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## **Transformative Potential: A Comprehensive Analysis of China-Pakistan Agricultural Cooperation under CPEC**

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## **ABSTRACT**

*Given the persistent concern of global food security, particularly in developing nations where agricultural sectors faces various challenges, the increasing collaboration between China and Pakistan under China-Pakistan Economic Corridor (CPEC) presents an interesting case study for agricultural cooperation. This research explores the partnership, examining its evolution, potential, and inherent challenges. The analysis maps out the growth of bilateral trade between China and Pakistan from 2011 to 2019, analyzing policy frameworks, and explores the diverse fields of cooperation, including infrastructure, product processing, machinery, and information exchange. While highlighting promising prospects, it identifies challenges such as low enterprise competitiveness, limited information exchange, and political risks, all considered in the context of CPEC and the Belt and Road Initiative (BRI). It emphasizes the transformative potential of China-Pakistan agricultural cooperation*

*under CPEC, underscoring the importance of comprehensive planning and strategic approaches to maximize mutual benefits in the domain of international agricultural collaboration.*

**Keywords:** China-Pakistan Economic Corridor (CPEC), Agricultural Cooperation, Pakistan's Agricultural Sector, Bilateral Trade, Belt and Road Initiative (BRI)

## **Introduction**

Located in the South Asian subcontinent, Pakistan, the world's fifth-most populous country, with a population of almost 232 million<sup>1</sup>, has a land area of about 796,000 square kilometers.<sup>2</sup> Data from World data atlas shows that the agricultural land area (land area that is arable, under permanent crops, and under permanent pastures) for Pakistan in 2022 is 367,230 sq. km.<sup>3</sup>

Geographically, Pakistan exhibits a tripartite topographical division comprising the Northern Highlands, the Balochistan Plateau, and the Indus Plain. These regions

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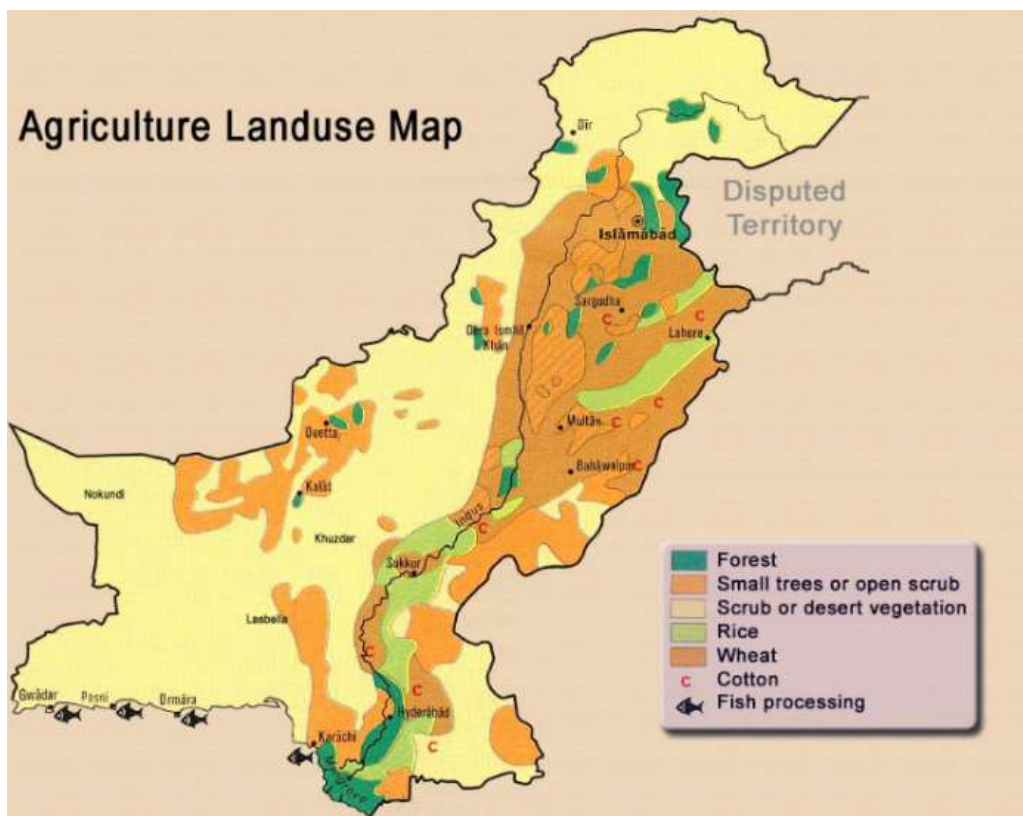
<sup>1</sup> WorldOMeter, "Pakistan Population (2019) - Worldometers," Worldometers.info, 2019, <https://www.worldometers.info/world-population/pakistan-population/>.

<sup>2</sup> The World Bank, "Land Area (Sq. Km) - Pakistan | Data," data.worldbank.org, 2021, <https://data.worldbank.org/indicator/AG.LND.TOTL.K2?locations=PK>.

<sup>3</sup> World Data Atlas, "Pakistan Agricultural Land Area, 1960-2022 - Knoema.com," Knoema, 2021, <https://knoema.com/atlas/Pakistan/Agricultural-land-area>.

are characterized by an array of mountain ranges, with elevations increasing progressively from the south to the north. Approximately 92% of Pakistan's landmass is classified as arid or semi-arid, with the nation experiencing an average annual precipitation of less than 300 mm. Notably, the Northern Highlands encompass the formidable Hindu Kush, the Karakorum Mountains, and segments of the Himalayan range. The elevated altitudes, lower temperatures, and frequent occurrence of snowfall in these Northern Highland areas impose significant limitations on arable land availability for extensive agricultural practices (see Figure 1).

**Figure 1: Agriculture Land use of Pakistan**



Source: National Drought Monitoring Center, Pakistan Meteorological Department<sup>4</sup>

Dating back to the period from 3,300 B.C. to 1,300 B.C., an agrarian civilization of great significance thrived within the confines of the Indus Valley, encompassing the present-day territory of Pakistan. Archaeological excavations have yielded compelling evidence substantiating the agricultural activities of the ancient Indus Valley inhabitants, who cultivated a diverse spectrum of crops, including barley, wheat, cotton, and dates. Concurrently, these civilizations exhibited remarkable advancements in hydraulic engineering, exemplified by the development of intricate irrigation and water management systems. These systems encompassed drainage mechanisms for effective waste disposal and the pioneering implementation of canal irrigation systems. Remnants and archaeological evidence gleaned from the Harappa and Mohenjo-Daro settlements unequivocally affirm the mastery of irrigation and drainage practices by the inhabitants of this region some 4,000 years ago (see Figure 2). Notably, Mohenjo-Daro boasted a network of wells that served as a readily accessible source of potable water for each locality within the settlement.<sup>5</sup>

**Figure 2: Drainage System in Harappa**

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<sup>4</sup> Pakistan Meteorological Department, “Agriculture Landuse of Pakistan,” [www.pmd.gov.pk](http://www.pmd.gov.pk), accessed December 25, 2023, [https://www.pmd.gov.pk/ndmc/index\\_files/Page1455.htm](https://www.pmd.gov.pk/ndmc/index_files/Page1455.htm).

<sup>5</sup> Tang Jun, “Historical Review of Mohenjo-Daro and Harappan Civilization in Pakistan,” *Pacific International Journal* 5, no. 2 (June 30, 2022): 31–42, <https://doi.org/10.55014/pij.v5i2.185>.



Source: Ancient Origins

Ancient agrarian civilizations, historically reliant on irrigated agriculture, fostered connections among diverse geographical regions. Presently, the Indus River basin serves as the lifeline of Pakistan's agricultural production. The fertile expanse of the Indus Plain, traversed by the Indus River and its tributaries, stands as a pivotal center for agricultural activities in Pakistan, particularly within the provinces of Sindh and Punjab.

Pakistan's agricultural calendar centers on two distinct seasons:

- i. Kharif: This summer season runs from April to June for sowing and October to December for harvesting. It thrives on monsoon rains and supports warm-weather crops like rice, sugarcane, cotton, maize, and millet.
- ii. Rabi: Spanning October to December for sowing and April to May for harvesting, this winter season utilizes residual soil moisture and cooler temperatures for crops like wheat, gram, tobacco, rapeseed, barley, and mustard.

These favorable agricultural conditions have boosted the Indus Plain into Pakistan's agricultural breadbasket. Punjab alone accounts for three-fourth of the nation's annual grain production, while Sindh's rice output is sufficient to meet the entire nation's demand. The Indus Plain is also conducive to the cultivation of cash crops, with Pakistan ranking as the world's fifth-largest sugarcane producer, constituting 3.6% of the country's GDP.

The Pakistani government places significant emphasis on the agricultural sector, implementing various measures and initiatives to foster its growth. These initiatives encompass agricultural scientific research, water resource management, irrigation infrastructure development, mechanization, financial and loan support, and policies concerning agricultural product pricing. Moreover, endeavors have been made to harness the potential of agricultural land, enhance per-unit production, and diversify agricultural products and sales channels. Decades of dedicated efforts have culminated in substantial advancements within Pakistan's agricultural sector. By the early 1980s, the nation achieved self-sufficiency in food production and gradually commenced food exports to foreign nations. Given the rapid population growth, the demand for agriculture in Pakistan has surged, prompting the nation to actively explore international agricultural collaborations with foreign countries.

The agricultural sector in Pakistan constitutes a fundamental pillar and a vital source of livelihood for its populace. According to data from the International Trade Administration, during the Fiscal Year 2020-2021, Pakistan's agricultural sector contributed 19.2% to the country's Gross Domestic Product and engaged 38.5% of the total workforce.<sup>6</sup> The Pakistan Agriculture Machinery Census reports that the agricultural machinery sector's overall worth is approximately \$1.2 billion, encompassing various equipment such as harvesters, irrigation machinery, tractors, and small-scale agricultural implements. Food security is designated as one of the top seven priority action areas in Pakistan's Vision 2025, as announced by the PML-N government in early 2014.<sup>7</sup> In recent years, the government has introduced effective measures and substantial economic reforms aimed at enhancing economic and agricultural development. Pakistan is on a trajectory towards establishing "a modern, efficient, and diversified agricultural sector that can ensure a stable and sufficient provision of basic food supplies for the country's population while also delivering quality products for export."<sup>8</sup>

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<sup>6</sup> International Trade Administration, "Pakistan - Agricultural Machinery and Equipment," [www.trade.gov](http://www.trade.gov), November 10, 2022, <https://www.trade.gov/country-commercial-guides/pakistan-agricultural-machinery-and-equipment>.

<sup>7</sup> Idrees Khawaja, "Vision 2025 Score," DAWN.COM, July 29, 2018, <https://www.dawn.com/news/1423578>.

<sup>8</sup> Ministry of Planning, Development & Reform, "Pakistan Vision 2025" (Government of Pakistan, 2014), <https://faolex.fao.org/docs/pdf/pak166456.pdf>.



## Situation of Pakistan Agriculture

The agricultural sector in Pakistan encompasses a diverse array of components, including five pivotal crops (wheat, maize, rice, sugarcane, and cotton), livestock, forestry, and fishing. Pakistan epitomizes the quintessential agricultural nation, with agriculture serving as the principal driving force behind the nation's economic expansion. In the fiscal year 2020-2021, the crop sector accounted for a substantial 35.81% share of the agricultural value and contributed significantly, constituting 19.2% of the Gross Domestic Product (GDP), marking a notable 2.8% increase from the preceding year (see Table 1). This surge in agricultural productivity can be attributed to favorable weather conditions, ample availability of agricultural inputs, such as water resources, certified seeds, subsidized fertilizers, pesticides, and agricultural credit, as well as the introduction of Prime Minister Nawaz Sharif's Agriculture Package, aimed at bolstering wheat and sugarcane production.

**Table 1: Pakistan Sector Point Contribution of FY 2019-2021 at Constant Prices 2005-06**

	FY2019	FY2020	FY2021	FY2019	FY2020	FY2021
	As percent of GDP (MP)			Growth Rates (%)		
A. Agriculture	18.7	19.4	19.2	0.6	3.3	2.8
B. Industry	19.9	19.2	19.1	(1.6)	(3.8)	3.6
<b>Commodity Producing Sector (A+B)</b>	<b>38.6</b>	<b>38.6</b>	<b>38.3</b>	<b>(0.5)</b>	<b>(0.3)</b>	<b>3.2</b>
C. Services Sector	61.4	61.4	61.7	3.8	(0.6)	4.4
<b>GDP (GVA)</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>2.1</b>	<b>(0.5)</b>	<b>3.9</b>

Source: Pakistan Bureau of Statistics

Statistical data released by the Pakistan Bureau of Statistics for the fiscal year 2019/20 reveals that the total worth of agricultural output in Pakistan amounted to approximately 2.42 trillion, constituting 19.31% of the GDP and engaging 35.8% of

the nation's total employed population. In the context of Pakistan's significance as an agricultural nation, key crops have played a pivotal role in contributing to the country's overall development. Table 2 presents a comprehensive overview of the area and production of essential crops in the past decade, spanning from FY 2011-12 to FY 2020-21.

**Table 2: Area and Production of important crops in Pakistan, 2011-2021**

(Area '000' hectares, Production '000' tonnes)

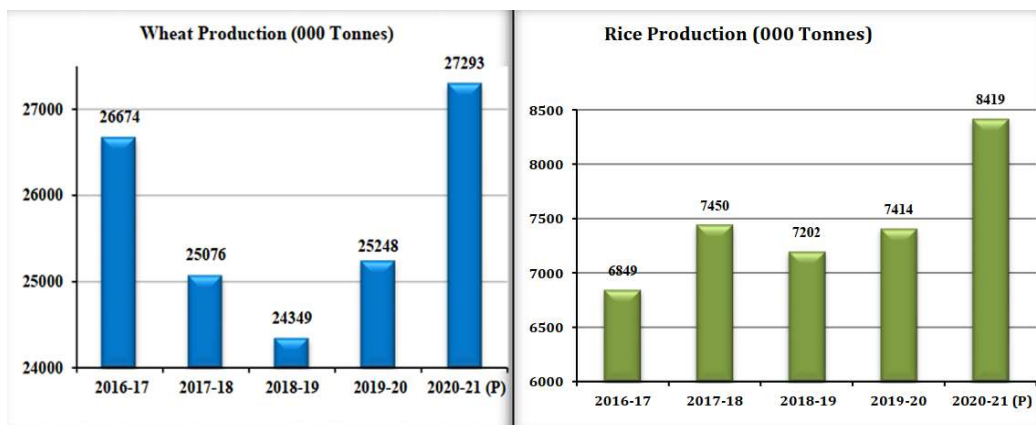
CROPS/ YEAR	Wheat		Maize		Rice		Sugarcane		Cotton*	
	Area	Production	Area	Production	Area	Production	Area	Production	Area	Production
2011-12	8649.8	23473.4	1087.3	4338.3	2571.2	6160.4	1057.5	58397.0	2834.5	13595.0
2012-13	8660.2	24211.4	1059.5	4220.1	2308.8	5535.9	1128.8	63749.9	2878.8	13030.7
2013-14	9199.3	25979.4	1168.5	4944.2	2789.2	6798.1	1172.5	67460.1	2805.7	12768.9
2014-15	9203.9	25086.1	1142.5	4936.8	2890.6	7002.8	1140.5	62826.4	2961.3	13959.6
2015-16	9223.7	25633.1	1191.2	5270.9	2739.5	6801.3	1131.6	65482.4	2901.9	9917.4
2016-17	8972.5	26673.6	1348.4	6134.2	2724.0	6849.3	1217.6	75482.2	2488.9	10670.6
2017-18	8797.2	25076.1	1250.8	5901.6	2900.6	7449.8	1341.8	83332.8	2700.3	11945.6
2018-19	8677.7	24349.0	1373.9	6826.4	2810.0	7202.0	1101.9	67174.0	2373.0	9860.8
2019-20	8804.7	25247.5	1404.2	7883.0	3034.0	7413.7	1039.8	66379.6	2517.3	9148.0
2020-21(P)	9168.2	27464.1	1417.8	8939.8	3335.1	8419.7	1165.0	81009.3	2078.9	7063.9

\* Cotton production is in thousand bales of 375 lbs. each  
P = Provisional

Source: Pakistan Bureau of Statistics

Wheat and rice hold paramount importance as staple foods for the Pakistani population. In the fiscal year 2020-2021, wheat production reached an unprecedented 27.293 million tonnes, contributing 1.8% to the GDP, with a cultivated area spanning 9,178 thousand hectares. Rice stands as the second most essential food crop after wheat. In the fiscal year 2020-2021, rice production attained 8.419 million tonnes, contributing 0.7% to the GDP, cultivated across 3,335 thousand hectares (see Table 3).

**Table 3: Wheat production and rice production from FY 2016 to 2021**

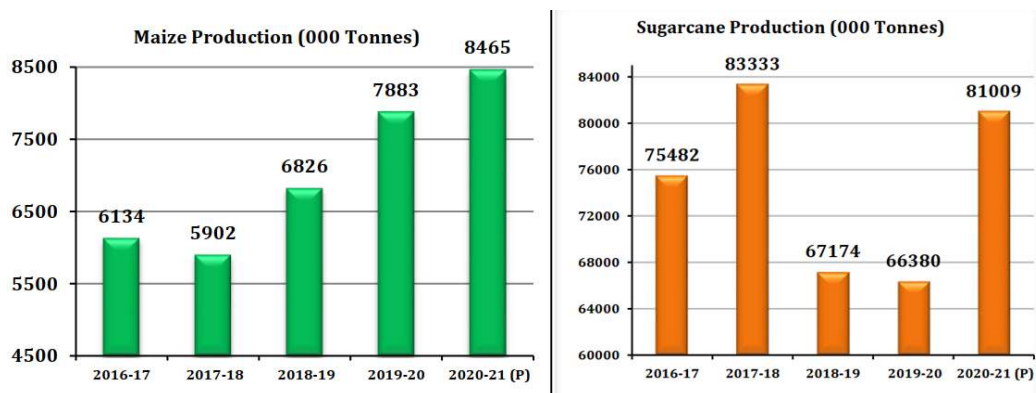


Source: Pakistan Bureau of Statistics

Maize, being a versatile crop serving both as food and fodder, occupies a pivotal position as the third most crucial crop after wheat and rice in Pakistan. In the fiscal year 2020-2021, maize contributed 0.6% to the GDP, with a production volume of 8,465,000 tonnes, reflecting a 7.4% increase compared to the preceding year. The surge in production is primarily attributed to the expansion of cultivated land, improved seed varieties, and enhanced economic performance.

Sugarcane, often referred to as the “cash crop” of the nation, contributed 0.7% to the GDP, yielding a production of 81,009,000 tonnes, marking a substantial 22% increase from the previous year. This noteworthy upsurge can be attributed to favorable climatic conditions, effective agricultural management practices, the utilization of quality inputs, and robust economic performance (see Table 4).











**Table 4: Maize production and Sugarcane production from FY 2016 to 2021**



Source: Pakistan Bureau of Statistics

Cotton, renowned as the most valuable non-food agricultural product worldwide, positions Pakistan as the fourth-largest cotton-producing country (see Table 5). Simultaneously, Pakistan ranks as the fourth-largest textile producer and the twelfth-largest textile exporter globally. The textile industry constitutes a pivotal and export-oriented industry within Pakistan, engaging approximately 1.7 million individuals in cotton production and its associated sectors.

**Table 5: Countries by Cotton Production, 2022**

	Country	Production (Tons)	Production per Person (Kg)
	India	6.188.000	4,63
	China	6.178.318	4,433
	United States of America	3.593.000	10,962
	Pakistan	2.374.481	11,762
	Brazil	1.412.227	6,74
	Uzbekistan	1.106.700	33,892
	Australia	885.100	35,334
	Turkey	846.000	10,469
	Argentina	327.000	7,349
	Greece	308.000	28,603

Source: Atlas Big<sup>9</sup>

In addition to the five primary crops, Pakistan heavily relies on a diverse array of other crops, encompassing bajra, jowar, gram, barley, rapeseed, and mustard. For the fiscal year 2020-2021, the production volumes for these crops amounted to 266,000, 96,000, 261,000, 47,000, and 488,000 tonnes, respectively. Furthermore, in the realm of masoor, moong, mash, potato, onion, and chilies, the production statistics are 4,900,000, 204,500, 7,000,000, 4,681,000, 2,099,000, and 103,700 tonnes, respectively, as shown in Table 6.

**Table 6: Area and Production of Other Crops, 2019-2021**

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<sup>9</sup> Atlas Big, “World’s Top Cotton Producing Countries,” AtlasBig, 2022, <https://www.atlasbig.com/en-us/countries-cotton-production>.

<b>Area and Production of Other Crops</b>				
<b>Crops</b>	<b>2019-20</b>		<b>2020-21(P)</b>	
	<b>Area (000 Hectares)</b>	<b>Production (000 Tonnes)</b>	<b>Area (000 Hectares)</b>	<b>Production (000 Tonnes)</b>
Bajra	522	384	350	266
Jowar	199	120	126	96
Gram	944	498	873	261
Barley	49	47	41	47
Rapeseed & Mustard	353	488	222	488
Tobacco	51	133	51	133
Masoor	9.5	4.9	6.5	4.9
Moong	172.9	125.9	231.1	204.5
Mash	13.9	6.5	11.0	7.0
Potato	185.4	4,552.7	234.4	4,681.0
Onion	148.2	2,122.0	153.8	2,099.6
Chillies	60.8	141.5	45.7	103.7

P: Provisional

Source: Pakistan Bureau of Statistics

Compared with crop sector, livestock and poultry sector enjoys a more important role in socio-economic development of the nation. Livestock in Pakistan includes cattle, buffalo, goat, sheep, horses, camels, asses, and mules. Livestock makes a significant contribution to agriculture value added services and holds a prominent position in the sector; in fact, livestock is one of the fastest-growing sub-sectors in most developing countries.<sup>10</sup> In FY 2021, the livestock sector accounts for 60.1% of agriculture value and 11.5% of GDP. More than 30 million people rely on this sector and 40% of their income is from it. On average there are 2-3 cattle/buffalo and 5-6 sheep/goat per family in rural areas. The government attaches much importance to the

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<sup>10</sup> Abdul Rehman et al., "Livestock Production and Population Census in Pakistan: Determining Their Relationship with Agricultural GDP Using Econometric Analysis," *Information Processing in Agriculture* 4, no. 2 (June 2017): 168–77, <https://doi.org/10.1016/j.inpa.2017.03.002>.

livestock sector for poverty alleviation. Many measures and policies are taken to improve livestock production and animal health. The herd population of past three years is listed in table 7.

**Table 7: Estimated livestock population, 2018-2021**

Estimated Livestock Population			(Million Nos.)
Species	2018-19 <sup>1</sup>	2019-20 <sup>1</sup>	2020-21 <sup>1</sup>
Cattle	47.8	49.6	51.5
Buffalo	40.0	41.2	42.4
Sheep	30.9	31.2	31.6
Goat	76.1	78.2	80.3
Camels	1.1	1.1	1.1
Horses	0.4	0.4	0.4
Asses	5.4	5.5	5.6
Mules	0.2	0.2	0.2

<sup>1</sup>: Estimated figure based on inter census growth rate of Livestock Census 1996 & 2006

Source: Ministry of national Food Security & Research, Pakistan

As an important sub-sectors of livestock sector, poultry sector provides 1.5 million jobs for the nation. In the last decade, it grows at an annual pace of 7.5% and now the nation ranks 11th among the top poultry producers in the world. The main reason for its fast growth is because of the high demand for white meat and eggs.<sup>11</sup> Pakistan has initiated modern technology and strategies to build poultry businesses

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<sup>11</sup> JP Wagenaar et al., “Final Report on Migratory Livestock and the Marketing System in Balochistan” (National Management Consultants (Pvt.) Ltd; 1997, n.d.).

controlled by local providers.<sup>12</sup> With friendly policies, farmers are encouraged to raise rural and commercial poultry production, as seen in Table 8.

**Table 8: Estimated Domestic/Rural & Commercial Poultry, 2018-2021**

Estimated Domestic/Rural & Commercial Poultry				
Type	Units	2018-19 <sup>1</sup>	2019-20 <sup>1</sup>	2020-21 <sup>1</sup>
<b>Domestic Poultry</b>	<b>Million Nos.</b>	<b>88.49</b>	<b>89.84</b>	<b>91.22</b>
Cocks	Million Nos.	12.18	12.51	12.85
Hens	Million Nos.	43.15	43.93	44.72
Chicken	Million Nos.	33.16	33.40	33.65
Eggs <sup>2</sup>	Million Nos.	4,315	4,393	4,472
Meat	000 Tonnes	122.28	124.72	127.22
<b>Duck, Drake &amp; Duckling</b>	<b>Million Nos.</b>	<b>0.40</b>	<b>0.38</b>	<b>0.37</b>
Eggs <sup>2</sup>	Million Nos.	17.93	17.18	16.47
Meat	000 Tonnes	0.54	0.52	0.50
<b>Commercial Poultry</b>	<b>Million Nos.</b>	<b>1,232.33</b>	<b>1,353.24</b>	<b>1,486.09</b>
Layers	Million Nos.	55.91	59.82	64.01
Broilers	Million Nos.	1,163.42	1,279.76	1,407.73
Breeding Stock	Million Nos.	13.01	13.66	14.34
Day Old Chicks	Million Nos.	1,215.19	1,336.71	1,470.38
Eggs <sup>2</sup>	Million Nos.	14,719	15,723	16,797
Meat	000 Tonnes	1,395.02	1,531.60	1,681.64
<b>Total Poultry</b>				
Day Old Chicks	Million Nos.	1,248	1,370	1,504
Poultry Birds	Million Nos.	1,321	1,443	1,578
Eggs	Million Nos.	19,052	20,133	21,285
Poultry Meat	000 Tonnes	1,518	1,657	1,809

1: The figures for the indicated years are statistically calculated using the figures of 2005-06.

2: The figures for Eggs (Farming) and Eggs (Desi) are calculated using the poultry parameters for egg production.

Source: Ministry of national Food Security & Research, Pakistan

## Agriculture Conditions

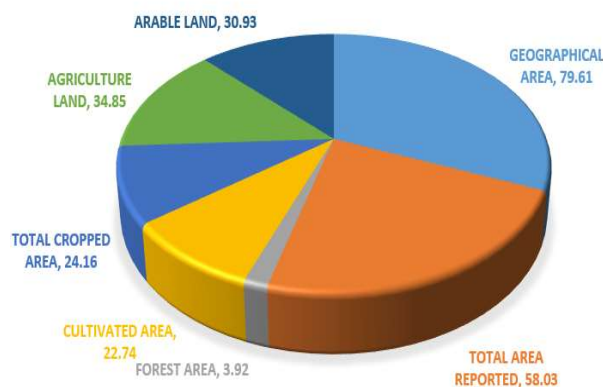
### Land resources

<sup>12</sup> Muhammad Shafiq and Muhammad Azam Kakar, "Current Livestock Marketing and Its Future Prospects for the Economic Development of Balochistan-Pakistan," *International Journal of Agriculture & Biology* 8, no. 6 (2006), [https://www.fspublishers.org/published\\_papers/50760\\_.pdf](https://www.fspublishers.org/published_papers/50760_.pdf).



Pakistan boasts a wealth of land resources, with arable land covering approximately 29% of the nation's total land area. Remarkably, the per capita arable land area in Pakistan is roughly double that of China. Furthermore, a substantial 80% of the arable land in Pakistan benefits from irrigation systems. Pakistan's land tenure system is predominantly privatized, with a staggering 99.85% of the land being privately owned, a distribution that encompasses 50% of the country's farmers. Conversely, the remaining 50% of the rural populace, predominantly constituting the economically disadvantaged segment of Pakistan, is characterized as landless. Graph 1 provides a comprehensive overview of land statistics based on data sourced from the Pakistan Bureau of Statistics.

**Graph 1: Land Statistics of Pakistan, 2019-2020**



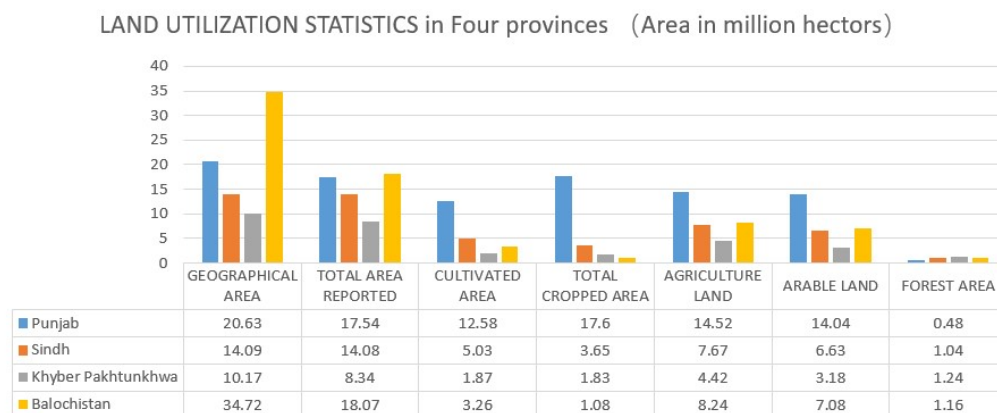
Source: Compiled by author<sup>13</sup>

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<sup>13</sup> Total area reported refers to the total physical area of the villages/ tehsils/ districts etc. Forest area refers to the area of any land administered as forest under any legal enactment dealing with forests.

To have a clear understanding of the detailed land statics of the four provinces, table 9 is listed for reference.

**Table 9: Land utilization Static in Four provinces, 2019-2020**



Source: Compiled by author

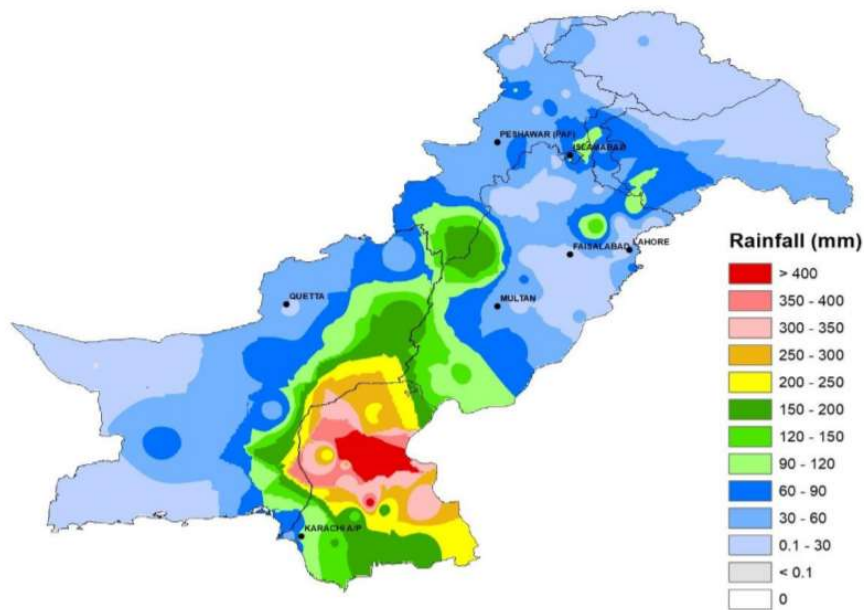
### Water Resources

The historical average annual precipitation in Pakistan spanning from 1901 to 2021 stands at 287.75 mm, with a notable low of 187.52 mm recorded in 2018. However, in the year 2022, Pakistan encountered an unforeseen and substantial rainfall event that affected a wide geographic expanse across the nation. Particularly heavy rainfall was observed in the regions of Sindh, Balochistan, and upper Khyber

Cultivated area refers to the area sown at least during the year under reference or during the previous year. Total cropped area refers to the aggregate area of crops raised in a farm during the year under reference including the area under fruit trees.

Pakhtunkhwa (see Map 1).<sup>14</sup>

**Map 1: Precipitation Distribution in Pakistan, August 2022**



Source: National Weather Forecasting Centre, Islamabad, Pakistan

The per capita water availability in Pakistan stands at 1,066 m<sup>3</sup>, with agricultural water consumption accounting for a significant portion, amounting to 69% of the total water utilization. It is imperative to note that agricultural production is inherently linked to the efficient supply and utilization of water resources. Despite the presence

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<sup>14</sup> Pakistan Meteorological Department, “Monthly Weather Reports | National Weather Forecasting Centre, Islamabad,” nwfc.pmd.gov.pk, 2022, <https://nwfc.pmd.gov.pk/new/monthly-reports.php>.

of comprehensive irrigation systems in Pakistan, a notable degree of inefficiency persists within the irrigation process. Consequently, the effective irrigation penetration rate in farmland remains suboptimal (see Table 10).

**Table 10: Farmland Irrigation by Various Sources in Pakistan, 2019-2020**

Area Irrigated by Different Sources									
Province	Total	Canals		Tubewells	Wells	Canal Tube-wells	Canal wells	Tanks	Others
		Government	Private						
		(Area in million hectares)							
<b>2019-20</b>									
<b>TOTAL</b>	<b>19.34</b>	<b>5.70</b>	<b>0.33</b>	<b>4.06</b>	<b>0.27</b>	<b>8.47</b>	<b>0.24</b>	<b>0.02</b>	<b>0.25</b>
Punjab	15.47	3.31	—	3.15	0.16	8.47	0.24	0.00	0.14
Sindh	1.65	1.29	—	0.36	*	—	—	—	—
Khyber Pakhtunkhwa	0.94	0.44	0.26	0.10	0.05	—	—	0.02	0.07
Balochistan	1.28	0.66	0.07	0.45	0.06	—	—	—	0.04
* = Nominal		Source: Provincial Agriculture Departments.							

Source: Pakistan Provincial Agriculture Departments

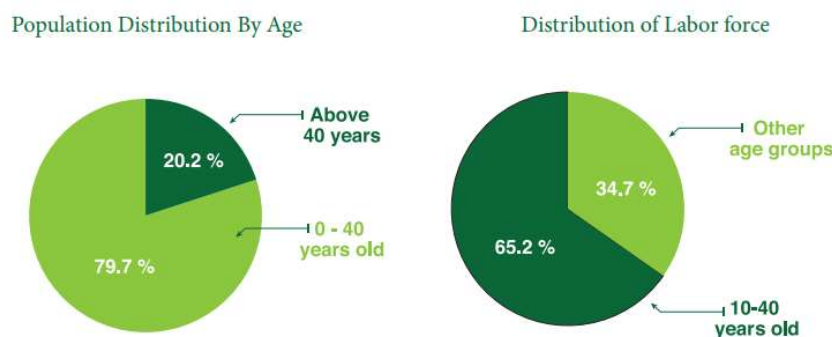
### Labor resources

Pakistan, as the fifth most populous country globally, boasts the eighth largest labor force, comprising 63,340,000 individuals.<sup>15</sup> About 68% of the country's population make a living from agriculture-related industries. Approximately 68% of Pakistan's populace is engaged in livelihoods directly linked to the sphere of agricultural-related industries. This demographic composition assumes a distinctive character, notably characterized by a substantial proportion of youthful labor force participants, as visually depicted in Graph 2. The presence of such a demographic

<sup>15</sup> WorldAtlas, "Labor Force by Country," WorldAtlas, December 9, 2015, <https://www.worldatlas.com/articles/the-workforce-giants-highest-labor-forces-in-the-world.html>.

dividend augments Pakistan's intrinsic potential to harness its abundant labor force for both economic and agricultural advancement.

**Graph 2: Population Distribution by Age & Distribution of Labor force**



Source: CPEC Authority

As part of the extensive development initiatives within the framework of the China-Pakistan Economic Corridor (CPEC), Pakistan's Technical and Vocational Education National Vocational & Technical Training Commission has orchestrated the formulation of a National Skill Strategy. This national-level program has been meticulously designed with a core emphasis on establishing a training system that is not only responsive to the evolving demands of the labor market but also characterized by a demand-driven orientation. Notably, the priority domains targeted for skill development under this strategic framework align harmoniously with the imperatives of CPEC projects. These encompass various sectors, including agriculture, industry, and the facilitation of an export-oriented cadre of skilled personnel.

This proactive approach towards skill development serves as a testament to Pakistan's commitment to harnessing the potential of its youthful workforce, further underscoring the country's resolve to meet the multifaceted demands of economic

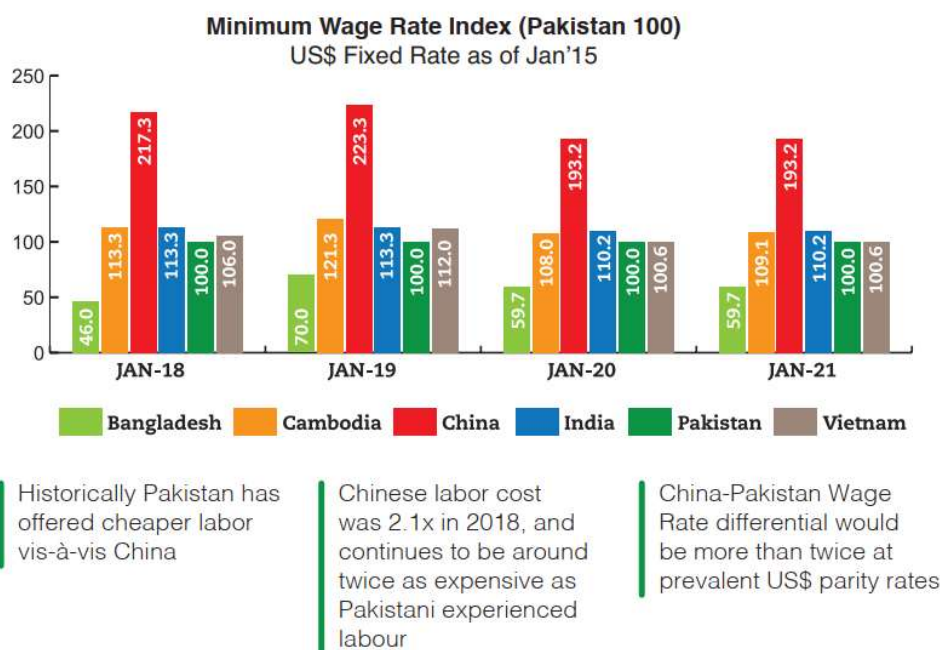
growth, industrial development, and the execution of collaborative ventures like CPEC.<sup>16</sup>

In comparison to China, Pakistan enjoys a competitive advantage in terms of regional labor costs. This advantageous position is exemplified by the Minimum Wage Rate Index, which is presented in Table 11. In conjunction with its substantial population, Pakistan stands as a formidable contender in the international labor market.

**Table 11: Minimum Wage Rate Index**

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<sup>16</sup> Ati Butt, “National Skill Strategy Devised by NAVTTC - Engineering Post - Leader in Engineering Journalism,” [enggpst.com](https://enggpst.com), April 4, 2022, <https://enggpst.com/national-skill-strategy-devised-by-navttc/>.



Source: CPEC Authority

## Agriculture Cooperation between China and Pakistan under CPEC

China and Pakistan, both distinguished as major agricultural nations, have demonstrated proactive engagement in fostering agricultural cooperation and trade over the past few decades. The bilateral agricultural trade between the two nations witnessed notable growth, surging from US\$ 490,000,000 in 2011 to US\$ 830,000,000 in 2019.<sup>17</sup> This trade encompasses various agricultural products,

<sup>17</sup> Tahir Ali, “Pakistan’s Exports to China Showing Positive Trend in 2021,” Gwadar Pro, January 3, 2022, <https://www.gwadarpro.pk/1477974332617277441/pakistans-exports-to-china-showing-positive-trend-in-2021>.

including textiles, crops, vegetables, dried fruits, leather goods, and several other agricultural commodities

### **Policy Framework**

In the contemporary era, the two countries have consistently pursued collaborative efforts to advance agricultural cooperation, culminating in the formulation of comprehensive policies, agreements, joint statements, and official meetings. Bolstered by governmental support from both sides, the agricultural cooperation between China and Pakistan has entered a new era with the implementation of the China-Pakistan Economic Corridor (CPEC). Table 12 elucidates a series of policy measures and endorsements undertaken by both nations in support of this collaborative endeavor.

**Table 12: Policy support in agriculture between China and Pakistan.**

<b>Year</b>	<b>Documents</b>	<b>Content</b>
<b>2006</b>	China-Pakistan Joint Statement	Enhancement of Technical Exchange and Collaboration in Agricultural Technology, with a Special Emphasis on Agricultural Product Processing, Pesticides, Drip Irrigation, and Fisheries.
<b>2006</b>	5-Year Development Plan for China-Pakistan Economic and Trade Cooperation (2007-2011)	Cooperation and Technical Training in Water-Saving Irrigation, Technology Transfer, Seed Industry Advancements, Pesticides, Agricultural Technology Training, Fruit and Vegetable Processing, and Chemical Fertilizers.



<p><b>2008</b></p>	<p>Memorandum of Understanding on Agricultural Science and Technology Cooperation between the Chinese Academy of Agricultural Sciences and the Pakistan Agricultural Research Council</p>	<p>Management of Water Resources, including Initiatives in Hybrid Cotton, Corn, Horticulture, and the Cultivation of Genetically Modified Crops.</p>
<p><b>2009</b></p>	<p>Memorandum of Understanding on Technical Cooperation between Hubei Seed Group Co., Ltd. and Pakistan Agricultural Development Research Council</p>	<p>Collaboration on Hybrid Rice and Technology Developments in Oilseed Crops.</p>
<p><b>2009</b></p>	<p>Memorandum of Understanding on Collaboration between Xintong Tianye Water Saving Irrigation Company Limited, the 8th Agricultural Division of Xintong Construction Corps, and Pakistan Agricultural Research</p>	<p>Provision of Consultation and Technical Services in the Fields of Water-Saving Irrigation, Hybrid Cotton, and Colored Cotton Cultivation.</p>

	Council	
<b>2010</b>	China-Pakistan Joint Statement	Initiatives in Grain Processing, Gas Conditioning, Establishment of Refrigerated Warehouses, and Implementation of Remote Sensing Satellite Systems for Crop Monitoring and Control.
<b>2010</b>	Memorandum of Understanding on Cooperation between the State Food Administration of China and the Ministry of Food, Agriculture, and Jai Pastoral of Pakistan	Development of Grain Reserves and the Establishment of Sustainable Mechanisms for Cooperation and Exchange in Grain Distribution.
<b>2010</b>	Memorandum of Understanding between Yangling Agricultural High-Tech Industry Demonstration Zone of Shaanxi Province, China, and the Ministry of Agriculture of Sindh, Pakistan	Establishment of an Agricultural Demonstration Base in Sindh, following the Model of Yangling, China
<b>2011</b>	Second Meeting of China-Pakistan Economic Cooperation Group	Facilitation of Agricultural Information Exchange, Promotion of Agricultural Product Processing and Trade, Implementation of Animal and Plant

		Quarantine Measures, Machinery Production and Maintenance, and Pesticide Management.
<b>2014</b>	Cooperation Agreement on the Industrialization of Hybrid Wheat between China and Pakistan	Introduction of High-Quality Hybrid Wheat Varieties into the Chinese Domestic Market.
<b>2014</b>	Agreement between the Pakistan Agricultural Research Council and the Yunnan Academy of Agricultural Sciences	Implementation of Pest Control and Plant Protection Measures.
<b>2019-22</b>	Meetings of the China-Pakistan Joint Working Group on Agriculture	Bilateral Collaborative Efforts in Agriculture and Livestock Sectors.

Source: Compiled by author

CPEC, officially launched in 2015, has yielded significant achievements across various domains. Notably, China-Pakistan agricultural cooperation has expanded from conventional agricultural trade to encompass agricultural investment, services, and collaboration in crop cultivation, agricultural processing, machinery, and information exchange. Within the context of CPEC, the potential for agricultural cooperation between the two nations has seen substantial exploration and development. Since the signing of the second phase of the China-Pakistan Free Trade Agreement (2019-2024),

bilateral agricultural trade has exhibited steady growth.<sup>18</sup> Notable increases have been observed in China's exports of garlic, tea, and tomato paste to Pakistan, while Pakistan has witnessed significant growth in the export of products such as sardines, sesame seeds, and nuts to China.

### **Agriculture Cooperation Features**

- i. The agricultural cooperation between China and Pakistan is inherently complementary, holding substantial untapped potential. Pakistan possesses favorable natural resources, while China boasts advanced technology, capital, and human resources. Leveraging this bilateral cooperation, the introduction of advanced agricultural technology can significantly enhance Pakistan's crop yields, meat and milk production, and unlock the latent potential of its fishery sector. Simultaneously, China's exports of seeds, pesticides, fertilizers, agricultural machinery, and related products contribute to Pakistan's food security and bolster China's global service capabilities.
- ii. The scope of cooperation has expanded into various fields. China-Pakistan agricultural collaboration has evolved from mere food and crop trade to encompass infrastructure development, product processing, agricultural machinery, and the application of agricultural information. These areas witnessed limited exchanges prior to the initiation of CPEC.

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<sup>18</sup> Ministry of Commerce People's Republic of China, "Protocol of the Second Phase of China-Pakistan Free Trade Agreement Enters into Effect Today," english.mofcom.gov.cn, December 2, 2019,

<http://english.mofcom.gov.cn/article/newsrelease/significantnews/201912/20191202919456.shtml>.

- iii. The cooperation lacks comprehensive planning and coordination. In comparison to sectors such as transportation, energy, and industry, agricultural projects typically entail substantial investments and lengthy timelines. The scope and mode of cooperation are influenced by the prevailing agricultural conditions. Furthermore, Chinese and foreign-invested enterprises engaged in agricultural cooperation in Pakistan tend to favor Punjab, particularly Lahore, over other provinces or cities. Effective information-sharing platforms have not been adequately developed, hindering the exchange of the latest agricultural information.
- iv. The cooperation exhibits limited diversity, with many projects adopting a project-based approach. Cooperation modes can be categorized into government projects, enterprise projects, and multi-party projects. Government projects, supported by national departments, often have large scales but are challenged by issues related to government mechanisms, which may affect continuity and efficiency. Enterprise projects, developed to meet the business interests and demands of enterprises, offer greater flexibility in terms of cooperation modes, scale, and methods, but they require substantial time for surveying and negotiations and entail uncertainties and potential investment risks.

Based on the aforementioned features, we identify several challenges and obstacles faced by both sides in agricultural cooperation, including:

- The low competitiveness of Chinese and Pakistani enterprises.
- Insufficient information exchange mechanisms.
- Political risks associated with government mechanisms.
- Fluctuations in the exchange rates of the Renminbi (RMB) and Pakistani Rupee.

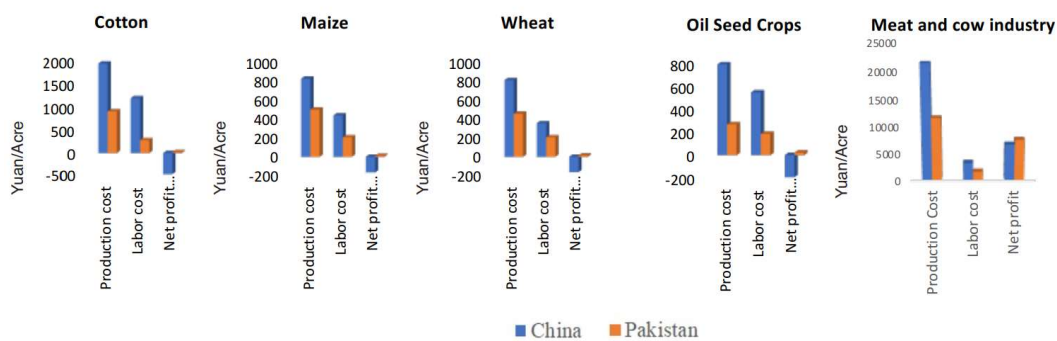
- Limited understanding of local customs, laws, and religion.

These challenges have the potential to lead to disputes and may impede the healthy growth of agricultural cooperation between China and Pakistan.

### Prospects of China-Pakistan agricultural cooperation

Pakistan, characterized by significant development potential and pressing developmental needs, offers numerous practical areas and fields for agricultural cooperation with China. As a developing country, Pakistan boasts a highly competitive labor cost advantage compared to China, given that agriculture is a labor and land-intensive industry. The production cost of five primary crops in Pakistan is merely 50% of the equivalent costs in China, as illustrated in Figure 3.

**Figure 3: Production Cost in China is twice than the cost in Pakistan**

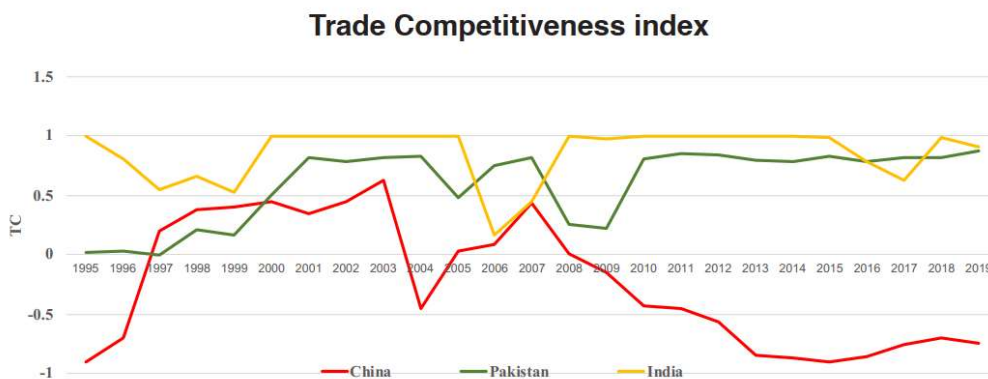


Source: China Agricultural Sector Development Report 2020, Crop Reporting Service Pakistan 2020

CPEC, the flagship initiative of the Belt and Road Initiative (BRI), represents a significant opportunity for Chinese enterprises to navigate challenges and for Pakistan

to embark on agricultural reform and development. Despite being a vast agricultural nation, China has transitioned from having competitive advantages to facing disadvantages, shifting from net exports to net imports. This trend is anticipated to continue, as depicted in Figure 4. In addition to Punjab, potential areas for China-Pakistan agricultural cooperation extend to other provinces with favorable agricultural production conditions, including Sindh and Balochistan. Consideration can also be given to establishing cooperation bases or offices in major cities such as Islamabad, Lahore, Karachi, Quetta, and Gwadar for agricultural project planning and development.

**Figure 4: The Trade Competitiveness (TC) of exported grain**

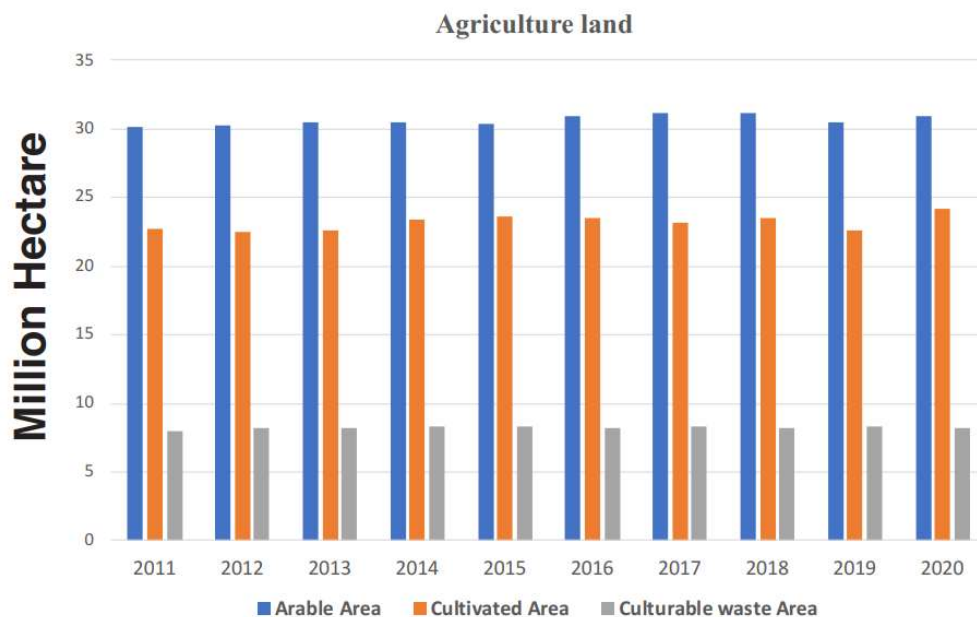


Source: China Agricultural Sector Development Report 2020 and Organization for Economic Co-operation and Development

The Government of Pakistan has proactively fostered agricultural cooperation, offering enticing incentives to foreign investors in areas like land leases, credit facilities, and income tax policies, as outlined in the Corporate Agriculture Policy. Corporate agriculture has been accorded industrial status, underlining its significance. The State Bank of Pakistan allocated a substantial sum of 1.7 trillion for agricultural

credit in the fiscal year 2022-23. Moreover, there are opportunities for expanding the utilization of cultivated areas and optimizing previously underutilized land areas, as illustrated in Figure 5.

**Figure 5: Agriculture land opportunities, 2011-2020**



Source: Pakistan Provincial Agriculture Departments

## Conclusion

Pakistan's ancient agricultural roots, interconnected with the Indus Valley civilization, forms the backbone of its economy. Despite arid landscapes, the fertile Indus Plain contributes significantly to GDP, employing millions, and ensuring food security. Through well-conceived policies and targeted programs implemented in recent years, Pakistan has increased agricultural productivity, achieving self-sufficiency in food production and the export market.



However, the growing population and the evolving demands of the modern world have prompted Pakistan to explore international agricultural collaborations, particularly under the China-Pakistan Economic Corridor (CPEC). This study provided a comprehensive overview of the agricultural conditions in Pakistan, highlighting the crucial role of crops, livestock, and other sectors. It explored the extensive cooperation between China and Pakistan in agriculture. Both nations, with their distinct advantages and resources, have laid the groundwork for substantial collaboration in agricultural trade, technology exchange, and infrastructure development.

Despite these promising prospects, the study also identified challenges and obstacles that may obstruct the growth of agricultural cooperation. These include issues related to competitiveness, information exchange, government mechanisms, and currency fluctuations. Addressing these challenges will be crucial to ensuring the success and sustainability of agricultural collaborations between China and Pakistan. Looking ahead, Pakistan's abundance of land and competitive labor rates present alluring opportunities for Chinese agricultural enterprises. As a Belt and Road Initiative flagship, CPEC fosters a fertile ground for collaboration, while Pakistan's proactive policies further incentivize expansion and optimization in the sector.