

Special Section 1: CPEC LTP: Opportunities for Agricultural Advancement in Pakistan

Introduction:

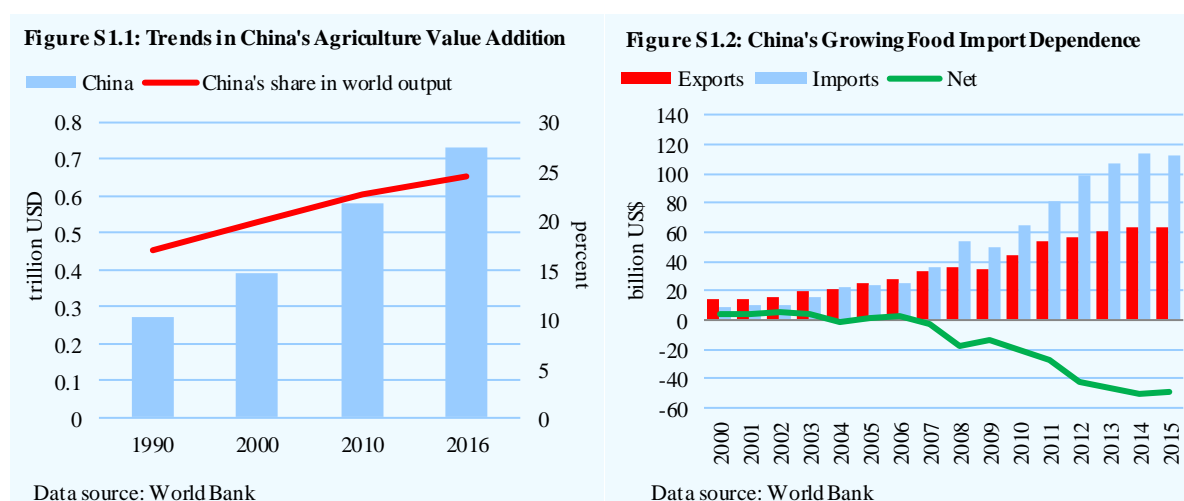
The CPEC Long Term Plan (LTP) envisages significant development of the agriculture sector of Pakistan – an often-overlooked area amidst the developments being made in the energy, infrastructure, and industrial sectors of the country. In the crop sector, there is a focus on increasing the use of modern machinery and synthetic fertilizers to enhance the yields, while food storage and processing zones would be constructed to reduce significant post-harvest losses. Similarly, the building of cold storage stations and meat processing plants is also being planned to enhance productivity of livestock and fisheries sectors besides making their output more competitive in the international market. These developments hold the potential to not only boost the agriculture output of the country, but also to narrow the trade imbalance between China and Pakistan by expanding food exports to the former.

However, it is important to note that the nature and direction of such a progress critically depends upon changes currently underway in the agriculture sector of the Chinese economy. China's food import dependence is rising amidst continued degradation of arable land and depletion of its livestock and fisheries resources. To address these concerns, it is investing heavily under the Belt and Road Initiative (BRI) by outsourcing its food supplies, while moving toward high value-added food products to contain its food trade deficit.

In this backdrop, this section intends to discuss and analyze: 1) the policy framework being adopted by China to address its growing food import dependence, particularly under the Belt and Road initiative (BRI); and 2) how Pakistan stands to benefit from the aforementioned transformation under the umbrella of CPEC.

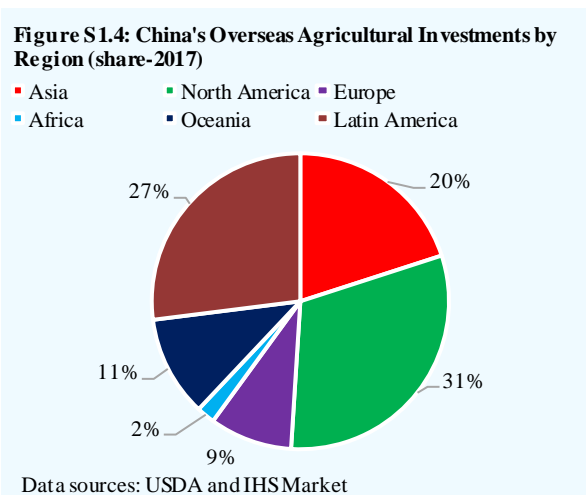
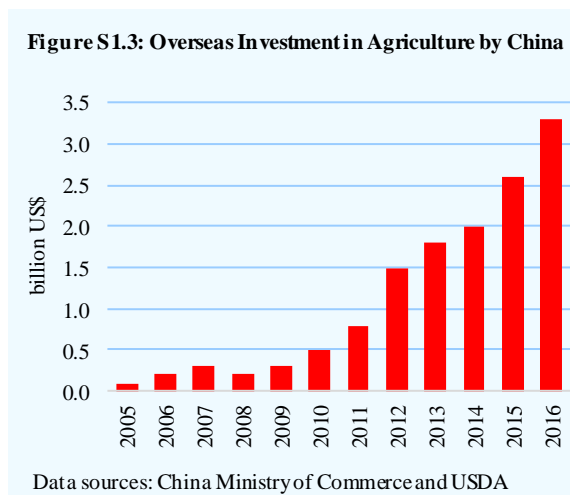
Food Security Concerns and Structural Transformation of the Agriculture Sector in China:

The farm output in China accounts for nearly a fourth of the total global agricultural production, up from 17 percent in 1990 (**Figure S1.1**). This remarkable performance, however, has come with a cost. For example, ample use of pesticides and fertilizers over the years has resulted in a gradual degradation of arable land. Meanwhile, rising population and a gradual shift towards consumption, fueled in part by growing incomes in the non-commodity sector, have amplified dependence on food imports (**Figure S1.2**).

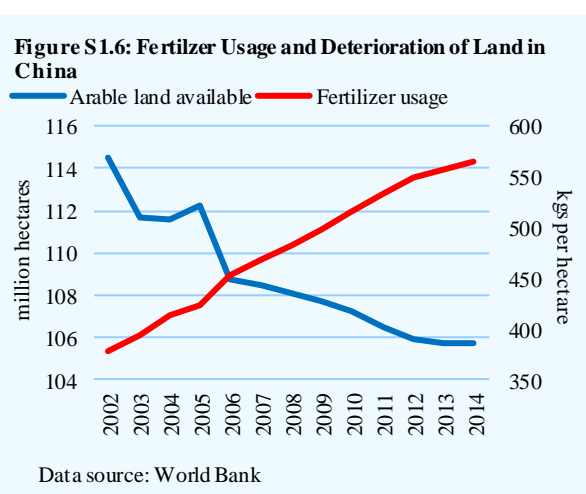
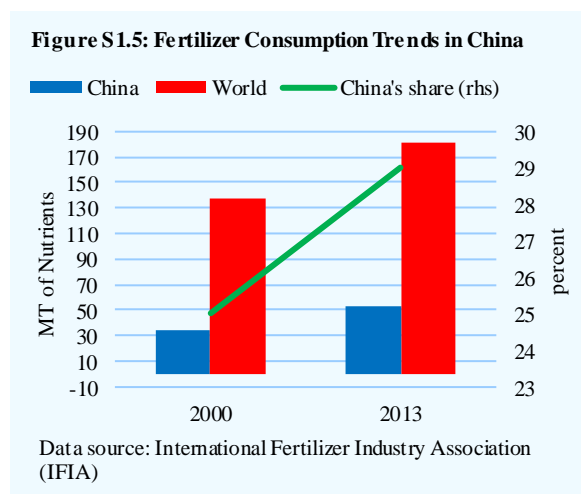


In this context, the year 2007-08 is considered a turning point when China's trade deficit in food products started widening at a substantial pace. This prompted a drastic policy drive towards tackling

food security. In this regard, a “going abroad” policy was drafted whereby China plans to tackle the negative trends affecting the agriculture sector through various initiatives and reforms.¹ While acknowledging the dependence on imports, the policymakers want to contain the vulnerability of domestic grain prices to international market. Resultantly, China intends to develop various food processing and storage stations across BRI economies to mitigate price fluctuations and increase supply of food products for the domestic market.² **Figures S1.3 and S1.4** detail the direct overseas investment originating from China in agriculture, forestry, and fishing.



Similarly, to address the rapid arable land degradation, China intends to move away from chemical usage by regulating the application of pesticides and synthetic fertilizers. At present, China’s fertilizer application rates are much higher compared to those in rest of the world (**Figure S1.5**).³ The excessive application, though increasing crop yields, has gradually resulted in the deterioration of the overall availability of arable land (**Figure S1.6**). To counter these trends, the government is encouraging the adoption of organic fertilizers in the agriculture sector.



¹ The aspirations referred to in this section stem from the First Policy Document (also known as the No. 1 Document) of China for CY17 and CY18.

² Various Chinese government policy documents and white papers use the term “zou chu qu” – “going/investing abroad” – when talking about the agricultural investments being made overseas.

³ This has resulted in the share of China in total global fertilizer consumption increasing from 25 percent to 29 percent during 2000 and 2013.

Simultaneously, the Chinese government plans to reduce the intensity of farming and provide adequate breeding space to the livestock and fisheries, mainly to mitigate pressure on the natural resources and obtain an overall sustainable growth in agriculture.⁴

Lastly, China is trying to enhance its presence in the high value-added spectrum of global supply chain to reduce the expanding food trade deficit. For this purpose, a number of initiatives are underway, which include the establishment of Research and Development (R&D) institutions and technological innovation centers in an effort to transition away from conventional farming towards production of commodities, such as coarse cereals, silkworm, edible fungus, and traditional medicine vegetables.⁵ The aim is to develop agricultural brands that would compete in the high-end international markets. To further promote the exports on a global scale, the country is striving to upgrade its agri-services sector to better market the commodities on a sustainable basis.

Potential Benefits arising for Pakistan:

Being one of the countries included in the BRI initiative, Pakistan can benefit from China's increased food import dependence and gradual transition towards high value addition in the agriculture sector. China is planning to outsource its agriculture supplies in the form of joint ventures by investing in and developing processing zones, warehouses, dairy farming, and cold storage stations in Pakistan. All of these developments hold the potential of narrowing the trade imbalance between Pakistan and China, which at present is tilted heavily towards the latter. CPEC stands to play a substantial part in this regard,⁶ and so would the geographic proximity.⁷ A few such opportunities are highlighted below:

a) Building of Storage Stations and Processing Zones

Pakistan is one of the countries where China would build its storage facilities and processing zones. **Table S1.1** details the various similar investments made by Chinese enterprises in other BRI and non-BRI economies. Local firms may take advantage by developing joint ventures with their Chinese counterparts. In this regard:

- This would help lower significant post-harvest losses experienced in the sector.⁸ According to MNFSR, the currently available storage facilities in the economy are sufficient to meet just one third of the total demand. Thus, private sector involvement in the segment would help mitigate the supply deficit. Furthermore, these joint ventures can provide learning opportunities and help transmit knowledge and improved storage knowhow amongst local farmers.

Year	Company	Host Country	Commodity	Market
2008	Sukala Refinery	Mali	Sugar	Local
2008	N/A	Senegal	Sesame	China
2009	ZTE	Congo	Palm Oil	World
2009	Chongqing Seed Shanghai	Tanzania	Rice	Local
2012	Pengxin China Complete Engineering Corporation	New Zealand	Dairy	China
2012-13		Ukraine South America	Corn	World
2014-15	COFCO**	/Europe	Soybeans	World
2017	Shandong Delisi	Australia	Beef	China

**COFCO=China National Cereals, Oils and Foodstuffs Corporation
Data sources: South African Institute of International Affairs; USDA

⁴ For instance, in order to address the dwindling biodiversity in Yangtze River Basin due to construction of dams and transport systems, the government is planning to develop new aquatic organism reserves, alongside maintaining existing ones.

⁵ This would also have a spillover impact of advancement in crop lifespan and animal husbandry techniques in general.

⁶ The comprehensive roadmap of agricultural mechanization and improvement mentioned under the CPEC LTP complements the changes sought after by China in its First Policy Document.

⁷ The Asian economies with food exports to China greater than those of Pakistan are (in descending order) Thailand, Malaysia, Singapore, Indonesia, and Vietnam. Four of these countries are geographically more distant to China relative to Pakistan (the exception being Vietnam). India is also a competitor, though its detachment from the BRI initiative makes it less likely a challenger in this regard.

⁸ Around one third of the produce is lost per annum in the agriculture sector due to inadequate post harvest facilities. Such losses in durables (cereals and pulses) and perishables (fruits and vegetables) are 10 percent and 22 percent respectively (Data source: MNFSR).

- Another positive spillover of this development would be in the government's efforts to achieve the "Zero hunger" Sustainable Development Goal (SDG). Pakistan ranks 106th out of 118 countries in the Global Hunger Index of 2017. Reduction in post-harvest losses of staple crops would help considerably in remedying this situation.
- The usability and accessibility of warehouse receipt finance in Pakistan would be enhanced. This would not only improve liquidity conditions of farmers but would also help resolve long standing issues to provide creditable collaterals to lending institutions.
- The local trading firms may gain by exploiting the potential transit arrangement between the two countries. The entrance of such firms may also bring much needed innovation in the domestic agricultural logistics system.
- This can also serve as an opportunity to modernize the processing segment of the agriculture sector. The sector can benefit in three ways. First, the presence of Chinese firms via joint ventures would ensure the adoption of modern processing machinery and methodologies. Second, the improved processing may potentially lead to higher earnings of food exports in the external markets. Third, it may help contain the spread of informal domestic processing plants by encouraging innovation and increasing margins (through mechanization, for instance). Currently, four out of nine proposed Special Economic Zones (the ICT Model Industrial Zone in Islamabad; Allama Iqbal Industrial City in Faisalabad; Bostan Industrial Zone in Balochistan; and Rashakai Economic Zone in Mardan) under CPEC would have food/fruit processing industry players participating in varying degrees.

b) *Enhancing the Share of Exports to China*

Out of around US\$ 99.6 billion food imports of China, Pakistan's share is only around 0.37 percent (roughly US\$ 0.4 billion). Pakistan can enhance its exports through various CPEC initiatives and by tapping into the growing import dependence of China in general. The Ministry of National Food Security and Research (MNFSR), in its 2018 Food Security Policy, envisages the development of nine agricultural development zones along the CPEC. By encouraging innovation, entrepreneurship, and collaboration, the zones could serve as platforms to develop clusters and infrastructure to nurture emerging rural businesses in an effort to produce commodities deemed exportable to China. These commodities include cereals, dairy, eggs, meat, honey, tobacco, seafood and fruits, etc.⁹

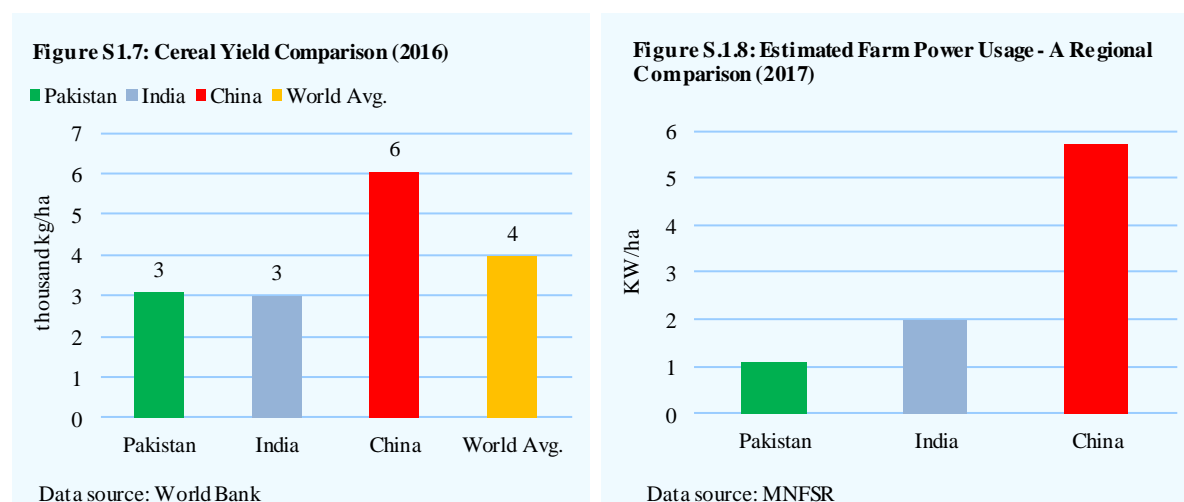
Although the import demand for these items is lower in China compared to commodities such as palm oil, soybean, and cassava, a low number of its importing partners indicate that a market share can be crafted and built upon.¹⁰ In this context, the Chinese No.1 document lists "diversification of agricultural import suppliers" as a policy objective and the agricultural investments envisioned under CPEC are meant to build upon that objective.

In this vein, the land remediation plans under CPEC would help increase productivity and efficiency of the crop sector by transforming low and medium yield lands into higher ones. The remediation efforts would also translate into usage of higher yield seed varieties and increased mechanization of agricultural operations. Pakistan lags behind regional economies in both these measures and a boost to yields would help enhance the production efficiency of farmland (**Figure S1.7 and S1.8**). Recently, Yuan Long Ping High-Tech Agriculture Co Ltd, one of the major Chinese hybrid seed

⁹ Chinese collaboration is expected, with private sector leading the initiative. The focus would be to harness the latest R&D to innovate and upgrade the processing techniques and post-harvest operations, and to develop marketing tools to better promote the produce.

¹⁰ Reference: Gooch, Elizabeth and Fred Gale. China's Foreign Agriculture Investments, EIB-192, U.S. Department of Agriculture, Economic Research Service, April 2018.

production companies, carried out a months long program in the areas of Swat, Mansehra, Sahiwal, and Larkana, etc. to develop a heat resistant rice seed variety that would enable the crop to be cultivated in all the four ecological zones of Pakistan. The company also provided training in local research institutions such as the Pakistan Agriculture Research Council (PARC) in hybrid seed breeding and field management skills. Market players predict that the hybrid seed varieties would also be exportable to economies such as Philippines in the near term.



c) Potential Investments in Livestock, Fisheries, and R&D

Fisheries and livestock sectors would also see potential investments, knowledge transfers, and relocations. Some opportunities include:

- Dairy Sector:** With increased focus on dairy under CPEP and an objective to export such commodities to China, private investments to modernize the sector are expected. Although the cattle population of Pakistan is around 72 million, currently only five percent of total milk production is used for the production of tetra-packed products.¹¹ Commodities such as dried milk and other dairy products can be manufactured to serve the needs of both domestic consumers and exporters. There is a precedent for it, as China has been investing in dairy plants across Asia (for instance in the Russian Far East) and, lately, in the continent of Australia.¹² Under the Friendly Khyber Pakhtunkhwa initiative (a project under the umbrella of CPEP), a joint venture with Chinese firms is set to be initiated in the dairy farming sector, with the eventual aim of exploiting the proximity to Afghanistan and Middle Eastern economies to increase the country's milk export share in the international markets. Moreover, on July 31 2018, Fauji Foods Ltd disclosed on the stock exchange that Inner Mongolia Yili Industrial Group Company Limited, a Chinese state-owned enterprise, has expressed interest in acquiring up to 51 percent of the voting shares and/or control in the former with the intention of expanding R&D operations and manufacturing high value added dairy products to be exported to China.
- Cold Storage Centers:** The fisheries sector would benefit by the proposed establishment of fish feed production units and hatcheries to meet the growing demand, promotion of aquaculture in saline inland and coastal areas of Sindh and Balochistan. As an example, Mufeng Biological Technology Co. has built a cold storage central near the Khunjerab Pass (which is active for eight months a year) from which seafood imports (such as squid, shrimp, pomfret and bonefish, etc.) to

¹¹ Data Source: MNFSR

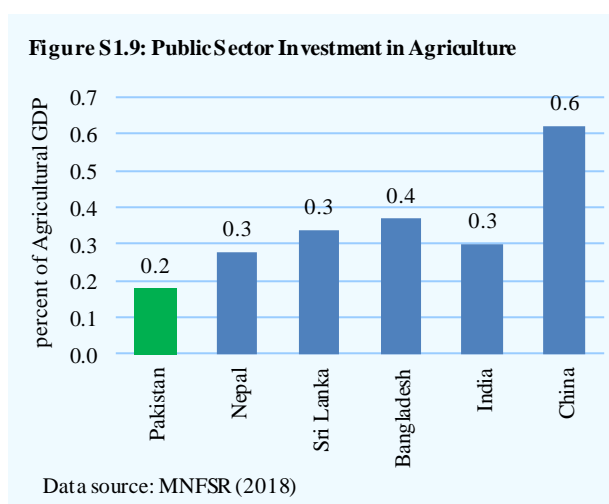
¹² China has also set up a dairy processing plant in Arkansas, United States as a joint venture between Dairy Farmers of America and China's Yili Group, while another Chinese firm – Bright Foods – acquired a US\$2.1 billion stake in an Israeli dairy firm Tnuva.

Xinjiang region and for sale in areas like Urumqi, Beijing, and Shanghai is managed. The storage center would also process orders that would arrive at Gwadar Port en-route to China.

- Animal Medicine and Vaccine Production:** Moreover, increased usage of and collaboration in animal medicine and vaccine production is listed as a policy objective under CPEC. This in turn would improve the lifespan and productivity of the livestock. The KP government website lists a plan for collaborative investment in biologics and vaccines, citing a substantial supply and demand deficit (annual production of 3.9 million doses as against an annual requirement of 132 million). The provincial government also states that the country has lost around US\$ 0.5 billion in the livestock sector due to animal diseases. In this regard, an initial investment worth US\$ 10 million has been earmarked. However, there is a need to ensure that Pakistan strengthens the regulatory mechanism to inspect the nature, intensity and frequency of such dosages to animals to ensure health and food safety standards are met. This is necessary as there has been an excessive application of vaccine dosages in China, which has left a lasting impact on its livestock population. Accordingly, the country is cutting down on production and application of animal vaccines and injections, and this is one of the reasons why relocations of such firms are planned across the BRI countries.

- Research Centers and Demonstration Plants:**

The establishment of joint venture Sino-Pakistan R&D operations dedicated to crops and livestock would aid in bringing innovation to the sector and increase productivity of the animals. Currently, Pakistan has a very low public sector agriculture investment rate compared to regional economies (**Figure S1.9**). Private sector involvement would hence help accelerate the modernization. China has a history of developing technology demonstration centers and training programs in African economies of Cameroon, Ethiopia, Liberia, Tanzania, and Uganda, etc., where Chinese experts share harvesting, breeding, and sowing



techniques with local partners and help the latter in research initiatives meant to improve productivity of the host countries' agriculture sectors. In addition to the hybrid seed-manufacturing project discussed above, numerous similar investments are expected in Pakistan under CPEC. Complementing the various agricultural investments in BRI economies by Chinese enterprises, China's Academy of Agricultural Sciences has launched a "Global Agricultural Big Data Information Services Alliance" in order to act as a dissemination and absorption center for information and data to support overseas investments by the Chinese agribusinesses.¹³

- Food Packaging and Marketing:** Under CPEC, a desire to innovate marketing and sales model of the agriculture sector is highlighted. This arrangement would be mutually beneficial and of a nature comparable to that of knowledge transfers. Chinese firms would be able to research on various marketing models, while Pakistan's agriculture would get a much-needed promotional boost. The Rashakai Economic Zone near Mardan, Khyber Pakhtunkhwa is expected to host firms working in the fruit and food packaging segments.

¹³ Reference: Ministry of Agriculture. 2016. "(Global agriculture big data and information service alliance established in Beijing)", Ministry of Agriculture Press Office. 16 November.

- **Meat Processing:** Lastly, the slaughtering and meat-processing sector would experience positive spillovers in the form of high value addition and exporting potential. Segments such as frozen foods would benefit from increased mechanization and improved marketing efforts. According to a USDA April, 2018 report on China's foreign agricultural investments, China has approved 56 inspection, testing, and cold storage facilities dedicated to imported meat. The initiative is meant to standardize and modernize the monitoring and inspection of meat imported from the BRI partners.

To Maximize Returns, Structural Problems would need to be Addressed

The aspirations under CPEC and the opportunity provided by the structural changes underway in China generally bode well for the agriculture sector of Pakistan. However, Pakistan would have to tackle longstanding structural roadblocks in order to fully benefit from the potential technology transfers and relocations. In particular:

- **Addressing Farmers' Illiteracy:** The automation, mechanization and general advancement desired under CPEC is challenged by the prevailing low literacy rate amongst local farmers and hence their willingness to adhere to conventional farming methods. There are some encouraging initiatives being undertaken to address this deficit, such as the DFID-Telenor joint venture Khushaal Zamindar,¹⁴ which aims to introduce mobile-based agricultural knowledge dissemination among cash crop farmers. However, the issue would need large-scale training and awareness measures to remedy the situation.
- **Bank Financing and New Product Directions:** Currently, the small-scale farmers face expensive informal lending, lack of proper incentives, and absence of any guidance and facilitation. The increasing participation of commercial banks in this regard is a welcome development, though the demand is still consistently higher than the supply of credit.¹⁵ The increased efforts of microfinance banks, fintech firms, and provincial departments (such as PITB and Sindh Agriculture Department) are also helping expand the coverage and of credit disbursement to small farmers with limited or negligible credit history (refer to **Chapter 7** for more discussion on digitization and e-governance).

In order for small scale corporate farming to flourish thus, these farmers would require cheap, accessible financing as well as new product directions (such as horticulture) to increase their competitiveness.

- **Innovation in the Seed Sector:** The existing trends in the crop seed segment paint a discouraging picture. Certified variants are available for certain crops only (such as wheat and rice), with fruits, vegetables, and grain counterparts almost exclusively imported. The increased yields and higher export incomes would be unachievable without due consideration to modernization and innovation in the sector.
- **Cluster Farming:** The vast majority of farmers in Pakistan have land units that are fragmented and are below 12.5 acres, which makes it difficult to generate economies of scale that would justify the use of mechanization and sophisticated cropping patterns. One possible solution is to encourage cooperative farming, which allows economy of scale by forming vibrant clusters of

¹⁴ For more detail, please refer to "Box 2.2: Khushaal Zamindar and Mobile Agriculture" in the SBP's First Quarterly Report for FY18 on the State of Pakistan's Economy.

¹⁵ During FY18, the SBP set banks' credit disbursement target of Rs 1 trillion for agricultural sector as against an estimated demand of Rs 1343 billion. The banks met 72 percent of total demand for agri credit during the period. In view of rising demand for agri credit, the central bank has set a higher target of Rs 1250 billion for FY19.

farmers.¹⁶ Another problem is the lack of proper documentation of land records. Efforts to digitize such records would ameliorate the concerns of potential investors by offering greater transparency.

- Water Administration: Lastly, the issue of water availability is to be addressed in order to inhibit the adverse impacts of climate change. Issues such as limited storage capacity, trans-boundary disputes (concerning the Indus Water Treaty), outdated distribution systems, and depleting groundwater resources underline such concerns.¹⁷ Additionally, the vulnerable water supply is being threatened by rising demand due to a planned increase in industrial activity, rising population, and urbanization efforts associated with the CPEC.

¹⁶ For more information, refer to “Special Section 1: The growth of the processed food industry in Pakistan: Changing trends and key challenges” of the State Bank of Pakistan First Quarterly Report for FY17.

¹⁷ For more information, refer to Chapter 7: “Water Sustainability in Pakistan - Key Issues and Challenges” of the State Bank of Pakistan’s Annual Report for FY17.