



# Technical Assistance Report

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Project Number: 52232-001  
Knowledge and Support Technical Assistance (KSTA)  
October 2019

## Islamic Republic of Pakistan: Enhancing Technology-Based Agriculture and Marketing in Rural Punjab

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Asian Development Bank

## CURRENCY EQUIVALENTS

(as of 17 October 2019)

Currency unit	–	Pakistan rupee/s (PRs/PRs)
PRs1.00	=	\$0.00639
\$1.00	=	PRs156.375

## ABBREVIATIONS

ADB	–	Asian Development Bank
ICT	–	information and communication technology
JFPR	–	Japan Fund for Poverty Reduction
PAD	–	Punjab Agriculture Department
TA	–	technical assistance

## NOTE

In this report, “\$” refers to United States dollars unless otherwise stated.

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## KNOWLEDGE AND SUPPORT TECHNICAL ASSISTANCE AT A GLANCE

<b>1. Basic Data</b>		<b>Project Number:</b> 52232-001
<b>Project Name</b>	Enhancing Technology-Based Agriculture and Marketing in Rural Punjab	<b>Department/Division</b> CWRD/CWER
<b>Nature of Activity</b>	Capacity Development	<b>Executing Agency</b> Agriculture Department, Government of the Punjab
<b>Modality</b>	Regular	
<b>Country</b>	Pakistan	
<b>2. Sector</b>	<b>Subsector(s)</b>	<b>ADB Financing (\$ million)</b>
✓ Agriculture, natural resources and rural development	Agricultural policy, institutional and capacity development	0.10
	Agricultural production	0.05
	Agriculture research and application	0.15
	Agro-industry, marketing, and trade	0.15
	Rural market infrastructure	0.05
	<b>Total</b>	<b>0.50</b>
<b>3. Operational Priorities</b>		<b>Climate Change Information</b>
✓ Addressing remaining poverty and reducing inequalities		Climate Change impact on the Project Low
✓ Accelerating progress in gender equality		
✓ Promoting rural development and food security		
✓ Strengthening governance and institutional capacity		
<b>Sustainable Development Goals</b>		<b>Gender Equity and Mainstreaming</b>
SDG 1.5		Some gender elements (SGE) ✓
SDG 2.3, 2.a, 2.c		
SDG 5.b		
SDG 9.3		<b>Poverty Targeting</b>
SDG 10.1		General Intervention on Poverty ✓
<b>4. Risk Categorization</b>	Complex	
<b>5. Safeguard Categorization</b>	Safeguard Policy Statement does not apply	
<b>6. Financing</b>		
<b>Modality and Sources</b>		<b>Amount (\$ million)</b>
<b>ADB</b>		<b>0.50</b>
Knowledge and Support technical assistance: Technical Assistance Special Fund		0.50
<b>Cofinancing</b>		<b>2.00</b>
Japan Fund for Poverty Reduction (Full ADB Administration)		2.00
<b>Counterpart</b>		<b>0.00</b>
None		0.00
<b>Total</b>		<b>2.50</b>
<b>Currency of ADB Financing:</b> US Dollar		

## I. INTRODUCTION

1. The knowledge and support technical assistance (TA) will facilitate the rapid adoption of advanced technologies to improve the productivity and profitability of the agriculture sector in Punjab province, Pakistan. It will help increase farmers' access to such technologies to strengthen agriculture value chains in rural Punjab. It will also enable further development and adoption of advanced technologies to benefit the agriculture sector. The TA will contribute to farmers' higher income, improved livelihood in rural communities, increased food security, and sustainable agriculture growth of the province.

2. The Punjab Agriculture Department (PAD) requested assistance from the Asian Development Bank (ADB) to improve the overall performance of the agriculture sector through strengthened value chains supported by advanced technologies. The TA is in line with ADB's Strategy 2030, which prioritizes rural development and food security, and the adoption of advanced technologies in ADB operations.<sup>1</sup> The country partnership strategy for Pakistan, 2015–2019 supports inclusive growth and knowledge solutions.<sup>2</sup> The Government of Punjab's agriculture policy emphasizes modernized agriculture management and improved value chain development.<sup>3</sup> The TA is not included in the country operations business plan for Pakistan, 2019–2021.<sup>4</sup>

## II. ISSUES

3. Agriculture is central to Pakistan's economy and food security. The agriculture sector contributes 20% to the country's gross domestic product, employs 42% of its labor force, contributes 65% of export earnings, and provides livelihood to 62% of the rural population. Punjab is the country's largest province in terms of population and economy. Its population totals 110 million, of which 65% reside in rural areas. The province covers nearly 73% of the national cropped area and 78% of the country's irrigated area. It contributes about 57% to the production value of the country's agriculture, which accounts for more than 26% of Punjab's gross domestic product and employs over 40% of the provincial labor force. The province provides a large share of the country's main crops: maize (78%), wheat (77%), cotton (73%), sugarcane (63%), and rice (52%).<sup>5</sup>

4. Pakistan's average annual agriculture growth rate has declined from 3.7% during 2001–2009 to 2.1% during 2010–2017 because of a number of challenges.<sup>6</sup> These include the inadequate availability of high-yielding cultivars and lack of diversification in cultivation, inefficient on-farm water management, poor infrastructure for value chain development, weak research and extension services that are largely disconnected from market demands, and lack of advanced agriculture management supported by new technologies and innovations. In addition, some policy and regulatory issues such as an enormous public wheat procurement program, excess subsidies in production, a weak seed management system, and poor access by farmers to capital and

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<sup>1</sup> ADB. 2018. [Strategy 2030: Achieving a Prosperous, Inclusive, Resilient, and Sustainable Asia and the Pacific](#). Manila.

<sup>2</sup> ADB. 2015. [Country Partnership Strategy: Pakistan, 2015–2019](#). Manila.

<sup>3</sup> Government of Punjab, PAD. 2018. [Punjab Agriculture Policy 2018](#). Lahore.

<sup>4</sup> The TA first appeared in the business opportunities section of ADB's website on 15 July 2019.

<sup>5</sup> Government of Punjab. Punjab Agriculture Department. 2015. [Punjab Agriculture Sector Plan](#). Lahore.

<sup>6</sup> Government of Pakistan, Bureau of Statistics. 2010. [Pakistan Statistical Yearbook 2010](#). Islamabad; and Government of Pakistan, Bureau of Statistics. 2017. [Pakistan Statistical Yearbook 2017](#). Islamabad. The country's agriculture growth rate has been below 3% during 2010–2017, whereas it was over 5% in the 1980s and over 4% in 1990s.

financial resources have contributed to the sector's underperformance.

5. These challenges are further aggravated by, among others, (i) the country's projected population growth rate, combined with improving living standards and lifestyle changes, especially in cities, and consequent changes in food demand in terms of quantity and quality; (ii) increasing competition for essential inputs such as land, labor, and water from other sectors in the economy; and (iii) increasing international competition for export commodities, especially for high-value produce. All of these factors have contributed to the provincial agriculture growth not benefiting the rural poor in Punjab relative to its potential. This situation is further exacerbated by the country's exposure to projected climate change impacts.<sup>7</sup>

6. The Punjab Agriculture Policy 2018 approved by the provincial government in November 2018, has identified a critical need for the rapid adoption of advanced technologies to revitalize the province's agriculture sector. Many new types of advanced technologies for agriculture have been introduced and have now become available for use in Asian countries including in India, the People's Republic of China, and Thailand. These include high-efficiency irrigation systems, mechanized farming technologies, and farming and marketing management systems based on information and communication technology (ICT). The use of these technologies has demonstrated sound efficiency in farming activities in terms of productivity and profitability.<sup>8</sup> In Punjab, such technologies have been introduced and piloted by large and progressive farmers. However, the use of these technologies by small farmers, representing more than 90% of the total farms in the province, is still very limited because of the lack of resources and opportunities for their access.<sup>9</sup> This has resulted in small farmers being continuously marginalized in the value chain economy, eventually contributing to the sector's underperformance.

7. The ADB-financed Punjab Basmati Rice Value Chain knowledge and support TA, which was implemented from 2014 to 2018, supported small farmers' use of advanced technologies in their farming practices for basmati rice, a premium commodity for export.<sup>10</sup> The Basmati TA successfully demonstrated to farmers the technologies of direct seeding for rice with laser land leveling, mechanized transplanting, and combine harvesting. The demonstration activities were conducted by private service providers, with the technical support of public and private research centers in Punjab.<sup>11</sup> Knowledge of the demonstrated technologies and results were also successfully disseminated through an ICT tool to farmers and private service providers who participated in the TA activities.<sup>12</sup> The Basmati TA set the stage for ADB private sector support to the basmati rice producers. Based on the achievements of the Basmati TA, the PAD intends to further support Punjab's small farmers in using and adopting advanced technologies with a focus on harvest, postharvest, and marketing activities for three grain crops—rice, wheat, and maize—that are the main income source of many small farmers in Punjab. This further support will include

<sup>7</sup> Government of Punjab, Planning and Development Board. 2015. [Punjab Growth Strategy 2018: Accelerating Economic Growth and Improving Social Outcomes](#). Lahore.

<sup>8</sup> World Bank. 2017. [Growth: A Shared Responsibility—Pakistan Development Update](#). Washington, DC.

<sup>9</sup> Government of Pakistan, Bureau of Statistics. 2010. [Agricultural Census 2010 – Punjab Province Tabulation](#). Islamabad. Small farmers own nearly 60% of the farmland in Punjab.

<sup>10</sup> ADB. Pakistan. [Punjab Basmati Rice Value Chain](#); and ADB. 2019. [Technical Assistance Completion Report: Punjab Basmati Rice Value Chain](#). Manila.

<sup>11</sup> ADB. 2018. [Punjab Basmati Rice Value Chain](#). Consultant's report. Manila (TA 8578-PAK). More than 100 services providers participated in the TA demonstration activities.

<sup>12</sup> The TA published two knowledge products: ADB; Central and West Asia Department; Environment, Natural Resources, and Agriculture Division. 2018. [Investment in Research and Development for Basmati Rice in Pakistan](#). ADB Central and West Asia Working Paper Series. No. 7. Manila; and Development Asia. [Case Study: Using Farm Mechanization to Strengthen the Rice Value Chain](#).

engagement with private service providers and relevant industries in the grain value chain, for which ADB's continued assistance is requested.

### III. THE TECHNICAL ASSISTANCE

#### A. Impact and Outcome

8. The TA is aligned with the following impact: Punjab's agriculture growth, rural livelihood, and food security improved.<sup>13</sup> The TA will have the following outcome: farmers' adoption of advanced technologies increased in TA pilot sites.<sup>14</sup>

#### B. Outputs, Methods, and Activities

9. The TA will have four outputs: (i) demonstration of advanced harvest and postharvest technologies conducted; (ii) ICT-based direct marketing platform developed and installed; (iii) capacity of stakeholders in developing and adopting advanced technologies increased; and (iv) investment opportunities to scale up the adoption of technologies formulated. Outputs 1 and 2 will be delivered through the pilot testing and demonstration activities in which small farmers and private service providers will be invited to participate.<sup>15</sup> TA testing and demonstration pilot sites will be in areas where farmers produce the three major crops. The TA will incorporate public and private research centers' technical support for testing and demonstrating technologies through both on-farm and laboratory-based research and development activities.

10. **Output 1: Demonstration of advanced harvest and postharvest technologies conducted.** The output will support small farmers in accessing advanced technologies for improved harvest and postharvest handling. Private service providers will demonstrate such technologies to small farmers. Good harvest and postharvest practices will improve the quality and quantity of select commodities by reducing their moisture content to prevent microorganism development and production of aflatoxins causing food safety hazards, thereby resulting in higher market prices. It will require timely and seamless handling of harvest, drying, and storage of farmers' produce. Using mechanized technologies can largely help small farmers address such challenges.

11. **Output 2: Information and communication technology-based direct marketing platform developed and installed.** The output will support small farmers' participation in direct marketing, using a web-based electronic platform supported by ICT.<sup>16</sup> This platform is a new marketing channel proposed by the PAD and approved by the provincial government in 2018. In Punjab, agriculture commodities are, in principle, brought to and auctioned at agricultural markets, the majority of which are regulated by the provincial government.<sup>17</sup> Small farmers, however, have not benefited from the current marketing practices because of the lack of transparency in auctioning, and the overwhelming presence and role of middlemen who control small farmers'

<sup>13</sup> Government of Punjab, Punjab Agriculture Department. 2018. *Punjab Agriculture Policy 2018*. Lahore.

<sup>14</sup> The design and monitoring framework is in Appendix 1.

<sup>15</sup> The project will work with a group of small farmers who live in selected pilot sites; it will not use a cooperative approach, as this is not a practice in rural Punjab.

<sup>16</sup> A new direct marketing platform will be built, installed, and accessed through a website provided by an independent web service provider. The platform will be owned and managed by the TA during its implementation. Its ownership and administration will be handed over to the PAD at the end of the TA implementation.

<sup>17</sup> M.A. Rana. 2018. [Commissions and Omissions: Agricultural Produce Markets in Pakistan](#). *Policy and Institutional Reforms to Improve Horticultural Markets in Pakistan Working Paper series*. No. 01/18. Caulfield, Australia: Monash University. There are 262 agricultural markets in Punjab.

marketing.<sup>18</sup> The proposed farmers' direct marketing will address such issues by allowing farmers to sell their produce directly to any buyer outside of the existing agricultural markets.<sup>19</sup> It will give farmers an opportunity to sell their produce at better prices if innovative technologies such as an ICT-based online trading application and its operating system are available for farmers to use and directly connect them to buyers.<sup>20</sup>

**12. Output 3: Capacity of stakeholders in developing and adopting advanced technologies increased.** The TA will assist in the capacity building of key stakeholders through workshops, seminars, and training programs to develop and adopt appropriate technologies for the achievements of outputs 1 and 2.<sup>21</sup> The stakeholders include government agencies, farmers, private service providers and machine manufacturers, and researchers. Output 3 will also support international and national short training courses for the researchers and experts who will exclusively conduct research and development on the rapid adoption of technologies for Punjab's agriculture value chain improvement. Such training courses will be held at or organized by the International Rice Research Institute, the International Food and Policy Research Institute, and/or other suitable international research centers. The TA will prepare various knowledge products to disseminate the results achieved under the TA and publish them for internal as well as external stakeholders.

**13. Output 4: Investment opportunities to scale up the adoption of technologies formulated.** The successful results of pilot testing carried out in outputs 1 and 2 need to be scaled up through both public and private sector investments for a further improved agriculture value chain with promising business opportunities for private entrepreneurs in Punjab. Output 4 will support the PAD in preparing short-, medium-, and long-term investment plans, and priority program and/or project concept notes. The TA will carry out a socioeconomic survey for baseline and end-line information of the TA pilot and demonstration component. In addition, studies on sustainable agriculture management and improved value chains will be conducted to identify potential investment opportunities in the province's agriculture sector.<sup>22</sup> The results of the socioeconomic survey and the studies will be used to formulate an investment plan and to design concepts for priority programs and/or projects.

**14. Innovation, lessons, and ADB's value addition.** The TA will promote innovative solutions to mainstream the use of advanced technologies to support the improved livelihood of small farmers in the rural communities of Punjab. To achieve its objectives, the TA will build upon the results and lessons from the Basmati TA, which was successfully implemented to promote advanced technologies for Punjab's basmati rice value chain, and from other ADB-financed

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<sup>18</sup> It would be beneficial to conduct a study to identify feasible approaches and models to provide small farmers with sustainable financial support, which is a root cause of the issue. The TA may carry out such a study under output 4.

<sup>19</sup> Government of Punjab. 2018. [The Punjab Agricultural Marketing Regulatory Authority Act 2018 \(Act XXIX of 2018\)](#). Lahore.

<sup>20</sup> Many ICT-based agriculture information applications have been developed and operated in Pakistan. However, none of them are intended for farmers' direct marketing, as this innovative approach was very recently introduced by the Government of Punjab.

<sup>21</sup> Women in landholding farming families in the TA pilot areas are encouraged to participate in various training activities under the TA, although they traditionally do not work in the fields and are mainly involved in livestock and/or household work. The empowerment of women from landless farming families in rural communities will be included in capacity building activities.

<sup>22</sup> These will include the following studies: investment in agriculture value chain research and development in Punjab, investment in services industries for the agriculture value chain, and technology-based agriculture and its impact on the livelihood of the most vulnerable rural communities in Punjab. In addition, a study on enhancement of climate-resilient agriculture for climate change adaptation and/or mitigation investment will be conducted, if required.

projects.<sup>23</sup> The TA will offer integrated solutions to address a mixed range of challenges through a “One ADB” approach that applies sharing of cross-cutting knowledge and innovations.

### C. Cost and Financing

15. The TA is estimated to cost \$2,750,000, of which (i) \$500,000 will be financed on a grant basis by ADB’s Technical Assistance Special Fund (TASF-6) and (ii) \$2,000,000 will be financed on a grant basis by the Japan Fund for Poverty Reduction (JFPR) and administered by ADB. The key expenditure items are listed in Appendix 2.

16. ADB’s Technical Assistance Special Fund will support various activities including consulting services and pilot testing (Appendix 2). Knowledge sharing and capacity development activities under output 3 will be solely financed by ADB. Such activities will include international and national short training programs to strengthen the agriculture sector’s capabilities to develop and adopt advanced technologies, and the preparation of knowledge products to disseminate the advanced technologies piloted in the TA. The JFPR will support activities related to outputs 1, 2, and 4 that will be implemented by TA consultants, including workshops and training for farmers.

17. The government will provide counterpart support in the form of staff, office accommodation,<sup>24</sup> data and information access, secretarial assistance, domestic transportation for counterpart staff, and other in-kind contributions.

### D. Implementation Arrangements

18. ADB will administer the TA, and will select, supervise, and evaluate consultants. The PAD will be the executing agency for the TA.<sup>25</sup> Its Agriculture Delivery Unit will be the focal point, coordinating relevant directorates of the PAD. At the TA inception stage, a TA advisory committee will be established among the directorates of the PAD for effective coordination to enable improved information and knowledge sharing related to TA activities and achievements. The TA advisory committee will be led by the PAD’s Monitoring and Evaluation Cell and the Agriculture Delivery Unit and will meet during every ADB TA review mission on behalf of the PAD to provide overall guidance to the TA implementation.

19. The implementation arrangements are summarized in the table.

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<sup>23</sup> ADB. [Regional: Addressing the Pre- and Postharvest Challenges of the Rice Supply Chain](#); ADB. [Regional: Improving Poor Farmers’ Livelihood through Rice Information Technologies](#); and [ADB. Regional: Improving Poor Farmers’ Livelihood through Post-Harvest Technologies](#).

<sup>24</sup> The government will provide main office accommodation in the premises of the PAD, Lahore.

<sup>25</sup> The PAD has experience in implementing investment projects financed by key development partners (ADB, the Japan International Cooperation Agency, the United States Agency for International Development, and the World Bank). The PAD successfully supervised the Basmati TA through its substitute agency, the Punjab Agricultural Research Board, wherein pilot testing and demonstration activities of advanced technologies and innovation in seed development and farming practices were undertaken. During implementation of the Basmati TA, the PAD, through the Punjab Agricultural Research Board, demonstrated good ownership, and coordinated with relevant stakeholders, including the private sector. Thus, the PAD has adequate financial and human resources capacity to administer the TA during its implementation, and to deal with the proposed advanced technologies beyond its completion. ADB. 2019. [Technical Assistance Completion Report: Punjab Basmati Rice Value Chain](#). Manila.

### Implementation Arrangements

Aspects	Arrangements		
Indicative implementation period	November 2019–October 2022		
Executing agency	Punjab Agriculture Department		
Consultants	To be selected and engaged by ADB		
	Firm: Quality- and cost-based selection (quality-to-cost ratio 90:10)	Enhancing Technology-Based Agriculture and Marketing in Rural Punjab	\$1,450,000
	Individual: Individual selection	5 international consultants (24 person-months) and 2 national consultants (16 person-months)	\$682,800
Procurement <sup>a</sup>	To be procured by consultants		
	Request for quotation	13 contracts	\$512,000
Advance action	Advance action will be applied to recruit a TA consulting firm and individual consultants.		
Disbursement	The TA resources will be disbursed following ADB's <i>Technical Assistance Disbursement Handbook</i> (2010, as amended from time to time) and in reference to the JFPR Technical Assistance Grant Policy Guidelines. Disbursement arrangements under the JFPR and TASF-6 financing will be cost sharing for consultants' expenditures, including the cost of pilot testing. Expenditures related to training, seminars, and conferences will be financed by TASF-6.		
Asset turnover or disposal arrangement upon TA completion	All equipment and software will be transferred to the executing agency upon completion of TA activities.		

ADB = Asian Development Bank, JFPR = Japan Fund for Poverty Reduction, TA = technical assistance, TASF = Technical Assistance Special Fund.

<sup>a</sup> Procurement Plan (accessible from the list of linked documents in Appendix 3).

Source: ADB.

20. **Consulting services.** ADB will recruit a consulting firm to implement TA activities using quality- and cost-based selection with a 90:10 quality–cost ratio. ADB will also recruit international and national individual consultants whose expertise will not be available through a firm. Advance procurement will be applied to recruit consultants. ADB will engage the consultants and carry out procurement following the ADB *Procurement Policy* (2017, as amended from time to time) and its associated project administration instructions and/or staff instructions.<sup>26</sup>

21. The TA will require 24 person-months of international and 94 person-months of national consulting services (footnote 23). During TA implementation, additional expertise on agricultural engineering, climate change, livestock development, financial management, and public-private partnerships may be required; estimated inputs are 3 person-months of international consulting services on an individual basis and 6 person-months of national consulting services through a firm, which will be financed from the TA contingencies.

22. **Pilot testing of project approach.** The scope of proposed pilot testing is to conduct a demonstration of advanced harvest and postharvest technologies (output 1), and to develop and

<sup>26</sup> Terms of Reference for Consultants (accessible from the list of linked documents in Appendix 3).

install a direct marketing platform based on ICT (output 2). Proposed technologies to be piloted will be (i) grain moisture control technologies, (ii) hermetic storage technologies, and (iii) an ICT-based platform and application for farmers' use.<sup>27</sup>

23. The TA fact-finding mission fielded from 25 March to 1 April 2019 assessed potential risks associated with the proposed pilot testing activities and conducted required due diligence. The mission confirmed through its aide-mémoire that (i) civil works will not be involved in the pilot testing activities and they will be undertaken only on existing farmers' farmland, and/or on existing government-owned or grain processors' premises; (ii) the PAD will facilitate obtaining permits and clearances for undertaking pilot activities in case such arrangements are required; (iii) the cost of pilot testing will not exceed 30% of ADB's financing amount, including JFPR financing for the TA, which satisfies ADB's rules; and (iv) proposed activities will not result in any potential adverse environmental and/or social impacts, and a rapid environmental assessment will be undertaken at the TA inception stage to ensure that the pilot testing activities meet ADB's Safeguard Policy Statement (2009) requirements.<sup>28</sup>

24. Goods and services required for the pilot testing will be listed in the procurement plan and procured by TA consultants using the provisional sum.<sup>29</sup> Assets procured and/or created by the TA will be handed over to the PAD at the completion of the TA. Application of the pilot results will be incorporated in investment opportunity plan, including ADB-financed investment prepared under output 4. During the TA implementation, TA review missions, together with the executing agency, will monitor the pilot testing activities and confirm compliance as required through aide-mémoires.

25. **Cofinancier requirements.** The TA's monitoring and reporting requirements and change in implementation arrangements will follow the JFPR Technical Assistance Grant Policy Guidelines.

#### IV. THE PRESIDENT'S DECISION

26. The President, acting under the authority delegated by the Board, has approved (i) the Asian Development Bank (ADB) administering a portion of technical assistance not exceeding the equivalent of \$2,000,000 to be financed on a grant basis by the Japan Fund for Poverty Reduction and (ii) ADB providing the balance not exceeding the equivalent of \$500,000 on a grant basis to the Government of Pakistan for Enhancing Technology-Based Agriculture and Marketing in Rural Punjab, and hereby reports this action to the Board.

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<sup>27</sup> Pilot Testing of Project Approach (accessible from the list of linked documents in Appendix 3). The pilot testing plan will be discussed by the executing agency, ADB's TA team, and TA consultants, and may be updated and/or amended during the TA implementation.

<sup>28</sup> Pilot activities classified category C for environment, involuntary resettlement, and indigenous peoples are allowed to be implemented.

<sup>29</sup> Procurement Plan (accessible from the list of linked documents in Appendix 3).

## DESIGN AND MONITORING FRAMEWORK

<b>Impact the TA is Aligned with:</b> Punjab's agriculture growth, rural livelihood, and food security improved (Punjab Agriculture Policy 2018) <sup>a</sup>			
<b>Results Chain</b>	<b>Performance Indicators with Targets and Baselines</b>	<b>Data Sources and Reporting Mechanisms</b>	<b>Risks</b>
<b>Outcome</b>  Farmers' adoption of advanced technologies increased in TA pilot sites	By the end of 2022  a. At least 25% of farmers who participated in pilot activities adopted the technologies demonstrated in the TA (2018 baseline: 0)	a. Consultant's TA final report, and ADB TA completion report	Natural hazard-based disasters (such as drought and flooding)
<b>Outputs</b> 1. Demonstration of advanced harvest and postharvest technologies conducted  2. ICT-based direct marketing platform developed and installed  3. Capacity of stakeholders in developing and adopting advanced technologies increased	1a. At least 2,000 farmers participated in pilot and demonstration activities by August 2022 (2018 baseline: 0)  1b. At least 3 advanced technologies demonstrated and used by farmers by August 2022 (2018 baseline: 0)  2a. ICT-based farmers' direct marketing platform developed by May 2020 (2018 baseline: not applicable)  2b. At least 500 farmers participated in pilot activities by August 2022 (2018 baseline: 0)  2c. At least 10,000 tons of farmers' produce offered for sale through farmers' direct marketing by August 2022 (2018 baseline: 0)  3a. At least 5 workshops organized for government and public institutions, farmers, private service providers and machine manufacturers, and market stakeholders for the knowledge and adoption of technologies by August 2022 (2018 baseline: 0)  3b. Technology literacy training at least for the targeted farmers, including women, organized by March 2022 (2018 baseline: 0)	1a–b. Consultant's TA final and progress reports, and ADB TA review  2a–c. Consultant's TA final and progress reports, and ADB TA review  3a–b. Consultant's TA final and progress reports, and ADB TA review	Excessive fall in market prices because of unforeseen external events

4. Investment opportunities to scale up the adoption of technologies formulated	<p>3c. At least 3 knowledge products developed and published by September 2022 (2018 baseline: not applicable)</p> <p>4a. Short-, medium-, and long-term investment plans prepared by March 2021 (2018 baseline: not applicable)</p> <p>4b. Concept notes for priority programs and/or projects prepared by December 2021 (2018 baseline: 0)</p>	<p>3c. ADB K-Nexus and ADB TA completion report</p> <p>4a–b. Consultants' TA final and progress reports, and ADB TA review</p>	Unexpected changes in government's priorities and procedures
<p><b>Key Activities with Milestones</b></p> <p><b>1. Demonstration of advanced harvest and postharvest technologies conducted</b></p> <p>1.1 3-year work plan and detailed first year work plan including pilot sites and implementation guidelines prepared by the executing agency, ADB, and consultants by January 2020</p> <p>1.2 Pilot testing orientation for stakeholders including farmers, private service providers and machine manufacturers, and researchers held by January 2020</p> <p>1.3 Pilot testing and demonstration of harvest, drying, and storage for maize and wheat conducted during March–May 2020 and its results reviewed, assessed, and documented by July 2020</p> <p>1.4 Detailed second year work plan prepared, and pilot testing and demonstration of harvest, drying, and storage for rice paddy and maize conducted during September–December 2020 and its results reviewed, assessed, and documented by February 2021</p> <p>1.5 Pilot testing and demonstration of harvest, drying, and storage for wheat conducted during March–May 2021, and its results reviewed, assessed, and documented by July 2021</p> <p>1.6 Detailed third year work plan prepared, and pilot testing and demonstration of harvest, drying, and storage for rice paddy and maize conducted during September–December 2021 and its results reviewed, assessed, and documented by March 2022</p> <p>1.7 Complete assessments and analysis on results prepared and incorporated in TA final report</p> <p><b>2. Information communication technology-based direct marketing platform developed and installed</b></p> <p>2.1 3-year work plan and detailed first year work plan including pilot sites and implementation guidelines prepared by the executing agency, ADB, and consultants by January 2020</p> <p>2.2 Pilot testing orientation for stakeholders including farmers, private service providers, and researchers held by January 2020</p> <p>2.3 Initial online application for farmers' direct marketing developed; its pilot testing and demonstration for farmers' maize conducted during March–May 2020; and its results reviewed, assessed, and documented by July 2020</p> <p>2.4 Pilot testing and demonstration of farmers' direct marketing for rice paddy and maize conducted during September 2020–January 2021, and its results reviewed, assessed, and documented by March 2021</p> <p>2.5 Pilot testing and demonstration of farmers' direct marketing for maize conducted during March–May 2021, and its results reviewed, assessed, and documented by July 2021</p> <p>2.6 Pilot testing and demonstration of farmers' direct marketing for rice paddy and maize conducted during September 2021–January 2022, and its results reviewed, assessed, and documented by April 2022</p> <p>2.7 Complete assessments and analysis on results prepared and incorporated in TA final report</p> <p><b>3. Capacity of stakeholders in developing and adopting advanced technologies increased</b></p> <p>3.1 3-year capacity building and training plan prepared by consultants, executing agency, ADB, and researchers by January 2020</p> <p>3.2 Capacity building and training plan implemented during February 2020–March 2022</p> <p>3.3 Workshop and individual meetings to communicate results and lessons learned to policy makers, grain processing and ancillary industries, farmers, and researchers organized by March 2022</p> <p>3.4 Results of capacity building and training activities reviewed, assessed, and shared with the executing agency and researchers by March 2022</p> <p>3.5 Knowledge products planned, prepared, and published on the ADB website by August 2022</p>			

#### **4. Investment opportunities to scale up the adoption of technologies formulated**

- 4.1 Assess investment needs to scale up adoption and diffusion of advanced technologies by August 2020
- 4.2 A socioeconomic survey for TA pilot project's baseline data collection conducted and economic analysis and cost-benefit analysis prepared to be used for investment planning and prioritizing by December 2020
- 4.3 Short-, medium-, and long-term investment plan based on the activities 4.1 and 4.2 prepared by March 2021
- 4.4 Concept notes of priority programs and/or projects prepared by December 2021

#### **TA Management Activities**

Consulting firm recruited and mobilized by end of November 2019

The selected consulting firm prepares and submits an inception report to ADB by January 2020, an interim report by December 2020, and a final report by August 2022

#### **Inputs**

ADB: \$500,000 (TASF-6)

JFPR: \$2,000,000

Note: The government will provide counterpart support in the form of counterpart staff, main office accommodation<sup>b</sup>, data and information access, secretarial assistance, domestic transportation for counterpart staff, and other in-kind contributions.

ADB = Asian Development Bank, ICT = information and communication technology, JFPR = Japan Fund for Poverty Reduction, TA = technical assistance, TASF = Technical Assistance Special Fund.

<sup>a</sup> Government of Punjab, Punjab Agriculture Department. 2018. *Punjab Agriculture Policy 2018*. Lahore.

<sup>b</sup> It will be in the premises of the PAD, Lahore.

Source: ADB.

**COST ESTIMATES AND FINANCING PLAN**  
(\$'000)

Item	Amount	
	ADB <sup>a</sup>	JFPR
A. Consultants		
1. Remuneration and per diem		
a. International consultants	5.0	462.0
b. National consultants	5.0	695.0
2. Out-of-pocket expenditures		
a. International and local travel	20.0	153.7
b. Office space rental and related facilities <sup>b</sup>	0.0	64.8
c. Goods (rental and/or purchase) <sup>c</sup>	12.0	0.0
d. Surveys	103.0	0.0
e. Training, seminars, and conferences <sup>d</sup>	100.0	0.0
f. Reports and communications	0.0	9.5
g. Pilot testing of project approach <sup>e</sup>	13.0	487.0
B. Training, seminars, and conferences <sup>f</sup>		
1. Facilitators <sup>g</sup>	9.2	0.0
2. Travel cost of ADB staff acting as a resource person	16.0	0.0
3. Venue rental and related facilities	12.0	0.0
4. Participants	80.0	0.0
C. Contingencies	124.8	128.0
<b>Total</b>	<b>500.0</b>	<b>2,000.0</b>

ADB = Asian Development Bank, JFPR = Japan Fund for Poverty Reduction, TA = technical assistance, TASF = Technical Assistance Special Fund.

The TA is estimated to cost \$2,750,000, of which contributions from ADB and the JFPR are presented in the table. The government will provide counterpart support in the form of counterpart staff, main office accommodation (in the premises of the PAD, Lahore), data and information access, secretarial assistance, domestic transportation, and other in-kind contributions. The value of government contribution is estimated to account for 10% of the total TA cost.

<sup>a</sup> Financed by ADB's TASF-6.

<sup>b</sup> Two field offices for pilot testing.

<sup>c</sup> Details are in the Procurement Plan (accessible from the list of linked documents in Appendix 3). All equipment will be transferred to the executing agency upon completion of TA activities.

<sup>d</sup> Amount per workshop and/or training will be paid in a lump sum.

<sup>e</sup> This includes \$13,000 for goods (rental or purchase) and \$487,000 for works (services). Refer to the Procurement Plan (accessible from the list of linked documents in Appendix 3). All goods (rental or purchase) will be financed by TASF-6. All equipment purchased by the TA will be transferred to the executing agency upon completion of TA activities.

<sup>f</sup> Expenses under this category will be financed only by TASF-6.

<sup>g</sup> This includes expertise required in agriculture research and development from the International Rice Research Institute, the International Food Policy Research Institute, and/or relevant international research centers, and in commodity market information technology development from national information technology industries.

Source: ADB estimates.

**LIST OF LINKED DOCUMENTS**

<http://www.adb.org/Documents/LinkedDocs/?id=52232-001-TARreport>

1. Terms of Reference for Consultants
2. Pilot Testing of Project Approach
3. Procurement Plan