

PAKISTAN

PROGRAM-FOR-RESULTS

**Strengthening Markets for Agriculture and Rural
Transformation in Punjab (SMART Punjab)
Program-for-Results**

**Environmental and Social Systems Assessment
(ESSA)**

World Bank

November 15, 2017

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ABBREVIATIONS AND ACRONYMS

AARI	Ayub Agriculture Research Institute
ADU	Agriculture Delivery Unit
ADP	Annual Development Plan
APTAC	Agricultural Pesticide Technical Advisory Committee
CNIC	computerized national identity card
CSA	climate-smart agriculture
DLI	Disbursement-Linked Indicator
DMP	disaster management plan
EIA	environmental impact assessment
EMP	environmental management plan
EPA	Environmental Protection Agency
EPD	Environment Protection Department
ESMF	Environmental and Social Management Framework
ESSA	Environmental and Social Systems Assessment
FAO	Food and Agriculture Organization
FAP	Farmers Association of Pakistan
FGD	focus group discussion
FY	fiscal year
GoPunjab	Government of Punjab
GRM	grievance redress mechanism
HIES	Household Integrated Economic Survey
HVA	high-value agriculture
IEE	initial environmental examination
L&DD	Livestock and Dairy Development (Department)
LUMS	Lahore University of Management Sciences
M&E	monitoring and evaluation
M&R	maintenance and repair
MSME	micro, small or medium enterprise
NEQS	National Environmental Quality Standards
NOC	no-objection certificate
NPK	(ratio of) nitrogen to phosphorus to potash
O&M	operation and maintenance
OFWM	on-farm water management
P&D	Planning and Development (Department)
P&E	Planning and Evaluation (Cell)
PAFDA	Punjab Agriculture, Food and Drug Authority
PARB	Punjab Agricultural Research Board
PCMU	Program Coordination and Monitoring Unit
PDO	Program Development Objective
PDU	Program Delivery Unit
PEPA	Punjab Environmental Protection Act
PforR	Program for Results
PIDA	Punjab Irrigation and Drainage Authority
PIPIP	Punjab Irrigated-Agriculture Productivity Improvement Project

PITB	Punjab Information Technology Board
PKR	Pakistani Rupee
PLRA	Punjab Land Records Authority
PMIU	Program Monitoring and Implementation Unit
R&D	research and development
SMART	Strengthening Markets for Agriculture and Rural Transformation
SME	small or medium enterprise
SPRU	Strategic Planning and Reform Unit
WHO	World Health Organization
WUA	water users' association
SOP	standard operating procedure

EXECUTIVE SUMMARY

A. Purpose of the ESSA

1. This Environmental and Social Systems Assessment (ESSA) has been prepared by the World Bank for the proposed Strengthening Markets for Agriculture and Rural Transformation (SMART) Program. It includes the following information: (a) a summary of the environmental and social risks and benefits associated with the proposed activities required to achieve the Program Development Objective (PDO) and Disbursement-Linked Indicators (DLIs) for each Results Area; (b) an assessment of the borrower's environmental and social management systems that apply to these activities, including their risks and benefits; (c) an evaluation of the borrower's performance and track record in implementing its environmental and social management systems; (d) an assessment of the extent to which the borrower's environmental and social management systems are consistent with the World Bank's core environmental and social principles, as spelled out in Bank policy and associated guidance materials; and (e) a set of recommendations and actions, which the borrower has agreed to undertake to improve the implementation of the applicable systems.

2. This report was prepared by Bank staff and consultants through a combination of reviews of existing program materials and the technical literature, interviews with government staff, and consultations with key stakeholders and experts. The findings of the assessment will be used to formulate an overall set of key measures to improve the environmental and social management outcomes of the Program. The findings, conclusions, and opinions expressed in the ESSA document are those of the Bank. The recommendations contained in the analysis have been discussed with and agreed to by the Government of Punjab (GoPunjab) counterparts.

B. Program Objectives, Results Areas, and Disbursement-Linked Indicators

3. The PDO is to increase the productivity of crop and livestock farmers, improve their climate resilience, and foster agribusiness in Punjab. The PDO indicators for the Program are: (1) farmers reached with agricultural assets or services, as measured by the absolute number of farmers (gender disaggregated) reached with SMART interventions; (2) area under high-value crops, measured as the increase in area under horticulture (fruits and vegetables), oilseeds, and pulses; (3) beneficiaries (gender disaggregated) reached with financial services, as measured by the number of matching grants extended to agribusinesses; (4) private wholesale markets and collection centers established; (5) farmers (gender disaggregated) covered by agricultural insurance; (6) farmers who adopt climate-smart agriculture (CSA) packages; and (7) improvement in irrigation water service delivery.

4. The proposed Program is expected to contribute to three Results Areas: (a) increased on-farm productivity and value of agriculture and livestock; (b) increased value addition and competitiveness in agriculture and livestock; and (c) enhanced resilience of smallholder farmers to climate change and natural disasters.

5. The DLIs of the SMART Punjab Program are based on the three Results Areas mentioned above. The DLIs for the Program are as follows:

a. **DLI 1:** Improving access to quality farm inputs. This involves a better targeting of subsidies on agricultural inputs (including fertilizers) to small farmers. This DLI will be measured

by tracking the number of small farmers (< 5 hectares) enrolled in the e-voucher scheme for fertilizers.

- b. **DLI 2:** Revitalizing provincial crop and livestock research systems. This comprises the design of a comprehensive, strategically relevant agriculture and livestock research and extension policy. In addition, funding for public research will increase over time (measured as a percentage of the agricultural gross domestic product spent on research), as will the role of the private sector (measured by the composition of the Punjab Agricultural Research Board and the percentage of research grants awarded on a competitive basis).
- c. **DLI 3:** Improving livestock health and breeding. This involves moving further away from curative animal healthcare toward preventive healthcare, as measured by the ratio of expenditures on preventive and curative medicine; and a gradual increase in the number of animals registered in progeny testing programs.
- d. **DLI 4:** Modernizing the wheat marketing system and transitioning to high-value agriculture. This DLI will be measured by (a) the official notification of gradual withdrawal by the GoPunjab from the wheat market and subsequent phasing out of government wheat procurement, a reduction in the size of strategic grain reserves, and construction of modern storage facilities; and (b) the percentage of the allocation to agriculture in the Annual Development Plan for high-value agriculture (HVA) schemes. An additional measure is the approval of the Punjab Agriculture Policy, which is expected to provide further strategic direction to agriculture policy in the province.
- e. **DLI 5:** Providing incentives to agribusinesses to invest in value addition and agricultural technology. The Program will support a matching grants scheme under the Agribusiness and Innovation Fund to be set up by the GoPunjab. Matching grants will be awarded on a competitive basis with special emphasis on women and youth. This DLI will be measured by the number of matching grants awarded to agribusiness firms.
- f. **DLI 6:** Improving market conditions for meat and raw milk. This DLI will be measured by the discontinuation of the notification of meat and (raw) milk prices.
- g. **DLI 7:** Modernizing agriculture markets. This DLI will be measured by the approval and notification of the Punjab Agricultural Marketing Regulatory Authority Act, which will allow greater private sector participation in agricultural marketing.
- h. **DLI 8:** Improving food safety. This DLI involves the development of better food and agriculture standards, backed by suitable testing and enforcement mechanisms, thereby improving the quality of food products and contributing to better public health. This DLI will be measured by tracking progress against establishing and operationalizing a provincial reference food-testing laboratory as well as a series of regional and mobile laboratories.
- i. **DLI 9:** Improving sustainability and efficiency of irrigation. This DLI aims to improve equity in access to water and more efficient on-farm water use, in addition to increasing the resources available for the maintenance and repair (M&R) of surface irrigation systems. The adoption of a provincial water policy and groundwater act is being targeted to help Punjab address the overexploitation of groundwater, falling groundwater tables, and increasing salinization, all of which threaten the efficient long-term use of soil and water resources. This DLI will be measured by the approval of the Punjab Water Policy, notification of the Punjab Groundwater Act (including demarcation of critical groundwater areas and establishment of a geo-referenced database and registration of tubewells), improvements in the area assessed for *abiana*, and better *abiana* collection rates and water delivery performance ratios in selected canals.

- j. **DLI 10:** Rolling-out an agricultural insurance system. This DLI aims to bring agricultural insurance products to all farmers in Punjab, with the type of insurance product and subsidy level differentiated by farm category. The main proposed product is Area Yield Index Insurance. This DLI will be measured by the official approval of the report by the GoPunjab, the development and notification of a work plan in line with the report's recommendations, a pilot crop insurance scheme in at least two districts, and subsequent rollout of the scheme to other districts.
- k. **DLI 11:** Increasing public investment in climate-smart agriculture. This DLI involves the allocation of additional funds in the development budget to promoting adoption of new technologies and approaches and lower potential yield losses caused by climate change.
- l. **DLI 12:** Communications, beneficiary feedback, capacity building, and monitoring and evaluation. This DLI focuses on the development of a substantial communications strategy (including citizen feedback) and capacity-building program that will generate stakeholders' support for, and further enable agriculture and rural transformation. Progress monitoring will be facilitated by strengthening the monitoring and evaluation (M&E) capacity of the main implementing departments.

C. Social Impacts and Risks

6. Growth in the agriculture sector in Punjab has been poor for some years and this has had a detrimental effect on the wellbeing of agricultural communities. Communities dependent on agriculture have traditionally included deprived members of society, including landless farmers, small tenant farmers, and groups who rely on seasonal agricultural labor. The objective of the proposed Program is to increase productivity in the sector, and thereby support household incomes and livelihoods in rural communities. The social benefits associated with the Program include improved economic status of farming communities, including livestock producers (mostly women); cheaper wheat and wheat flour; enhanced resilience of farmers through the provision of affordable and accessible agricultural insurance products and increased investments for climate smart agriculture; a more equitable distribution of water; the development and implementation of a participatory citizens engagement strategy for farmers; and the capacity building of key government departments, farmers, and agribusiness entrepreneurs to ensure that the objectives of the Program are met.

7. The ESSA concludes that there are no risks regarding land acquisition and resettlement and Indigenous Peoples. The key risks associated with the Program can be grouped as (a) inadequate access to program benefits among vulnerable and marginalized groups and (b) social conflict (Core Principles 5 and 6 of the ESSA).

8. More specifically, the social risks are as follows:

9. **Procedures and Availability of Subsidies on Agricultural Inputs:** At present, too few small farmers have access to the subsidy on fertilizer because it is not offered on those brands with the largest market shares. Moreover, some small farmers find the process of obtaining the subsidy – which involves sending SMS text messages with long numerical codes – difficult. The subsidy on fertilizer is currently based on proof of purchase and is supposed to be capped by the issuance of a limited number of bags of fertilizer against one person's identity card. The Bank's support is intended help the GoPunjab to target the subsidy more closely at small farmers, using the registration scheme for farmers.

10. **Uptake of Livestock Services:** The Livestock and Dairy Development (L&DD) Department has worked hard to revamp its services and instituted elaborate systems to ensure greater outreach in communities. However, there is a low risk that these services may not be used as expected, given the high level of expectation among communities. A continued, focused outreach strategy and the provision of quality vaccination services at outlets would go a long way to facilitate improved uptake and user satisfaction.

11. **Reform of Wheat Marketing:** The GoPunjab's wheat procurement drive covers approximately 25-40% of the wheat produce. Field consultations suggest that small and medium farmers in particular rely heavily on *artis* or intermediaries, and find it difficult to access the government procurement system. To this extent, a withdrawal of the procurement system will not have a direct impact on small farmers. However, phasing out wheat procurement would entail dismantling the support price mechanism and this would have consequences for all farmers. In the short term, they are likely to experience a decrease in producer prices (given that international wheat prices are significantly lower than the domestic support price – but mitigated by the import duty as long as it exists, currently 60%). The GoPunjab is working to finalize a compensation plan of cash transfers that would tide over small farmers in particular during a period of lower prices. In the longer run, wheat producers will face fluctuations and price variability. Consumers, over 90% of whom are net wheat flour buyers, will benefit from lower prices. Furthermore, the powerful farm lobby, which has a presence in the provincial legislature, as well as banks may oppose the withdrawal of the wheat subsidy. As such, this reform needs to be approached carefully and preceded by a well-designed citizens' engagement and stakeholder consultation strategy. Given the widespread potential impacts of this policy reform, it poses substantial equity and political risk.

12. **Move toward High-value Agriculture:** Small and medium farmers and other vulnerable categories such as women and landless tenants will require targeted support (for example, through assurance of input supply, adequate market information, assistance in bringing produce to the right markets, etc.) to move toward HVA, otherwise there is a substantial risk that they may be excluded from the benefits associated with this transition. The GoPunjab needs to carry out more groundwork to understand exactly what sort of support is needed and arrange – including capacity enhancement – to provide this support, either through existing extension services or by involving civil society stakeholders.

13. **Incentives for Agribusiness:** The GoPunjab plans to institute a financial support scheme for agribusiness through a system of matching grants. The contours of the scheme are being developed and it will incorporate special incentives to promote the participation of women-owned enterprises and firms working with small farmers. This is commensurate with a larger social development focus: the scheme should not solely focus on promoting entrepreneurship, but also on social and development outcomes such as technology transfer and an enabling environment for enterprises that might otherwise be excluded from agribusiness.

14. **Liberalizing Meat and Milk Prices:** The GoPunjab plans to remove district administration-enforced caps on the retail prices of meat and fresh milk across Punjab. The ESSA finds that removing these price caps would impede the rent-seeking behavior of local officials and may also have some positive impact on producers by way of increased sale prices of produce. However, this reform area could potentially have some negative impact on the food consumption patterns of stakeholders (consumers of unpackaged milk in low-income households). The reform should be preceded by a well-crafted engagement strategy in which stakeholders are apprised of the benefits of deregulation well in advance, and milk producers

can move toward increasing their supply capacity in anticipation of better prices. Unless such a strategy is implemented, consumer rights groups could raise concerns regarding the removal of price caps and the consequent increase in prices of meat and dairy. In addition, price deregulation should ideally occur in tandem with strengthened food safety and quality assurance measures, which are also to be undertaken through SMART (DLI 8). The ESSA recommends exploring the social impacts associated with this deregulation in more detail before the reform is implemented so that adequate mitigation measures can be put in place. The implementation of this reform without adequate lead-in could carry substantial social risk.

15. **Reform of Agricultural Markets:** The GoPunjab plans to introduce a new law, the Punjab Agriculture Marketing Regulatory Authority Act, which would significantly liberalize the agriculture marketing system. The law would permit any person, subject to registration, to set up a wholesale market, farmers market, consumer market, or electronic/web-based market dealing in primary agricultural produce in the province. The proposed legislation will likely limit the currently unlimited power of existing market committees and, as such, poses a low risk of opposition from these powerful actors, who are also politically connected. It also will, however, benefit market players, who will be given a level playing field in which to compete.

16. **Improving the Functioning of Irrigation Systems:** This reform relates to the assessment of *abiana* for better collection and to the enactment of legislation to regulate the use of groundwater. It also entails the notification of a policy for integrated water resource management. All these are necessary and long overdue steps to check the wastage and misuse of water in the province. However, there is a risk that any attempt to improve collection of water use rates is likely to be met with resistance from the powerful farm lobby. There is thus a political risk associated with this DLI. The Punjab Irrigation Department may, in the future, use improved, ‘modern’ methods of *abiana* assessment, at which time this reform will need a more thorough assessment to identify social impacts and risk mitigation measures.

17. **Communications and Outreach:** There is a strong possibility of mitigating the social risks associated with the Program by instituting systems of engagement with stakeholders at an early stage in the reform process, and keeping these consultations open throughout the period of program implementation. As such, this measure to enhance engagement and outreach is integral to the success of the Program and would go a long way to mitigating identified as well as unforeseen risks. In a very positive move, the GoPunjab has recently developed a draft communications strategy that aims to share information on the Program with legislators and policymakers, farmers and consumer groups. The strategy includes key messages to be conveyed to stakeholders, explaining the salient features of the reform Program. This will entail using a variety of tools, including face-to-face meetings, social and print media, TV and radio shows and even cell phone-based communication to disseminate the key messages. The rollout of this strategy should go a long way toward mitigating possible social risks and dispelling any misgivings among key stakeholder groups.

Assessment of the Borrower’s Capacity to Manage Social Effects

18. The Planning and Development (P&D) Department has requisite project monitoring skills, while the Departments of Agriculture and Irrigation have some experience of social mobilization, including through their role in implementing recent World Bank projects. The Department of Livestock and Dairy Development has significantly increased its outreach and extension services. In recent years, the implementing departments of SMART have also enhanced their M&E capacity and instituted IT-based grievance redress systems. However, the departments concerned need to further strengthen their capacity to carry out sustained social

impact assessments that focus on gender and social inclusion issues and on the state of small farmers and agricultural workers, the landless, and other vulnerable communities. Such assessments and tracking of social issues will be required as program implementation proceeds, which is why this ESSA recommends establishing a Social Management Framework to focus on issues of gender, social inclusion, and poverty and track impacts on vulnerable groups in particular and on rural communities in general. This would involve incorporation of substantial social management expertise in the Program Coordination and Monitoring Unit (PCMU) in the Planning and Development (P&D) Department, as well as in the departmental Program Delivery Units (PDUs) where appropriate. This would ensure that the risks of marginalization and social conflict are mitigated throughout implementation.

D. Environmental Impacts and Risks

19. Punjab's natural resources, agriculture, and environment are under stress for many reasons. Most of its environmental problems stem from: (a) poor agricultural practices (imbalanced use of fertilizer, overuse of pesticides, wasteful use of irrigation water, use of untreated wastewater for irrigation, burning of crop residues, etc.); (b) poor management of water (low water prices, poor management and maintenance of irrigation infrastructure, weak law enforcement, etc.); (c) a large stock of low-yield livestock; and (d) the lack of appropriate technology application. Moreover, climate change has brought new challenges associated with changes in rainfall and temperature as well as extreme and unexpected events.

20. The expected environmental risk associated with the Program's activities is assessed as being medium to low. The proposed environmental risk of the operation is **moderate**. The environmental issues associated with the Program are related to: increased use of fertilizers and pesticides due to the shift from conventional crops to HVA crops (especially fruits and vegetables); food safety; institutional capacity for effective environmental management; inadequate water management; and potential environmental non-compliance by micro and small enterprises and testing laboratories.

21. The Program represents a positive response to these environmental issues. The agricultural reforms it supports involve diversifying cropping patterns and promoting the balanced use of fertilizers. The support to the irrigation sector focuses on improving water management by strengthening the regulatory framework. This has multiple benefits in the form of more productive and efficient use of water, decreased waterlogging and salinity, improved crop yields, and increased farm income. The Program is not expected to finance large infrastructure. Wheat storage facilities are subject to the environmental impact assessment (EIA) process required under national law. Since the Program does not support any expansion of the irrigation network, the downstream impacts in terms of water quantity are minimal. The Program does not support any expansion of agricultural land, but rather promotes water resource efficiency and increased land productivity. The transition to HVA crops will, in most cases, demand the judicious use of fertilizers and pesticides, as certain horticultural crops (such as vegetables and fruits) may result in increased use of pesticides. Improvements in animal health, combined with the deregulation of livestock prices, will benefit public health. The more productive animals resulting from improved breeding programs will be mostly stall-fed and will not place any additional pressure on rangelands and pastures. The Program also supports agribusiness development, but mostly on a smaller scale, given the nature of support required to improve processing and value addition. A more detailed analysis of some of these issues can be summarized as follows:

- a. **Use of Fertilizers:** In Punjab, farmers on average apply less fertilizer per hectare than in other countries such as India, Bangladesh, and China. Most farmers do not use the recommended ratios of nitrogen, phosphorus, and potassium and are inclined to use more nitrogen than phosphorus and potassium. There has been a growing trend in fertilizer application since 1980, with a substantial increase in 2000 due to a rise in price of wheat. The Punjab Irrigated-Agriculture Productivity Improvement Project (PIPIP) (P125999) maintains that farmers who shift from grain crops to fruits and vegetables reduce their water and fertilizer use by 80% and 60%, respectively. Increased incomes from higher yields, as reported by farmers, vary between 50% and 70%.
- b. **Use of Pesticides:** The use of pesticides could increase due to the transition from conventional crops to HVA. Punjab's has a poor track record in managing pesticide application, storage, and disposal.
- c. **Effects on Livestock Sector:** Realigning the livestock sector and introducing market-based principles under the Program will certainly help increase the sector's productivity and the quality of livestock products (less contamination and higher nutrients). The Program could help decrease the livestock population by introducing high-yield cows and buffaloes in collaboration with the L&DD Department.
- d. **Water Management:** The enactment of legislation supported by the Program will help control the overexploitation of groundwater, thereby decreasing waterlogging and salinization, increasing the productivity of water, increasing crop yields and farmers' incomes, and improving the overall governance of the water sector. Since the Program does not support any expansion of the irrigation network and agricultural land, impacts on downstream water availability are not expected. The focus of the Program is on improving water resource efficiency, land productivity, and overall governance of water management in the province. These interventions will benefit the environment in the form of reduced waterlogging and salinity, less pressure on groundwater resources, and reduced use of fertilizers and pesticides. This operation does not apply OP 7.50 (Projects in International Waterways) on the understanding that: (a) the SMART Punjab Program for Results (PforR) will not finance any water supply-side activities, including any development and rehabilitation of irrigation infrastructure; and (b) given the operation's focus on replacing public financing with *abiana* collection, there will be no increase in irrigation infrastructure as a direct consequence of the operation.
- e. **Effects of Deregulation in the Agriculture Sector:** The deregulation of the agriculture sector is expected to create space for increased budgetary allocations in the public sector through the reduction of subsidies. The budget could then be reallocated to better maintenance of irrigation infrastructure, promoting HVA, improving agricultural services delivery, research and extension, and agricultural insurance. If the legislation pertaining to agriculture, water, and the environment is enforced and complied with, deregulation will benefit the environment in the form of improved water efficiency and productivity, and the reduced use of fertilizers and pesticides.
- f. **Food Safety:** During operations, food-testing laboratories may generate contaminated wastewater, hazardous solid waste, and air pollution (generators and other emissions). Accordingly, they must arrange to mitigate these environmental risks by managing the level of emissions in compliance with the National Environmental Quality Standards (NEQS). The establishment of food-testing laboratories may require an EIA or initial environmental examination (IEE), depending on the size and location of each laboratory. Before construction, a no-objection certificate from the Punjab Environmental Protection Agency (EPA) must be obtained under the Punjab

Environmental Protection Act (PEPA) 2012. The capacity of the Food Department with respect to compliance with the PEPA 2012 remains limited.

- g. **Environmental Effects of Rural Enterprises:** Investments in agribusiness could result in the implementation of physical projects, most of which will be relatively small-scale/low-risk. Implementation of these projects – with respect to the size of enterprise – may require environmental approvals (EIAs and IEEs) from the Punjab EPA. Most agribusinesses are not likely to be subject to EIA/IEE requirements under the PEPA 2012 rules and regulations.
- h. **Impacts of Climate Change:** The Program supports increased public sector investments in CSA, a diagnostic of the existing crop insurance system, the design of a pilot insurance program, implementation of the pilot program in two districts, and the rollout of the insurance program in all districts. The insurance program will create financial resources for farmers to mitigate the effects of natural disasters linked to climate change. This will also help improve farmers' resilience to climate change impacts. Other than stress-tolerant crop varieties, investments in sustainable water management, improved agricultural inputs, research in the agriculture and livestock sectors, and crop insurance will contribute proportionately to making the agriculture sector more climate-resilient. From an environmental standpoint, climate-smart activities will benefit the environment.

22. **Policy and Legal Framework:** The Government of Pakistan and the GoPunjab have enacted a range of laws, regulations, and procedures relevant to the environmental and social effects of the proposed Program. The federal and provincial environmental and social management systems applicable in Pakistan and the province of Punjab are, from a legal and regulatory perspective, appropriate and comprehensive. On paper, the scope of these systems is considered adequate to address the underlying environmental and social risks. Thus, no significant changes to the overall structure of the applicable legal and regulatory systems are envisioned or proposed under this operation.

23. **Institutional Capacity:** The institutional capacity for managing environmental and social risks is variable. The key implementing institutions in charge of reform (the Departments of Agriculture, L&DD, Food, and Irrigation) have good environmental management capacity. In some cases (such as the Agriculture Department), this capacity has been strengthened through implementation of a number of World Bank-funded projects and their performance has been satisfactory and in compliance with the PEPA 2012. However, the environmental management capacity of the relevant institutions should be increased with regard to human resources, technical knowledge of environmental and social management, and/or the financial capacity to operate the system as designed.

24. **Compliance with Bank Policy Core Principles:** Generally, the applicable environmental and social management systems at the federal and provincial levels are appropriate and comprehensive, albeit with some gaps in relation to the principles of the ESSA. These include: limited enforcement of screening, implementation capacity, lack of coordination, evaluation of alternatives, cumulative impact assessments, meaningful consultation, and supervision.

E. Recommendations and Proposed Actions

25. The following recommendations and proposed actions focus on institutional strengthening with regard to: capacity and finance, the development of standard operating

procedures and better enforcement of the regulatory framework and guidelines, undertaking technical studies, and developing sustainability frameworks.

Social Aspects

26. The following recommendations have been devised based on a review of the systems currently in place vis-à-vis the PforR principles and institutional arrangements for program implementation.

Institutional Measures

27. As SMART seeks to fundamentally alter established practices in agriculture in the province, rural communities could face longer-term impacts that are difficult to foresee at this stage. The capacity of the relevant departments to carry out such sustained analysis is relatively low, both in terms of resources and time. SMART should, therefore, incorporate institutional structures that will track, analyze, and eventually work to mitigate negative effects and replicate positive ones where applicable. The Program needs to institute a system of continuous oversight and feedback by establishing an overall Social Management Framework under which capacity can be established in the PCMU (and, where appropriate, in PDUs) to track the poverty, social exclusion, and gender issues arising from the implementation of the reforms. The PCMU should take the lead in developing guidelines for social risk screening for the units concerned, incorporating its newly instituted communications expertise to maximize effective outreach. Each of the implementing departments should have some form of grievance redress mechanism in place; these can be engineered to make them available for feedback on SMART at the grassroots level, in addition to more general use.

Engagement and Outreach

28. The Program needs to institute systems of consultation and debate. Discussions with government departments have revealed that a participatory outreach strategy to communicate the details of the proposed reforms to the stakeholders concerned is being developed. The elements of this strategy are being finalized, but this effort should go beyond simply informing stakeholder groups of reform measures that have already been decided on. Instead, it is important to get feedback on how stakeholders – particularly small farmers and the landless – see these measures and what effects they anticipate.

29. As part of its communications strategy, the GoPunjab should hold consultations with consumer groups to explain why the price caps have been removed and how this could benefit consumers.

30. An outreach strategy is needed to apprise market committee members, commission agents, traders, and farmers of the details of the new legislation.

31. The Punjab Agriculture Food and Drug Authority, which is responsible for testing pesticide residue, should promote food safety awareness among consumers.

Promoting Better Access

32. The Department of Agriculture should extend the subsidy on potash and other fertilizers to as many retail brands as possible, particularly market leaders, so that its effects are spread more widely. The procedures for obtaining subsidized agricultural inputs should be simplified as far as possible to give small farmers easier access. At the same time, the government should

think of moving toward a targeted subsidy, based on information from the various databases it is building.

33. The Department of Agriculture should also ensure that the matching grants scheme is structured such that (a) small companies and entities, including those owned by women, are encouraged to apply and that (b) they face a level playing field.

34. The Food Department needs to devise a strategy to cushion the impact of fluctuations in wheat prices. It will be essential in the short run to protect small farmers in particular, even those who do not use the government's procurement system. The government is considering compensation proposals in this regard and these should be in place before the reform is implemented. The Bank has agreed with the government to provide significant technical assistance to assist the Food Department during this transition.

35. A concerted effort is needed to encourage small and medium farmers to move toward the production of high-value crops, with the provision of quality seed and market information being the primary policy tools in this regard. Agricultural extension services can go a long way toward documenting the concerns and needs of small farmers, and then providing counsel on the available options. The review of existing agriculture extension services should also take stock of such needs and make recommendations in this regard to inform the new agriculture extension policy and strategy that will be approved under SMART. An appropriate, agro-ecological zone-specific strategy should be devised and extension workers trained to disseminate information accordingly.

36. The Livestock and Dairy Development Department has made considerable effort to improve its visibility in the field by increasing the number and presence of field personnel. However, it needs to strengthen these efforts further to meet communities' high expectations. Timely approval of the draft Punjab Water Policy and draft Punjab Integrated Water Resources Management and Regulation of Groundwater Act is essential to lay the foundation for improvements in the sustainability of groundwater use. Better collection of *abiana* should be effected in consonance with improved service and the institution of more equitable means of water distribution.

Research

37. There is a need for focused research on issues and areas that would specifically benefit small and medium farmers and agricultural workers, including women. The new agriculture and livestock research policy and strategy that will be approved under SMART should include provisions in this regard. Focusing on women is especially important as many more are expected to become active in the sector with the transition to HVA.

38. The Department of Livestock and Dairy Development should undertake a detailed analysis of the possible effects of removing price caps on meat and milk on urban and rural households and on vulnerable categories, particularly women and children in households. This assessment should identify the requisite mitigation measures and be completed before the price caps are removed.

Environmental Aspects

39. Recommendations related to environment include actions to improve implementation capacity, specific environmental management measures for selected activities, monitoring,

research to improve environmental knowledge, and mainstreaming environment and climate change. These are outlined below, followed by the line department(s) responsible:

Implementation Capacity

40. Conduct training in environmental risk management for the following GoPunjab line departments: L&DD, Food, Industry, Irrigation, P&D, and the Directorate of Pest Warning and Quality Control of Pesticides – by June 2018, EPA.

41. Train farmers in integrated pest management and the balanced use of fertilizers – by June 2018 and continuously thereafter, Department of Agriculture.

Specific Environmental Management Measures

42. Ensure that subprojects that do not fall under the PEPA 2012 (such as micro, small and medium enterprises) apply the ESMF before the approval of matching grants – Department of Industry.

Monitoring

43. Monitor agribusiness for compliance with the NEQS – annually, EPA.

44. Establish a baseline of fertilizer application for each HVA and monitor the level of application to ensure that it does not exceed the optimal amount – by December 2017 and biannually thereafter, Department of Agriculture.

Research to Improve Environmental Knowledge

45. Ensure the optimal use of fertilizer and pesticides under different cropping patterns – by March 2018, Ayub Agriculture Research Institute, and Department of Agriculture.

46. Disseminate research outputs among farmers to encourage them to avoid using untreated wastewater for irrigation purposes and to make them aware of the associated risks.

Mainstreaming Environment and Climate Change

47. Establish a Climate Change Extension Cell in the Agriculture Department – by June 2018, Department of Agriculture.

1. INTRODUCTION: SCOPE OF PROPOSED PROGRAM, PDO AND DLIs¹

Context

48. After a weak performance in the fiscal year (FY) 2015/16, the agriculture sector in Pakistan picked up during FY16/17 and grew at 3.5% due to improved performance of cotton, sugarcane, and maize. However, enhanced and improved allocation of investment in agriculture and agriculture-based value chains is required for agricultural and rural transformation, as well as for sustained economic growth and poverty reduction. Agriculture growth is held back by slow adoption of new technologies; weaknesses in agricultural research and extension services; low water productivity largely due to poor water pricing policies and weak irrigation management; poor access to finance; and, perhaps mostly, by inappropriate policies. Ample evidence confirms that subsidies, agricultural support prices, caps on meat and milk prices, low investment, and weakening institutions support investment in traditional crops at the expense of HVA, discourage efficient water use, and ultimately suppress agricultural growth. Important considerations for future growth for the sector include: (i) rapid shift in domestic demand away from food grains to high-value agriculture products; (ii) a significant, yet largely unexploited, comparative advantage for a number of products providing opportunities for generating export revenues and creating jobs; and (iii) use of irrigation water has reached its upper limit, and future improvements in productivity would need to rely on “more crop per drop”, with a view to ensure enhanced resilience of agricultural production systems to climate change. Punjab is an important province for agriculture in Pakistan. 72.6% of national cropped area and 77.7% of the country’s irrigated area are located in this province. The province’s shares in national production of wheat, cotton, rice, sugarcane and maize are 77%, 73%, 52%, 63%, and 78% respectively.² The performance of Punjab’s agriculture sector is therefore crucial to any strategy for generating accelerated GDP growth in both the province and Pakistan.

Program Description

Program Development Objective(s)

49. The Program Development Objective (PDO) is to increase the productivity of crop and livestock farmers, improve their climate resilience, and foster agribusiness in Punjab.

Key Program Results

50. The proposed Program is expected to contribute to three Results Areas, which are detailed below. The proposed PDO indicators are:

- a. *Results Area 1 (increased on-farm productivity and value of agriculture and livestock):*
 - i. *PDO Indicator 1: Farmers reached with agricultural assets or services (gender disaggregated)*
 - ii. *PDO Indicator 2: Area under high-value agriculture (HVA)*
- b. *Results Area 2 (increased value addition and competitiveness of agriculture and livestock):*

¹ For a full description of the program scope, PDO and DLIs as well as the development and economic context of this operation, please refer to the Program Appraisal Document.

² Government of Punjab, Agriculture Department. 2015. *Punjab Agriculture Sector Plan 2015*, p. 12. Retrieved from <http://agripunjab.gov.pk/system/files/Agri%20Sectoral%20plan%202015.pdf>

- i. *PDO Indicator 3: Beneficiaries reached with financial services (gender disaggregated)*
- ii. *PDO Indicator 4: Number of private wholesale markets and collection centers established*
- c. *Results Area 3 (enhanced resilience of smallholder farmers to climate change and natural disasters):*
 - i. *PDO Indicator 5: Farmers covered by agricultural insurance (gender disaggregated)*
 - ii. *PDO Indicator 6: Farmers adopting CSA packages*
 - iii. *PDO Indicator 7: Improvement in irrigation water service delivery*

Proposed Program-for-Results Operation Context: PforR Program Boundary

Government Program

51. The core of the Government of Punjab (GoPunjab)'s program towards agriculture and rural transformation is articulated in section 3.4 of the Punjab Growth Strategy 2018 "Improving Productivity in Agriculture and Livestock" and Chapters 6 ("Improving Agricultural Productivity and Market Access") and 7 ("Focusing on Livestock and Dairy") of the same document. The Government's vision is further described in the Punjab Agriculture Sector Plan 2015 and the Punjab Livestock and Dairy Development Policy 2015. The Punjab Skills Sector Plan 2018 and the Punjab Industries Sector Plan 2018 are also relevant in defining the Government's program.

52. The GoPunjab program has envisioned stimulating agriculture and rural transformation by enabling productivity, increasing competitiveness in agriculture marketing and trade, and enhancing resilience. The Government's vision is reflected in various planning documents including the Medium-Term Development Framework.

53. The Government's broader program is supported by a capital investment in agriculture, livestock, farm to market roads, and irrigation of US\$3.797 billion over five years (FY18 to FY22), out of which US\$1.145 billion is allocated to agriculture and livestock. In addition, there is a recurrent budget allocation of US\$0.330 billion for irrigation maintenance and repair (M&R) and US\$0.115 billion for human resources, bringing the size of the program expenditure framework to US\$4.242 billion. The GoPunjab also spends an estimated US\$515 million each year on agricultural subsidies including wheat (US\$333 million) as part of its recurrent expenditures. The Program for Results (PforR)-supported Government Program is limited to the allocation for agriculture and livestock, plus human resources and irrigation M&R, for a total of US\$1.59 billion.

The PforR Program: SMART

54. GoPunjab has requested the Bank to support the Strengthening Markets for Agriculture and Rural Transformation (SMART) Program under its PforR operations. SMART Punjab will support selected parts of the GoPunjab's broader program by helping the Government to bring transformational change in the agriculture, livestock, water resources (surface irrigation and groundwater) management, and the rural non-farm sector with a focus on increasing productivity, improving the functioning of markets including food safety, supporting the rural non-farm economy, and enhancing resilience and inclusiveness over a five-year period. The activities supported under SMART Punjab are mapped to three major Results Areas to improve

Table 1.1: Results chain for SMART Punjab PforR

Activity/Action	Outputs	Intermediate Outcomes	Outcomes	DLIs
Results Area 1: Increased on-farm productivity and value of agriculture and livestock				
<ul style="list-style-type: none"> ▪ Launch and implement E-Voucher Scheme for agricultural inputs over 5 years 	<ul style="list-style-type: none"> ▪ E-Voucher Scheme extended to 200,000 farmers with land holdings less than 5 ha. 	<ul style="list-style-type: none"> ▪ Improved access and use of quality farm inputs by small farmers through targeted subsidy 	<ul style="list-style-type: none"> ▪ Increased crop productivity 	<ul style="list-style-type: none"> DLI 1 – Improving access to quality farm inputs
<ul style="list-style-type: none"> ▪ Prepare series of background papers for Agricultural Policy document ▪ Conduct stakeholders’ consultation regarding main recommendations ▪ Produce review of existing agriculture & livestock research & extension policy and strategy ▪ Restructure Punjab Agriculture Research Board (PARB) Act 1997 ▪ Gradually increase financial support to agriculture and livestock research 	<ul style="list-style-type: none"> ▪ Punjab Agriculture Policy notified ▪ Punjab Crops and Livestock Research & Extension Policy and Strategy ▪ PARB Act 1997 amended ▪ Increased budgetary allocation for agricultural research from 0.1% of Ag GDP in 2017 to 0.4% in 2022 ▪ Competitive grants for research 	<ul style="list-style-type: none"> ▪ Adoption of strategic policy framework for agriculture sector, including research & extension ▪ Strengthened coordination between responsible agencies for implementation of policy framework ▪ Improved links between agricultural research and extension ▪ Increased private sector participation in agricultural research 	<ul style="list-style-type: none"> ▪ Improved efficiency of public investment in agriculture and livestock (including agriculture and livestock research) and increased private sector investment in agricultural research ▪ Improved functioning of crop and livestock research system ▪ Increased crop productivity 	<ul style="list-style-type: none"> DLI 2 – Revitalizing provincial crop and livestock research systems
<ul style="list-style-type: none"> ▪ Separating heads for curative and preventive health allocation in the budget ▪ Tilt financial support for animal health towards preventive care ▪ Promote breeding of high value stock 	<ul style="list-style-type: none"> ▪ Budgetary allocation ratio for animal preventive and curative healthcare increased from 65:35 in FY17 to 90:10 by FY22 ▪ 80% of previous year allocation for animal health spent ▪ Registration of selected species of livestock in progeny testing programs 	<ul style="list-style-type: none"> ▪ Public sector resources moved from curative to preventive animal healthcare ▪ Improved animal care and better breeding practices in the province ▪ Increased private sector participation in curative healthcare 	<ul style="list-style-type: none"> ▪ Increased livestock productivity 	<ul style="list-style-type: none"> DLI 3(a) – Improved livestock health DLI 3(b) – Improved livestock breeding
<ul style="list-style-type: none"> ▪ Gradually phase out the public wheat procurement system ▪ Tender for construction of bulk wheat storage facilities for up to 2 million tons (MT) 	<ul style="list-style-type: none"> ▪ Wheat strategic reserves reduced to no more than 2 million MT by 2021 ▪ Steel silos for bulk storage of up to 2 million tons of wheat established under private-public partnerships 	<ul style="list-style-type: none"> ▪ Wheat subsidy cost substantially reduced 	<ul style="list-style-type: none"> ▪ Wheat market distortions eliminated 	<ul style="list-style-type: none"> DLI 4(a) – Modernizing the wheat marketing system

Activity/Action	Outputs	Intermediate Outcomes	Outcomes	DLIs
<ul style="list-style-type: none"> ▪ Promote HVA in the province 	<ul style="list-style-type: none"> ▪ Increased capital investment in HVA from 3% in FY17 to 15% of the agriculture ADP allocation by FY22 	<ul style="list-style-type: none"> ▪ Discouragement of wheat production and increased adoption of HVA by farmers 	<ul style="list-style-type: none"> ▪ Shift from wheat to HVA 	DLI 4(b) – Transitioning to HVA
Results Area 2: Increased value addition and competitiveness of agriculture and livestock				
<ul style="list-style-type: none"> ▪ Establish Agribusiness and Innovation Fund ▪ Develop matching grants manual ▪ Attract interest of investors in agribusiness through calls for proposals ▪ Evaluate proposals and extend grants to successful applicants 	<ul style="list-style-type: none"> ▪ Agribusiness and Innovation Fund established ▪ Operational Manual for the Fund notified 	<ul style="list-style-type: none"> ▪ Matching grants promote private sector engagement in value addition and agribusiness 	<ul style="list-style-type: none"> ▪ Increased value addition of agri-products ▪ Increased employment opportunities 	DLI 5 – Providing incentives to agribusinesses for investments in value addition and agricultural technology
<ul style="list-style-type: none"> ▪ Refraining from announcing price caps for meat and raw milk 	<ul style="list-style-type: none"> ▪ Market-based pricing for meat and raw milk 	<ul style="list-style-type: none"> ▪ Increased competition and improved transparency in livestock markets 	<ul style="list-style-type: none"> ▪ Livestock market partially deregulated 	DLI 6 – Improving market conditions for meat and raw milk
<ul style="list-style-type: none"> ▪ Submit Punjab Agriculture Markets Regulatory (PAMRA) Act for approval 	<ul style="list-style-type: none"> ▪ PAMRA Act approved and enforced ▪ Relevant rules notified 	<ul style="list-style-type: none"> ▪ Increased private sector participation and investment in agricultural produce marketing ▪ Gradual phasing out of public sector control over agricultural markets ▪ Transition to new legal regime by 2021 for agriculture markets 	<ul style="list-style-type: none"> ▪ Modern and more competitive agriculture produce markets 	DLI 7 – Modernizing agricultural produce markets
<ul style="list-style-type: none"> ▪ Establish food safety testing laboratory infrastructure 	<ul style="list-style-type: none"> ▪ Agriculture produce and food testing infrastructure established at provincial, regional, and divisional level 	<ul style="list-style-type: none"> ▪ Enforced agriculture and food safety standards 	<ul style="list-style-type: none"> ▪ Improved food safety 	DLI 8 – Improving food safety
Results Area 3: Enhanced resilience of smallholder farmers to climate change and natural disasters				
<ul style="list-style-type: none"> ▪ Submit Punjab Water Policy for approval followed by notification ▪ Submit Punjab Groundwater Act for approval followed by notification 	<ul style="list-style-type: none"> ▪ Punjab Water Policy approved and notified ▪ Groundwater (Protection, Regulation, and Development) Act approved and notified ▪ Abiana revenues increased to PKR1.8 billion 	<ul style="list-style-type: none"> ▪ More equitable water distribution ▪ Improved financial sustainability of maintenance and repair of surface irrigation 	<ul style="list-style-type: none"> ▪ Improved sustainability of irrigation system 	DLI 9 – Improving sustainability and efficiency of irrigation

Activity/Action	Outputs	Intermediate Outcomes	Outcomes	DLIs
<ul style="list-style-type: none"> ▪ Improve assessment of abiana by introducing modern assessment methods ▪ Improve collection of abiana ▪ Improve measurement and monitoring of water delivery in 6 canals 	<ul style="list-style-type: none"> ▪ Delivery Performance Ratio in 7 canals brought to 90% 	<ul style="list-style-type: none"> ▪ Better management of groundwater resources 		
<ul style="list-style-type: none"> ▪ Prepare diagnostic report for agricultural insurance ▪ Prepare Operational Manual for agricultural insurance ▪ Pilot agricultural insurance system in at least two districts ▪ Roll out agricultural insurance system to other districts 	<ul style="list-style-type: none"> ▪ Gradual roll out of crop and livestock insurance ▪ Operational Manual governing agriculture insurance approved and notified 	<ul style="list-style-type: none"> ▪ Affordable and accessible agricultural insurance products available for all farmers 	<ul style="list-style-type: none"> ▪ Improved farmers' resilience through enhanced access to crop and livestock insurance 	DLI 10 – Rolling out an agriculture insurance system
<ul style="list-style-type: none"> ▪ Increased investment in climate-smart agriculture (CSA) including technologies and projects from 3% in FY17 of total capital allocation to agriculture sector to 15% in FY22 	<ul style="list-style-type: none"> ▪ Farmers reached with government-supported CSA programs 	<ul style="list-style-type: none"> ▪ Adoption of CSA technologies 	<ul style="list-style-type: none"> ▪ Enhanced resilience of small farmers to climate change 	DLI 11 – Increasing public investment in climate-smart agriculture
<ul style="list-style-type: none"> ▪ Develop and implement communications strategy, including beneficiary feedback ▪ Develop and implement series of annual capacity development plans in agribusiness, institutional strengthening in key participating GoPunjab Departments and other government organizations over five years 	<ul style="list-style-type: none"> ▪ Communications strategy developed and implemented, beneficiary feedback obtained ▪ Annual work plans for capacity building/training and institutional training developed ▪ Projects approved for improved monitoring and evaluation (M&E) systems in key participating departments 	<ul style="list-style-type: none"> ▪ Stakeholders well informed about policy reforms ▪ Institutional training and capacity building in participating departments strengthened ▪ Improved quality of proposals submitted to agribusiness fund ▪ Strengthened ICT-based M&E systems in Agriculture, Food, and Livestock & Dairy Development Departments 	<ul style="list-style-type: none"> ▪ Improved buy-in of stakeholders ▪ Improved planning and delivery systems in participating departments ▪ Improved M&E capacity in participating departments 	DLI 12 – Communications, beneficiary feedback, capacity building and monitoring and evaluation

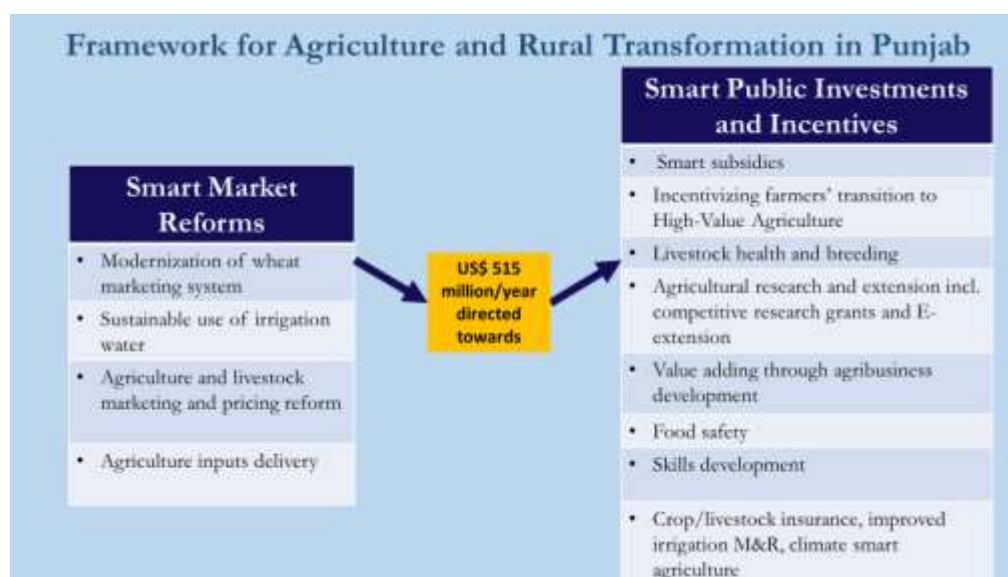
the allocation and management of public expenditures on agricultural and rural development. The links between the selected activities and preliminary Disbursement-Linked Indicator (DLI) targets of the Program are presented in detail through a results chain formulation in Table 1.1.

55. The SMART PforR will focus on three key Results Areas that are closely aligned to the SMART government program. Each of these Results Areas will involve a specific combination of policy reforms, institutional strengthening and public investments.

56. **Results Area 1: Increased on-farm productivity and value of crops and livestock.** This first key result will be achieved through support to SMART reforms in the policy regime governing the farm and non-farm sectors, leading to a reorientation of public expenditures from subsidies towards targeted investments aimed at increased productivity, shift towards HVA commodities, improved water efficiency, productivity and management, deregulation of farm and non-farm markets, and further development of value chains. Improved targeting of remaining subsidies forms a key part of this program result. Interventions will span policy aspects of diversification to high value commodities including modernization of wheat marketing; removing price caps on milk and meat products; improving agricultural marketing; promoting agriculture research and innovative extension; improving animal healthcare and breeding; and promoting private services delivery, quality inputs and skills development.

57. **Results Area 2: Increased value addition and competitiveness of crops and livestock.** Allocations to agriculture should increase substantially by utilizing some of the resources released as a result of policy and institutional reforms. Improved public investment targeting will be achieved by strengthening the planning process underpinning the allocations in the Annual Development Plan (ADP) and providing performance incentives for participating departments and the private sector to develop and implement policies and investments that aim to stimulate agriculture growth, promote post-harvest management and value chains, and improve food safety. Implementation of SMART will require high-level coordination among the major departments driving agriculture, livestock, irrigation and agribusiness development in the province. In the public sector the planning, approval and monitoring of public investments will be improved with the ADP brought into line with the SMART framework (see Figure 1.1 below) and the improved policy regime. The SMART framework will also promote these public investments to be made in partnership with the private sector to increase their leverage, relevance and efficiency, e.g., private-public partnerships to support research and development (R&D), extension services, irrigation, silos and agricultural markets. To alleviate access to finance constraints in the private sector, a matching grants scheme will be developed with special emphasis on including women and youth entrepreneurs to further stimulate private sector investments in both the farm and non-farm rural economy. This would include matching grants for agro and agro-industrial entrepreneurs and associations that promote investments, set standards, and build regional and international linkages. The grant scheme would be implemented and function independently with oversight from government and industry to promote transparency and attract quality private sector applicants into targeted agribusiness subsectors. The fund would focus on commercial activities that are matched by the benefitting companies and share the investment risk, leverage private sector funds, and ensure a wider social impact, such as drawing smallholder farmers into HVA value chains.

Figure 1.1: SMART Framework for Agriculture and Rural Transformation



58. **Results Area 3: Enhanced resilience of smallholder farmers to climate change and natural disasters.** Punjab needs to make concerted efforts at adaptation to conserve its water resources and build resilience. The third key result will be achieved through support to improved agricultural insurance products and extend their coverage, improved water use assessment and groundwater management, and improved irrigation infrastructure M&R contributing to higher water efficiency, productivity and security. In recognition of the fact that improved agricultural policies and public investment allocation will have to be accompanied by institutional change, the PforR will support strengthening the institutional capacity of, and trans-sectoral linkages between, key public institutions responsible for agriculture and rural development including the agriculture, livestock, irrigation, food, industries, finance, and planning & development departments, as well as selected other agencies including the Punjab Agricultural Research Board (PARB). Institutional strengthening and change also imply a reorientation of the functions of public institutions away from direct market interventions towards control and enforcement; e.g. the Food Department would move away from focusing on wheat procurement towards ensuring food safety.

ESSA Methodology

59. The ESSA has been prepared by the Bank task team in accordance with the requirements of Bank policy PforR and associated Interim Guidance Note for PforR operations. Specifically, the ESSA was developed based on (a) a review of existing policies, acts, regulations, frameworks, and guidelines; (b) list of questions prepared for each stakeholder institution in the light of configuration of the Program stated in the PAD and role and responsibilities allocated to each stakeholder institution; (c) meetings and interviews with different stakeholders, particularly those involved in the environmental and social assessment as well as planning, implementation, and monitoring of proposed activities; (d) an assessment of relevant environmental and social management systems relative to the PforR principles; (e) an assessment of the capacity and performance of institutions; (f) development of an action plan to enhance environmental and social management capacity and performance; and (g) development of recommendations. The formulation of the ESSA was supported by a consultative process involving key stakeholders. Consultation workshops on the draft ESSA were carried out in October 2017 to better understand the environmental and social concerns of stakeholders and to seek feedback on the findings and recommendations of the ESSA team.

60. With regard to the social systems assessment in particular, the methodology for the ESSA included three distinct elements. The first consisted of key informant interviews with concerned departments to understand the contours and implementation processes of key reforms proposed, as well as to understand the motivation behind them. The second element consisted of a limited number of focus group discussions (FGDs), which were arranged to get feedback directly from communities, or special interest groups, to assess possible impacts on different categories of stakeholders. The breakdown of these groups is given in Table 2.2, but they covered male and female members of farming communities in four districts, Lahore, Multan, Kasur and Nankana. Annex I and II give the list of persons met, and locations for fieldwork respectively.

61. The choice of districts was dictated by the need to cover northern and southern regions of the province. The initial plan was to hold FGDs in the rural areas of Lahore and Multan, to ensure ease of access. This was important given the limited timeframe in which the FGDs were to be completed. In reality though, the rural areas of Lahore were found to be rapidly urbanizing to the point that communities relying mainly on farming can hardly be found in the district. The fieldwork was then shifted to Kasur and Nankana, although one FGD in Lahore was also documented. Kasur is also a rapidly urbanizing district, while more traditional forms of agricultural practice are found in Nankana. Multan was retained as the site of FGDs in south Punjab as rural areas in the district offered enough variation in agricultural practices and livelihoods of communities to justify the choice.

62. In addition, FGDs were also held with members of Market Committees, commission agents, and two farmer's organizations, the Kissan Ittehad, consisting mostly of farmers with medium landholdings (up to 20 hectares) and the Farmers Association of Pakistan (FAP), which consists mainly of farmers with large landholdings (above 40 hectares).

2. ENVIRONMENTAL AND SOCIAL IMPACTS OF THE PROPOSED PROGRAM

63. Overall, the proposed Program as defined by the PDO, Results Areas, and DLIs poses some environmental and substantial social risks.

64. The environmental issues associated with the Program include: (a) increased use of fertilizers and pesticides due to the shift from conventional crops to HVA crops (mainly fruits and vegetables), (b) food safety, (c) institutional capacity for effective environmental management, (d) inadequate water management, and (e) environmental compliance by micro and small enterprises and testing laboratories.

65. In the case of social systems assessment, the risks relate to (a) access to Program benefits by vulnerable and marginalized groups, and (b) social conflict. The following sections provide a detailed overview of the likely range of environmental and social issues that were identified during the ESSA. The sections describe both the nature and significance of these risks with respect to five key concerns: (a) likely impacts, (b) environmental and social context, (c) sustainability, (d) institutional and capacity risks, and (e) reputational risks.

66. A summary of these risks is given in Table 2.1 below. The risk profile is a result of the analysis presented in this chapter and considers the existing capacity and potential effects associated with the activities envisioned under the proposed operation.

Table 2.1: Summary of Social and Environmental Risks

#	DLI	Social		Environment	
		Potential Risks	Risk Rating	Potential Risks	Risk Rating
Result Area 1					
1	Improving access to quality farm inputs	Agricultural input subsidies will have positive impacts on small farmers in general. However, small farmers may not benefit as much as expected due to low coverage and complex procedures. Under the Program, input subsidies will be more closely targeted at small farmers.	Low	Balanced use of fertilizer will have environmental benefits such as reductions in soil and water contamination, improved soil nutrient balances, and downstream eutrophication of water resources if farmers are trained in proper application of fertilizer.	Moderate to low, if management measures are in place.
2	Revitalizing provincial crop and livestock research systems	Beneficial social impacts if research is directed into areas concerning small and medium farmers, including women, and the landless.	Low	Research itself will not generate effects on the environment, but strengthening research capacity can help address environmental issues such as proper fertilizer use and prevention of crop residue burning.	No risk
Result Area 2					
3	Improving livestock health (3a) and improving livestock breeding (3b)	While better outreach services and a focus on preventive care could have significant social benefits for all farmers, farmers in the field had	Low	Healthier and more productive livestock will deliver multiple environmental benefits. These may include less pressure on rangelands, a	Low, if management measures are in place.

#	DLI	Social		Environment	
		Potential Risks	Risk Rating	Potential Risks	Risk Rating
		higher expectations of service delivery and expressed some reservations about the quality of service. The DLI carries a low institutional risk in that it may not lead to the expected level of uptake of services.		lower disease burden on rural communities sourced from livestock, better community health owing to an increased supply of nutrients due to increases in milk supplies, etc.	
4	Modernizing the wheat marketing system (4a) and transitioning to high value agriculture (HVA) (4b)	There are political risks in that the government's policy of withdrawal from the wheat market could come in for criticism from the politically influential farm lobby. There is also the risk of excluding small and vulnerable categories of farmers with regard to the shift to HVA, if the requisite inputs and information services are not specifically targeted at these groups and if extension services are not mobilized to provide support.	Substantial	Transition from conventional crops to HVA crops could help reduce fertilizer use depending on the type of HVA crop. Pesticide use could increase for vegetables and fruits.	Moderate, if management measures are in place.
5	Providing incentives to agribusiness for investment in value addition and agricultural technology	Benefits will accrue to small businesses if the terms of engagement with the grant-making body are specified such that considerations of equitable access to the grants are paramount. If the enterprise is conducted with inclusion as an objective, there is no risk.	No risk if inclusion is an objective.	Increased emissions and waste production resulting from the implementation of physical investments are expected to be relatively small because of the nature and modest scale of most agribusinesses.	Low, if management measures are in place.
6	Improving market conditions for meat and raw milk	Producers will benefit from price increases, but their negotiating power with middlemen is generally weak. A positive effect is the removal of a rent-seeking mechanism for public officials. Possible negative impacts on low-income households, which are largely dependent on the sale of unpackaged milk in small towns, peri-urban areas, and low-income	Moderate	Income increases, less pressure on rangelands, and improved public health. Deregulation of livestock will bring in corporate market actors who will focus on higher productivity per animal rather than increases in animal numbers.	Moderate to low, if management measures are in place.

#	DLI	Social		Environment	
		Potential Risks	Risk Rating	Potential Risks	Risk Rating
		<p>areas in large cities as prices of essential commodities such as unpackaged milk may rise.</p> <p>Overall, the social effects of this DLI need more investigation.</p> <p>Possible opposition from consumer rights groups.</p>			
7	Modernizing agriculture markets	<p>Positive effects from loosening the autocratic control of government-appointed market committees. However, more transparency is needed on how the provisions of the Act will be implemented.</p> <p>Risks include possible agitation from current members of market committees, who will lose authority.</p>	Low	Promotion of HVA, reduction in the use of fertilizer, improvement in market infrastructure, and hygiene through improved service delivery with increased role of the private sector.	Low
8	Improving food safety	<p>Ensuring food quality is crucial for the health and safety of citizens.</p> <p>No negative social effects.</p>	No risk	The construction and operation of laboratories might generate contaminated wastewater, hazardous solid waste, and air pollution.	Moderate, if management measures are in place.
Result Area 3					
9	Improving sustainability and efficiency of irrigation	<p>This DLI is associated with political risk as any attempt to regulate <i>abiana</i> collection or the use of groundwater is potentially contentious and may be opposed by the powerful farm lobby. Furthermore, if increased collection does not correspond to better delivery services and more efficient distribution, it may provoke a negative reaction. The Irrigation Department may revise the current assessment system to use modern methods, at which stage the risk assessment should be re-examined.</p>	Substantial	Better maintenance of irrigation infrastructure, more productive and efficient use of water, decrease in waterlogging and salinity, higher crop yields, and improved farm incomes.	Low, if management measures are in place.

#	DLI	Social		Environment	
		Potential Risks	Risk Rating	Potential Risks	Risk Rating
10	Rolling-out an agricultural insurance system	The proposed program takes into account the needs of small farmers and does not carry any social risks.	No risk	Increased resilience of farmers against natural disasters caused by climate change.	Low, if management measures are in place.
11	Increasing public investment in climate-smart agriculture	No negative social effects.	No risk	Increased resilience of crops against climate change, more judicious use of water resources and use of fertilizers and pesticides depending on the type of resilient crop.	Low, if management measures are in place.
12	Communications, beneficiary feedback, capacity building, and monitoring and evaluation	No negative social effects.	No risk	Communications, M&E will help measure the impact and progress of the overall Program.	No risk

Social Benefits and Risks

Context

67. Agriculture is the single largest sector in Pakistan’s economy, contributing about a fifth of the GDP and employing just over 40% of the total workforce. However, the sector has suffered a period of low growth over the last decade, with annual growth rates averaging just 2.2% for the six years from FY09/10 to FY15/16.³ This has implications for the substantial number of employed workers in Pakistan in general, and in Punjab in particular, who rely on the sector for a livelihood. In general, agricultural communities have traditionally comprised the most deprived members of society, including landless laborers, small tenant farmers, and nomadic communities who rely on seasonal agricultural labor. Combined with the abysmal state of public services in many rural areas, a significant proportion of the population reliant on agriculture is vulnerable to economic shocks and liable to experience poverty at regular intervals, if not subject to chronic poverty.

68. Preliminary results from the census of 2017 place the size of the rural population in Pakistan at about 135 million (of a total population of 207 million). The total population of Punjab is estimated at just over 110 million, of which almost 64% are estimated to be living in rural areas, thus placing the rural population of the province at about 70 million. Estimates of rural poverty differ by agro-climatic zone in Punjab and fall within a significant range, from 50% of all households in south Punjab (the low intensity belt) to only 15% in *barani* (or rain-fed) areas in northern Punjab.⁴ Poverty is particularly prevalent among non-farm (or landless) households, with 42% of such households falling below the poverty line, compared to 22% of

³ Based on calculations from the Pakistan Economic Survey for 2016/17, published by the Economic Advisor’s Wing of the Ministry of Finance. Pakistan does not publish provincial GDP or sectoral growth estimates, so the figures are for the country as a whole. Punjab, is however, estimated to contribute more than half of total agricultural GDP in the country.

⁴ Haroon Jamal. 2014. *Profiling Rural Pakistan for Poverty, Inequality and Social Exclusion*, Research Report No. 91. Karachi: Social Policy and Development Centre.

landowning households. Among small farmers (those with less than 5 hectares of land), 22% fell below the poverty line, while among medium and large farmers (those with more than 5 hectares), poverty incidence was significantly lower at just over 8% of all households.

69. There are an estimated 5.25 million farms in Punjab, of which 82% are farmed by owners, while the rest are farmed either by owners along with tenants (8.5%), or by tenants alone (9%).⁵ Of the total farms, an overwhelming 92% are classified as small farms of less than 2 hectares, while medium farms (classified in the study as farm holdings of 2 to 10 hectares) account for 6% of all farms and the rest consist of large farms. In terms of area, though, small farms (less than 2 hectares) account for only 58% of the total farmland, while large farms (more than 10 hectares) cover almost a quarter of the total available farmland.⁶ In effect, land distribution in the province is heavily skewed, with an estimated 2.4% of farmers owning almost a quarter of the total farmland.

70. Punjab’s rural economy is characterized by an unequal distribution of resources and a proliferation of small landholders who do not necessarily have access to policymakers and legislators who formulate strategies for the agriculture sector. Unless a concerted effort is made to make agricultural policy more inclusive, this stratum is in danger of being left out of the analysis. Policies that aim to boost productivity tend to focus on a certain segment (larger farmers), given that small landholdings are generally less productive and large farmers are better placed to adopt innovative practices in addition to having better access to improved inputs. A focus on productivity does, however, risk losing sight of the vast majority of players in the sector who are barely able to eke out a living from subsistence agriculture.

71. Given this context, the potential social risks for some DLIs are significant, as mentioned in the table above. The assessment of social risks is based on key informant interviews with government officials from key implementing departments, and on FGDs in the field. The latter were structured as detailed in the table below.

Table 2.2: Focus Group Discussions

Location	Male Farmers	Female Farmers	Commission agents or Mkt Committees	Farmers Organizations
	Number			
Lahore	1	-	2	2
Kasur	2	1	-	-
Nankana	1	1	-	-
Multan	3	2	2	
Total	7	4	4	2

Summary of Social Risks

72. The ESSA reveals that there are extremely low risks regarding land acquisition and resettlement and no risks regarding Indigenous Peoples as none are known to reside in the Province. The key risks associated with the Program can be grouped under (a) access to program benefits for vulnerable and marginalized groups, and (b) social conflict (Core Principles 5 and 6 of the ESSA). The assessment of social risks is divided by DLI, as given in

⁵ Asad Naseer et al. 2016. ‘Current Status and Key Trends in Agricultural Land Holding and Distribution in Punjab, Pakistan: Implications for Food Security’, *Journal of Agricultural Studies*, 4(4): 14–27, Table 1.

⁶ *Ibid.*, Table 2.

the next section, but we begin with a more general assessment of risks going across the Program.

73. With regard to the first Results Area (increased on-farm productivity and value of crops and livestock), small farmers could benefit from the subsidy on agricultural inputs and from improved vaccination services for livestock. Withdrawing the support price mechanism for wheat could, however, cause significant volatility in the market, which would affect all producers, including the majority (particularly the majority of small farmers) who do not sell wheat to the Food Department, but who can negotiate terms with the *arti* or middleman based on the support price. Consumers of wheat flour, on the other hand, would benefit from the removal of a price floor on wheat. On balance, phasing out the wheat procurement system alone has significant implications (positive for consumers and negative for producers who are net sellers) for large sections of the population.

74. The policy of helping farmers transition into high-value crops needs more active engagement with communities on the part of agricultural extension services, otherwise there is a substantial risk that vulnerable categories of farmers might not access the benefits associated with this transition. The transition will require reliable and affordable supplies of good-quality seed for off-season vegetables, oilseeds, and other high-value crops; improved irrigation methods, including the use of drip irrigation; and technical support for small and medium farmers in particular. Farmers are also concerned whether they will find markets for high-value crops and need to be apprised of the possibilities. Such information systems need to be developed and rolled out.

75. The second Results Area, which focuses on value addition, will essentially deregulate markets for crop and livestock products. Some of these measures, such as removing the price caps on meat and milk, and checking collusion in the administration of wholesale markets, could benefit producers of agricultural products as well as retailers who would not have to deal with government machinery. However, consumers from low-income households who consume unpackaged meat and milk could be adversely affected. In general, it is true that price caps are an anachronism in modern economies and their enforcement is costly and often ineffective. They may also have adverse effects on public health by perpetuating the lack of incentive to improve the quality of produce and by encouraging adulteration. This does not, however, absolve the government of its duty to protect the consumer – not through price caps perhaps, but by regulating the quality of products. A first step has been made in this regard through SMART, with the establishment of food-testing laboratories.

76. The third Results Area focuses on enhancing resilience to disasters and climate change through better maintenance of irrigation systems, the introduction of a crop insurance mechanism, and higher public support for climate smart agriculture. It carries no risk and is socially beneficial in that instituting a culture of payment for use of a scarce resource such as water is essential, while insurance systems and further research will benefit all tiers of the farming community. Nevertheless, service standards need to improve if the collection of user charges is to rise.

77. Overall, the SMART Program tackles some long-standing government-sponsored incentives to the farming community that are costing the public sector both financially as well as in terms of human resources for implementation. However, where possible, these need to be replaced with functioning targeting systems – private markets that can provide services to all categories of producers as well as better service standards. Agriculture employs more than 44% of the working-age population, but it does not allow for the regulation of employment terms,

nor does it provide social safety nets that can help smooth out significant fluctuations in the value of production, or allow for formal sector financing models to be rolled out at scale. Interventions in these areas are needed to make a positive difference to the lives of the 92% of farmers who live off landholdings of less than 2 hectares. Building capacity for research and analysis in the implementing departments, as detailed later, would go some way toward ensuring that the Program's benefits reach a wide swathe of stakeholders and that its social risks are mitigated.

Social Risks by DLI

78. Our assessment of social risks began with a more general investigation into the level of awareness of the GoPunjab's Kissan (Farmer) Package, the key features of which include the provision of an interest-free loan of PKR25,000 per acre for *rabi* (winter) crops and PKR40,000 per acre for *kharif* (summer) crops. These loans are given to small farmers and landless tenants. The field consultations reveal, however, that it is precisely these groups that find it difficult to produce the necessary documentation to avail the benefits of the package, as detailed below.

79. **Awareness of Kissan Package:** Although the SMART Program does not focus on the GoPunjab's Kissan Package per se, the field team assessed awareness of the facilities offered under this package as an indicator of the outreach of government assistance programs in a rural population, and also because at least some of the initiatives offered through SMART – such as the input subsidies and the initiative to promote agribusiness – are likely to be presented as components of this package.

80. The FGDs conducted in communities in Kasur, Nankana, and Multan indicate that small farmers in particular are not very confident of being eligible for the government's welfare schemes. Often, they cannot avail such facilities because they are unable to meet the terms and conditions of the offer, which include proving that they do not carry any loan liabilities from the formal banking sector, providing computerized certificates of accession and, in the case of landless tenants, providing copies of tenancy agreements with their landlords.

81. The discussions started with more general questions about the GoPunjab's Kissan Package and focused on probing the extent of farmers' knowledge of its components. In Kasur, it was mainly large farmers (those with over 20 hectares of land) who could quote details of the package – information that many of them had obtained from television. The same pattern was observed in Nankana, where only one farmer in an FGD of 12 persons had some details. In Multan, of three FGDs with male farmers, only two farmers in one FGD knew of the key features of the package.

82. Those who have heard of the package were of the opinion that many small farmers would be automatically excluded from at least the loan component, as the package requires that those applying for small loans do not have a bad credit history, and are not currently in debt to a formal banking institution. A number of small farmers have recently taken loans from the Zarai Taraqiati Bank Ltd and the rate of default on these loans is high, rendering them ineligible. Small farmers in particular feel that registering for the package benefits is a cumbersome process on account of the documentation they would have to produce, particularly proof of ownership in cases of jointly held property.

83. It is important to point out that, in the FGDs with female farmers and farm workers in both north and south Punjab, women repeatedly pointed out that they had never even thought of getting a loan from a formal banking institution, as in most cases their names did not appear

on land records, and in general they rarely ventured out to deal with government agencies and financial institutions. In one or two cases, women are acknowledged as owners of particular segments of land, but the official land records give the names of fathers or husbands.

84. In terms of information from farmers' organizations, the field team met with members of the Kissan Ittehad, consisting mainly of farmers with landholdings of 4 to 20 hectares, and members of the Farmer's Associates of Pakistan (FAP), consisting mainly of large farmers with holdings of more than 40 hectares on average.⁷ Their perspectives on the Kissan Package are quite different from one another. Members of the Kissan Ittehad are more skeptical, believing that applications for the loan scheme involve a series of complicated processes that cannot be fulfilled by small farmers. Only one person of a group of seven has registered through the Kissan Package. Farmers are aware of the Agriculture Department's house-to-house registration drive, but claim it has yet to begin, even though announcements to this effect have been made.

85. The FGD with the FAP yields some interesting insights from a group that is very aware of agricultural policy and highly educated. Members of this group also feel that small farmers will not really benefit from initiatives such as the Kissan Package loans because the debt burden on this group is already very high. Instead, the FAP representatives recommend a more market-based approach to relieve the problems of small farmers, with an emphasis on linking them to markets and ensuring a supply of inputs at reasonable prices, while also implementing policy that will benefit agriculturists. An example of the latter is the proposed ban on palm oil imports, which they claim will boost local oilseed production. They are also critical of a recent policy whereby imports of tomatoes were allowed from India just when the local crop had reached the market. According to them, this had resulted in a crash in prices and discouraged all farmers from moving toward vegetable cultivation.

86. **DLI 1: Improving access to quality farm inputs.** As mentioned earlier, this DLI refers to the implementation of the government's targeted input subsidies. While the subsidy program started with potash fertilizer⁸, it is currently being extended to other agricultural inputs (seed, other fertilizers).

Modalities

87. The potash subsidy is currently offered on the product of 12 companies, which do not include the two big market players in fertilizer – Engro and Fauji Fertilizer Company. The GoPunjab has been in negotiations with these two entities – which together control an estimated 70% of total fertilizer sales in Punjab – to fund a subsidy on their product. Talks have stalled because the GoPunjab has asked for guarantees that the sale price will be maintained at a certain

⁷ The FAP FGD was also joined by some members of the Potato Growers Association and Pakistan Agricultural Coalition, both groups representing mainly large farmers.

⁸ The subsidy on potash is currently delivered as follows. The subsidy voucher is placed in bags of certain brands of potash fertilizer. The voucher is in the form of a scratch card bearing a number. The purchaser sends this number, along with his computerized national identity card (CNIC) number, to a specified recipient by SMS. The recipient in this case is based at the PITB. The purchaser's CNIC number is checked against a database maintained at the PITB, which contains details of landholders and tenant farmers registered with the PLRA as well as farmers being registered for the government's Kissan Package under a house-to-house survey initiated by the Department of Agriculture. If the purchaser's CNIC is not in the database, he/she receives an SMS giving him/her a helpline number to call to be registered against proof of purchase. Once this process is complete, the subsidy amount, which comes to PKR800 on each bag of sulphate of potash and PKR500 on each bag of muriate of potash, is credited to the purchaser's mobile cash account, and he/she can redeem the money at any mobi-cash outlet of a specific cell phone company (in this case, Mobilink's Jazz Cash).

level, to which neither company is amenable. Negotiations are, however, continuing and gaining momentum as the government signals its plan to extend the fertilizer subsidy to urea and di-ammonium phosphate, in addition to potash. As of now, the potash subsidy is available on 12 brands, which together account for less than one-third of the total market. Having said that, as per the data available from the Agriculture Delivery Unit (ADU), 83,000 vouchers have been redeemed, with the government spending about PKR45 million on the subsidy from 1 February 2017 to date.

Farmers' Registration

88. The key element of this is the registration process, currently a two-pronged one. On the one hand, the Department of Agriculture, which manages the input subsidy program, depends on the Punjab Land Records Authority (PLRA) to register farmers – both landholders and landless tenants – under a scheme to facilitate the extension of loans under the Chief Minister's Kissan Package. This loan scheme, which targets landless tenants and small farmers (with landholdings of less than 5 hectares), requires that eligible persons take the initiative to come in and be registered at one of the PLRA's Arazi Record Centers. The PLRA also maintains the (now computerized) land record of the province and therefore has large landholders in its database as well. So far, this is the most comprehensive database on landholders in the province and is now being extended, through the loan scheme, to landless tenants. However, the PLRA expects small farmers and landless tenants to register themselves at an Arazi Record Center and is thus dependent on the efficacy of an awareness campaign targeting this group. The Department of Agriculture plans to supplement this with its own house-to-house survey of farmers in Punjab and has embarked on this campaign as of September, 2016. Both these databases are maintained at the Punjab Information Technology Board (PITB).

89. In addition to the two distinct streams of registration detailed above, there is a third wave of registrations consisting of those purchasers of potash who are not registered either with the PLRA or with the Agriculture Department. For the moment, their details are maintained in a separate database, but they are given the subsidy based on proof of purchase. Their registration in the central database depends on their details being verified by the Department of Agriculture.

90. The subsidy is based on proof of purchase and is largely untargeted, except for the restriction on amount of purchase (10 bags per crop season). According to the Agriculture Department, this ensures that large farmers do not gain much benefit.

Risk Assessment

91. **Small farmers:** The fertilizer subsidy should yield benefits for small farmers who have not used the relatively expensive potash fertilizer and are likely to see an increase in yields. This effect is somewhat diluted by the fact that the more popular brands do not offer the subsidy at present and market outreach is, therefore, relatively limited.

92. This is visible from the FGDs conducted at the community level. In Kasur, in one FGD comprising eight persons, only one has availed the potash subsidy. A similar pattern emerges in Nankana, while in Multan, virtually none of the participants knew of the subsidy on potash fertilizer. The FGDs in northern Punjab reveal that farmers use potash, particularly in Kasur, for high-value crops such as potato. This could be another reason that the information on the potash subsidy has not caught on – the potato crop is sown between mid-August and mid-September, and at the time the FGDs were held, farmers had not started preparing the fields.

Representatives of the farmers' organizations have responded similarly, with most saying that the subsidy was initiated when the sowing for the season was complete. Uptake may, however, increase in the next sowing cycle. Representatives of Kissan Ittehad are also critical of the process, saying that small farmers have problems understanding how the subsidy works, particularly the process of sending SMS messages with long numerical codes.

93. To sum up, the fertilizer subsidy will benefit small farmers if offered on the bulk of brands, or at least those with major market shares. It will certainly be more effective if the process is simplified, perhaps using shorter numerical codes.

94. **Large farmers:** The subsidy will also have a positive impact on large farmers, although to a lesser degree as it will only cover part of their total requirement.

95. **Overall,** the subsidy program has no negative fallout on any of the groups specified. In the longer term however, an untargeted subsidy is a drain on the public exchequer and should only be extended for a specified period, otherwise it will become fiscally unsustainable. There is also the danger of the provision mechanism being misused such that some groups benefit disproportionately. This came out most notably in an FGD in Kasur, where a large farmer claimed to have used 16 CNICs from among his farmhands to purchase 80 bags of subsidized potash. In a situation where the number of vouchers available is already limited, such misuse could marginalize many potential beneficiaries.

96. **Nature of Risks:** The SMART Program supports the e-voucher-based input subsidy program conditional on the program reaching a certain number of small farmers.

97. **DLI 2: Revitalizing provincial crop and livestock research systems:** This DLI refers to the restructuring of the Punjab Agricultural Research Board (PARB) and greater allocation to agricultural research in the provincial budget.

Modalities

98. The GoPunjab issued a notification on 7 July 2017 in which the Chief Minister has nominated nine "non-office members" to the PARB. These include three provincial assembly members, three progressive farmers (including one woman), and three other stakeholders (a nominee from the LUMS Center for Entrepreneurship, a representative of the International Food Policy Research Institute, and a representative of the Centre for Agriculture and Bioscience International). These members are to remain in office for a period of up to three years. The current Chief Executive of the Board has sent his suggestions to the Chief Minister regarding amendments to the Board Rules and PARB Act, and is awaiting the latter's agreement.

Risk Assessment

99. This DLI does not carry any significant social risks, but it is necessary to ensure that the agricultural research carried out includes issues and areas that would benefit small and medium farmers. Another area of research is that of the role of women in agriculture, not only as farm workers and caretakers of livestock, but also as owners and primary cultivators. There is presently little data or information specifically on how women are engaged in the sector.

100. **DLI 3: Improving livestock health and livestock breeding.** The DLI refers to a proposal under the Livestock and Dairy Development (L&DD) Policy, which proposes shifting

from curative to preventive animal health services and a wider breeding program for indigenous breeds.

Modalities

101. The L&DD Department claims to have undergone extensive restructuring over the last two years in which their Extension Wing has significantly expanded outreach and revamped services. As per their information, the department's veterinary services take the form of a veterinary hospital at the district level, with smaller facilities (or a category B hospital) at the tehsil and town levels, respectively. They also run dispensaries at the union council level staffed by doctors or veterinary assistants and/or artificial insemination technicians. Vet assistants have been provided motorcycles, and every tehsil, according to the department, has a mobile veterinary service consisting of a fully equipped car, personnel, medicines, and an artificial insemination facility. More importantly, a training program is now being launched through which 45,000 extension workers – two per village – will be deployed to help households in livestock care. Half these extension workers will be women.

102. The department also runs 20 livestock farms across Punjab – the breeds maintained there are region-specific and studs are leased out to farmers. The department has also been carrying out a door-to-door vaccination campaign for the last two years. It has recently started a program whereby it trains livestock community facilitators – one man and one woman from each village to operate as first-level responders in the field. These facilitators are paid a stipend for a 20-day training period and work on honorariums if their services are utilized.

103. In efforts to strengthen the progeny testing program for the Sahiwal breed of cows, the L&DD Department maintains three farms for the preservation of this particular breed.

104. The L&DD Department is proud that its recent efforts have resulted in the passage of five livestock sector-related acts by the Punjab assembly.⁹

Risk Assessment

105. This DLI could strongly benefit landless tenants, and small and medium livestock holders who rely on government veterinary services and often lack the resources to access private veterinary care. The DLI could also have positive impacts on women, who are typically the primary caretakers of livestock at the household level. A service that reaches them at the grassroots level could greatly facilitate their management of a key household asset.

106. The field findings on the functioning of the L&DD Department show some promise. The visibility of the department in the field has improved in that its personnel are now mobile (on motorcycles and in vans) and can be observed in small towns and tehsil headquarters. The department admits, however, that its revitalization began only two years ago, and the FGDs held with communities indicate the latter's lack of trust when it comes to using the department's services. When asked about the quality of government veterinary services, communities invariably expressed their dissatisfaction. People complained that government vets lacked proficiency, had poor diagnostic skills, were unable to provide medicine, and were reluctant to make field visits.

⁹ These include the Punjab Poultry Production Act 2016, the Punjab Halal Development Agency Act 2016, the Punjab Animals Feed Stuff and Compound Feed Act 2016, the Punjab Animals Slaughter Control (Amendment) Act 2016, and the Punjab Livestock Breeding Act 2014.

107. Of the communities visited, the one in Lahore was largely oblivious to the presence of L&DD Department personnel, although they were primarily small farmers largely dependent on livestock. However, their situation was unique in that the village was encircled by housing societies and is hardly considered a rural settlement any more. In Kasur and Nankana, the FGDs confirmed that the relevant personnel were stationed at the union council and tehsil levels, but asserted that vets and their assistants rarely ventured into the field, which meant farmers had to transport their animals to them for check-ups, which was expensive. A community in Kasur confirmed that the government was running a vaccination program in which vaccination services were provided onsite at regular intervals. In both Kasur and Multan, a few participants recalled training for community livestock facilitators taking place some years ago. One participant from Multan even recalled that the trainees were paid PKR2,800 for a month's training. Apparently, they did not move on to providing regular services, not least because they were not properly equipped with stocks of medicines.

108. Overall, communities (both men and women) are more likely to have faith in private veterinarians, even if this means paying more to have their animals treated. The perception, perhaps untested, is that private sector vets are more competent and more responsive, particularly in terms of making onsite visits. Women's groups are particularly vocal about the lack of quality care available from public personnel and insist that veterinary care be provided at the doorstep, rather than requiring families to transport animals. There is a general reluctance to endorse the role of personnel from the L&DD Department. Better availability of medicines at government facilities and greater field outreach may help meet these high service delivery requirements and increase the level of user satisfaction and uptake.

109. **Nature of Risks:** The low level of social risk associated with this DLI is mainly institutional in that the impact of the DLI may be diluted by limited uptake of services.

110. **DLI 4: Deregulating the wheat market and transitioning to high-value added agriculture.** This DLI requires the government to gradually withdraw the wheat procurement program.

Modalities

111. According to the Food Department, the wheat procurement drive is based on *girdawari* or crop records whereby small and medium farmers with less than 10 hectares of land are given preference in government procurement.¹⁰ Even allowing for this, the government procures between 25% and 40% of the total crop in Punjab, so that a substantial number of small farmers are still left out of the government net.

112. In practice, there appear to be many exceptions to the government's stated policy. Across the board, at all the FGDs, farmers clearly said that they did not use the government procurement system, but instead relied exclusively on *artis*. Their reasons for this are simple: *artis* provide service at the farm gate, are available around the year, are easily contacted at any time, and their services go far beyond crop procurement. They are generally the first port of call for loans for everything from personal expenses to input financing. Although the interest rate they charge can be up to double the bank rate, their services are easily accessible, require no paperwork, and are available on demand. These informal financial arrangements, however, preclude any chance of looking for auction sites or other forms of market-based procurement,

¹⁰ This figure was mentioned by the Director of the Food Department during an interview.

as *artis* have the “right” to procure the crop for which they have extended loans, albeit at lower prices.

113. However, it goes beyond that. Even if a farmer does not depend on the *arti*'s financial services, government procurement systems are difficult to access. Getting gunny bags from the procurement site is itself a major task – even if the government were to go by the rules, farmers would be at a disadvantage because the number of bags typically available at any one site are based on a calculation of 800 kg of wheat produce per acre. With wheat yields now much higher than this, the needs of an area can be underestimated. Even once the gunny bags are obtained (often by settling with a rent-seeking official), it is the farmer's responsibility to transport the crop to the center, have it weighed, and checked for quality. Again, farmers are at a disadvantage: often, their produce is judged to not meet the moisture content requirements and cannot be sold at full weight. In short, the system is not geared toward facilitating medium and small farmers. It may, however, benefit large farmers. By some accounts, large farmers are often collude with government procurement officials to stock gunny bags on their private farms and then sell these to medium and small farmers at higher rates.

114. The FGDs with farmers' organizations provided some interesting insights in this regard. While participants of the discussion with Kissan Ittehad all said they used the services of an *arti* to get their crop to market, representatives from the FAP – mainly large farmers – claimed to be using the government's procurement system, although they complained that the quota determined by the government was not enough to pick up a sizable portion of their produce.

Risk Assessment

115. **Small Farmers:** The field assessment shows that small farmers are not always direct beneficiaries of the government's procurement system.

116. **Large Farmers and Financial Institutions:** Large farmers, particularly those well connected to the government, have historically benefitted from the procurement policy and would be adversely affected were it phased out. Banks, which typically fund the procurement operation, will also lose out.

117. In any event, the withdrawal of the support price system poses a risk to growers in general, as market prices are likely to fluctuate more in the absence of a support price mechanism. When the support price of wheat is significantly higher than the international price – as is the case now – wheat farmers would suffer losses of revenue. Even small farmers who do not rely on government procurement systems but on *artis*, are protected somewhat by the support price, as the *arti*'s offer price is typically 15–20% lower than the support price. This is a potential area of risk for all farmers.

118. **Consumers:** Data from the Household Integrated Economic Survey (HIES) for 2013/14 suggests that the average monthly household expenditure on food items in Punjab is PKR12,478, of which 12.8% is on wheat and wheat items.¹¹ Interestingly, the data for rural households in Punjab also indicates a high level of expenditure on wheat, with 14.6% of the total expenditure on food items going to wheat and wheat products. The data suggests that even rural households spend, on average, PKR1,700 a month on wheat and related products

¹¹ Pakistan Bureau of Statistics. 2017. *Household Integrated Economic Survey (HIES) (2015–16)*, Table 17n. Available at <http://www.pbs.gov.pk/content/household-integrated-economic-survey-hies-2015-16>

(probably flour). The high support price for wheat thus has implications for both rural and urban consumers, who may stand to gain if the procurement price drops.

119. **Political Fallout:** This DLI could also have a political fallout as large landholders are well represented in the provincial and national legislature and are likely to react strongly to the phasing out of the support price and procurement process. Large players could mobilize public opinion against the move.

120. **Switch to High-Value Crops:** The second part of the DLI relates to the move toward high-value crops. At a meeting at the PARB, technical experts suggested that oilseeds were an obvious substitute, but that switching to a new crop from a staple would not be easy because farmers would require support in terms of technical knowhow, input costs, and assurance of crop purchase. They would also need access to wholesale markets to sell their produce, particularly for crops produced in small volumes.

121. The field discussions reveal that, for farmers, the concept of high-value crops varies by region. In the north (Kasur, Lahore, Nankana), vegetables – and particularly potatoes – are considered high-value crops, along with oilseeds and maize. Farmers are aware of the potential profits that such cultivation can bring. Even without much help from extension services, the cultivation of these crops is considered whenever inputs, particularly seeds, are readily available and market conditions are favorable. The FGDs in north Punjab also reveal that farmers are interested in growing off-season vegetables, understanding fully that such cropping could enhance their profits. In the south, however, farmers are more inclined to cultivate major crops, and consider sugarcane and cotton high-value crops. More than high-value in terms of price, farmers appear to want assurances that their crop will be picked up for market and has a demand.

122. One of the FGDs conducted in Kasur included a female farmer who cultivates high-value crops on 6 hectares of land. An educated woman (she was the principal of a local college), she was vocal about the need to shift to high-value crops such as potatoes, corn, and maize, but emphasized that it was not just here that women's labor was important. As she pointed out, women work alongside men in agricultural labor throughout the province and are not socially restricted in any way. However, in the cultivation of certain exotic fruits that are harvested through picking, women could potentially have a greater role to play. There is also potential for women to become more involved in tunnel farming and fruit harvesting, which implies that technical support initiatives in these areas must target women farmers and farm workers.

123. Across the board, farmers would like more support from the government and even the private sector (particularly seed companies) in deciding on which crops to cultivate. They are particularly interested in understanding market trends and demand so that they can tailor production patterns accordingly.¹² Unless such assistance is forthcoming, particularly for small farmers, the potential of high-value farming will remain unrealized.

124. Another potential risk in the move to HVA is that a sudden drop in the production of a staple crop may have implications for the poorest tenant farmers who are paid in grain. It is

¹² Programs such as the government's proposed Connected Agriculture Platform Punjab, where the Department of Agriculture will work with Telenor, a mobile services corporation, to disseminate information through smartphones, could be an interesting way to do this. It is too early to comment on the success of the initiative, however.

unclear what the government can do to ensure that tenancy agreements are crafted such that the risk of food insecurity is removed.

125. **Nature of Risks:** The risks associated with this DLI fall into multiple categories. There are distributional risks associated with possible fluctuations in market prices, which could affect producers adversely and will have greater effect on small farmers who are more vulnerable to price uncertainty. There are also political risks in that the government's policy of withdrawal from the wheat market could come in for strong criticism from the politically influential farm lobby. There is also the risk of excluding small and vulnerable categories of farmers with regard to the shift to HVA, if the requisite inputs and information services are not targeted at these groups and if extension services are not mobilized to provide support.

126. **DLI 5: Providing incentives to agribusinesses for investments in value addition and agricultural technology.** This DLI involves the institution of a matching grants scheme, operated by an autonomous organization, which will solicit proposals from private sector entities, particularly those led by women or involving women farmers, to implement agribusiness projects. The matching grants scheme is envisaged as a two-tier system, with one tier targeting large enterprises with the ability to target a substantial number of farmers. Tier 2 schemes would be aimed at small and medium enterprises and would involve smaller grants.

Risk Assessment

127. The key question here is whether the design and implementation arrangements for the proposed matching grants scheme will enable targeting small landholders and overcome hurdles for this group so that it benefits from the grants as stakeholders. At this stage, it may be difficult to make a definitive statement as the scheme is still in the design phase. During initial discussions, the focus seemed to be on companies, medium to large landholders, and businesspersons with the necessary resources and technical expertise to put forward strong proposals and furnish the money to match the grants. However, an effort to make schemes accessible to smaller groups, including women, is said to be underway.

128. The ADU in the Department of Agriculture has stated that the matching grants scheme is likely to be accompanied by an effort to train farm labor, particularly women, in working with high-value crops using the more specialized techniques required. This initiative is likely to be based out of the GoPunjab's Regional Agricultural Economic Development Center in Vehari, which is mandated to promote skills development among farmers. In general, though, matching grants will likely favor medium to large landholders or entities that can meet the necessary capital requirements.

129. Grant-awarding authorities should ensure that land needs (if any) for schemes are met through willing-buyer-willing-seller arrangements. Award authorities should also develop operating procedures to ensure that any land acquisition is done in line with the Core Principles of the PforR.

130. It is important to point out that the matching grants scheme should not focus primarily on promoting entrepreneurship, but on social and development outcomes such as promoting technology transfer and providing an enabling environment for enterprises that are otherwise likely to be excluded from the agribusiness sector. Unless social considerations are kept paramount, such schemes could end up subsidizing dynamic private sector enterprises that are likely to have achieved some degree of success anyway.

131. *Nature of Risks:* If the grants scheme makes adequate provision for including women and small farmers, it should not pose any risk.

132. **DLI 6: Improving market conditions for meat and raw milk.** This DLI involves the deregulation of prices of raw milk and meat.

Background

133. Both meat and milk are essential parts of the diet in Punjab. Data from the HIES for 2015/16 suggests that meat constitutes almost 8% of total food expenditure of an average household in the province, while unpacked milk constitutes a significant 24%.¹³ These proportions do not differ significantly across rural and urban areas – in rural Punjab, 25% of household food expenditure is on unpacked milk.

134. According to the Price Control and Prevention of Profiteering and Hoarding Act 1977, the government is authorized to regulate the prices of 38 essential commodities, including meat and milk. District Commissioners or Coordinating Officers, along with the Secretary Industries Department in each province are authorized to act as Controllers General of prices in this regard. Prices are typically decided on every six months and notified to retailers. Although violations of the price caps carry a maximum sentence of three years, such extreme punishments are rarely enforced and violators, if checked, are normally fined a nominal amount. However, the extent to which prices of milk and meat are regulated in the market is uncertain – it seems that in large cities at least, prices are not controlled in many localities. Data obtained from a survey carried out by the Department of Industries shows that, while the fixed rate for mutton was PKR580 per kg on average in Punjab, it was selling at about PKR700 per kg on average. Similar differentials were found for beef.

135. Arguably, while the cap on meat and milk prices prevents uncontrolled price increases, it also creates rent-seeking opportunities. If the caps were implemented in the right spirit, they would more likely protect the poorest consumers.

136. To understand how these caps work in practice, the ESSA team conducted a limited survey of two dozen meat and milk-selling establishments in Lahore and Multan.¹⁴

137. In general, most shops were found to display price lists, with seven exceptions, five of these being milk shops in Multan. Of the remaining two exceptions, one was a meat shop in Multan and the other, a shop in Lahore. The price lists displayed were not uniform, however, with prices of meat varying widely. There was less variation in Lahore, with only one shop giving a different price for milk; mutton prices remained uniform throughout and beef prices varied from PKR330 to PKR400 per kg. Shops in Multan showed more variation, with milk prices varying from PKR75 to PKR80 per kg and the range for both types of meat exceeding PKR40.

138. In all instances, shopkeepers reported that a government official had visited the shop to check prices. Generally, shopkeepers were not sure how prices were determined. When asked who sets prices, responses ranged from market committees and producers associations to the local government and the district coordination officer. However, even though all retailers

¹³ Pakistan Bureau of Statistics. 2017. *Household Integrated Economic Survey (HIES) (2015–16)*, Table 17n. Available at <http://www.pbs.gov.pk/content/household-integrated-economic-survey-hies-2015-16>.

¹⁴ Twelve such establishments, equally divided across the two commodities and located in low-income neighborhoods, were surveyed in each city.

agreed that the district magistrate or his/her representative had visited their shops to check prices, they did not explain the variations that existed despite this surveillance.

139. Only two retailers, both milk sellers in Multan, said they did not generally follow government-issued prices (neither seller displayed a price list). Nevertheless, the field team found price variations for the commodities being sold, sometimes in the same market, and observed that the prices mentioned in the price list often did not correspond to the prices at which items were sold.

140. During the FGDs, farmers were asked about the sale of milk and meat. Responses indicate that large milk companies such as Nestlé, which once procured from medium farmers as well, now concentrate on large dairy farms. Small and medium farmers sell their milk and meat to local intermediaries or retailers at prices that are typically 30–40% below retail prices.¹⁵ Farmers are quick to allege that intermediaries not only shortchange them, but also carry out adulteration, particularly in milk, before selling it to the end-consumer.

Risk Assessment

141. The limited survey points to the variable enforcement of the price caps and the possibility that some degree of rent-seeking takes place. On the other hand, the price of milk is somewhat regulated and varies within a smaller range compared to meat – perhaps because it is a relatively low-value product.

142. Farmers: Some positive impacts could accrue to livestock farmers who may be able to get better prices for their produce if the caps are removed. For the most part though, the extent to which the caps are enforced clearly varies, and removing them may well not translate into higher producer prices. The key issue here is access to markets, which the intermediaries control.

143. There is a chance that consumer rights groups may demand the re-institution of the price caps, which could potentially cause some unrest in peri-urban areas in particular. A public awareness campaign is needed to explain why these are being removed.

144. While implementing price caps may not be a suitable strategy for the local administration, regulating the quality of goods in general and fresh produce in particular is a necessary function of the government and should not be eschewed. This is covered in DLI 8. In general, however, the proposal to remove price caps needs further assessment and a thorough market survey is recommended.

145. **Nature of Risks:** This DLI carries the potential risk of a negative impact on a certain group of stakeholders, i.e., low-income consumers dependent on unpackaged milk sales, particularly women and children. It also carries a reputational risk on the part of the government, which could face some opposition from consumer groups. Hence, this reform should be investigated further before implementation to identify potential impacts and their magnitude, and to set in place the requisite mitigation measures.

146. **DLI 7: Modernizing agriculture markets.** This DLI relates to the notification of the Punjab Agriculture Marketing Regulatory Authority Act, which will significantly liberalize the agriculture marketing system. The Act permits any person, subject to registration, to set up a

¹⁵ For example, farmers typically sell milk at PKR40 to PKR50 per liter to a middleman, whereas retail establishments sell milk for PKR70 to PKR80 per liter.

wholesale market, farmers market, consumer market, or electronic/web-based market dealing in primary agricultural produce in the province.

Background

147. The ESSA team held meetings with representatives of market committees as well as groups of commission agents to discuss the possible implications of this measure. Contrary to the requirements of the original Punjab Agricultural Produce Markets Ordinance 1978, market committees are no longer constituted by district governments and do not typically include representatives of growers or consumers from the area. Instead, as per the Rules issued under the Act and amended recently, the district coordination officer simply appoints an administrator, who is supported by a secretary, an inspector, and four to five sub-inspectors.

148. Market areas are typically divided into plots or shops, which are auctioned to bidders. Applicants for market licenses can find forms readily at the market committee office. These forms are not very detailed and simply require applicants to provide basic information on the nature of their business and details of their CNIC, etc. The Committee generally issues licenses to people who can demonstrate that they have rented or bought a plot or shop in the market area. Once a license is granted, the business is monitored for a week to ensure that protocols on auctions etc. are being met. Thereafter, licensees pay a set fee to the Committee for their daily business (fixed at PKR1 per quintal (100 kg) of produce sold). Licenses are renewed annually on payment of a renewal fee, which depends on the category of the market (markets are classified into three categories according to revenue generation potential), as well as (since 2015) an advance withholding tax that ranges from PKR7,500 to PKR10,000 depending on market categorization. The latter is a point of contention for licensees, who are often reluctant to pay.

149. An FGD with fruit and vegetable market commission agents in Lahore revealed a degree of discontent with the functioning of the Market Committee. Commission agents are of the view that their current lack of representation on the Committees has rendered them subject to political influence and unfair practices.

Risk Assessment

150. There is little doubt that the Market Committees, as they are constituted at present, have the leeway to function undemocratically, with minimum consultation with commission agents or *artis*, and consumers. None of the members of the Committees or commission agents had, however, seen the new draft Act and were not able to comment on its provisions. The members of Market Committees in both Lahore and Multan were, predictably, reluctant to endorse new legislation as they felt any move to make Committees more inclusive would reduce their control and they would not be able to run markets “effectively”.

151. The proposed legislation may succeed in making a dent in the currently unlimited power of the Market Committees and, as such, poses a risk of opposition arising from these powerful actors, who are also politically connected. It will, however, benefit market players by giving them a more level playing field in which to compete.

152. **Nature of Risks:** The key risk for this DLI relates to possible opposition from members of Market Committees who do not appear to have been adequately consulted on the proposed reforms. The provisions of DLI 12 on outreach and communications should come into play to mitigate the risks associated with this reform.

153. **DLI 8: Improving food safety.** This DLI involves the establishment of food safety labs at the provincial, regional and divisional level, involving an international partner that would provide technical support.

154. The GoPunjab's newly constituted Punjab Agriculture, Food and Drug Authority (PAFDA, under the Food Department), together with the Punjab Food Safety Authority (PFSA, responsible for the provincial reference lab and belonging to the Department of Agriculture) will be the focal points for implementing this DLI. The relevant legislation for PAFDA was enacted in May 2016, but the Authority has yet to become fully functional.

Risk Assessment

155. This reform measure is not expected to carry significant social risks. Once established and implemented properly, the intervention will be extremely beneficial from a social perspective.

156. **DLI 9: Improving sustainability and efficiency of irrigation.** This DLI focuses on improving equity in access to water, improving the assessment and collection of *abiana*, and adopting a provincial Water Policy and provincial Groundwater Act.

157. *Abiana* rates were previously based on crop records collected by the Revenue Department (or *girdawari* records). About a decade ago, these were converted to flat rates per acre, with a different rate applicable to the two crop seasons (PKR50 and 85/acre in rabi and kharif respectively). The Department of Agriculture contends that this change was made because *girdawari* records were unreliable. A flat rate, however, has not yielded any increases in collection. With regard to the second part of the DLI, the draft of the Groundwater Act has been given to the chief engineers at the Punjab Irrigation Department to review, after which it will be sent to the Chief Minister's office for review.

158. The Punjab Irrigation Department is responsible for the assessment of *abiana*. The village *numberdar* or junior revenue official of the Board of Revenue is responsible for collecting *abiana* and depositing the sums collected with the relevant authorities. At one FGD in Kasur, participants revealed that the *numberdar* charged them slightly higher rates (PKR100 and PKR60, respectively) as the collection charge. In general, farmers had no issue with the current *abiana* rates. A common complaint among canal water-fed communities was that *abiana* had to be paid regardless of the use and availability of water. There were also complaints across of the board of how water scarcity was, increasingly, a major issue, but that this was not reflected in *abiana* collection arrangements.

Risk Assessment

159. **Farmers:** As the DLI relates to better *abiana* collection, it will have an impact on small and large farmers alike, who will be subject to closer assessment and increased pressure for collection. The assessment procedure, which is to be based on cultivated area, may be revised. Communities claim they cannot avoid paying *abiana* even if they wanted to, as they are charged based on the acreage noted in the land records maintained by the Revenue Department. This assertion is belied by the low collection of the charge.

160. The DLI carries a social risk as any attempt to raise *abiana* collections are likely to be met with resistance, particularly from large farmers who represent a politically powerful lobby. In addition, attempts to improve the collection of *abiana* without improving service (water

availability and distribution) is also likely to meet with resistance. The risks associated with this DLI are thus significant. A comprehensive stakeholder engagement strategy, which is currently being finalized, will help mitigate the risk of resistance from various segments to a certain extent. However, a more detailed social risk analysis of this reform is recommended once the revised assessment modalities have been finalized, so that further appropriate risk mitigation measures can be implemented.

161. **Nature of Risks:** This DLI is associated with a political risk, given that the powerful farm lobby will resist attempts to scrutinize *abiana* collection and/or regulate the use of groundwater.

162. **DLI 10: Rolling-out an agricultural insurance system.** This DLI aims to bring about the gradual rollout of agricultural insurance products to all farmers in Punjab, with the type of insurance product and subsidy level differentiated by farm category. The proposed product is Area Yield Index Insurance (AYII) which the GoPunjab will take out. This DLI will be measured by the official approval of the report by the GoPunjab, the development and notification of a work plan in line with the recommendations of the report, piloting a crop insurance scheme in two districts, and rolling out the scheme in all districts.

Risk Assessment

163. The major social risk to be assessed in this DLI is the accessibility of the scheme to small and vulnerable farmers. Such options are on the table and small and medium farmers are likely to be offered comprehensive coverage at different subsidy levels.

164. **DLI 11: Increasing public investment in climate smart agriculture.** This DLI involves the allocation of additional funds in the development budget to promoting adaptation to climate change in agriculture.

Risk Assessment

165. This DLI was discussed with the PARB, which has provided a list of climate change projects it hopes to work on with research institutions across Punjab. The DLI carries no social risks.

166. **DLI 12: Communications, beneficiary feedback, capacity building and monitoring and evaluation.** This DLI relates to the formulation of a substantial communications strategy and capacity building program that will generate stakeholders' support for, and further enable, agricultural and rural transformation.

167. In a positive move, the GoPunjab has recently developed a draft communications strategy that aims to share information on the program with legislators and policymakers, farmers, and consumer groups. The strategy includes key messages to be conveyed to stakeholders, explaining the salient features of the reform program, and plans to use a variety of tools, including face-to-face meetings, social and print media, TV and radio shows and even cell phone-based communication to disseminate key messages. Rolling out this strategy should go a long way toward mitigating possible social risks and dispelling any misgivings among key stakeholder groups. If properly implemented, this activity could help mitigate many of the social risks highlighted in this ESSA.

Environmental Benefits and Risks

168. The environmental problems faced by the agriculture sector in Punjab include waterlogging and salinity, soil degradation, insufficient drainage, and degraded rangelands.¹⁶ Punjab's natural resources and agriculture are under stress for many reasons. Most of its environmental problems arise from (a) poor agricultural practices (imbalanced use of fertilizer, overuse of pesticides, wasteful use of irrigation water, use of untreated wastewater for irrigation, burning of crop residues, etc.); (b) poor management of water (low water prices, poor management and maintenance of irrigation infrastructure, weak law enforcement, etc.); (c) a large stock of low-yield livestock; and (d) the lack of appropriate technology application. Moreover, climate change has brought new challenges associated with changes in rainfall and temperature as well as extreme and unexpected events.

169. Under the Pakistan Climate Change Policy, Punjab Growth Strategy, and Draft Punjab Water Policy, the environmental objectives for the agriculture sector are to: rationalize fertilizer application, reduce pesticide application, reduce farm and non-farm waste resulting from poor post-harvest management, improve water efficiency, maintain healthy rangelands and more productive livestock, and maintain the health of rivers. These signal Punjab's interest in prioritizing solutions for sectoral issues with a significant environmental footprint.

170. The following sections provide a detailed overview of the likely range of Program-related environmental issues identified in and around existing activities. The sections describe both the nature and significance of these risks with respect to key concerns such as likely impacts, environmental and social context, sustainability, institutional and capacity risks, and reputational risks.

Use of Fertilizers

171. **Issues:** The excessive use of fertilizer has short-term and long-term environmental impacts, including soil contamination, contaminated farm water runoff, an increase in the disease burden of farmers, and a higher incidence of livestock disease. Rock phosphate, if not processed under strict industry controls, can lead to dangerously high cadmium concentrations in the soil. The excessive use of fertilizer can leave residual heavy metals in the soil, such that the consumption of crops grown in these soils is associated with stunting and kidney damage.¹⁷ However, while fertilizer use has risen exponentially in Pakistan, this did not result in the environmental impacts normally attributed to the excessive use of fertilizer.¹⁸

172. The use of fertilizer per unit of arable land depends on the nutrient characteristics of the soil, the type of crop, price, and the buying capacity of farmers. Table 2.3 shows that Pakistan remains one of the lowest consumers of fertilizer per unit of arable land in South Asia and elsewhere. One of the reasons for this, according to the director of the Soil Fertility Research Institute, is the high price of fertilizer (phosphate and potash) in Pakistan.

¹⁶ Government of Punjab, Planning and Development Department. 2015. *Punjab Growth Strategy 2018: Accelerating Economic Growth and Improving Social Outcomes*. Retrieved from http://www.pndpunjab.gov.pk/system/files/Punjab_Growth_Strategy_2018_Summary_0.pdf

¹⁷ Ibid.

¹⁸ M. Hameed. 2004. *Chemical Fertilizers and Human Health*. Farming Outlook, SAGE Foundation, Islamabad.

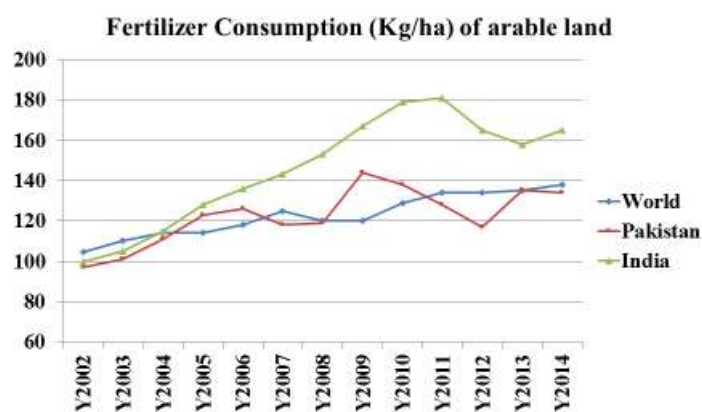
Table 2.3: Fertilizer Use on Arable Land, 2014

Country	Fertilizer Use (kg/ha)
Egypt	663
China	565
Bangladesh	279
United Kingdom	243
Japan	241
Indonesia	212
India	165
France	152
USA	138
Pakistan	134
Turkey	105
Canada	89
Australia	54

Source: Soil Fertility Research Institute, based on data from <http://data.worldbank.org/indicator/AG.CON.FERT.ZS>

173. Figure 2.1 shows that Pakistan’s fertilizer consumption is much lower than that of India. However, fertilizer application has risen consistently over the last few decades, from about 2 million to 3.8 million nutrient tons between 1991 and 2015.¹⁹ The Agriculture Department plans to promote three types of fertilizer: nitrogen, phosphorus, and potash. Table 2.4 presents the recommended quantities and ratios by the type of crop. A comparative analysis of the recommended ratios of nitrogen: phosphorus: potash (NPK) and fertilizer application practices since 2006 shows that farmers in Pakistan use higher proportions of N (which is cheaper) and lower proportions of P and K (which are more expensive).

Figure 2.1: Trends in Fertilizer Application in Pakistan



Source: <http://data.worldbank.org/indicator>

¹⁹ Presentation by the Agriculture Department, GoPunjab.

Table 2.4: Fertilizer Nutrient Ratios

Fertilizer nutrient ratios required (Soil Fertility Directorate, Punjab)

Crop (Fertilizer Requirement Kg/ha ⁻¹)	N	P ₂ O ₅	K ₂ O
Wheat (160-114-60)	1.41	1.0	0.54
Rice (135-90-60)	1.49	1.0	0.66
Cotton (250-125-100)	2.00	1.0	0.80
Sugarcane (250-125-125)	2.00	1.0	1.00

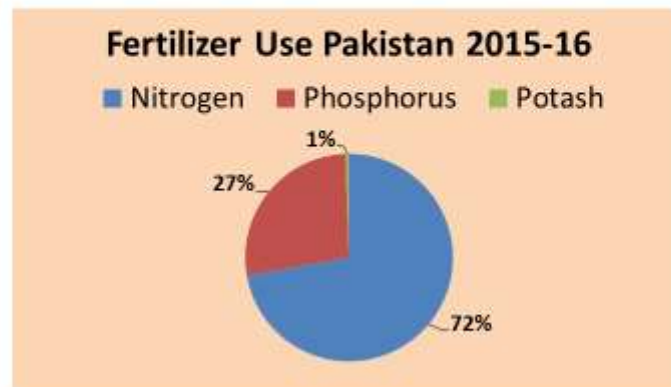
Fertilizer nutrient ratios applied in Pakistan

	N	P ₂ O ₅	K ₂ O
2006-07	2.70	1.0	0.027
2007-08	4.55	1.0	0.041
2008-09	4.76	1.0	0.038
2009-10	4.00	1.0	0.028
2010-11	4.00	1.0	0.040
2011-12	5.06	1.0	0.033
2012-13	3.82	1.0	0.026
2013-14	3.61	1.0	0.027
2014-15	3.40	1.0	0.034
2015-16	2.65	1.0	0.019

Source: NFDC, Islamabad

**FERTILIZER OFFTAKE BY NUTRIENTS PAKISTAN
(000 TONS)**

Year	N	P ₂ O ₅	K ₂ O	Total
2015-16	2672	1007	20	3699



Source: NFDC Islamabad

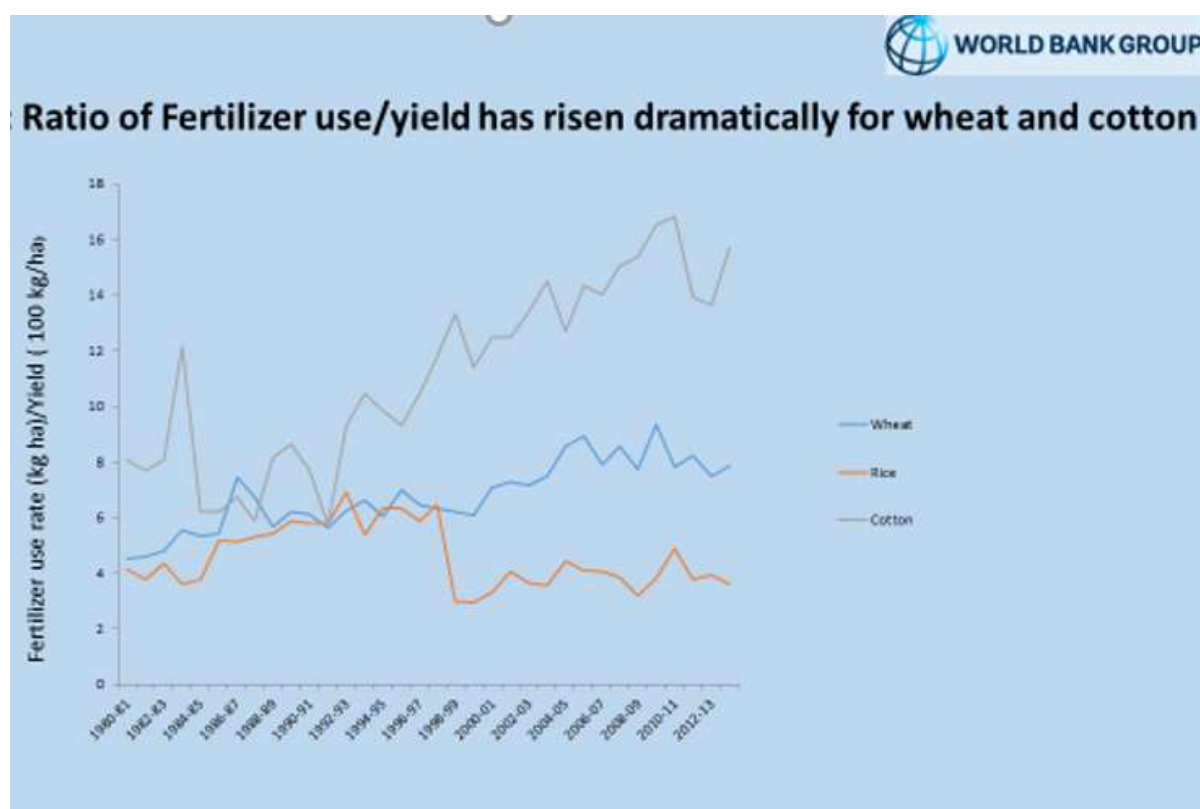
174. The Agriculture Department reports that the high wheat prices fixed by the government have resulted in a substantial increase in fertilizer application per unit area for the wheat crop. Figure 2.2 shows the trend in fertilizer application to wheat. Given its higher profitability, farmers can afford to increase their application of fertilizer per acre of wheat crop to achieve higher yields.

175. **Risks:** The data indicates that the key issue is the imbalanced use of fertilizer in Punjab, with farmers using more N and less P and K, given that the latter are more expensive. This carries health risks, especially for infants and patients suffering from hypertension.

176. The Program will address the issue of imbalanced applications of NPK by subsidizing potash. It will also encourage a shift from subsidies for suppliers of general fertilizer to focused subsidies for the poor through an e-voucher system on the demand side. This will entail an e-voucher system with a focused subsidy for potash, to be expanded to di-ammonium phosphate and urea fertilizers (and other agricultural inputs as well), focusing on poor farmers. This will likely encourage more balanced ratios in fertilizer application and enable farmers to adopt best fertilizer application practices if given the proper training.

177. The Program proposes that wheat prices be rationalized to reduce the wheat surplus and stimulate the transition to HVA. The Agriculture Department has suggested that ensuring the optimal application of fertilizer within the recommended range (see Table 2.4) will require adopting more efficient irrigation technologies – such as drip irrigation. The Punjab Irrigated-Agriculture Productivity Improvement Project P125999 (PIPIP) claims that farmers who shift from grain crops to fruits and vegetables can reduce their water and fertilizer use by 80% and 60%, respectively, and improve the efficiency of other inputs (such as better quality of seed and precision land leveling).

Figure 2.2: Ratio of Fertilizer Use per Yield



Source: Presentation of the World Bank to the Chief Minister Punjab

178. The analysis above can be summarized as follows:

- Farmers in Punjab apply less fertilizer per hectare of arable land compared to other countries in the region, such as India, Bangladesh, and China.
- Most farmers do not use the recommended ratios of NPK and are inclined to use higher amounts of nitrogen, which is more affordable.
- Fertilizer application has risen since 1980, with a substantial increase in 2000 due to an increase in the support price of wheat.

- Research is needed to establish the impact of HVA crops on the use of fertilizer application.

179. **Implications:** The Program needs to coordinate effectively with the following directorates under the Agriculture Department to promote the balanced use of fertilizer and ensure that adopting HVA will not increase the use of fertilizer beyond permissible limits:

- Directorate of Research;
- Directorate of Extension and Adaptive Research;
- Directorate of Field;
- Directorate of Water Management; and
- PARB.

*Use of Pesticides*²⁰

180. **Issues:** Excessive pesticide use has negative environmental impacts. Pesticides kill friendly organisms along with targeted organisms. Excessive use can lead to pest resurgence and the development of resistant varieties. In addition, pesticides often contain chemicals that are harmful to human and animal health. In Pakistan, the use of pesticides increased between the mid-1950s (250 MT) and 2004 (129,598 MT). After 2005 (105,164 MT), pesticide use declined, reaching its lowest level in 2008 (39,186 MT), but then rising to 73,632 MT in 2010. At the national level, the highest use of pesticide is associated with the cotton crop (50–55%), followed by fruits and vegetables (15–22%).

181. The external cost of pesticide use in the form of environmental costs (drinking water contamination, pest resistance, loss of biodiversity, and the cost of prevention and abatement measures) and social costs (occupational poisoning, food residues, public health, and the cost of awareness campaigns) is normally greater than the cost of the pesticide itself and the income from higher crop yields. For example, 63% of households and 87% of women cotton-pickers report ill health during the pesticide spraying season in the cotton zone, while 50% of industrial workers at pesticide plants report health issues. Pesticide residue contamination occurs along the food chain (fruits and vegetables) to the extent of 40–63%, with 70% above the maximum residue limit established by World Health Organization (WHO) standards. Pesticide residues are also reported in irrigation and drinking water and other agricultural products (cotton seed, oil, lint and cattle feed, cottonseed cake, and animal milk). Biodiversity losses occur mostly in the form of pollinator damage (honey bee poisoning, soil fauna contamination, and wildlife and bird health impacts). An assessment from 2000 estimated that the external cost of pesticide use in Pakistan is about PKR11.7 billion annually.

182. Another important issue related to pesticides is storage and disposal. Pakistan's track record is not terribly promising. Although the Pesticides Ordinance 1971 and the rules governing hazardous waste management under the PEPA 2012 establish comprehensive requirements for pesticide storage and disposal, these are seldom followed. In 2010, an estimated 6,000 tons of expired pesticide was stored across Pakistan, with most containers suffering from leakages. Preventive measures, such as the decomposition of poisonous

²⁰ The information in this section is taken from the Government of Sindh's Integrated Pest Management Plan. See: Government of Sindh, Agriculture, Supply and Prices, and Livestock Departments. 2013. *Sindh Agricultural Growth Project: Integrated Pest Management Plan (IPMP)*. Retrieved from <http://documents.worldbank.org/curated/en/804851487922025102/pdf/SFG3080-EA-P158769-Box402891B-PUBLIC-Disclosed-2-22-2017.pdf>

materials, are not applied at pesticide manufacturing/formulation plants. A survey conducted by the National Fertilizer Development Center in 2002 revealed that about 48% of pesticide users simply threw away the pesticide packing, 34% buried it, and 3% washed and reused it.

183. Integrated pest management (IPM) can help reduce the use of pesticide. There is no standard set of IPM practices for different crops or areas, and these generally comprise ways of treating different chemicals, the use of bio-pesticides, the augmented release of predators/parasites, the development of pest-resistant species, crop rotation, and the balanced use of fertilizer.

184. **Risks:** The Program encourages a transition from conventional crops such as wheat and sugarcane to HVA crops such as horticulture (mainly vegetables and fruit trees), medicinal plants, spices, and legumes. These are currently cultivated on only 9% of the cropped area. Table 2.5 lists HVA crops that could be grown as alternatives to conventional crops in Punjab. In combination with the modernization of the wheat marketing system, budgetary reallocations in favor of HVA are a means of realizing the proposed transition. According to the Pest Warning and Quality Control of Pesticides Directorate General, the use of pesticides could increase once HVA crops become more common. Experts suggest that pesticide use could be reduced by adopting comprehensive IPM practices and efficient water use measures such as sowing crops on beds or ridges to avoid flooding, irrigating crops with the exact amount of water needed at critical stages, and using drip and sprinkler irrigation in orchards and crop rows.

Table 2.5: Alternative High-Value Crops to Main Cash Crops

Crop	Alternative High-Value Crops
Wheat	Oilseeds, lentil, gram, vegetables, orchards
Cotton	Mung, mash, sesame, pearl millet, sunflower, guar, soybean, sweet potato, orchards
Rice	Vegetables, mung, orchards
Sugarcane	Maize, sorghum, sunflower, sesame, pearl millet, orchards
Maize	Sorghum, sesame, sunflower, sweet potato, orchards

Source: Punjab Agriculture Department

Effects on Livestock

185. **Issues:** Livestock products, i.e., milk, meat, and eggs, represent at least 50% of Punjab's agricultural GDP (or about US\$20 billion). Punjab has approximately 22 million buffaloes and 19 million cattle. It is estimated that more than 6.5 million households in Punjab rear livestock and about 30–40% of household income is generated through livestock products. The province's share in the national livestock herd is substantial (65% of buffaloes, 49% of cattle, 37% of goats, and 24% of sheep). Households consider livestock a form of savings that can be cashed in bad times. Some of the key issues in this sector include non-optimal feeding, poor housekeeping, a low-quality gene pool and small number of registered bulls with high-quality genes, limited artificial insemination, and poor-quality drugs and vaccines. These factors have resulted in low productivity. For example, the milk yield of livestock reared by small farmers is only 5–6 liters a day.²¹

186. The Animal Sciences Institute at the National Agriculture Research Institute confirms the high prevalence of infectious diseases in the country's livestock, with obvious implications for the sector's productivity. A study by the Food and Agriculture Organization (FAO) found

²¹ SMART Punjab Technical Assessment.

that most diseases affecting humans originate from animals.²² Diseased livestock is thus a serious threat to community health. Prevailing diseases include foot-and-mouth disease, *peste des petits ruminants*, and high parasitic loads. Climate change also affects livestock health in the shape of rangeland desertification, an increase in waterborne diseases, and the degradation of watersheds.

187. Livestock waste is a key environmental issue. Two main types of waste are generated by the livestock sector: dung and waste from veterinary hospitals and clinics. The L&DD Department reports that dung is used nominally as fuel and fertilizer. Biogas plants have not caught on in Punjab due to technical and social limitations. Large amounts of dung are stored at the farm level with no productive use. Medical waste comprises empty bottles (glass and plastic) of antibiotics, vaccines, and injections, and some surgical waste. Most medical services are provided by government clinics and hospitals and the department claims that all such waste is collected and properly disposed of.

188. Livestock productivity in Punjab is low compared to the levels achieved by progressive farmers in other Asian countries, and the growth of yield has remained flat. Increases in livestock production have resulted primarily from increases in the number of animals. Pakistan is one of the world's largest milk producers, but yields per animal (milk and meat) and per unit of biomass consumption have remained low, along with the poor quality of milk produced (due to hormone contamination and low level of nutrients).

189. **Risks:** The Program emphasizes a strategic move from curative to preventive livestock health (i.e., close to 100% preventive care, leaving curative care to the private sector). It also aims at increasing the registration of animals in progeny testing programs. Given that Punjab's livestock comprises large herds of low-productivity and unhealthy animals, the Program should help increase the share of healthy, more productive cows and buffaloes.

190. The Program proposes discontinuing price caps on meat and fresh milk in favor of market principles and mechanisms. The technical assessment indicates that price caps have discouraged investment in livestock productivity and have a negative impact on food safety.

191. Realigning the livestock sector with market mechanisms will help increase its productivity and the quality of livestock products (less contamination and higher nutrients). The Program could also help decrease the livestock population by introducing high-yield cows and buffalo in collaboration with the L&DD Department. Such increases in productivity will have three major benefits: increases in income, improved food safety, and better public health.

Water Management

192. **Issues:** With the 2010 18th Amendment to the Constitution, the Punjab Irrigation Department has become responsible for about 56 MAF (canal command) and 10 MAF (flood water) of surface water in the province. The safe level of groundwater extraction is about 43 MAF – 60% in the fresh groundwater zone and the rest in marginal to brackish zones. However, Punjab over-extracts about 3.1 MAF annually. The lowering of the water table has become a serious issue in rain-fed and large urban areas. The agriculture sector consumes about 95.4% (95.3 MAF) of the total water available in the province. Given that its water demand will likely increase to 112.3 MAF by 2025, in the absence of additional surface water, Punjab's groundwater resources – which are already under pressure – will be strained further. In these

²² FAO. 2013. *World Livestock 2013: Changing Disease Landscapes*. Rome: FAO.

circumstances, an increase in water productivity is essential. Key issues facing the water sector include: fixed-rotation and continuous-flow systems; waterlogging and salinity; the indiscriminate abstraction of groundwater; the abstraction of brackish water, resulting in secondary salinization and sodification of soils and the redistribution of salts in the aquifer; the inefficient use of water, resulting in low water productivity; poor operation and maintenance (O&M) of irrigation infrastructure owing to low levels of *abiana* rates and collection; and the inadequate capacity of the Irrigation Department to ensure an equitable distribution of water based on volume-equity.²³

193. This operation does not apply OP 7.50 (Projects in International Waterways) on the understanding that: (a) the PforR Program will not finance any water supply-side activities, including any development and rehabilitation of irrigation infrastructure; and (b) given that it focuses on replacing public financing with *abiana* collection, there will be no increase in irrigation infrastructure M&R as a direct consequence of the operation.

194. **Risks:** The PforR supports the approval of the Punjab Water Policy and Punjab Groundwater Act, which is part of DLI 9. This is an essential part of the groundwork for improving sustainable groundwater use and will have multiple benefits in the form of more productive and efficient use of water, decreased waterlogging and salinity, higher crop yields, and higher incomes for farmers. In addition, the Program proposes modernizing *abiana* assessment methods. It expects to demarcate critical areas for groundwater, ensure tubewell registration, and increase the delivery performance ratio (equivalent to the decrease in water theft). The goal is to move toward (a) improving the sustainability of surface irrigation systems by increasing the resources available for M&R, and (b) helping users understand that water is an increasingly scarce good and, therefore, should have an economic price.

195. The Program aims to improve the sustainability of water management by supporting the approval of the provincial Water Policy and Groundwater Act, and helping improve *abiana* assessment and water distribution equity. Such policies will help control the overexploitation of groundwater, thereby decreasing the incidence of waterlogging and salinization, increasing the productivity of water, increasing crop yields and farmers' incomes, and improving overall governance in the water sector. The Program does not support any expansion of the irrigation network or agricultural land, which implies that there should be no impact on downstream water availability. Any risk associated with the approval of the Punjab Water Policy and Punjab Groundwater Act (which is part of DLI 9) is low, given that both instruments promote institutional and policy measures to improve sustainability and water resource management in the province.

Effects of Deregulation in the Agriculture Sector

196. **Issues:** Over-regulation in the agriculture sector has resulted in the extension of regressive subsidies; externalized environmental impacts and costs (higher use of fertilizer and pesticide, water inefficiencies, and over-exploitation of groundwater resources); less scope for HVA; low investment in, and limited adoption of, modern technologies; poor service delivery; inefficient water delivery and pricing; and poor agricultural markets.

²³ Government of Punjab, Irrigation Department. 2016, July. *Punjab Water Policy*.

197. **Risks:** The PforR supports the approval and notification of the draft Punjab Agriculture Market and Regulatory Authority Act, along with the establishment of the authority, the purpose of which is to deregulate Punjab's agriculture sector (farm and non-farm markets).

198. The deregulation of the agriculture sector – and reduction of subsidies – will create space for increased budgetary allocations in the public sector as well as greater incentive for investment by the private sector toward better maintenance of irrigation infrastructure, promoting HVA, reducing the use of fertilizer, improving agricultural service delivery (with an increased role for the private sector), R&D, and agricultural insurance. If the agriculture, water, and environment-related legislation is enforced and complied with, then deregulation will also benefit the environment in the form of improved water efficiency and productivity, and the reduced use of fertilizers and pesticides.

Poor Food Safety

199. **Issues:** The Food Department focuses on food safety at the restaurant level. Recently, the department has taken stringent action on this front and penalized restaurants that did not comply with the relevant safety standards. Part of the problem stems from the use of untreated wastewater for irrigation, and overuse of fertilizer and pesticides for fruits, vegetables, and other crops. Moreover, contaminated water is often used to clean vegetables and fruits, thereby introducing further contaminants into the food supply chain, with adverse health effects. In response, the GoPunjab has established the Punjab Food Authority (PFA) under the Punjab Food Authority Act 2011. The organization's mandate is to regulate food processing, storage, distribution, sale, and import, and to establish food standards. The GoPunjab has also established the Punjab Agriculture, Food and Drug Authority (PAFDA) which is responsible for the forensic examination and testing of fertilizers, pesticides, foods, and drugs.²⁴ At present, the testing capacity of the Food Department is limited to restaurants in major cities, but this needs to be extended to all foods in the market.

200. **Risks:** Other than food security extension services, the Food Department plans to establish a network of food-testing laboratories. The Program supports the establishment of one provincial reference food-testing laboratory and three divisional testing laboratories. During operations, these laboratories may generate contaminated wastewater, hazardous solid waste, and air pollution (generators and other emissions). The Food Department will prepare the requisite EIAs and initial IEEs under the PEPA 2012 rules and regulations, secure no-objection certificates (NOCs) from the Punjab Environmental Protection Agency (EPA), and comply with the NEQS during operations.

Impacts of Climate Change

201. **Issues:** Pakistan ranks among the top 10 countries most vulnerable to climate change on the Global Climate Risk Index. The frequency and intensity of extreme weather events and natural disasters has increased considerably. In the last 30 years, the mean temperature in Pakistan has increased by 0.5°C. This has resulted in long-term reductions in rainfall in semi-arid areas and increased glacial melting.²⁵ Glaciers contribute about 70% of the water in river flows and a World Bank study warns that the increased speed of melting in the Hindu Kush-

²⁴ Government of Punjab. 2016. *The Punjab Agriculture, Food and Drug Authority Act 2016 (Act XXXII of 2016)*. Retrieved from <http://punjablaws.gov.pk/laws/2650.html>

²⁵ Annual glacial melting rates in Pakistan are about 2.3% – one of the fastest in the world.

Karakoram-Himalayan glaciers could lead to fluctuations in the Indus Basin water flows, with implications for agriculture.²⁶ In all, two extreme floods in 2010 and 2014 caused damage worth about US\$14 billion, affected 38 million people, and damaged 4.3 million hectares of cropland. Temperatures and rainfall levels are also projected to increase in Pakistan, leading to a mean temperature increase of 1.4–3.7°C by 2060 (higher than the expected global average). This will likely increase the frequency of extreme events.

202. Pakistan ranks 148th among global emitters, contributing only 0.8% to global emissions. The agriculture sector is the biggest contributor (41%), of which livestock accounts for 78% and crops for 22%. Punjab’s agriculture sector is already at the receiving end of many negative environmental impacts in the form of flash floods, heavy monsoons, drought, and decreased yields due to weather stressors. The sector’s production demand, however, remains unchanged, given the high population growth rate and increase in consumption due to improvements in the quality of life and changes in diet in favor of animal-based food. This transformation is bound to increase greenhouse gas emissions in the agriculture sector.

203. Moreover, the poor are more vulnerable to climate change impacts.²⁷ According to HIES 2013/14 data, 13.3 million people in Punjab were classified as vulnerable to falling in and out of poverty following a small income shock.²⁸ Creating climate resilience in this segment of the population is, therefore, essential.

204. During consultations, the Agriculture Department informed the ESSA team that several sustainable and climate change resilience projects had been prepared, focusing on the development of climate-resilient varieties and crop improvement through better practices and agronomic interventions. In addition, it was making efforts through extension advisory services to provide area- and crop-specific weather conditions that would mitigate the adverse effects of sudden changes in weather. Table 2.6 lists the stress-tolerant crop varieties identified by the Agriculture Department with the support of associated institutions. A Climate Change Research Center has been set up at the Ayub Agriculture Research Institute (AARI) in Faisalabad.

Table 2.6: Stress-Tolerant Crop Varieties

Crop	Variety
Cotton	Heat-tolerant (FH-Noor, MNH-992, VH-Gulzar, FH Lalazar) Drought-tolerant (FH-326, VH-327, FH-6071, MNH-1016, FH-942) Sucking pest-tolerant (MNH-1016, FH-Kahkashan)
Wheat	Heat and drought-tolerant (Jauhar-16, Gold-16, Ihsan-16, Fatehjang-16, Faisalabad-2008, Dharabi-2011, Chakwal-50)
Rice	Salinity-tolerant (KS-282, Basmati-385, Shaheen Basmati)
Chickpea	Drought-tolerant (Punjab 2008, Bittal-2016)
Lentils	Disease-resistant (Punjab Masoor 2009)
Mash	Photoperiod-insensitive (Arooj-11)

Source: Punjab Agriculture Department

²⁶ Winston Yu et al. 2013. *The Indus Basin of Pakistan: The Impacts of Climate Risks on Water and Agriculture*. Washington, DC: World Bank.

²⁷ To manage exposure to uninsured risks, farmers may have to forgo activities with higher expected incomes. Poorer households, which cannot cope with shocks, may be forced into distress sales of land and livestock. Child education and health can suffer long-term consequences when children are taken out of school in response to shocks or are exposed to early periods of malnutrition, leading to intergenerational transfers of poverty. See: World Bank. 2007. *World Development Report 2008: Agriculture for Development*. Washington, DC: World Bank.

²⁸ Vulnerability is defined based on individuals whose consumption falls within a 20% band around the poverty line.

205. The following schemes relevant to CSA are included in the Punjab ADP:

- Resilient maize hybrids of maize and millet;
- Promotion of HVA through the provision of climate-smart technology packages;
- Rainwater management in cotton fields to minimize the impact of climate change;
- Development of hybrid and open-pollinated varieties in horticulture crops resilient to climate change;
- Gram cultivation under climate change;
- PIPIP (high-efficiency irrigation systems);
- Construction of watercourses and laser leveling equipment;
- Provision of laser land levelers to farmers/service providers at subsidized costs; and
- Rehabilitation of salt-affected soil through gypsum application.

206. In addition, the GoPunjab has increased the financial allocation for CSA in the ADP from 3% of the total allocation for agriculture in in FY17 to 6% in FY18.

207. **Risks:** Pakistan and Punjab must develop climate change adaptations for the agriculture sector in the short term to make both agriculture and water more climate-resilient. In this context, CSA interventions, comprising technological and best practices adaptation, are needed to increase agricultural productivity, enhance resilience, and reduce greenhouse gas emissions. In this regard, investments in water infrastructure, research and extension, and agriculture adaptation and mitigation measures are critical. The vulnerability of the poor to climate change can be addressed by increasing their access to insurance and adoption of CSA technologies.

208. The Program supports an increase in public sector investments in CSA and a diagnostic of the existing crop insurance system, the design of a pilot insurance program, implementation of the pilot program in two districts, and an insurance program rolled out in all districts. The latter will create the financial resources farmers need to mitigate natural disasters linked to climate change, thereby improving their resilience to climate change impacts.

209. Other than stress-tolerant crop varieties, investments in sustainable water management, better agricultural inputs, research in agriculture and livestock, the decrease in subsidies, and crop insurance will contribute proportionately to making the agriculture sector more climate-smart. Overall, climate-smart activities will benefit Punjab's environmental resources considerably.

Environmental Effects of Rural Enterprises

210. **Issues:** In Pakistan, about 50% of farm household income is generated through off-farm activities and enterprises. The income potential of these sources remains untapped to the extent that only 3% of Punjab's milk production is processed. The key constraints to agribusiness are: poor access to (and the high cost of) finance, inefficient markets, low skill levels, insufficient power (electricity), and a weak enabling environment. Experience in Punjab demonstrates that corporatizing farm-related activities can help reduce post-harvest losses, adopt advanced technologies, generate market surpluses, improve standardization, enhance storage capacity, improve market access for farm products, and improve packaging. The major environmental issues associated with off-farm activities are local wastewater discharge, air emissions, and solid waste generation. These enterprises are primarily micro and small enterprises.

211. **Risks:** The Program plans to increase joint public and private sector investments through a matching grants modality for agribusiness. It aims to foster agribusinesses involved in post-harvest processing and value addition to fruits and vegetables, bulk storage facilities for wheat, food safety measures, grading and packaging, the development of value chains, smallholder-based dairy operations (milk collection and distribution), livestock markets, meat retailing, and storage of high-value crops (e.g., apples).

212. Investments in agribusiness could result in the implementation of physical projects, most of which will be relatively small-scale. Most small agribusinesses are unlikely to be subject to the EIA/IEE requirements under the PEPA 2012 rules and regulations. Micro, small, and medium enterprises that do qualify will need to secure NOCs from the Punjab EPA before they are set up. During operations, agribusinesses will need to comply with the NEQS. It is important to mention that the outreach of the Punjab EPA in terms of environmental monitoring is generally weak. For the most part, it monitors such enterprises in cases of environmental accidents and complaints submitted by residents.

213. In cases where an EIA/IEE is not required, the Environmental and Social Management Frameworks (ESMFs) already in use by the Agriculture Department and its affiliated project activities (such as the PIPIP) should be adopted and implemented after customization.

3. POLICY AND LEGAL FRAMEWORK FOR MANAGING THE ENVIRONMENTAL AND SOCIAL IMPACTS OF THE PROPOSED PROGRAM

Introduction

214. The Government of Pakistan and the GoPunjab have enacted a wide range of laws, regulations, and procedures relevant to the environmental and social effects of the proposed Program. From a legal, regulatory, and institutional perspective, the applicable federal and provincial environmental and social management systems in Pakistan and Punjab are appropriate and comprehensive. On paper, the scope of these systems appears adequate to address the Program's underlying environmental and social risks. Thus, no significant changes to the overall structure of the applicable legal and regulatory systems are envisioned or proposed under this operation. The following sections describe the most relevant aspects of the existing legal and regulatory framework as they apply to the proposed Program.

215. Several laws, regulations, procedures, and technical guidelines have been developed at the federal and state levels to regulate the sectors in which this Program will operate. Labor issues in Punjab are regulated by a total of 16 laws, covering bonded labor, minimum wage rules, and workers' compensation, etc., but these do not apply to agricultural labor for the most part, as almost all employment in agriculture falls within the informal (unregulated) sector. The GoPunjab requires the submission of EIAs (or IEEs) before any project is submitted for approval, and these are supposed to include environmental and social impact assessments. However, there are no standard guidelines indicating how social impact assessments should be conducted within EIAs and IEEs. The Planning and Development (P&D) Department has issued Social Impact Assessment Guidelines for infrastructure projects to be carried out under public-private partnerships, but there are no guidelines for assessing the social impact of policy initiatives. A number of laws govern operational issues in the agriculture, livestock, and irrigation sectors, some of which may affect how the Program is implemented. These laws, and other legislation, are discussed in this section.

216. The following criteria were used to select the relevant legislation that best describes the country's system for addressing and managing the Program risks:

- Federal and GoPunjab environmental and climate change policies;
- Sector-specific GoPunjab policies that are linked to the Program objectives and intervention activities;
- Federal and GoPunjab environmental protection acts; and
- Legislation in the targeted sectors and subsectors relevant to the Program objectives, and interventions that provide relevant environmental instructions.

217. Below is a brief review of selected policies and legislation under these criteria. The review describes the country's system for managing the environmental risks attached to the Program interventions.

Policy Framework

218. The Government of Pakistan prepared the National Conservation Strategy in 1990. Subsequently, it was updated and the National Environment Policy prepared in 2005. In 2010, the 18th Constitutional Amendment was approved by the National Assembly. Under this

amendment, environmental functions in the territory of the federal capital were delegated to the Pakistan EPA, while the provincial EPAs were delegated environmental management at the provincial level. In 2012, the federal government converted the Ministry of Environment into the Ministry of Climate Change, which is responsible for managing common climate change impacts and implementing international conventions signed by the Government of Pakistan. The Program will be implemented predominantly under the provincial environmental policy and PEPA 2012. In addition, the Climate Change Policy 2012 and Punjab Growth Strategy 2018 set the strategic context for defining government programs and projects implemented by the GoPunjab, as in the case of this PforR.

219. There are two policies of special significance to this Program:

220. **Draft Punjab Water Policy.** Following the 18th Constitutional Amendment, the province of Punjab has become responsible for its own surface and groundwater resources. The Punjab Irrigation Department manages and develops the province's water resources. The Water and Power Development Authority is responsible for the following: hydropower projects, Indus River system management, inter-provincial water projects for irrigation, and water storage. The goal of the Water Policy is to *“manage the provincial water resources, surface, groundwater and wastewater, so that they can sustain social, economic and environmental uses for the prosperity of people of Punjab”*. The overall objective of the Water Policy is to *“provide clear policy directions to the Government of Punjab on the sustainable management and development of water from all sources of water (surface water, groundwater and wastewater), for all subsectors of water use (domestic, stock water, agriculture, industry, commercial and environment) and for all regions (Indus basin canal commands and outside the canal commands) at the basin level through equitable water allocations, management and development.”* The policy has adopted four basic guiding principles: (a) water as a scarce and vulnerable resource, (b) participation of all stakeholders, (c) incorporating a gender perspective, and (d) water as a social and economic good. It addresses both the quantity and quality aspects of surface and groundwater resources as well as delivery of water services. The Water Policy spans four Policy Action Areas: water governance, water allocation, management of water quantity and water-related disasters, management of water quality, and management of water outside the canal commands (the Potohar Plateau, the Thal and Cholistan deserts, the Suleiman range, and riverine areas).

221. **Punjab Environment Policy 2015.** This policy emphasizes managing urban sprawl on prime land, reducing the use of fertilizers and pesticides, abating the contamination of groundwater and subsurface water resources, and reducing pollution-related risks to community health. It also proposes that, for the provision of basic facilities such as sanitation, sewerage, electricity, health, education, safe drinking water, paved streets, roads, parks, and transport, the GoPunjab should prepare a Punjab Rural Development Policy and a Punjab Rural Housing Schemes Policy.

Legislative Framework

Pakistan Environmental Protection Act 1997

222. The Pakistan Environmental Protection Act 1997 is the main legislative tool empowering the government to frame regulations to protect the environment. The Act applies to a wide range of issues and extends to air, water, soil, marine, and noise pollution, and the handling of hazardous wastes. The key features of the law, insofar as it has a direct bearing on the proposed subprojects, relate to the requirement for an IEE or EIA for development

subprojects. Section 12(1) requires that: “*No proponent of a subproject shall commence construction or operation unless he has filed with the Federal Agency an Initial Environmental Examination [IEE] or, where the subproject is likely to cause an adverse environmental effect, an Environmental Impact Assessment [EIA], and has obtained from the Federal Agency approval in respect thereof.*” Following the 18th Amendment in 2010, the Pakistan EPA has delegated the powers of review and approval of environmental assessments to the provincial EPAs, in this case the Punjab EPA. Geographical areas outside the provinces but within the administrative boundaries of Pakistan are covered by the Pakistan Environmental Protection Act 1997.

Punjab Environmental Protection Act 2012

223. PEPA 2012 is the overriding environmental legislation in Punjab, Section 30 of which states that the provisions of the act “*shall have effect notwithstanding anything inconsistent therewith contained in any other law for the time being in force.*”

224. PEPA 2012 is comprehensive with respect to its legal coverage for ensuring environmental compliance by the type of intervention in rural and urban areas, and economic development sectors, including agriculture. The provisions of Section 11 establish that the law is universal and applies to all sources of pollution and threats to natural resources. During the consultation meeting, the Director EPA informed the ESSA team that the Punjab EPA’s main priority, as environmental regulator for the province, was to ensure environmental compliance by industries, with special emphasis on industries located in urban areas. Large and medium agro-based industries such as sugar mills, cotton ginning plants, and rice processing mills are also included in the priority category. However, the EPA’s regulatory focus on on-farm agricultural interventions – such as the burning of crop residues, use of wastewater for irrigation, agro-based small and medium enterprises (SMEs), irrigation infrastructure (distributaries, water courses, sprinklers, and drip irrigation), and farm-to-market roads (renovation and widening) – is only nominal.

225. The NEQS established under PEPA 2012 are the standards applicable at the point of discharge of emissions. These are relevant to Program activities that are likely to result in the discharge of emissions. Under PEPA 2012, failing to comply with the NEQS and pay pollution charges will invoke the implementation of punitive sections of the Environmental Protection Order, with penalties imposed on every non-complying person, corporate body, government agency, local authority, or local council. Cases challenged by any party will be settled by the environmental magistrate and tribunal; if required, these cases can also be appealed in the higher courts. The NEQS for the following types of effluent and emissions may be relevant to certain projects:

- Municipal and liquid industrial effluent parameters (32) for discharge into inland waters, sewage treatment facilities, and the sea;
- Industrial gaseous emissions (16) into the atmosphere;
- Motor and vehicle exhaust and noise (3);
- Ambient air quality (9);
- Drinking-water quality (33); and
- Noise standards for residential, commercial, industrial, and silence zones.

226. Ambient standards will be highly relevant to Program activities. PEPA 2012 Section 6 instructs the Punjab EPA to establish ambient quality standards for air, water, and land, of which it has yet to establish ambient standards for land and water.

227. PEPA 2012 Section 11(2) on levying pollution charges, states that “*the Provincial Government may levy a pollution charge on any person who contravenes or fails to comply with the provisions of subsection (1), to be calculated at such rate, and collected in accordance with such procedure as may be prescribed.*” Further to this, Section 11(3) states that “*any person who pays the pollution charge levied under subsection (2) shall not be charged with an offence with respect to that contravention or failure.*”

228. Under PEPA 2012, project proponents must conduct an EIA or IEE according to the size and impact of a given subproject of the Program. In this context, EIAs or IEEs may be required when setting up food-testing laboratories and certain agribusinesses, and when constructing new farm-to-market roads or buildings. Section 12 establishes that “*no proponent of a project shall commence construction or operation unless he has filed with the Provincial Agency an initial environmental examination or where the project is likely to cause an adverse environmental effect, an environmental impact assessment, and has obtained from the Provincial Agency approval in respect thereof.*” Under PEPA 2012, public participation through public hearings is an essential part of the IEE and EIA process. In this case, the Pakistan EPA Review of IEE and EIA Regulations 2000, prepared by the Pakistan EPA, stipulates the complete approval system for IEEs and EIAs.

229. **Punjab EPA Review of IEE and EIA Regulations:** The PEPA provides for two types of environmental assessments: IEEs and EIAs. EIAs are carried out for projects that could have a “significant” environmental impact, whereas IEEs are conducted for smaller projects with less potential for significant impacts. The Punjab EPA Review of the IEE and EIA Regulations categorizes projects that require an IEE or EIA. Schedules I and II, attached to the regulations, list which projects require an IEE or EIA. The regulations are comprehensive with respect to the preparation and submission of environmental management plans (EMPs), their coverage of environmental aspects and impacts, and the review of IEEs and EIAs.

230. In the case of wastewater discharge into the canal system and use of wastewater for irrigation purposes, Section 11 of PEPA 2012 establishes that “*no person shall discharge or emit or allow the discharge or emission of any effluent or waste in excess of Punjab Environmental Quality Standards*” and that “*if the water is conforming NEQs, it can be used for irrigation purposes, otherwise not.*”

Hazardous Substances Rules 2003

231. These rules make provision for granting licenses for the collection, treatment, storage, importation, and transportation of hazardous substances. They consist of 22 rules and 5 schedules.

232. Substances prescribed as being “hazardous” are listed in Schedule I. Pesticides and fertilizers (their manufacturing, formulation, and storage) are covered under these rules. Projects involving hazardous substances require an EIA to obtain a license. Rules 7 and 8 deal with the issuance of licenses, and the conditions and requirements this entails. Packaging and labeling provisions are outlined in rule 9. General safety precautions and precautions for workers are covered in rules 11 and 12. Provisions for the validity, renewal, and cancellation of licenses are set out in rules 13–15. The authorized staff of the federal agency/provincial

agency are entitled to enter and inspect premises at which hazardous substances are generated, collected, treated, disposed of, or stored (rule 16). Safety plans and waste management plans must be submitted to the federal agency (rules 17–19). The details to be provided when applying for a license to import and transport hazardous substances are given in rules 20 and 21.

Hospital Waste Management Rules 2005

233. Under Section 31 of the Pakistan Environmental Protection Act 1997, the federal government established these rules to govern the proper handling, minimization, and final disposal of waste. The rules relate to hospitals, but are equally relevant to veterinary hospitals and animal clinics.

234. The rules require every hospital to properly manage the waste it generates up until final disposal in accordance with the provisions given. The rules also require every healthcare facility to form a waste management team with a given composition and specific duties/responsibilities. Each facility is required to prepare and implement a waste management plan, the key elements of which are specified in the rules. They also define detailed procedures for waste segregation, collection, transportation, storage, disposal, minimization, and reuse.

Punjab Bio-Safety Rules 2014

235. These rules are applicable to: (a) the manufacture, import, and storage of micro-organism and gene technological products for research, whether conducted in laboratories of teaching and research, R&D institutions, or private companies involved in the use and application of genetically modified organisms and the products thereof; (b) all works involved in the field trial of genetically manipulated plants, animals (including poultry and marine life), micro-organisms and cells; and (c) the import, export, sale, and purchase of living modified organisms, substances or cells and products thereof for commercial purposes.

236. Under these rules, *“No person shall import, export, sell, purchase or trade living modified organisms, substances or cells and products thereof for any purposes, without obtaining license from the Provincial Agency. An applicant seeking license for activities shall submit an application prepared in conformity with the requirements of the Bio-safety guidelines to the Provincial Agency accompanied by a copy of the receipt of the deposit of the prescribed fee. Any person to whom a license has been granted shall notify the Provincial Agency and the Bio-safety Committee of any change in or addition to the information already submitted.”*

Punjab Local Government Act 2013 and Amendment 2016

237. The Punjab Local Government Act establishes a comprehensive institutional arrangement for local governments throughout the province. It covers all operational and development aspects of rural and urban development. A summary of the chapters and sections relevant to the Program, and to the environment, is presented below.

238. At the operational level, rural areas are governed under districts and union (village) councils. Under Chapter VII, union (village) councils are responsible for land use planning, implementation of building bylaws, management of environmental and health hazards, management of food adulteration, provision and maintenance of rural water supply schemes and public sources of drinking water, management of grazing areas, and community

mobilization to upgrade local infrastructure (transportation, landscaping, and the removal of encroachments).

239. Under Chapter VIII, district councils are responsible for the overall welfare of the population (health and safety) as well as the improvement and maintenance of district main transportation routes (including the removal of encroachments) and other local infrastructure such as open spaces, graveyards, and public open spaces. They are supposed to help the relevant authorities in providing relief services in the case of natural calamities (fires, floods, hailstorms, earthquakes, epidemics). They are also supposed to help union councils in the provision and maintenance of rural drinking water supply schemes; control over land use and spatial planning (agricultural, industrial, commercial, residential); promoting animal husbandry and dairy development; and enforcing municipal laws.

240. Under the Second Schedule, both district and union councils are responsible for managing dangerous and offensive articles and trades such as the oil industry and business, sugar mills and refineries, wastewater treatment plants, tanneries, and all other industrial and trade operations.

241. Under the Fourth Schedule, Parts 1 and 2 of the Act, local governments can take offenders to court for: discharging chemicals into drains and public watercourses and onto public land when likely to cause a public health hazard; disposing of effluent in the water supply and sewerage system (by industrial and commercial concerns); adulterating eatables and drinkables; cultivating agricultural produce or crops, using sewer water or any such liquid for irrigation; and dumping solid waste and refuse anywhere other than a landfill or dumping site.

242. Under the Seventh Schedule, Part 2 bylaws, local governments are instructed to make bylaws for rural SMEs (such as tanneries and abattoirs); land use development and control; animal husbandry; use of sewer water for farming and irrigation; and the prevention of air, water, noise, and soil pollution.

243. Under the Eighth Schedule (“General Powers of Local Governments: Drainage and Sewerage”), local governments are responsible for the construction and maintenance of public drains and for instructing industrial and commercial concerns to treat waste or effluent; in cases of non-compliance, the local government is authorized to construct a disposal and treatment system at the cost of the offender. Under the same schedule and the section on “Environmental Protection”, local governments are mandated to prepare and implement pollution abatement schemes to prevent air, water, and land pollution. The section on “Development Planning” instructs local governments to establish the positive and negative environmental impacts of all strategic, master, and development plans. Under the section on “Public Health and Sanitation”, local governments are instructed to ensure that no buildings or lands create insanitary conditions for communities. Local governments are also responsible for removing refuse from all public spaces, and for constructing and operating sanitary landfills subject to an NOC from the Punjab EPA as per the provisions of the PEPA 2012.

Canal and Drainage Act 1873 and Amendment Act 2016

244. This Act deals with the construction and maintenance of drainage channels; this includes prohibiting channel obstructions or ordering them to be removed. It also covers issues related to canal navigation. The Act briefly addresses issues relating to environmental pollution: Section 70(5) clearly states that no one is allowed to “*corrupt or foul the water of*

any canal so as to render it less fit for the purposes for which it is ordinarily used.” In addition, under Section 73, anyone who has willfully damaged or obstructed a canal or “rendered it less useful” may be arrested without a warrant or taken before a magistrate.

245. The Act mentions the right of the provincial government to control for public benefit, the waters of all rivers, streams, and lakes as well as subsoil water and other natural bodies of still water. Different sections deal with the application of water for public purposes, the construction and maintenance of water supply works, water rates and liability for unauthorized use, canal navigation, drainage and labor for canal drainage, and offences and penalties for violations of the Act.

Punjab Irrigation and Drainage Authority Act 1997

246. The Punjab Irrigation and Drainage Authority (PIDA) was established under this Act to implement the GoPunjab’s strategy for streamlining the irrigation and drainage system. The Act aims to (a) achieve economical and effective O&M of the irrigation, drainage, and flood control systems in the province; (b) make the irrigation and drainage network sustainable in the long term; and (c) enable beneficiaries to take part in the operation and management of the system. Clause 29, Section 5 instructs PIDA to conduct regular studies evaluating the impact of its policies and operations on the ecology and environment and to ensure that all possible options have been incorporated to minimize any adverse environmental impacts.

On-Farm Water Management and Water Users Associations Ordinance 1981

247. The Ordinance provides for on-farm water management (OFWM), conservation and better use of irrigation water sources, and the formation of water users’ associations (WUAs) in Punjab. The irrigators of a watercourse must agree to form a WUA and file a formal application with the field officer, who then issues a registration certificate. Under the field officer’s supervision, WUAs are responsible for the reconstruction and maintenance of watercourses. A total of 48,000 WUAs are registered in Punjab.

Punjab Agricultural Produce Markets Ordinance 1978

248. The Ordinance provides for improved regulation in the purchase and sale of agricultural produce, the establishment of markets, and rules to improve their administration and management. It also allows for the Government to notify market committees, which are responsible for issuing and renewing licenses to dealers for a fee. The Ordinance stipulates the composition of these committees, their functions (including anti-encroachment), their powers to impose penalties, and the broad areas of permissible expenses from the funds they collect. The Government, however, retains the power to bypass or de-notify these committees if it is not satisfied with their work.

Punjab Essential Articles (Control) Act 1973

249. The Act stipulates powers that regulate and control the production, acquisition, prices, possession, storage, movement, transport, supply, distribution, disposal, use, and consumption of certain essential articles in Punjab, as well as trade and commerce in these articles. The inclusion of fertilizer in this list gives the Government significant power to regulate the fertilizer market, allowing it to control prices and production and to check hoarding through government-appointed officials. Based on this Act, the GoPunjab issued the Punjab Fertilizer (Control) Order 1973, which deals with fertilizer and its adulteration as well as fertilizer

dealers, importers, and producers. This order also allows the Government to regulate prices and quantities sold, and gives it powers to inspect and check adulteration, among other things.

Price Control and Prevention of Profiteering and Hoarding Act 1977

250. The Act was designed to prevent profiteering and hoarding across the country. It lists 38 items for which the Government can regulate prices. For the purposes of the ESSA, the items of interest include milk, beef, and mutton. The provisions of the Act are enforced through federal and provincial price magistrates. The Government issues a price list for these commodities through notifications, which is then enforced by designated government functionaries who are empowered to fine or imprison violators.

Seed Act 2015

251. Section 4 of the Act states the functions of the National Seed Council. The Act stipulates the role and functions of Seed Certification Authority officials and seed-testing laboratories with respect to enforcing procedures for seed quality and purity. The only function relevant to ecology and environment is the maintenance of genetic potential, which can be interpreted to include the habitats of the wild gene pool of species such as wheat, medicinal plants, and cereals. Under the Act, the task of developing seeds resistant to unfavorable conditions (such as drought or changes in temperature and rainfall) to ensure increased yields is entrusted to the national council, provincial councils, and the Federal Seed Certification and Registration Department. Should a seed production agency fail to comply with seed certification procedures for maintaining the quality and purity of seeds, it is liable to have its registration and license cancelled after a series of detailed legal and institutional assessments. In addition, the competent court can extend financial and punitive penalties to the non-compliant party and forfeit the seeds and plants in question.

252. Section 22E establishes that “no person shall (a) *conduct seed business in Pakistan unless such person is registered to do so under section 22B, 22C or section 22D; (b) import, sell, stock or exhibit for sale, barter or otherwise supply any seed of any variety or hybrid which is not registered or enlisted under this Act for cultivation in Pakistan; or (c) import, sell, stock or exhibit for sale, barter or otherwise supply any seed of any variety or hybrid if misbranded.* Seed businesses, processing units, dealers, horticulture nurseries, and seed and plant variety testing laboratories are instructed to register with the Federal Seed Certification and Registration Department.

253. There are comprehensive procedures for the registration of plant varieties or hybrids. The Act instructs the Federal Seed Certification and Registration Department to periodically issue a national list of registered plant varieties or hybrids. In addition, Section 22G establishes procedures for the registration of genetically modified plant varieties. The Act emphasizes that “*no registration of genetically modified plant variety or hybrid shall be made, if the application for registration does not accompany (a) an affidavit from the applicant declaring that such variety does not contain any gene or gene sequence involving terminator technology; (b) a certificate from the National Biosafety Committee established by the Federal Government to the effect that the traits of genetically modified variety or hybrid shall have no adverse effect on the environment, human, animal or plant life and health; and (c) field data of two crop season trial in respect of Biosafety and performance as prescribed.*”

Plant Breeders' Rights Act 2016

254. Under Section 15, the Act stipulates that applications for new plant varieties must be “(a) accompanied by an affidavit sworn by the applicant declaring that such variety does not contain any gene or gene sequence involving terminator technology.” Applicants must also ensure that they “(b) provide a certificate from the National Bio-safety Committee constituted by the Federal Government to this effect that the genetically modified organism (GMO) variety shall have no adverse effect on the environment, human, animal or plant life and health.”

Punjab Animals Feed Stuff and Compound Feed Act 2016

255. The Act aims to regulate the manufacture, storage, supply, transport for sale, and marketing of feed stuff and compound feed in Punjab. It looks to ensure standards of production and the quality of feed stuff as well as to check the adulteration and misbranding of poultry and livestock feed stuff and compound feed ingredients. Under Section 3, the Act lists which ingredients can be used in feed. It also provides for licensing feed production units and ensuring product packaging and branding as per the given guidelines. Compliance is enforced through feed inspectors authorized to collect different feed samples and send them to government-notified public sector laboratories for testing. Feed inspectors may confiscate feed products and dispose of them in the manner prescribed. Section 18 lays out the penalties for contravention, which include both imprisonment and fines.

Punjab Livestock Breeding Act 2014

256. This comprehensive Act aims to regulate livestock breeding services, improve the genetic potential of breeds, and protect indigenous breeds of livestock in Punjab. The Livestock Breeding Services Authority set up under Section 2 regulates the provision of breeding services in accordance with the Act and aims to raise awareness of the standards and quality of breeding services, including the conservation and development of local genetic resources. It also lays down a timeline for issuing detailed standards and procedures for breeding. Furthermore, it records the pedigree and performance of different breeds, for which the breeders' association is given a significant role. The Act introduces the registration of breeding males and businesses that provide breeding services. It also provides for engaging experts and third parties in addition to the appointment of inspectors by the Government.

Punjab Livestock, Dairy and Poultry Development Board Act 1974

257. The Act provides for the establishment of a Livestock, Dairy and Poultry Development Board in Punjab to establish, manage, control, and run livestock, dairy, poultry, and other allied projects in the public sector. The Board is chaired by the Minister for Livestock and Dairy Development. Other members include the Additional Chief Secretary Punjab and secretaries of other relevant departments of the GoPunjab. The Board runs and manages all the projects given in the Schedule. These include stud farms, poultry farms, dairy farms, dairy plants (including milk collection and chilling centers), feed mills, slaughter houses, poultry processing plants, deepfreeze and storage plants, quality testing laboratories for feed and livestock products, wholesale and retail marketing, and agencies for products of livestock, dairy, and poultry development projects.

Punjab Milk Boards Ordinance 1963

258. The Ordinance was designed to regulate the production and marketing of milk and milk products in the province. It provides for the creation of milk boards in different areas whose members are appointed by the Government. Each milk board is responsible for the purchase and collection of milk from producers; the establishment of centers for collecting and testing milk; the transportation of collected milk to the factory and its processing; the marketing, distribution, and sale of milk and milk products and the establishment of depots for this purpose. Milk boards are supposed to manage the purchase, sale, and distribution of concentrates and fodder; to organize milk producers on a cooperative basis; and to sell or let for hire to producers of milk and milk products, any plant, machinery, vehicles, or other equipment necessary to produce milk and milk products. Finally, they are also responsible for the establishment of producers' colonies to which milk producers can be removed and provided housing and other facilities for themselves and their livestock; and for the acquisition and maintenance of lands, buildings, plants, machinery, vehicles, or other equipment required for any scheme or other purpose under this Ordinance with a view to stimulating dairy development or milk consumption.

Punjab Agriculture, Food and Drug Authority Act 2016

259. As per the preamble to the Act, "*The Punjab Agriculture, Food and Drug Authority is being established for forensic examination and testing of fertilizer, pesticide, food and drug; to render an expert opinion in respect of the ingredients and quality of fertilizer, pesticide, food or drug; and, to deal with other related matters.*" The salient features of the Act that are relevant to environmental impacts are stated in Section 5. The PAFDA is instructed to make policies for: (a) carrying out forensic tests of fertilizers, pesticides, foods, and drugs and establishing and managing testing facilities for this purpose; (b) accrediting facilities for forensic examination and testing; (c) providing expert opinions; (d) establishing forensic examination and testing procedures and monitoring enterprises involved in collecting or handling fertilizers, pesticides, foods, and drugs; (e) conducting periodic forensic examinations and testing of samples; and (f) developing databases and conducting R&D.

Agricultural Pesticides Ordinance 1971 and Amendment 2012

260. Following the 18th Amendment, the enforcement of this Ordinance has been delegated to the provinces. The GoPunjab has adopted the 1971 Ordinance and all related amendments, which are implemented by the Directorate of General of Pest Warning and Quality Control of Pesticides (under the Agriculture Department).

261. The import, manufacture, formulation, sale, distribution, and use of pesticides is controlled by the Agricultural Pesticides Ordinance 1971, through the Agricultural Pesticides Rules 1973. The Ordinance covers: pesticide registration, the period for which registration is effective, registration renewal or cancellation, import guidelines, proper labeling of packages, the storage and use of pesticides, quality checks by a public analyst at federal/provincial pesticide laboratories, the appointment of inspectors to monitor pesticides, penalties for violators, and laws relating to the aspects above.

262. An important outcome of the Ordinance was the establishment of the Agricultural Pesticide Technical Advisory Committee (APTAC) to advise the federal government on technical matters arising out of the administration of this ordinance. The APTAC is headed by a chairperson, assisted by a vice-chairperson, members, officers of the central or provincial

government, and persons representing the pesticide trade and industry as appointed by the central government.

263. The APTAC's functions include:

- Studying the workings of the Agricultural Pesticides Rules with a view to recommending any necessary amendments to the federal government;
- The registration of pesticides; and
- Approval of the specifications for the technical grades of registered pesticides for local procurement or import.

264. The Ordinance was revised in 1992 and seven sections amended. In 1973, the federal government – in consultation with the APTAC – designed the Agricultural Pesticides Rules 1973.

265. These rules establish the procedure for the registration of pesticides, for which the APTAC is responsible. This entails the submission of applications, analysis of pesticide samples by the pesticide laboratory, granting certificates of registration, and the payment of fees. The rules prohibit the import of non-registered pesticides, except for experimental purposes. The manufacture, formulation, and sale of pesticides are subject to the conditions set out under Rules 10 and 11 (e.g., staff qualifications, keeping of detailed records, inspections by personnel authorized by the provincial government, proper storage of pesticides, etc.). The rules make detailed provision for the packaging and labeling of products, and for ensuring that places used to store pesticides are kept clean, properly equipped and ventilated, and well maintained. The safety precautions set out are to be followed when working with any kind of pesticides to ensure workers' health and safety.

266. Pesticides are registered in three categories: (i) under a trade name, for which efficacy trials are carried out in the field for two years and registration takes place over a period of two to three years; (ii) under a generic name, for which the government analyst's report is considered sufficient; and (iii) imported pesticides registered in their country of manufacture, based on satisfactory documentary proof. By 2000, a total of 2,116 pesticides had been registered, including 498 under trade names, 792 under generic names, and 826 based on registration in the country of manufacture.

267. In 1994, 23 pesticides were deregistered and their use banned in the country. Four products have been recommended for deregistration based on the WHO hazard classes I.a ("extremely hazardous") and I.b ("highly hazardous"). Pakistan also subscribes to the FAO/United Nations Environment Program code of conduct and has placed 17 products on their Prior Informed Consent list. However, despite these restrictions, banned pesticides are still used, albeit on a limited scale, as they are smuggled in from neighboring countries.

Factories Act 1934

268. The Factories Act 1934 concerns the regulation of labor in factories with respect to wages, working hours, and health and safety. Rural SMEs located in rural areas also fall under its ambit. The Act refers briefly to environmental issues. Section 14, which deals with the disposal of industrial wastewater, states that "*effective arrangements shall be made in every factory for the disposal of wastes and effluents due to the manufacturing process carried on therein.*" The Factories Act also states that "*the Provincial Government may make rules*

prescribing the arrangements to be made under subsection (1) or requiring that the arrangements made in accordance with that subsection shall be subject to the approval of such authority as may be prescribed.” While the Act does not specifically deal with air pollution, certain clauses do address the issue. Section 33Q allows provincial governments to establish rules for factories in cases where their operation exposes persons to “*serious risk of bodily injury, poisoning, or disease.*”

4. CAPACITY ASSESSMENT FOR MANAGING ENVIRONMENTAL AND SOCIAL EFFECTS

Introduction

269. This section summarizes the ESSA team's evaluation of the capacity of different institutions to implement the Program's environmental and social management systems. Focusing on institutions linked directly and indirectly to the implementation of these systems, the section briefly describes the background and mandate of each institution; its hierarchical organization and the adequacy thereof; its institutional capacity with regard to staff, budget allocations, training, and so on; the effectiveness of inter-agency coordination arrangements; and the performance of the implementing agency in ensuring that rules and procedures are followed.

270. While institutions exist at the provincial level to deal with environmental and social issues, their capacity to do so effectively, varies. This capacity should be increased with respect to human resources and/or financial capacity to operate the system as designed. To begin to address these capacity constraints and to close important implementation gaps, an incremental step-by-step, risk-based approach is recommended throughout the life of the proposed Program.

271. The following institutions will be engaged in implementing the Program. The institutional capacity assessment presented below is based specifically on the role of each institution with respect to the environmental management of Program components:

- a. Punjab P&D Department
- b. Punjab Agriculture Department
 - i. Directorate General Agriculture, Extension and Adaptive Research
 - ii. Directorate General Agriculture, Pest Warning and Quality Control of Pesticides
 - iii. Directorate General Agriculture, Water Management and OFWM
 - iv. Director General Agriculture, Field
 - v. Special Secretary Agriculture, Marketing
 - vi. Punjab Agriculture Research Board
 - vii. Ayub Agriculture Research Institute
- c. Punjab Agriculture Research Board
- d. Punjab Livestock and Dairy Development Department
- e. Punjab Food Department
- f. Punjab Irrigation Department
- g. Punjab Industry, Commerce and Investment Department
- h. Punjab Finance Department
- i. Punjab Environmental Protection Agency

Punjab Planning and Development Department (P&D)

272. The P&D Department is the chief planning agency in the province and is responsible for overseeing implementation of the GoPunjab's development schemes, including all projects carried out under the development budget. The department is also responsible for evaluating provincial development policy in general, commenting on prevailing economic conditions, and coordinating all economic activities in the province. The board is headed by a Chairperson who is the senior-most bureaucrat in the GoPunjab after the Chief Secretary. The Chairperson is supported by a Secretary, a Chief Economist, and eight members who are responsible for portfolios such as infrastructure development, the production sector, private sector development, public-private partnerships, and social infrastructure and environment, along with sectors such as health, education, and energy. The PCMU will be headed by a Program Director assisted by qualified support staff, all hired on a competitive basis.

273. The P&D Department has a strong M&E system through a directorate headed by a Director General and supported by a Director Coordination, along with 12 officers, including project managers, research analysts, and sector specialists. The latter include a specialist dealing with forest, agriculture, and livestock issues. The directorate is responsible for monitoring all development projects in the province, overseeing third-party evaluations, and carrying out special assignments that the GoPunjab may require for specific projects. The directorate uploads its reports on its website and has the capacity to conduct quantitative and qualitative field research, develop sampling techniques, and carry out data analysis and report writing.

274. In terms of Program implementation, the P&D Department in general, and its Directorate for M&E in particular, has the capacity to monitor the Program, carry out field investigations meeting beneficiaries and implementing agencies, and conduct data collection exercises. If needed, special studies can also be commissioned for the purpose and managed by the department.

275. The P&D Department has extensive experience of overseeing Bank projects, including those implemented by other departments. Within the government, it is the custodian for policy reform and assessment of economic and social impacts. The department will need to add specialized capacity to track and assess social risks, and to track issues related to gender and the inclusion of marginalized communities. Since it already has experience of monitoring, managing social impact studies should not be too difficult. It has instructed its development departments to conduct environmental assessments of all projects; climate change impacts, adaptations, and mitigations should also be included in the project design. There is no permanent Chief of Environment in the Environment Section.

Punjab Agriculture Department

276. The Agriculture Department will lead Program implementation. Given the diverse nature of the reforms agenda, however, different sections are being reviewed and evaluated and are to be implemented by different sub-offices. The department is headed by a Secretary, supported by a second tier consisting of five Director Generals and one Special Secretary. The five Director Generals are responsible for research, extension, field, pest warning, and water management, respectively, while the Special Secretary deals exclusively with agricultural marketing.

277. Within the department are champions of some of the reforms, who are responsible for driving discussion on particular policies. The introduction of crop marketing reforms through the Punjab Agriculture Markets Regulatory (PAMRA) Act, for example, are being championed by the Special Secretary. The Director General for Agriculture Extension is taking the lead in setting up the process for disbursement of the subsidy on agricultural inputs. The department has recently created the ADU, which will act as its Program Delivery Unit (PDU). A Chief Technical Advisor has been appointed for the PDU, who is supported by a team overseeing different reform actions. In addition, the Chief, Planning and Evaluation (P&E) Cell – which, in turn, grew out of the M&E component of an earlier World Bank project – will have a key role in overseeing implementation of policy reforms.²⁹ Within the department, the P&E Cell has traditionally been responsible for overseeing foreign-aided projects.

278. With respect to the social impacts of the proposed Program, the P&E Cell has, so far, taken on the responsibility of monitoring foreign-funded agriculture projects in the province, along with preparing draft position papers and writing special evaluation reports. Most of its reports, though, focus on the technical rather than social aspects of project implementation. The department also runs the Punjab Agricultural Helpline, which provides technical advice to farmers on modern farming methods. The helpline was instituted in 2003 and a recent research paper suggests that it is an effective source of information dissemination.³⁰ There is, however, no data on helpline use.

279. The Directorate General of OFWM in the Agriculture Department, is responsible for working closely with WUAs to carry out watercourse improvements. As the staff of the directorate explained though, they interact primarily with the executive body of the WUA – consisting of seven persons, generally all men – and work with them to supervise watercourse maintenance. Their interaction with the larger general body of the WUAs appears to be limited.

280. The Agriculture Department also includes a Directorate of Information, which is responsible for all public information campaigns undertaken for agriculture in Punjab. The directorate is working with the communications team at the PCMU to design an engagement strategy, the draft of which is ready as of October, 2017.

281. The department has been implementing the World Bank’s PIPIP through its OFWM Directorate and has some social mobilization capacity through its organization of WUAs. Its capacity to carry out social assessments and social impact studies is likely to be enhanced as the ADU becomes stronger.

282. The capacity of the Agriculture Department with respect to environmental issues, impacts, and legal requirements is substantial. It has already implemented a number of climate change resilience projects financed by the World Bank and other multilateral financiers, as mentioned earlier in Section 2. The projects financed by these multilateral institutions comply with PEPA 2012 and the World Bank’s environmental safeguard policies and procedures (the World Bank Operational Guidelines). In the case of projects financed solely through the GoPunjab, compliance with PEPA 2012 is partial. The technical teams of these organizations are highly qualified.

²⁹ The World Bank-funded Punjab Agriculture Extension and Adaptive Research Project, which was approved in 1978, established an M&E cell that was later incorporated into the department as the P&E Cell.

³⁰ Muhammad Arfan et al. 2013. ‘Comparative Analysis of Punjab Agriculture Helpline and Other Agricultural Information Sources for the Farmers in District Lahore’, *Journal of Agricultural Research*, 51(4), 473–478.

283. The Agriculture Department is engaged in promoting high-value crops such as olives and grapes in the province. At present, it is conducting research on the hybrid development of maize, tomato, and basmati rice as well as on new high-value crops, including olives in Potohar; date palm in south Punjab; grapes in Potohar and south Punjab; and avocado, chiku, nectarines/peaches, pistachio, berries, passionfruit, mangosteen, figs, and medicinal plants (kalonji, tulsi, ispaghol, and fennel). In addition, the department is involved in adaptability studies of soybean and sesame; intercropping (pulses/vegetables with sugarcane); tunnel farming; chips-quality potatoes; garlic and ginger cultivation; the promotion of wheat, castor bean, mustard, and pearl millet in Cholistan; and sprinkler irrigation for gram in Thal.

Directorate General Agriculture, Extension and Adaptive Research

284. Disseminating the appropriate technology – including its environmental management aspects – to farmers is vital if they are to benefit from technological advances. Moreover, the gap between research findings and farmers' adoption of technology needs to be filled through adaptive research. This task is carried out through agriculture extension in Punjab.

285. Adaptive research aims to devise site-specific technology packages to increase agricultural production. It helps adjust the results of research into suitable form before this information is transmitted to farmers, keeping in view their local agro-climatic and socioeconomic conditions.

286. To achieve its objectives at the provincial level, the directorate performs the following functions: preparing and printing production technology/plans for crops, fixing area and production targets, preparing provincial development projects, interacting with other provincial and federal governments, recommending amendments to agricultural laws and implementing the latter at the provincial level, monitoring district-level activities, planning and testing new strategies for technology transfer, and looking after the service matters of provincial cadres.

287. At the district level, the directorate is responsible for: implementing production technologies to achieve area and production targets, maintaining agricultural statistics, training farmers at the village level, implementing approved projects, preparing district-level projects, implementing agriculture laws, monitoring agricultural input availability, participating in provincial review meetings, and providing feedback on researchable problems.

288. The directorate has implemented many projects financed by the GoPunjab as well as international finance institutions. Its environmental capacity is moderate, given its experience, and staff are likely to need environmental training for specific program activities.

Directorate General Agriculture, Pest Warning and Quality Control of Pesticides

289. The directorate is responsible for monitoring pest development and executing all plant protection activities in Punjab. Specifically, these include:

- Plant protection activities with the main aim of adopting IPM techniques and applying pesticide only when needed;
- Quality control of pesticides, including the registration of pesticide distributors; and
- Training farmers, pesticide dealers, and extension agents in plant protection and the safe handling and use of pesticides.

290. The directorate also performs the following functions:

- Monitoring pest development;
- Issuing weekly/fortnightly pest scouting reports for all crops, orchards, and vegetables in different ecological zones of the province;
- Training farmers, extension workers, and pesticide dealers to identify insect pests and apply appropriate and timely control measures;
- Registering pesticide distributors in Punjab; and
- Ensuring that quality pesticides are available to farmers.

291. Directorate officials claim that the decline in use of pesticides in Punjab is attributable to steps taken by the directorate to promote IPM practices (biological controls, cultural controls, land preparation, genetically modified crops, chemical controls, and capacity building of farmers). The directorate informed the ESSA team that 133 pesticide inspectors were presently operating in the province and had conducted 140 raids, tested 6,500 samples, and registered 350 court cases of non-compliance with the Pesticides Ordinance 1971. Directorate officials also claim that pesticide management in Punjab is far better than in the other provinces.

Directorate General Agriculture, Water Management and OFWM

292. The directorate is recognized as a driving force behind the transformation of Punjab's agriculture sector. Its objective is to maximize crop and water productivity by ensuring that irrigation water is efficiently conveyed, applied, and used. This is done by promoting improved water management interventions through user participation. The directorate has the following main functions:

- Organize and register WUAs;
- Renovate, rehabilitate, and improve watercourses;
- Strengthen precision land leveling services in the private sector;
- Promote high-efficiency pressurized (drip and sprinkler) irrigation systems;
- Develop small-scale irrigation schemes in non-canal command areas;
- Construct water storage ponds and tanks;
- Provide solar-powered high-efficiency irrigation systems;
- Subsidize the installation of tunnels with high-efficiency irrigation systems;
- Provide on-farm surface drainage facilities;
- Identify, acquire, pilot-test/evaluate, indigenize, and promote/upscale the latest irrigation water management interventions/technologies through adaptive research;
- Build the capacity of stakeholders (technical staff, trainers/extension workers, and farmers) in improved water management interventions; and
- Coordinate with international, regional, national, and provincial organizations as well as the research, extension, and field wings of the Agriculture Department for irrigation water management technology transfer.

293. The directorate has the capacity needed to meet environmental management requirements during the implementation of OFWM projects. It has significant implementation experience of many projects financed by the GoPunjab and multilateral organizations.

Directorate General Agriculture, Field

294. The Field Wing of the Agriculture Department provides engineering services to farmers and other stakeholders in the area, including land leveling and development, ground water exploration, well drilling, soil and water conservation, and R&D related to agricultural machinery using highly skilled labor. It also works to promote renewable energy resources at farm level and maintains agricultural engineering workshops throughout Punjab for the M&R of departmental as well as farmer-owned machinery and equipment.

295. The Agricultural Mechanization Research Institute in Multan undertakes R&D on low-cost and appropriate agricultural machinery and farm mechanization technologies. Ensuring food security and sustainability, given the increased population, and alleviating poverty are the key aims of the directorate.

296. The directorate has developed its capacity for environmental and resource efficiency compliance linked to precision land leveling, groundwater efficiency, rainwater harvesting, and technology development (such as renewable energy applications) through its experience of previous World Bank-funded projects and current implementation of the Punjab Irrigated-Agriculture Improvement Project (PIPIP).

297. The Special Secretary Agriculture-Marketing: Punjab Agriculture Produce Markets Act 1939 was promulgated on the recommendation of a royal commission constituted by the British Indian Government in 1927. The purpose of the Act was to regulate agricultural business with a view to ensuring that growers received a fair return on their produce. Market committees were established under the provisions of this Act to safeguard the interests of growers.

298. The Act of 1939 was replaced by the Punjab Local Government Act 1975, but for legal and technical reasons, the provisions of the latter could not be enforced. Subsequently, the relevant provisions were replaced by the Punjab Agricultural Produce Markets Ordinance 1978, for which rules were framed in 1979. The Agriculture Marketing Wing was established in January 2004. Its chief functions are to:

- Manage agricultural markets in Punjab, including grain, fruit, vegetable, and feeder markets;
- Supervise market committees in Punjab;
- Establish new markets;
- Collect and disseminate marketing information;
- Release a daily price bulletin through electronic and other media;
- Assess crop economics and produce price analysis reports for various crops;
- Carry out surveys and studies; and
- Produce monthly price and crop situation reports for various crops.

299. The agricultural marketing system is looked after by the Directorate of Agriculture (E&M) and market committees.

300. The environmental capacity and performance of the directorate is assessed as being low. The environmental conditions of wholesale markets in Punjab is generally poor.

Punjab Agricultural Research Board

301. The Punjab Agricultural Research Board (PARB) was established as an autonomous body under PARB Act 1997. Its aim is to foster an integrated approach to research planning and efficiently allocate research resources so that the province's agriculture innovation system can generate appropriate solutions to the problems that stakeholders face along the food and fiber chain.

302. PARB's vision is to enhance sustainable productivity, reduce poverty, ensure food security, and promote competitiveness in the agriculture sector through output-oriented agricultural R&D. Its mission is to support the efficient development of scientific technologies for the prosperity of agricultural stakeholders.

Ayub Agriculture Research Institute (AARI)

303. The Ayub Agricultural Research Institute (AARI), Faisalabad is responsible for generating agricultural technology, which serves as an engine of economic growth. Its mission is to develop technologies for food safety and the sustainable generation of exportable surplus as a means of value addition and conserving natural resources. AARI played a key role in the green revolution of the late 1960s and continues to do so to meet contemporary productivity challenges and ensure national food security.

304. As the most important crops grown in Pakistan, cotton, wheat, sugarcane, and rice are crucial to the overall performance of the national economy. Several studies demonstrate that agricultural research has a positive and significant impact on agricultural productivity.

305. The Agriculture Department has established an Organic Farming Research Section at AARI and submitted a draft of the Organic Farming Act to the GoPunjab. It reports that progressive farmers have begun to grow organic vegetables on a small scale, adding that Pakistan has good prospects for growing organic pulses and orchards. Among the country's agro-ecological zones, the arid zone and Thal offer the best potential. The department notes that effectively exploiting this potential will need the establishment of a certification agency.

306. Climate Change Research Center has been set up at AARI. Its staff report that AARI has adequate infrastructure and human resources. While its capacity to understand the impact of climate change on agriculture is adequate, AARI needs modern equipment and further capacity building to conduct more detailed research into climate change impacts, adaptation, mitigation, and resilience. Moreover, its capacity to engage with and influence other development departments is limited and needs strengthening. This underlines the need for institutional mainstreaming of climate change impacts and resilience.

307. The ESSA team recommends making the Agriculture Department responsible for mainstreaming resilience to climate change in collaboration with AARI. In this regard, it proposes setting up a Climate Change Extension Cell at the department, responsible for sensitizing other development departments to climate change impacts, adaptation, mitigation, and resilience.

Livestock and Dairy Development Department

308. The L&DD Department is headed by a Secretary, and supported by the Director General (Extension) and Director General (Research). It is primarily the Directorate General

Extension that will be responsible for implementing the relevant policy reforms under SMART (DLI 3: Improving livestock health and livestock breeding). The Director General is supported by four Directors, including those dealing with communications and extension, livestock farms, and livestock. The office of the Director (Communications and Extension) is responsible for raising awareness of research and technology among stakeholders and for the capacity of the field force.

309. Traditionally the department has had little institutional capacity for social organization at the community level, but this is changing. Its outreach services have recently become more active and it plans to send 45,000 extension workers – half of them, women – into the field. Once this program is launched, the department’s community outreach should be strengthened considerably. The department also runs a helpline for requesting services, but field interviews suggest that there is little information available on using it.

310. The department is moving from “disease attendant” to “livestock asset manager” by shifting from curative to preventive care to help make the sector more competitive. This will contribute to food security, improve the lives of stakeholders, and ultimately generate exportable surpluses for domestic and international markets. The department’s main functions include:

- The management of livestock, dairy, and poultry farms
- Animal health
- Livestock production extension services
- Preservation and development of livestock genetic resources
- Research and training for livestock production.

311. In terms of its capacity for environmental management, the department’s activities produce hospital and clinic waste (mostly syringes and packing material) and limited surgical waste. Under PEPA 2012, the Hazardous Substances Rules apply to all veterinary hospitals and clinics, thereby warranting environmental management of these facilities. Department officials report that EIAs and IEEs are prepared for every project as per the requirements of PEPA 2012 and that NOCs are secured from the Punjab EPA. Given that the L&DD Department has complied with PEPA 2012 in preparing EIAs and IEEs for past projects, its environmental capacity is assessed as being moderate.

Punjab Irrigation Department

312. The Punjab Irrigation Department (PID) is one of the oldest departments under the GoPunjab and consists of a Program Monitoring and Implementation Unit (PMIU), a Strategic Planning and Reform Unit (SPRU), and a Project Management Office for Barrages. This is in addition to the PIDA, which oversees the M&R of the irrigation, drainage, and flood control systems in the province and enables beneficiaries to participate in the O&M of these systems. PIDA oversees five Area Water Boards that have been constituted in each canal command area and a series of farmers’ organizations at the distributary level.

313. In the context of the Program, the SPRU will act as the PDU. The SPRU arose out of a previous World Bank project in which it was responsible for coordinating a series of development policy loans for Punjab’s irrigation sector from 2006 to 2009. It now coordinates all foreign-funded programs under the Irrigation Department and carries out M&E. To this

extent, the unit has experience of implementing safeguards for World Bank projects, having implemented the Punjab Barrages Improvement Project. The SPRU has carried out social mobilization exercises in the recent past for this project, but the FGDs suggest that its outreach at the grassroots level is neither widespread nor regular. The unit works through three directorates: Engineering and M&E, Institutional Reforms, and Groundwater Management. Recruitment for key posts was ongoing as of July 2017, but the SPRU is not currently functioning at full capacity. The Irrigation Department has traditionally worked through revenue officials on issues such as *abiana* and will likely continue with this model in the near future.

314. The department's PMIU runs a complaints cell that allows users to file complaints through a helpline, by email, and by direct application. The cell entertains complaints on water theft and watercourse tampering, among other things. The PMIU's webpage allows complainants to track the status of their complaint or query.

315. The department has developed a good capacity for environmental management through the implementation of bilateral and multilateral-financed projects. Thus far, it has complied with the environmental requirements established by PEPA 2012 and the World Bank's environmental safeguards.

Industries, Commerce, and Investment Department

316. The Secretary of the department is supported by two Additional Secretaries (for Administration and Commerce, respectively) and the World Trade Organization Cell. The department is currently implementing the Jobs and Competitiveness Program funded by the World Bank in Punjab and is well versed with the Bank's requirements. Its capacity to carry out social assessments or mitigation strategies is, however, limited.

317. The Program supports SMEs in the agriculture sector. The department's monitoring activities have thus far focused on industries that have installed boilers and pressure vessels. Since agricultural SMEs tend to be simple processing industries, they carry a low environmental risk. Should any SMEs need to install boilers and pressure vessels, then the department has adequate capacity for monitoring these through its field inspectors.

Food Department

318. The Food Department is headed by a Secretary, supported at the next tier by an Additional Secretary, a Cane Commissioner, Director Food, and Director General Food Authority. The office of the Director Food is primarily responsible for wheat procurement. The department's vision is to improve people's quality of life by providing them quality flour at reasonable prices, while safeguarding the interests of wheat growers by ensuring they receive a minimum guaranteed price for their produce. The department has little outreach experience and is not equipped to handle any social issues arising from its operations.

319. The department operates with a narrow focus on food safety at the restaurant level. It needs to carry out food safety responsibilities at a far wider level, with a special focus on the contamination of fruits and vegetables at the production, processing, and supply stages. In this regard, the Program will engage the PAFDA to (a) ensure effective regulation of food processing, storage, distribution, sale, and import; (b) establish food standards; and (c) conduct forensic testing of food products. Given the Food Department's limited capacity for food

testing, the Program will support measures to extend its activities to the agriculture sector and establish infrastructure for monitoring the food production cycle.

Punjab EPA

320. The Punjab EPA is responsible for (a) the protection, conservation, rehabilitation, and improvement of the environment; (b) prevention and control of pollution; and (c) promotion of sustainable development in the province. It faces several constraints – low capacity, a weak control and command system, and budgetary limitations – to enforcing PEPA 2012. Moreover, its outreach to rural SMEs is almost negligible since the environmental monitoring of rural SMEs has never been prioritized. The EPA will be engaged by the Program to operationalize environmental monitoring synergies with other departments under an interdepartmental coordination framework, and to obtain the relevant environmental permits if necessary. Specifically, the Program will coordinate with the EPA’s district offices. In efforts to strengthen its capacity, the Environment Protection Department (EPD)/EPA has recently embarked on a process that will reform and improve its internal systems. This is being supported by two World Bank-funded operations:

- The Bank-funded Job and Competitiveness (P155963) PforR includes a component titled *Capacity Building of EPA Punjab for Enforcement of Environment Standards in Punjab*. The program focuses on building the capacity of the EPD and EPA with respect to completing the legislative framework; restructuring the EPA; strengthening their capacity to process EIAs/IEEs; establishing an Environmental Monitoring Center; developing and deploying an environmental information management system; and strengthening environmental testing laboratories. This capacity building process is comprehensive and will involve the preparation of standards and sectoral environmental assessment guidelines that will target many of the thematic areas and issues related to this Program and discussed in this ESSA.
- As part of this initiative launched by the Punjab EPD, the World Bank has recently engaged with the GoPunjab to develop the Green Development Program (P165388). Its objective is to support environmental governance reforms and selected green investment priorities in Punjab. The program will support, among other aspects, measures to improve environmental governance in the province. This will be achieved by supporting reforms to improve the structure and build the capacity of the EPD/EPA, and to promote coordination with key stakeholders on green development, including the private sector and financial institutions. This program is being prepared and will be approved by the Bank in FY18.

5. COMPARATIVE ANALYSIS OF BORROWER'S SYSTEMS AND BANK POLICY CORE PRINCIPLES

Introduction

321. This section provides an assessment of the extent to which the applicable systems are consistent with the core principles and key planning elements expressed in the Bank's policy on PforR (OP 9.0). It also provides a review of aspects where gaps exist between the two.

322. The agriculture and livestock sectors operate through diversified inputs and outputs with strong interaction with ecology, the environment, and society. The Program has been designed to strategically address major issues that have greater impact on the livelihoods of the rural population, the economy, and natural resource management. The Program interventions require environmental compliances under the legislative framework of the province. The diversity of the agriculture and livestock sectors means that they operate under a wide range of legislations. The comparative analysis is presented below and a detailed matrix of findings and recommendations is given in Annex V of this report.

Core Principle 1

323. Environmental and social management procedures and processes are designed to (a) avoid, minimize, or mitigate against adverse impacts; (b) promote environmental and social sustainability in program design; and (c) promote informed decision making relating to a program's environmental and social effects.

324. *1.1 Bank program procedures are backed by an adequate legal framework and regulatory authority to guide environmental and social impact assessments at the programmatic level.*

325. The current environmental legal system relevant to Program interventions comprises two types of legislations, i.e., environmental legislation (PEPA 2012), and agriculture and livestock sector-related legislation, with dovetailed environmental legal provisions. The Program interventions need to comply with both types of legislation. PEPA 2012 mostly deals with the establishment and operation of physical interventions proposed under the Program. The environmental legal provisions that dovetail in the agriculture and livestock sectors deal mostly with production and distribution activities.

326. **Fertilizers and Pesticides:** Environmental aspects of production, storage, distribution, and use of fertilizers and pesticides are covered under PEPA 2012 through its provisions for EIA/IEE, the Hazardous Substances Rules, and compliance with the NEQS; the Agricultural Pesticides Ordinance 1971 and Amendment 2012; the Punjab Agriculture, Food and Drug Authority Act 2016; the Factories Act 1934; and the Groundwater Act.

327. **Water Management and Efficiency:** Overall water management, along with environmental concerns such as irrigation efficiencies, contamination of water resources, use of wastewater for irrigation, and depletion of groundwater, will be covered under the Groundwater Act; PEPA 2012 and its provisions for the Hazardous Substances Rules, and compliance with the NEQS; the Punjab Local Government Act 2013 and Amendment 2016; and the Canal and Drainage Act 1873 and Amendment 2016.

328. **Agricultural Production:** In addition to the major inputs (fertilizers, pesticides, and water), environmental concerns stemming from other agricultural inputs such as seed certification, plant breeding, the use of microbes, and crop burning are addressed under the implementation of the Seed Act 2015, the Plant Breeders' Rights Act 2016, PEPA 2012, and the Bio-Safety Rules 2014 under PEPA 2012.

329. **Livestock Sector:** Environmental concerns related to livestock such as the generation of waste linked to the operations of slaughter houses, the establishment and operations of hospitals and clinics, and the establishment of biogas plants are covered under PEPA 2012 and its provisions for EIA/IEE, the Hazardous Substances Rules, and compliance with the NEQS.

330. **Food Safety:** Environmental issues such as the contamination of food during the supply chain, bacterial contamination of food due to the application of untreated wastewater, and heavy metal contamination due to overuse of pesticides are covered under the forensic testing requirements of the Punjab Food Authority Act 2011. The establishment and operations of food-testing laboratories are covered under PEPA 2012 and its provisions for EIA/IEE, the Hazardous Substances Rules 2003, and compliance with the NEQS.

331. **Rural Enterprises:** The Program will provide matching grants for the establishment and scaling up of agro-businesses. The environmental management issues of these enterprises will be covered under the PEPA 2012 provisions for EIA/IEE, the Hazardous Substances Rules, and compliance with the NEQS.

332. The review above indicates that the current environmental and social legal systems of Pakistan and Punjab support the environmental and social assessments of projects and interventions proposed by the Program. The PEPA 2012 and sector legislations provide a comprehensive legislative framework for the protection, conservation, rehabilitation, and improvement of the environment. However, the capacity of regulatory institutions for environmental and social monitoring is moderate to low in some cases.

333. *1.2a Early screening of potential effects*

334. Under PEPA 2012, a screening process is in place based on provision in Schedule I and II of the Review of IEE and EIA Regulations 2000. The guidelines for preparation and review of EIA reports specify the need to scope important issues at an early stage. The Punjab Bio-Safety Rules 2014 have a screening system for the import and production of microbes and living organisms. The Draft Integrated Water Resources Management and Groundwater Act has a screening system for the installation of tubewells and discharge of wastewater into the canal system. The Seed Act 1976 and Amendment 2015 and the Plant Breeders' Rights Act 2016 have screening systems for the selection of seeds and plants, respectively. Finally, the Agricultural Pesticides Ordinance 1971 and Amendment 2012 have comprehensive screening systems for the certification of pesticides in the province.

335. *1.2b Consideration of strategic, technical, and site alternatives (including the 'no-action' alternative)*

336. In the case of the Program, alternative analyses are required for the location of new food-testing laboratories, the establishment of veterinary hospitals and clinics, and rural enterprises under the PEPA 2012 guidelines for preparation and review of environmental reports. Section 2.6 mandates the analysis of alternatives, including a "no-build option". There is often a high degree of reluctance to critically evaluate alternatives from an environmental

and social point of view, or to carry out any significant modifications to project location or design at this stage. Although site alternatives must be assessed before finalizing site selection, it has been observed that this analysis is mostly done in retrospect to justify the site already selected, without considering the environmental and social aspects.

337. *1.2c Explicit assessment of potential induced, cumulative, and transboundary impacts*

338. Most IEEs/EIAs are conducted for site-specific spot analyses and do not determine cumulative environmental impacts. Assessments need to be conducted for the proper application of fertilizers/pesticides and their downstream impacts. The existing legislation does not, however, cover cumulative environmental impacts under its legal provisions and policy guidelines.

339. *1.2d Identification of measures to mitigate adverse environmental or social impacts that cannot be otherwise avoided or minimized*

340. The guidelines for the preparation and review of environmental reports under PEPA 2012, Sections 3.7 to 3.9, and sector legislations include the assessment of environmental, social, health, economic, and fiscal impacts. Accordingly, the proponent of a project is required to prepare an environmental action plan to mitigate adverse environmental and social impacts arising from the project. While procedures for assessing environmental and social impacts are in place for development projects, actual implementation is often only partial. The reports provide recommendations, but their implementation is limited to projects financed by multilateral and bilateral institutions.

341. *1.2e Clear articulation of institutional responsibilities and resources to support implementation of plans*

342. Institutional responsibilities and resources for preparation, implementation, monitoring, and inspection are clearly spelled out in the relevant regulations (PEPA 1997, PEPA 2012, and the Review of IEE/EIA Regulations 2000). The mandate for monitoring the implementation of the IEE/EIA Regulations lies with the Punjab EPA. The mandates for land acquisition and physical and cultural resources are vested in the Board of Revenue and Archaeology Department, respectively. The mandate for implementing labor laws is delegated to the Labor Department. Provincial departments are mandated by the administrative order of the Punjab P&D Department and sector-specific legislation to prepare environmental assessments and, subsequently, to implement environmental mitigations during project implementation and operations.

343. *1.2f Responsiveness and accountability through stakeholder consultation, timely dissemination of program information, and through responsive grievance redress measures*

344. A key requirement is that of public consultation with the relevant stakeholders, local authorities, and representatives of the communities and organizations directly affected by a project (Guidelines for Public Consultation). Such public consultations are generally better in projects financed by multilateral and bilateral institutions. The complaints cell of the Punjab EPA actively addresses complaints related to environmental and social aspects. Grievance redress mechanisms (GRMs) are absent at the program and policy level, where the only recourse is through the courts. GRMs are implemented only at the project level.

345. Although the timing and techniques for consultation are clearly stated in the guidelines, public consultation is carried out in two stages: during the socioeconomic and inventory surveys at the baseline data collection stage of the EIA, and at the public hearing as part of the EIA process. GRMs need to be established at the program level.

Core Principle 2

346. Environmental and social management procedures and processes are designed to avoid, minimize, and mitigate any adverse effects (on natural habitats and physical and cultural resources) resulting from the program.

347. *2.1 Includes appropriate measures for early identification and screening of potentially important biodiversity and cultural resource areas.*

348. PEPA 2012, through its provisions for IEE/EIA, incorporates the profiling of natural habitats, flora and fauna species, national parks, important ecological areas, and impacts on downstream fresh water bodies. An impacts matrix of project components and activities during the construction and operation phases of any project, including mitigation measures, is an essential part of the IEE/EIA. Physical and cultural resources are protected under the Antiquities Act 1975.

349. *2.2 Supports and promotes the conservation, maintenance, and rehabilitation of natural habitats; avoids the significant conversion or degradation of critical natural habitats, and if avoiding the significant conversion of natural habitats is not technically feasible, includes measures to mitigate or offset impacts or program activities*

350. The protection of natural habitats and sensitive biodiversity areas is covered under the IEE/EIA guidelines in line with international best practices and protocols. Critical natural habitats are designated “national parks”. Pakistan has 29 protected national parks, wildlife sanctuaries, and game reserves. Stringent rules exist to avoid the significant conversion or degradation of natural habitats located in national parks. According to the Modern Protected Areas legislation, a national park is a protected area set aside by the government for the protection and conservation of its outstanding scenery and wildlife in a natural state. The construction of roads and rest houses is permitted to promote public use, but using firearms, polluting water, clearing land for cultivation, and the destruction of wildlife is banned in these areas.

351. *2.3 Takes into account potential adverse impacts on physical cultural property and, as warranted, provides adequate measures to avoid, minimize, or mitigate such effects*

352. The main legislation on the conservation of archeological heritage is the Antiquities Act 1975, which was adopted by Punjab in 1985. The 1975 Act focuses on the conservation of monuments, whereas the Punjab law extends this to the area surrounding monuments. However, most government agencies are not aware of the Act.

Core Principle 3

353. Program procedures ensure adequate measures to protect public and worker safety against the potential risks associated with (a) construction and/or operations of facilities or other operational practices developed or promoted under the program and (b) exposure to toxic chemicals, hazardous wastes, and otherwise dangerous materials.

354. *3.1 Promotes community, individual, and worker safety through the safe design, construction, operation, and maintenance of physical infrastructure, or in carrying out activities that may be dependent on such infrastructure with safety measures, inspections, or remedial works incorporated as needed.*

355. This is addressed through the EMP, which is an essential part of an IEE/EIA. The IEE/EIA for relevant investments under the Program covers safe design, construction, and O&M for the whole Program, including infrastructure, layout, land acquisition, community safety, and so on. However, EMP implementation for physical projects varies in quality and supervision.

356. *3.3 Promotes the use of recognized good practice in the production, management, storage, transport, and disposal of hazardous materials generated through program construction or operations; promotes the use of integrated pest management practices to manage or reduce pests or disease vectors; and provides training for workers involved in the production, procurement, storage, transport, use, and disposal of hazardous chemicals in accordance with international guidelines and conventions.*

357. PEPA 2012, under the provisions of the Hazardous Substances Rules 2003, along with the Agricultural Pesticides Ordinance 1971 and Amendment 2012, instruct the proponent of a project to adopt good production practices in the management, storage, transport, and disposal of hazardous materials generated through program construction or operations. They also provide for training workers involved in the production, procurement, storage, transport, use, and disposal of hazardous chemicals in accordance with international guidelines and conventions. However, implementation remains inadequate. Major instances of non-compliance take place at the storage and stock levels. The Directorate of Pest Warning under the Agriculture Department is mandated to promote IPM and the safe handling of pesticides throughout the province.

358. *3.2 Includes measures to avoid, minimize, or mitigate community, individual, and worker risks when program activities are located within areas prone to natural hazards such as floods, hurricanes, earthquakes, or other severe weather or climate events.*

359. These aspects are covered by the IEE/EIA Regulations, usually under a disaster management plan (DMP), which is part of the environmental management of the IEE/EIA. Implementation quality and supervision efforts, however, are variable.

Core Principle 4

360. Land acquisition and loss of access to natural resources are managed in a way that avoids or minimizes displacement, and affected people are assisted in improving, or at least restoring, their livelihoods and living standards.

361. *4.1 Avoids or minimizes land acquisition and related adverse impacts.*

362. Land acquisition may take place for two DLIs – DLI 5, which relates to promoting agribusiness through matching grants, and DLI 8, which may require the acquisition of land to set up food-testing laboratories. In the first case, private sector parties may enter the market for agricultural land for the explicit function of creating an agribusiness demonstration project. However, such initiatives are not likely to involve acquisition of large tracts of land and will be met through willing-buyer-willing seller arrangements. In the second case, the land may be

acquired by the GoPunjab and once again, this is not envisioned as large tracts. The main legal tools used for land acquisition by the GoPunjab are the Land Acquisition Act 1894 and the Punjab Land Acquisition Rules 1983.

363. *4.2 Identifies and addresses economic and social impacts caused by land acquisition or loss of access to natural resources, including those affecting people who may lack full legal rights to assets or resources they use or occupy.*

364. The Land Acquisition Act (LAA) 1894 has clear provisions and procedures in this regard when it comes to land and titleholders. However, it does not cover people without titles. The GoPunjab has made special provisions in this regard in previous projects such as the Metro Bus Projects in which payment was also made to non-title holders. Similar SOPs could be adopted in the case of the SMART Program.

365. The matching grants awarding authorities should lay out the criteria for meeting land needs. These should, ideally, be met through willing-buyer-willing-seller agreements. SOPs should also be developed to ensure that the acquisition of land is done in line with the principles of the PforR.

366. *4.3 Provides compensation sufficient to purchase replacement assets of equivalent value and to meet any necessary transitional expenses, paid prior to taking of land or restricting access.*

367. The concerned agencies must include provisions to ensure that compensation is fair and is processed in a transparent manner as per the principles of the PforR.

368. *4.4 Provides supplemental livelihood improvement or restoration measures if taking of land causes loss of income-generating opportunity (for example, loss of crop production or employment).*

369. Livelihood restoration is not specified in the Land Acquisition Act 1894 or Punjab Land Acquisition Rules 1894 and this is a significant gap. However, land acquisition procedures for the Metro Bus Projects had some provision for loss of business. The concerned agencies must include provisions in their SOPs for matching grants to ensure that compensation for livelihoods – including for tenants and non-titleholders – is done in accordance with the principles of the PforR.

370. *4.5 Restores or replaces public infrastructure and community services that may be adversely affected.*

371. Public infrastructure and community services are normally relocated by the relevant department.

Core Principle 5

372. Due consideration is given to cultural appropriateness of, and equitable access to, program benefits, giving special attention to the rights and interests of indigenous peoples and to the needs or concerns of vulnerable groups.

373. *5.1 Gives attention to groups vulnerable to hardship or disadvantage, including as relevant the poor, the disabled, women and children, the elderly, or marginalized ethnic*

groups. If necessary, special measures are taken to promote equitable access to program benefits.

Indigenous Peoples/Ethnic Minorities

374. Indigenous peoples are not found in Punjab and, therefore, this aspect is not applicable to the Program. With regard to equitable access to benefits for vulnerable groups, the social assessment gives details of how different vulnerable groups may be affected, and the ESSA recommends measures the government should take to reduce/mitigate such effects. There is no overarching agency under the GoPunjab that looks at the social impact of development projects, although, as stated earlier, such assessments are incorporated into the P&D Department's monitoring reports.

Core Principle 6

375. Avoid exacerbating social conflict, especially in fragile states, post-conflict areas, or areas subject to territorial disputes.

376. *6.1 Considers conflict risks, including distributional equity and cultural sensitivities.*

377. The ESSA takes these into account and recommends mitigation measures.

6. STAKEHOLDER CONSULTATIONS

Introduction

378. Stakeholder consultations were an integral part of the ESSA process and were carried out keeping in view similar principles and objectives of other Bank operations. This section of the ESSA highlights the consultation process, elaborating on the participatory approach, stakeholders, tools and techniques adopted, and major findings and recommendations from the key stakeholders. It also provides details pertaining to the Bank-sponsored multi-stakeholder workshop held in Lahore on 23 October 2017.

Summary of Stakeholder Meetings

379. The social assessment included consultations at the field level, with a total of 17 FGDs being carried out in villages in districts Lahore, Kasur, Nankana, and Multan (see also Table 2.2). The FGDs covered male and female groups from communities, commission agents, and members of market committees, as well as two FGDs with farmers' organizations.

380. The Bank-sponsored **multi-stakeholder workshop in Lahore on 23 October 2017** provided another forum for consultations. Participants included a range of stakeholders from the government, international organizations, academia, the private sector, local government, and civil society. Participants were divided into three groups, with each group discussing one of the following three Results Areas:

- **Results Area 1:** Increased on-farm productivity and value of crops and livestock. (DLI 1, 2, 3 and 4)
- **Results Area 2:** Increased value addition and competitiveness of crops and livestock. (DLI 5, 6, 7 and 8)
- **Results Area 3:** Enhanced resilience of smallholder farmers to climate change and natural disasters. (DLI 9, 10, and 11)

Results Area 1

381. ***Input Subsidy to be Targeted:*** Participants of this group debated in detail the environmental and social issues linked to the fertilizer subsidy currently being provided by the GoPunjab. They felt that the subsidy, which is currently untargeted, should be targeted in future as proposed under the Program. This will not only help the government increase fiscal space for other important interventions, but will also help direct the benefits of this Program to those who need it most. In addition, participants agreed that a targeted subsidy on fertilizer would create opportunities for the balanced use of fertilizer by farmers. Presently, the subsidy is given to anyone able to provide proof of purchase and willing to register in the farmers' database. This can potentially lead to misuse of the subsidy by farmers with large landholdings; a few cases of misuse have been reported from the field. Participants asked how the targeting would proceed once the database had been set up, and whether it would be linked to land ownership or given to those farming the land. Participants were of the view that the data being collected under the subsidy program should ultimately be reconciled with the data collected by other organizations such as the PLRA to design a more focused intervention.

382. ***Tracking the Effects of the Subsidy:*** Participants proposed a third-party verification mechanism to track the subsidy, monitor the people receiving it, and gauge the social and

economic impacts of this intervention. They also felt that the larger fertilizer producers should be brought into the scheme. The Agriculture Department said this was being done and that negotiations were underway. The ESSA team responded by saying that tracking the subsidy would be strengthened under the Program.

383. **More Research Needed:** Participants agreed that there was a dearth of research in agriculture and that R&D budget allocations were insufficient to encourage innovation in social and environmental issues. The R&D budget in Pakistan is lower than in other countries in South Asia. The reorganization of the PARB, along with better financial resources, could certainly increase and improve the quality of agricultural research. Participants endorsed the proposed environmental and social research package under the Program.

384. **Preventive Care for Livestock Endorsed, but Needs to be Publicized:** When discussing the shift from preventive to curative care for livestock in Punjab, participants acknowledged that the L&DD Department was already working toward encouraging farmers to seek preventive rather than curative treatment, and that several programs were currently being implemented by the Extension Wing of the department. There is increased visibility of the L&DD Department in the field, and the GoPunjab sees this as a priority area. Last year, medicines worth PKR400 million were distributed across Punjab to livestock farmers; this sum is expected to double this year. However, one of the biggest problems identified by the participants was farmers' lack of awareness of the programs being run by the GoPunjab. Without rigorous and focused information dissemination efforts, they said, this intervention would not yield the desired results. To this end, there should be a mass dissemination campaign run through the print, electronic, and social media. The potential use of mobile phone technology was also raised. Given the large number of mobile phone users in rural Punjab, mobile networks could be used not only to increase awareness among farmers of the interventions being run by the GoPunjab, but also to disseminate information. The ESSA team responded by saying that an independent DLI (DLI 12) has been included in the Program to ensure effective communication and dissemination of project activities and results.

385. **Caution in Phasing Out Wheat Procurement:** Participants felt there were significant risks associated with phasing out the wheat procurement (by the GoPunjab). Some participants warned there could be opposition from farmers' groups, who saw wheat as the backbone of the entire agricultural economy. These risks branch out to other areas such as livestock feed – if farmers are not assured a support price for their wheat, this could also potentially cause losses and lower production in the livestock sector, as wheat is not grown only for the grain, but the stalks are also used as fodder. The biggest potential loser could be the grower. Presently, the government's wheat procurement prices set a benchmark that also determines the price of wheat in the open market. Even farmers who are unable to sell directly to the government can fetch a price close to the government-determined price of wheat. Another important aspect is the place of wheat in the food basket of the average Pakistani household. The ESSA team explained that all these risks had been analyzed in consultation with stakeholder institutions during program appraisal. They said that the government's wheat procurement program would be reduced through an agreed process and system to ensure that farmers' incomes should not be affected. They also stressed the need to ensure rationalization of the wheat market in the light of movements in the international wheat market, food security in the country, and alternatives to wheat crop. Finally, they stressed the significant benefits of lower wheat prices to net wheat consumers who represent the vast majority of the population.

386. **Transition to HVA Needs Support:** On the issue of transition to high-value crops, most participants felt that the government should do more preparatory and background work to make

the transition process smoother. They were concerned that, without requisite planning, moving toward HVA might not deliver the desired results. One of the biggest hurdles in the transition is the lack of information on markets for HVA crops. Participants called for a phased withdrawal of the government from the wheat market to mitigate the potential risk. They also recommended that the government should not hurry into the process – as it had done for sunflower seed, where farmers were encouraged to grow sunflower in the absence of the required market linkages, leading to losses among farmers across Punjab. Participants agreed with the ESSA’s finding that pesticide use would likely increase with the shift from conventional crops to HVA (fruits and vegetables). They also agreed with the proposal that the Program should include best practices in IPM and efficient irrigation to mitigate the environmental impacts of pesticides. The ESSA team assured the participants that their concerns had been noted.

Results Area 2

387. ***Removal of Caps Endorsed:*** Participants agreed that livestock farmers had no incentive to increase and improve the production of milk and other dairy products under the existing price cap system. There is a large market for milk and dairy products in the country, but price capping has retarded the growth of the dairy industry. Adulteration is also a major issue that arises from these caps. The participants said that, although these price caps were loosely enforced, they could also be selectively enforced. Participants agreed with the findings and recommendations of the Program and ESSA team on the subject.

388. ***Issues Posed by Multinationals:*** Participants pointed out the problems posed by multinational firms to the livestock industry. The government has traditionally shied away from regulating the corporate dairy industry.

389. Participants largely agreed that the removal of milk and meat caps would help local producers and eventually encourage the local milk, dairy, and meat industry. Apart from improving the livelihoods of local producers, it would also improve the quality of milk and meat supplied in the province.

390. ***Marketing Issues:*** The presence of gaps in the marketing chain for agricultural products was raised by almost all the participants. They felt that the biggest problem facing agriculture-based industry was farmers’ lack of access to markets. Until the government focused on the agriculture market value chain and the development of efficient market mechanisms, it would not be able to realize the goal of a productive and efficient agriculture sector in the province. Participants also said that the government was encouraging farmers to move away from staple foods toward HVA, but without a developed market for the latter. Opening up markets in the cities and moving them out of the hands of intermediaries and market committees was seen as a good step that would help farmers fetch better prices for their produce. The ESSA team responded by saying that market corrections and streamlining were part of the Program.

Results Area 3

391. ***Abiana Collection Difficult to Enhance:*** Participants were of the view that improvements in *abiana* collection should go hand in hand with improving water service delivery. Farmers at the tail end do not receive their full share of water; expecting them to pay a fixed amount per acre for a service that is not delivered efficiently is very difficult. There should be a method whereby people are billed for their usage of water rather than a fixed rate

per acre. The ESSA team assured the participants that all these concerns had been addressed in the Program.

392. ***Groundwater Act Essential:*** The government's bill on groundwater was welcomed by the participants. Given the alarming rate at which the water table is falling, there is an urgent need to tackle the problem. However, participants also said that, to better understand the impact of the legislation, the government should pilot the intervention in selected areas to assess its socioeconomic and environmental impact. They also proposed a separate PforR for the water sector and its related issues. The need to focus on water quality was highlighted and participants felt it should be prioritized by the government.

393. ***Climate Change Efforts to be Coordinated:*** Participants agreed with the ESSA finding on the need for coordination among departments on the issue of climate change and its potential impacts on the agriculture sector. As of now, these departments have neither the dedicated staff to gauge the impact of climate change on farmers and other producers, nor are they coordinating their efforts to create synergy in tackling this issue. On the legislative front, the GoPunjab will have to expedite the passage of some important legislation. The drafts of Punjab's climate change policy and groundwater management act have been prepared and are awaiting approval. The participants endorsed the recommendation to establish a Climate Change Extension Cell in the Agriculture Department.

7. RECOMMENDATIONS AND PROPOSED ACTIONS

Introduction

394. This section summarizes the key measures that need to be taken during Program implementation for social as well as environmental aspects. In a broader context, the measures recommended are designed to help proponents improve their system performance and to address important gaps between the provincial systems and the PforR core principles and key elements.

395. These recommendations and proposed actions focus on institutional strengthening with regard to capacity and finance, SOP development and improved enforcement of the regulatory framework and guidelines, undertaking technical studies, and developing sustainability frameworks. The recommendations and proposed actions are described in detail below.

Social Aspects

396. The following recommendations have been devised based on the review of the systems in place and their comparison with the PforR principles and institutional arrangements for Program implementation.

397. To begin within a broader framework, Program objectives can only be achieved if the concerned departments work in tandem and ensure that reforms are sequenced such that rural communities are able to absorb shocks and benefit from opportunities. As an example, crop insurance systems should be well instituted before the phasing out of the government's wheat procurement program begins, to ensure that farmers considering a change in cropping patterns are protected to some extent. Similarly, some degree of quality control measures should ideally be in place before price caps on basic commodities are removed. Overall, the Program needs to be assessed holistically, with reforms being implemented such that they complement each other. This task belongs essentially to the PCMU, but the Bank can play a role in providing support to the PCMU.

398. The social systems assessment in this report is a first step in trying to assess possible effects on a range of stakeholders. As the Program seeks to fundamentally transform agriculture in the province, rural communities could face longer-term impacts that are not always easy to envisage at this stage. The Program should incorporate institutional structures that will track, analyze, and eventually work to mitigate negative effects, and replicate positive ones where applicable. The social assessment makes the following recommendations:

Institutional Measures

399. Institute a system of continuous oversight and feedback by establishing an overall Social Management Framework for the Program whereby adequate social management expertise is established in the PCMU, and in departmental PDUs where appropriate, to track and analyze poverty, social exclusion, and gender issues arising from implementation of the reforms; and to design measures to mitigate negative effects as the Program unfolds. The PCMU should take the lead in developing guidelines for social risk screening for the concerned units, incorporating its newly instituted communications expertise to maximize effective outreach. This effort has begun in that a draft communications strategy is now in place and will be finalized after review, but before Program implementation begins. In terms of timelines, the

social management expertise should be instituted in the PCMU and relevant PDUs as soon as possible, and preferably by loan effectiveness.

400. The GoPunjab needs to significantly strengthen its food testing and quality control systems – this is necessary not only for consumer health and safety, but also to prevent extortionary practices on the part of retailers who apply price discrimination based on stated differences in quality.

Engagement and Outreach

401. There is a need to institute systems of consultation and debate and the Program includes activities in this regard under DLI 12. The ESSA team’s meeting with the Director Information, Department of Agriculture, revealed that the Government is preparing an outreach strategy to communicate details of the proposed reforms to the concerned stakeholders. It is imperative that this effort goes beyond simply informing stakeholder groups of reform measures that have already been decided on. Instead, it is important to get feedback on how stakeholders, particularly small farmers and the landless, see these measures and what effects they anticipate.

402. Each of the implementing departments should have some form of GRM in place. These can be engineered to make them available for feedback on the Program from the grassroots level up, in addition to more general use.

403. The GoPunjab should hold consultations with consumer groups to explain why the price caps have been removed and how this could benefit consumers.

404. The Agriculture Department needs to launch a public consultation program, focusing on farmers’ organizations to begin with, and then moving to the community level, to assess what it can do to facilitate non-traditional agriculture and a move away from major crops.

405. An outreach strategy is needed to apprise members of market committees, commission agents, traders, and farmers of the details of the new legislation. Market players need to be fully informed of the proposed reforms and their input should be reflected in the final draft, where possible.

406. PAFDA, which is in charge of testing pesticide residue, should raise awareness among consumers on food safety and quality.

Promoting Access for All Stakeholders

407. The Department of Agriculture should: (a) Extend the subsidy on potash and other fertilizers to as many retail brands as possible, particularly market leaders, so that its effects are spread more widely. At the same time, the government should be thinking of moving toward a targeted subsidy, using the information in the various databases it is generating. Any subsidy should be directed primarily toward small farmers and the landless. (b) Simplify the process of obtaining the subsidy. Farmers’ organizations have pointed out that the system of entering long numerical codes into an SMS message defeats quite a few illiterate or barely literate consumers, and helplines are often swamped. It should be technologically feasible to engineer a simpler process, and this possibility should be explored.

408. The Livestock and Dairy Development Department has made a considerable effort to improve its visibility in the field by increasing the number and presence of field personnel. However, it needs to strengthen its efforts further to meet the high expectations of communities.

It should also follow up on the status of initiatives such as that of community facilitators and make more effort to ensure that medicines are available at the field level and that field staff are facilitated to make home visits.

409. The Food Department should devise a system to stabilize producer incomes on a temporary basis during and immediately after the phasing out of the wheat procurement system. Such proposals are indeed on the anvil, and involve devising systems of cash transfer for producers. Policymakers are debating whether the transfer should be instituted for those farmers from whom the government procures wheat, or for small farmers across the board, regardless of whether they sell their produce to the government. The issue is thus on the government's radar and a scheme should be announced as the phase-out begins.

410. A concerted support effort is needed by the Agriculture Department to encourage small and medium farmers to move toward the production of high-value crops, with the provision of quality seed and market information perhaps being the primary policy tools in this regard. More research is needed on what precisely small and medium farmers need, to be able to move to HVA. This includes studying available marketing structures for produce and perhaps even defining what precisely the term 'high-value agriculture' means to different farmer groups (an agro-ecological zone-specific strategy). The necessary information and support should then be extended to farmers through extension services, whose staff should be trained to address concerns related to the proposed shift. The review of existing agriculture extension services should take stock of such needs and make recommendations that can eventually inform the new agriculture extension policy and strategy that will be approved under SMART.

411. The Agriculture Department should also ensure that the matching grants scheme is structured such that small companies and entities are encouraged to, and can easily, apply – and face a level playing field. The project document states that women and youth will participate in the matching grants scheme. The department could consider giving priority to companies owned or managed by women.

412. Timely approval of the Draft Punjab Water Policy and Draft Punjab Integrated Water Resources Management and Regulation of Groundwater Act is essential to lay the foundation for improvements in the sustainability of groundwater use. Better collection of *abiana* should be implemented in consonance with improved service and the institution of more equitable means of water distribution. The flat rate for *abiana* is indirectly benefitting large farmers, as this is a form of regressive pricing. In the longer run, the canal irrigation system needs a comprehensive and thorough review.

Research

413. There is a need for focused research on issues and areas that would specifically benefit small and medium farmers and agricultural workers, including women. Whether this is on introducing cost-effective seed varieties or water conservation techniques or health and safety issues, research that benefits marginalized groups should be a priority. The new agriculture and livestock research policy and strategy that will be approved under SMART should include provisions in this regard. Focusing on women is especially important as it is expected that a large number will enter the sector due to the transition to HVA.

414. A detailed analysis is needed of the effect of removing price caps on meat and raw milk on urban and rural households and on vulnerable categories, particularly women and children, within households. The limited assessment through the FGDs and small survey done for this

ESSA gives mixed results, with possible benefits accruing to producers, but with consumers – particularly in low-income households in small towns – facing a further expenditure constraint due to higher prices of at least one essential commodity (milk). While lessening the discretionary power of junior government officials is a step in the right direction, some form of consumer protection may be necessary. This assessment should be completed before implementing the reform.

415. A detailed analysis to determine further social impacts and risk mitigation measures is needed once the modalities of the new and ‘modern’ way of assessing *abiana* has been determined. This should be completed before the new assessment mechanism is implemented.

Environmental Aspects

416. Recommendations related to environmental aspects include actions to improve implementation capacity, specific environmental management measures for selected activities, monitoring, research to improve environmental knowledge, and mainstreaming environment and climate change (Table 7.1).

Table 7.1: Recommended Actions: Environment

Action	Responsible Agencies	Timeline	Estimated Activity Cost (US\$ million)
Implementation capacity			
Environmental assessment and risk management training for departments of L&DD, food, industry, irrigation, P&D, and Directorate of Pest Warning and Quality Control of Pesticides	EPA	June 2018	0.226
Farmers’ training in IPM and balanced use of fertilizers	Agriculture Dep.	June 2018 Continuous	0.060
Subtotal			0.286
Specific environmental management measures			
Development and application of an ESMF for subprojects that do not fall under PEPA 2012 (e.g. MSMEs)	Agriculture Dep.	Before matching grants approval	NA
Monitoring			
Environmental monitoring of agribusinesses	EPA	2017–2020 Annually	0.450
Establish baseline and monitor fertilizer application for each HVA	Agriculture Dep.	Dec 2017 Biannually	0.516
Subtotal for above activities			0.966
Research to improve environmental knowledge			
Optimal use of fertilizer and pesticides under different cropping patterns	AARI and Agriculture Dep.	Mar 2018	0.700
Subtotal for above activities			0.700
Mainstreaming environment and climate change			
Establishment of Climate Change Extension Cell	Agriculture Dep.	Dec 2018	0.870
Subtotal for above activities			0.870
TOTAL			2.822

ANNEX I: LIST OF KEY PERSONS MET FOR SOCIAL SYSTEMS ASSESSMENT

Planning and Development Board

Malik Mukhtar Ahmad Noel, Member, Production Sector Wing
Dr Mohammad Ashraf, Chief, Production and Agriculture
Mr Amjad Duraiz, Chief (ECA)

Department of Agriculture

Dr Ghazanfar Ali Khan, Additional Secretary (Planning)
Ms Silvat Saeed, Special Secretary, Agricultural Marketing
Mr Kashif Jamshed, Project Coordinator, Agricultural Marketing
Mr Azhar Hussain, Deputy Director (Planning), Planning and Evaluation Cell
Malik Muhammad Akram, Director General, On-Farm Water Management
Dr Maqsood Ahmad, Deputy Project Director (Watercourses)
Ch. Abdul Ghafoor, Director, Agricultural Extension
Mr Ishtiaq Amin, Director, Agricultural Information

Agriculture Delivery Unit, Department of Agriculture

Mr Babar Malik, Chief Technical Advisor
Mr Talal Hassan Khan, Policy and Strategy Analyst

Department of Irrigation

Dr Mohammad Javed, Director, Social and Environmental Management
Mr Imran Aslam, Manager (Reforms), PIDA

Food Department

Dr Zia ul Haq, Director, Food

Department of Livestock and Dairy Development

Dr G. M. Gill, Director General, Extension Services
Mr Muhammad Ramzan, Assistant Chief, Planning and Evaluation
Dr Asif Sahi, Registrar, Livestock Breeding Authority

Department of Industries, Commerce and Investment

Mr Javed Iqbal, Economic Advisor
Mr Khalid Saleem, Managing Director, Punjab Small Industries Corporation
Ch. Khalid Mahmood, Deputy Secretary

Punjab Land Record Authority

Ms Ayesha Hameed, Additional Director General
Mr Zeeshan Javaid, Director, Operations and Coordination
Mr Usman Ahmad

Punjab Agricultural Research Board

Dr Noor ul Islam Khan, Chief Executive

ANNEX II: LIST OF FGD LOCATIONS

No.	Location	Range of Landholding Size	Participants	Number of Participants
1	Village Nain Sukh, Sagian Kalan, district Lahore	0.5 to 4 acres	Male	9
2	Basti Bagban Pora, Khudian Khas, district Kasur	10 to 100 acres	Male	8
3	Village Sanda, district Kasur	10 to 50 acres	Male	10
4	Basti Bagban Pora, Khudian Khas, district Kasur		Female	7
5	Village Mangtan Wala, district Nankana Sahib	5 to 100 acres	Male	12
6	Village Mangtan Wala, district Nankana Sahib		Female	14
7	Market Committee Office, 25 Vegetable Market, Multan Road, Lahore		Male	5
8	Vegetable and Fruit Market, Allama Iqbal Town, Lahore		Male	3
9	Farmers Associates of Pakistan, Gulberg, Lahore		Mixed	5 men 1 woman
10	Kissan Ittehad Office, 17 College Road, Lahore		Male	7
11	Chak 13 MR, UC 119, Multan	5 to 8 acres	Male	11
12	Village 97, UC 97, district Multan	2 to 10 acres	Male	10
13	Basti Moora Wali, Nawabpur village, Proper Doyam	4 to 7 acres	Male	13
14	Chak 13 MR, UC 119, Multan		Female	11
15	Basti Moora Wali, Nawabpur village, Proper Doyam		Female	8
16	Secretary, Market Committee		Male	1
17	Commission agents		Male	

ANNEX III: LIST OF REFERENCES

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ANNEX IV: STAKEHOLDER CONSULTATION PARTICIPANTS

See Section 6 for details of consultation comments and feedback.

Invitation List for ESSA Consultative Workshop 23 October, 2017, Lahore

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ACC
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ANNEX V: ENVIRONMENTAL AND SOCIAL RISK MATRIX

Environmental and Social Assessment and Action Plan Summary

Core Principle 1: Environmental and social management procedures and processes are designed to (a) avoid, minimize, or mitigate adverse impacts; (b) promote environmental and social sustainability in program design; and (c) promote informed decision-making relating to a program's environmental and social effects.			
Key Elements	System Requirements	Key Findings	Recommendations
<p>1.1 Bank program procedures are backed by an adequate legal framework and regulatory authority to guide environmental and social impact assessments at the programmatic level.</p>	<p>The Government of Pakistan and the GoPunjab have enacted a range of environmental and sector-specific laws, regulations, and procedures relevant to the environmental and social effects of the proposed Program. The applicable federal and provincial environmental and social management systems in Pakistan and the province of Punjab, from a legal, regulatory, and institutional perspective, are generally appropriate and comprehensive. Issue-specific legal system coverage and requirements are as below:</p> <p>Fertilizers and pesticides: Environmental aspects of production, storage, distribution, and use of fertilizers and pesticides are covered under PEPA 2012 through its provisions of EIA/IEE, Hazardous Substance Rules 2003, and compliance with NEQS; Agricultural Pesticides Ordinance 1971 and Amendment 2012, Punjab Agriculture, Food, and Drug Authority Act 2016, Punjab Wildlife Act 1974, Factories Act 1934, and Groundwater Act.</p> <p>Water management and efficiency: Overall water management along with environmental concerns such as irrigation efficiencies, contamination of water resources, use of wastewater for irrigation, and depletion of groundwater will be covered under Groundwater Act; PEPA 2012 and its provisions for Hazardous Substance Rules 2003, and compliance with NEQS; Punjab Local Government Act 2013</p>	<p>Most Program interventions, if implemented following the requirements of the legislative framework, will benefit the environment and enhance livelihoods of rural communities.</p> <p>The capability of regulatory authority is low, which results in low integration of environmental and social assessment at the implementation stage of projects. Strengthening of EPA is taking place under the Jobs and Competitive PforR through which EPA is expected to achieve the required level of institutional strength. World Bank is expected to deliver additional financing to EPD through the proposed Green Development Program. Institutional capacity of line departments to manage environmental and social risks is variable.</p> <p>Lack of coordination among departments on environmental and social issues.</p>	<p>The following actions should be included in the program:</p> <p>Implementation capacity</p> <ul style="list-style-type: none"> ▪ Conduct training in environmental assessment and risk management for line departments (Agriculture, L&DD, Food, Industry, Irrigation, P&D). ▪ Conduct training for farmers in IPM and balanced use of fertilizers. ▪ Conduct training for Directorate of Pest Warning and Quality Control of Pesticides. ▪ Conduct awareness raising for consumers on food safety. <p>Research to improve environmental knowledge</p> <ul style="list-style-type: none"> ▪ Corporate models of biogas generation need to be investigated. ▪ Optimal use of fertilizer and pesticides under different cropping patterns with attractive yields and financial returns to the farmer that also result in decreased use of fertilizer and pesticides. <p>Mainstreaming environment and climate change</p> <ul style="list-style-type: none"> ▪ Climate Change Extension Cell to be established in the Agriculture Department.

	<p>and Amendment 2016; and Canal and Drainage Act 1873 and Amendment Act 2016.</p> <p>Agriculture production: In addition to the major inputs (fertilizers, pesticides, and water) mentioned above, environmental concerns of other agriculture inputs such as seed certification, plant breeding, use of microbes, and burning of crops are covered by Seed Act, Plant Breeders' Rights Act, PEPA 2012 and Bio-Safety Rules 2014 under PEPA 2012.</p> <p>Livestock sector: Environmental concerns of livestock such as generation of waste linked to the operation of slaughter houses, establishment and operation of hospitals and clinics, and establishment of biogas plants are covered under PEPA 2012 and its provisions for EIA/IEE, Hazardous Substances Rules 2013, and compliance with NEQS.</p> <p>Food safety: Environmental issues such as contamination of food during supply chain, bacterial contamination of food due to application of untreated wastewater, and heavy metal contamination due to overuse of pesticides is covered under forensic testing conducted under Punjab Food Authority Act 2011. Establishment and operation of food-testing laboratories is covered by PEPA 2012 provisions for EIA/IEE, Hazardous Substances Rules 2003, and compliance with NEQS.</p> <p>Rural enterprises: SMART will provide matching grants for the establishment and scaling up of agro-businesses. Environmental concerns of these enterprises will be covered under PEPA 2012 provisions for EIA/IEE, Hazardous Substances Rules 2003, and compliance with NEQS.</p>	<p>The research culture in general is weak in departments.</p> <p>The approval and effective implementation of Punjab Water Policy and notification and enforcement of Groundwater Act proposed under SMART will improve water management in the province and yield multiple benefits in the form of: more productive and efficient use of water, decrease in waterlogging and salinity, higher crop yields, and higher incomes for farmers.</p>	<p>Specific environmental management measures</p> <ul style="list-style-type: none"> ▪ In cases where EIA/IEE is not required, the ESMFs already in use by the Agriculture Department and its affiliated project activities should be adopted and implemented by the Agriculture Department after customization.
1.2. Incorporate recognized elements of environmental	Under PEPA 2012 a screening process is in place based on provisions in Schedule I and II of Review	Enforcement of environmental screening processes under PEPA	All the agencies involved in implementation of Program activities will implement the

<p>and social assessment good practice, including the following: 1.2a Early screening of potential effects</p>	<p>of IEE and EIA Regulations 2000. The guidelines for preparation and review of EIA specify the scoping of important issues at an early stage. The Punjab Bio-Safety Rules 2014 have a screening system for the import and production of microbes and living organisms. Draft Integrated Water Resources Management and Groundwater Act has a screening system for the installation of tubewells and discharge of wastewater into the canal system. The Seed Act 1976 and Amendment 2015 and Plant Breeders' Rights Act 2016 have screening systems for the selection of seeds and plants, respectively. The Antiquities Act 1975 has a screening system for the preservation of built heritage. The Agricultural Pesticides Ordinance 1971 and Amendment 2012 has a comprehensive screening system for the certification of pesticides in the province.</p>	<p>2012 and other departments is variable.</p>	<p>required screening procedures defined by the local regulations or by the ESMF (in the case of matching grants). This requirement will be strengthened with the provision of specific training in environmental assessment and risk management.</p>
<p>1.2b Consideration of strategic, technical, and site alternatives (including the 'no-action' alternative)</p>	<p>Alternative analyses are required for the location of new food testing laboratories, establishment of veterinary hospitals and clinics, and rural enterprises under the guidelines for preparation and review of environmental reports. Section 2.6 mandates the analysis of different alternatives including the "no-build option".</p>	<p>The evaluation of alternatives from an environmental and social point of view and incorporation of significant modifications to project location or design is variable. In some cases, although site alternatives are required to be assessed before finalizing site selection, such analysis is mostly done in retrospect to justify the site already selected without a comprehensive consideration of the environmental and social aspects.</p>	<p>All the agencies involved in implementation of Program activities will implement the analysis of alternatives when required by the legislation. This requirement will be strengthened with the provision of specific training in environmental assessment and risk management.</p>
<p>1.2c Explicit assessment of potentially induced, cumulative, and transboundary impacts</p>	<p>Most IEEs/EIAs are conducted for site-specific spot analyses. Determination of cumulative environmental impacts is not covered by the scope of IEE/EIA. Assessments need to be conducted for proper application of fertilizers/pesticides.</p>	<p>Cumulative impacts of air and water pollution are rarely assessed.</p>	<p>Monitoring</p> <ul style="list-style-type: none"> ▪ Establish baseline of fertilizer application for each HVA and monitor the level of application so that the application does not exceed the optimal amount. ▪ Strengthen capacity for the determination and mitigation of cumulative impacts as

			part of the training in environmental assessment and risk management.
1.2d Identification of measures to mitigate adverse environmental or social impacts that cannot be otherwise avoided or minimized	The guidelines for the preparation and review of environmental reports under PEPA 2012, Sections 3.7 to 3.9, and sector legislations include the assessment of environment, social, health and economic and fiscal impacts.	Procedures for the assessment of environment and social impacts are in place for development projects; mitigations and recommendations are provided in the environmental assessment report in the form of EMP, but their implementation is variable. There is a better degree of success and implementation/supervision in projects financed by multilateral and bilateral institutions.	Implementation will be strengthened by enhancing institutional capacities of the relevant institutions through participation in series of training in environmental assessment and risk management (included as part of the Program recommendations).
1.2e Clear articulation of institutional responsibilities and resources to support implementation of plans	Institutional responsibilities and resources for preparation, implementation monitoring, and inspection are clearly spelled out by relevant regulations (PEPA 1997 and PEPA 2012, Review of IEE/EIA Regulations, 2000). The mandate for monitoring implementation of IEE/EIA lies with Punjab EPA. The mandates for land acquisition and physical and cultural resources lie with the Board of Revenue and the Archaeology Department, respectively. The mandate for implementation of labor laws is delegated to the Labor Department. Provincial departments are mandated by the administrative order of Punjab P&D and sector-specific legislations to prepare environmental assessments and later implement environmental mitigations during project implementation and operations.	According to the mandate, the IEE/EIA section of the EPA reviews the IEE/EIA and issues the NOC. Punjab EPA's capacity for post-NOC monitoring is limited.	Monitoring capacity of EPA will be strengthened as part of the project "Capacity Building of EPA Punjab for Enforcement of Environment Standards in Punjab", financed under the Jobs and Competitiveness Bank-funded Program.
1.2f Responsiveness and accountability through stakeholder consultation, timely dissemination of program information, and through responsive grievance redress measures	Public consultation with relevant stakeholders, local authorities, and representatives of communities and organizations directly affected by projects is required (Guidelines for Public Consultation). Public consultation is generally better in projects financed by multilateral and bilateral institutions. The complaints cell at the Punjab EPA addresses complaints by communities related to environmental	Although the timing and techniques of consultations are clearly stated in the guidelines, public consultation is often carried out in two stages: during the socioeconomic and inventory surveys at the baseline data collection stage of the EIA and	Program will ensure that meaningful public consultations with relevant stakeholders are conducted and the process is more inclusive in accordance with the requirements of the guidelines for public consultation by the EPA. The training for environmental assessment and risk management will include a module on meaningful consultation process.

	and social aspects. GRMs absent at program and policy level, where the only recourse is through the courts. GRMs are only implemented at the project level.	during the public hearing as part of EIA process in the presence of EPA representatives. Measures proposed for addressing grievances. In most cases, stakeholders are not effectively represented in the consultations, and grievances are not fairly addressed during implementation of the project.	
Core Principle 2: Environmental and social management procedures and processes are designed to avoid, minimize, and mitigate adverse effects on natural habitats and physical cultural resources resulting from the program.			
Key Elements	System Requirements	Key Findings	Recommendations
Includes appropriate measures for early identification and screening of potentially important biodiversity and cultural resource areas	<p>PEPA 2012 through its provisions for IEE/EIA covers the profiling of natural habitats, flora and fauna species, national parks, important ecological areas, and impacts on downstream fresh water bodies. An impacts matrix of project components and activities during construction and operational phases of projects, including mitigation measures, is an essential part of IEE/EIA.</p> <p>The Antiquities Act 1975 demands protection of physical and cultural resources.</p>	<p>Most governmental agencies are not aware of the Act. The Archeology Department conducted a survey across Punjab in 1994–96 to map possible spots of archeological significance. According to this survey, Bahawalpur, Rawalpindi, and Multan districts have a high number of unprotected and unexcavated archeological sites. No SOPs are available to share with construction companies/projects. However, under the law, chance finds should be reported to the Archeology Department within 7 days. If ruins</p>	The Program ensures that during the implementation of all physical activities, this aspect is taken care of based on PEPA 2012 and its guidelines. The training in environmental assessment and risk management will include a module on protection and management of natural habitats.

		are discovered, all construction work must be stopped to allow the Archeology Department to conduct a site assessment.	
Supports and promotes the conservation, maintenance, and rehabilitation of natural habitats; avoids the significant conversion or degradation of critical natural habitats and if avoiding the significant conversion of natural habitats is not technically feasible, includes measures to mitigate or offset impacts or program activities.	The protection of natural habitats and sensitive biodiversity areas is covered under IEE/EIA guidelines in line with international best practices and protocols.	This aspect is taken care of in IEE/EIA process and is important for the physical components of the program.	The training in environmental assessment and risk management will include a module on protection and management of natural habitats.
Takes into account potential adverse impacts on physical cultural property and, as warranted, provides adequate measures to avoid, minimize, or mitigate such effects.	The main legislation on conservation of archeological heritage is the Pakistan Antiquities Act 1975. This Act was adopted by Punjab in 1985. The Antiquities Act 1975 focuses on conservation of monuments whereas the Punjab law also includes conservation of the area surrounding monuments.	Most government agencies are not aware of the Act and ignore it during the planning process. The Archeology Department conducted a survey across Punjab in 1994–1996 to map possible spots of archeological significance. According to this survey, Bahawalpur, Rawalpindi, and Multan districts have a high number of unprotected and unexcavated archeological sites.	Any proposed site for a new development such as laboratory and storage facility should be screened for possible impact on sites of archeological significance. Increase awareness of the Antiquities Act 1975 among stakeholders and improve its implementation.
Core Principle 3: Program procedures ensure adequate measures to protect public and worker safety against the potential risks associated with (a) construction and/or operations of facilities or other operational practices developed or promoted under the program and (b) exposure to toxic chemicals, hazardous wastes, and otherwise dangerous materials.			
Key Elements	System Requirements	Key Findings	Recommendations
Promotes community, individual, and worker safety through the safe design, construction, and O&M of	This is addressed in the EMP, which is an essential part of an IEE/EIA. The IEE/EIA for relevant investments under the SMART Program covers safe design, construction, and O&M for the whole	Implementation of the EMP for physical projects is variable in terms of quality and supervision.	Punjab EPA capacity for post-NOC monitoring of IEE/EIA implementation needs to be strengthened. This aspect will be strengthened as part of the project “Capacity

<p>physical infrastructure, or in carrying out activities that may be dependent on such infrastructure with safety measures, inspections, or remedial works incorporated as needed.</p>	<p>program, including infrastructure, layout, land acquisition, community safety, etc.</p>		<p>Building of EPA Punjab for Enforcement of Environment Standards in Punjab”, financed under the Jobs and Competitiveness Bank-funded Program. The training in environmental assessment and risk management will include a module on public and worker safety protection.</p>
<p>Promotes the use of recognized good practice in the production, management, storage, transport, and disposal of hazardous materials generated through program construction or operations; promotes the use of IPM practices to manage or reduce pests or disease vectors; and provides training for workers involved in the production, procurement, storage, transport, use, and disposal of hazardous chemicals in accordance with international guidelines and conventions.</p>	<p>PEPA 2012 under the provisions of Hazardous Substances Rules 2003, and Agricultural Pesticides Ordinance 1971 and Amendment 2012 instruct the proponent of a project to adopt good production practices in management, storage, transport, and disposal of hazardous materials generated through program construction or operations. Also provide for training workers involved in the production, procurement, storage, transport, use, and disposal of hazardous chemicals in accordance with international guidelines and conventions. However, implementation is not at the desired level. Major non-compliance happens at storage places of distributors and stockists. Directorate of Pest Warning in Agriculture Department is mandated to promote IPM throughout the province.</p>	<p>Implementation of these rules is limited.</p>	<p>Directorate of Pest Warning will promote IPM and safe handling of pesticides. Farmers and other stakeholders will participate in dissemination and training activities to be provided by the Program.</p>
<p>Includes measures to avoid, minimize, or mitigate community, individual, and worker risks when program activities are located within areas prone to natural hazards such as floods, hurricanes, earthquakes, or other severe weather or climate events.</p>	<p>These aspects are fully covered by IEE/EIA, usually under a DMP, which is part of the environmental management included in the IEE/EIA reports.</p>	<p>Implementation of DMP is variable.</p>	<p>Increase the capacity of all stakeholder institutions and communities. Punjab EPA’s enhanced capacity for post-monitoring of EIA implementation will also help improve opportunities for DMP implementation. This will be done through the project “Capacity Building of EPA Punjab for Enforcement of Environment Standards in Punjab”, financed under the Jobs and Competitiveness Bank-funded Program.</p>

Core Principle 4: Land acquisition and loss of access to natural resources are managed in a way that avoids or minimizes displacement, and affected people are assisted in improving, or at least restoring, their livelihoods and living standards.			
Key Elements	System Requirements	Key Findings	Recommendations
Avoids or minimizes land acquisition and related adverse impacts	Land acquisition for public sector projects in Punjab is governed by the Land Acquisition Act 1894 and related Rules enacted in 1983. As per Section 3 of the Rules, if land is to be acquired for a public purpose, the Collector (or in contemporary terms the district coordination officer) of the district is supposed to “ <i>examine its feasibility taking into consideration the genuineness of the public purpose involved, the minimum requirements of the acquiring agency and suitability of the area proposed for requisition...</i> ” (Section 4 of the Rules). The district administration is then supposed to set in motion a process by which the value of the land is fairly assessed for acquisition.	In practice, private companies are only subject to the provisions of the Land Acquisition Act 1894 if acquiring land for public housing or to construct public infrastructure. Land acquisition or purchase by a private company for agribusiness would not fall within the purview of this legislation.	Matching grants authority should ensure that private companies or individuals who acquire land for agribusiness should do so using willing-buyer-willing-seller arrangements. SOPs should be developed to ensure that land acquisition under SMART is done in accordance with the Core Principles of PforR.
Identifies and addresses economic and social impacts caused by land acquisition or loss of access to natural resources, including those affecting people who may lack full legal rights to assets or resources they use or occupy	The Land Acquisition Act 1894 does not cover non-title holders. The main considerations for valuation of the acquired land include market value of land on the date of publication of the notification signaling intent to acquire; and further compensation for damage to standing crops or public and social infrastructure.		Companies availing the matching grants scheme should be bound to buy land only through a willing-buyer-willing-seller arrangement. SOPs for ensuring that land acquisition under SMART is done in accordance with the Core Principles of PforR should include a process for assessing land prices in line with market rates, compensation for assets and livelihoods for landowners, tenants, and non-titleholders. The administrator of the grants scheme should be assisted and monitored in this regard by Social Management experts in the PCMU and ADU, who will advise on formulating SOPs and determining compensation for non-title holders in line with the PforR Core Principles.
Provides compensation sufficient to purchase replacement assets of	According to the Land Acquisition Act 1894, compensation is paid for all assets at market value.	The acquisition of land for the matching grants scheme would be based on willing-buyer-willing	The acquisition of land for the matching grants scheme should be based on willing buyer-willing seller arrangements, with prices

equivalent value and to meet any necessary transitional expenses, paid before taking of land or restricting access	The market value is determined by a committee set up by the local administration. The process for the determination of market price relies on recent land sale transactions of similar nature in the nearby area. The market rates are also notified by the relevant deputy commissioner on an annual basis.	seller-arrangements, with prices determined by the market, but with a mechanism for compensation to non-title holders built in. The proposed Social Management Unit at the PCMU will formulate an appropriate compensation framework for non-title holders.	determined by the market, but with a mechanism for compensation to non-title holders built in. The Social Management experts in the PCMU and ADU should help formulate an appropriate compensation framework for non-title holders.
Provides supplemental livelihood improvement or restoration measures if taking of land causes loss of income-generating opportunity (for example, loss of crop production or employment)	Livelihood restoration or improvement are not issues covered in the Land Acquisition Act or associated Rules.	The rules for operation of the matching grants scheme have yet to be worked out, but will include detailed instructions on land acquisition for matching grants in accordance with PforR Core Principles.	The rules for operation of the matching grant scheme have yet to be worked out, but should include detailed instructions on land acquisition and compensation for matching grants in accordance with PforR Core Principles.
Restores or replaces public infrastructure and community services that may be adversely affected.	Public infrastructure and community services are normally relocated by the department concerned. The Social Management expert in the PCMU should oversee such relocation.		
Core Principle 5: Due consideration is given to cultural appropriateness of, and equitable access to, program benefits, giving special attention to the rights and interests of indigenous peoples and the needs or concerns of vulnerable groups.			
Key Elements	System Requirements	Key Findings	Recommendations
Undertakes free, prior, and informed consultations if indigenous peoples are potentially affected (positively or negatively) to determine whether there is broad community support for the program.	According to the World Bank's definition, only the Kalash people of the Chitral district qualify as indigenous people in Pakistan. As such, this element does not apply. Possible impacts and mitigation measures for other vulnerable groups are discussed in detail in the ESSA.		
Ensures that indigenous peoples can participate in devising opportunities to benefit from exploitation of customary resources or indigenous knowledge, the latter (indigenous	As above.		

knowledge) to include the consent of the indigenous peoples.			
Gives attention to groups vulnerable to hardship or disadvantage, including, as relevant, the poor, the disabled, women and children, the elderly, or marginalized ethnic groups. If necessary, special measures are taken to promote equitable access to program benefits.	There is no clear reference to the rights of vulnerable people (particularly non-title holders) in the Land Acquisition Act 1894 and Punjab Land Acquisition Rules 1983. Labor laws related to working conditions, sexual harassment, and child labor are in place but their implementation is limited and they do not cover agricultural labor, as most agricultural activity takes place in the informal economy and is largely undocumented. The ESSA postulates that Social Management experts should ensure that issues of poverty, gender and the rights of vulnerable groups are systematically tracked and addressed as implementation proceeds.	Currently, public systems do not have a mechanism to include public opinion or feedback. A communications and outreach strategy is being prepared for the Program, but its key elements are not clear yet and it is likely to begin with limited stakeholder engagement.	The proposed Social Management Units working at the PCMU level need to develop a more comprehensive engagement strategy and implementation schedule for it such that engagement and feedback is an ongoing process. The process cannot stop here and feedback loops must be closed, in that each PIU, as well as the PCMU must have systems in place to respond to stakeholder concerns on an ongoing basis.
Core Principle 6: Avoid exacerbating social conflict, especially in fragile states, post-conflict areas, or areas subject to territorial disputes.			
Key Elements	System Requirements	Key Findings	Recommendations
Considers conflict risks, including distributional equity and cultural sensitivities	To some extent, these are covered, as “social impacts” in the government’s feasibility studies or PC-1s prepared by the P&D Department.	Possible issues related to equity and social opposition are detailed in the ESSA and may arise from the phasing out of subsidies, changes in water collection mechanisms, and removal of price caps.	Transparency, and continuous citizens’ engagement may help reduce this risk. The Social Management experts can play a key role in this regard.