2013	2014	2015	2016	2017	2018	2019	(% in 2019)	Ag enterprises	HH	Dekhan	
	all crops	821044	864776	828437	830578	837299	837157	826704	846990					
cereals and pulses		231697	437433	412626	422947	423460	411571	374994	383771	45%	12%	25%	63%	
	of which	wheat	143590	318595	292573	295632	297479	285867	255549	263960	11%	26%	63%	
		other cereals	74393	93799	95213	102768	103292	100058	93314	94770				
		pulses	11843	16792	16972	16917	15231	17028	17005	16301				
		peas	1871	8247	7868	7630	7458	8618	9126	8740				
	lentils		1726	892	636	643	617	633	588	527				
technical crops		310054	222961	207661	188627	190656	203367	214560	215493	25%	19%	19%	81%	
	of which cotton		298835	190925	177637	159642	162558	173979	185817	185671				81%
	oil seeds and other technical		11219	32036	30024	28985	28098	29388	28743	29822				
Potato, vegetables, melons		13137	112559	103533	116612	119909	120753	137970	140766	17%	6%	37%	57%	
	potato										7%	36%	56%	
	vegetables										6%	43%	52%	
	melons										7%	17%	76%	
Fodder crops		226607	90801	104620	102392	103265	101466	99182	106960	13%	17%	22%	61%	

11. The analysis has selected the following crops as a representative of each crop group: wheat and barley – cereals; lentil – lentils; cotton – technical crops; potato – potato; carrot – vegetables; apricot – fruits and berries. Table A4.2 presents the results of all models described in the financial analysis.

Table A4.2. Summary: Financial Analysis.

Strengthening Post-COVID Response and Resilience of the Agriculture Sector in Tajikistan (P175952)											
F I N A N A L Y S I S	CATEGORY	Total Estimated Investment Costs (US\$)	Annual Net Benefits (US\$)			Annual Inc. net benefits per 1US\$ of Inv.	IRR (%)	NPV (US\$)	Benefit-cost ratio	Return to family labor, US\$/day	Return to hired labor, US\$/day
			Without Project	W. Project Full Dvt	Incremental						
	Wheat crop model (1ha)	102	464	507	42	0.4	29.33%	295	1.39	1.40	4.19
	Barley crop model (1 ha)	11	300	312	12	1.1	26.33%	77	1.16	0.80	2.39
	Lentil crop model (1 ha)	389	405	427	22	0.1	36.73%	162	1.12	1.92	5.75
	Cotton crop model (1 ha)	60	487	527	40	0.7	43.46%	308	1.21	0.21	0.62
	Potato crop model (1ha)	496	2,651	2,747	96	0.2	32.63%	678	1.23	1.90	5.71
	Carrot crop model (1 ha)	354	3,155	3,260	105	0.3	47.83%	830	1.47	1.67	5.02
	Apricot orchard model (1 ha)	1,140	2,418	5,492	3,074	2.7	13.68%	11,406	5.97	2.63	7.89
	ALC model (1 unit)	3,900,000	0	1,235,779	1,235,779	0.3	19.64%	3,754,245	2.44	0.00	5.48

12. **Economic analysis:** The economic analysis was obtained from the financial analysis by converting financial/market



prices into economic values, phasing project interventions and benefits in a conservative pace and aggregating costs and benefits at the scale of the entire project. Though all project costs will not lead to direct economic benefits (e.g. project management), the entire cost of the project was incorporated in the calculations.

13. It is anticipated that the project will reach about 70 percent of all cropping farms (project coverage or adoption rate) with improved planting materials in the country will adopt improved technologies, leading to sustained benefits. These beneficiaries will be reached through a phased manner within seven years from the project beginning, using the following scheme: Y1 – 5%, Y2 – 10%, Y3 – 10%, Y4 – 15%, Y5 – 15%, Y6 – 20%, Y7 – 25%.

14. The period of economic analysis is 20 years to account for the phasing and gestation period of the proposed interventions. Given the above benefit and cost streams, the base case economic rate of return (ERR) is estimated at 18.6 percent. The base case net present value of the project's net benefit stream, discounted at 6 percent, is US\$135.7 million in economic terms. This proves that the project economically viable and justified and recommended for financing from the economic point of view. The summary of economic analysis is presented in Table 5.

15. **GHG analysis.** In its 2012 Environment Strategy, the WB adopted a corporate mandate to conduct GHG emissions accounting for investment lending. The quantification of GHG emissions is an important step in managing and ultimately reducing emissions and is becoming common practice for many international financial institutions. To assess a project's net carbon balance, the WB has adopted the Ex-Ante Carbon-balance Tool (EX-ACT) developed by FAO in 2010.

16. An ex-ante assessment of the impact of the project on the GHG emission has been undertaken using the FAO Ex-ACT tool. The net carbon balance is the difference between the gross results of With and Without project scenarios achieved for 20 years, including 5 years of project implementation and 15 years of capitalization periods. The project finances several activities that can be captured with the GHG accounting tool.

17. Firstly, Component 1 focuses on a set of interventions that aim to increase the adoption of improved agricultural practices, using improved varieties of annual and perennial crops in the country. The estimated sown areas to be brought effectively under project interventions (annual crops under sustainable management with improved inputs) is 518,390 ha (70 percent of the total 740,557 ha targeted). Out of this area, 268,640 ha will be under wheat and other cereals and pulses, 369 ha – under lentils, 150,845 ha under technical crops (including cotton), 36,446 ha – under potato, 57,740 ha under – vegetables, and 4,351 ha will be occupied by improved orchards. It is worth to mention that the bulk of sequestration within the project is ensured by this activity.

18. Secondly, the improved agricultural practices are associated with improved inputs use in production. Three main chemicals (N-, P-, K-fertilizers) were considered by the analysis to estimate the effect of improved inputs use on net carbon balance of the project.

19. Thirdly, within Component 2, the construction of three ALCs with the total buildings area of 20,000 meters² also contributes to emissions of greenhouse gases. It was estimated that 20 and 80 percent of all materials used in construction works are metal and concrete, respectively.

20. Finally, it was estimated that three operating ALCs contribute to greenhouse gases emissions by usage of electricity. The total electricity needs were calculated as follows: 1 meter² of ALCs requires 100 KWh per year.

21. Considering the abovementioned, the amount of total net carbon balance estimated at 38,440 tCO²-eq of mitigated emissions (which means that carbon sequestration outweighs emissions within the project) per year at full development or 768,793 tCO²-eq during the whole project lifetime. Details of the results are shown in Table A4.3.



Table A4.3. Results of the Ex-Ante GHG Analysis

Project activities	Over the economic project lifetime (tCO2 eq)			Annual average (tCO2 eq/ year)		
	GHG emissions of "without project" scenario (1)	Gross emissions of "with project scenario" (2)	Net GHG emissions (2-1)	GHG emissions of "without project" scenario (3)	Gross emissions of "with project" scenario (4)	Net GHG emissions (4-3)
Annual Agriculture	0	-2,534,211	-2,534,211	0	-126,711	-126,711
Perennial Agriculture	54,881	-16,178	-71,059	2,744	-809	-3,553
Inputs and investments	8,099,283	9,935,760	1,836,477	404,964	496,788	91,824

22. Considering the estimated shadow price of carbon, that will evolve from year to year according to the World Bank Shadow Price of Carbon Guidance Note, the ERR and the ENPV were calculated. The results of scenarios with low carbon price (starting from US\$41 and evolving over years), high carbon price (starting from US\$82 and evolving over year) and without carbon are presented in Table A4.4 below.

Table A4.4. Project Economic indicators with carbon externalities

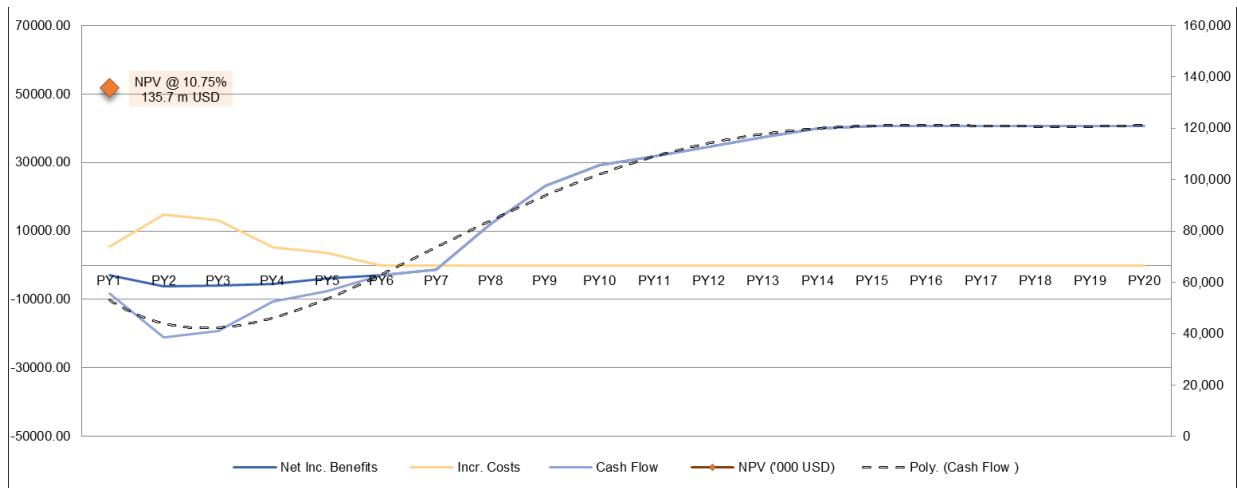
	Without carbon benefits scenario	Low carbon price scenario	High carbon price scenario
ENPV (US\$ million)	135.7	151.8	167.9
ERR	18.6%	19.9%	21.3%

23. The low shadow price of carbon scenario has a potential to improve the ERR from 18.6 percent to 20.0 percent, while the high shadow price of carbon scenario will improve the ERR up to 21.4 percent.

24. **Sensitivity analysis.** Economic returns were tested against changes in benefits and costs and for various lags in the realization of benefits. In relative terms, the ERR is equally sensitive to changes in costs and in benefits. In absolute terms, these changes do not have a significant impact on the ERR, and the economic viability is not threatened by both a 20 percent decline in benefits nor by a 20 percent increase in costs, since the ERR in both cases remains well above the discount rate. A one-year delay in project benefits reduces the ERR to 17.0 percent, with which it remains economically viable. The results are presented in Tables A4.5, A4.6, and Graph A4.1:

Table A4.5. Summary of economic analysis and Sensitivity analysis

Sensitivity Analysis (20-year period)	Base case	Costs Increase			Increase of Benefits		Decrease of Benefits			Delay of Benefits	
		+10%	+20%	+50%	+10%	+20%	-10%	-20%	-30%	1 year	2 years
ERR	18.6%	17.8%	17.2%	15.4%	19.3%	19.9%	17.8%	16.9%	16.0%	17.0%	15.4%
ENPV (USD mln)	135.7	132.1	128.5	117.6	152.9	170.1	118.5	101.3	84.6	114.0	93.5

**Graph A4.1. Project ENPV (in mln US\$)****Table A4.6. Associated risks and implications on the Project ERR**

$\Delta\%$	Link with the risk matrix	ERR
Base scenario		18.6%
Project benefits -10%	Combination of risks affecting output prices, productivity and adoption	17.8%
Project benefits -30%		16.0%
Project costs 10%	Increase of goods costs	17.8%
Project costs 20%		17.2%
1 year lag in ben.	Risks affecting adoption rates and low implementation capacity	17.0%
2 years lag in ben.		15.4%