



## Contribution of CPEC to Mitigate Issues in Agri Sector

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**Citation** | Saira batool, Maryam M. Ali, and Areeba Amer, “Contribution of CPEC to Mitigate Issues in Agri Sector”, IJASD, vol. 3, no. 4, pp. 77–86, Nov. 2021.

**Received** | Oct 15, 2021; **Revised** | Nov 08, 2021; **Accepted** | Nov 13, 2021;

**Published** | Nov 18, 2021.

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CPEC's involvement in Pakistan's agriculture industry will be examined as part of this study's goal of identifying critical challenges in Pakistan's agricultural sector. A substantial part of Pakistan's economic growth has come from agriculture, which has supported rural livelihoods and contributed to the country's overall growth. The CPEC umbrella has three stages of successful project completion. These CPEC projects, which are now underway, will benefit the agriculture business somehow. Energy shortages may have been a major factor in the country's agricultural downturn over recent decades. The study's goals were met through a thorough review of the literature. Climate change, insufficient extension services, high fertilizer prices, land insecurity, and other problems have all been pointed to as having a substantial impact on agriculture's ability to produce enough food for a growing population. This study found that successfully completing CPEC-related energy and infrastructure projects will boost agricultural output, create jobs, and alleviate poverty.

**Keywords;** CPEC, Farmer's Difficulties, Energy Crises, Fertilizer.

## Introduction

Agriculture is the primary source of income for 2.5 billion people in rural areas worldwide [1][2]. The bulk of the country's non-urban population relies heavily on agriculture as a source of income. Pakistan's economic growth and well-being depend heavily on agriculture. Since independence, Pakistan's economy has been heavily reliant on agriculture [3]. The agriculture sector in Pakistan continues to provide around 19.1% of the GDP and 45.1% of total employment [4][5]. Additionally, Pakistan's textile industry, which is the country's principal industrial sub-sector, is supplied with raw materials from the country. The remaining 67.3% of the non-urban population is dependent on agriculture in one way or another to make a living. Furthermore, agricultural raw materials make up around 64 percent of the country's total exports [6].

Pakistan is a country with two separate farming seasons. April to December is known as the "Kharif" season. From October to December, the "Rabi" season lasts until June. As a whole, wheat accounts for about 10% of the agricultural industry and 2.2% of the GDP [7]. Rice comes in second place with a share of agriculture of 2.9% and a GDP Pakistan is known around the world for producing high-quality rice. Cotton contributes 1.4 percent of GDP, making it a valuable cash crop. Sugarcane contributes 0.9% of GDP and 3.1% of agricultural output. 11.9 minor crops account for the percent of agricultural output [8][9]. This sector also relies heavily on animals. As a food source for the local community, it provides milk, meat, and yogurt [8]. Agriculture is strongly tied to food security, rural development, poverty alleviation, and the attainment of aspirational goals. Despite this, there are still a number of big and essential challenges facing the agriculture sector [10].

The country has undergone enormous population expansion in recent decades. From 31.9 million people in 1947 to 209.1 million in 2017, Pakistan's population increased steadily [11][12]. There will be 237 million people in 2025 and 361 million by 2050. "[13]. As the world's population grows at an alarming rate, agricultural land is being degraded by conversion to residential use [14][15]).

Consequently, as the world's population expands, so will the global food supply. To keep up with the increased demand for food, we must increase our production per unit area. To meet the expanding food needs of a growing population, each parcel of land should be given the utmost attention [16]. In developing countries, such as Pakistan, land fragmentation is a major concern and negatively influences yield per unit area [14], [16]. As a secondary effect, farmers have less access to new technologies, research methods, and improved farming practices, contributing to low yields. There is also a widespread adoption of poor agricultural extension strategies based on outdated farmer education methodology and inadequate financial resources for most small farmers [17][18].

While global arable land per capita is expected to decrease to 0.16 ha by 2050, in 2016 it was 0.18 ha. The per capita land area in Pakistan was approximately 1.49 ha in 2016 and is expected to fall to 0.059 ha by 2050 [19]. More than 80 percent of Pakistan's agricultural land is in dry and semi-arid regions, making it a predominantly arid country. Currently, Pakistan is one of the world's driest countries, with an average annual rainfall of fewer than 225 millimeters (2.4 inches). About 60% of Pakistan's rain falls during the monsoon season (July to September), while the rest falls during the winter months (December to February) (October to March). Pakistan's rivers are supplied by the monsoon, western depression, and glacier melting [20][21].

Geo-economic and geo-strategic relationships have emerged between governments in the twenty-first century due to regional and global strategic developments. By reorganizing their policies, countries could recognize their own interests better. Many countries are making every effort to enhance international cooperation in various fields. Trade and commerce, infrastructure development, and other vital economic sectors are

included in the list of initiatives. The China-Pakistan Economic Corridor (CPEC) is an example of this relationship. China intends to make a \$50 billion investment in Pakistan's infrastructure [22]. In addition, Pakistan will acquire increased significance in the region and worldwide by constructing these megaprojects. Pakistan and China are now developing megaprojects that benefit both countries. Pakistan's economy will stabilize if the China-Pakistan Economic Corridor project is fully implemented[23].

These megaprojects will be developed under the China-Pakistan Economic Corridor. Short-, medium-, and long-term efforts are all included in these plans, with completion dates[24]. Construction on these massive undertakings will cost upwards of \$47 billion. Trains and roads and transport systems and energy networks are included. Development countries' economies are said to be built on agriculture. In rural places, it is the sole source of income and employment. Agriculture has always been a significant element of Pakistan's economy, although recent decades have seen a decline in its growth rate [24]. Agriculture would profit directly or indirectly from the China-Pakistan Economic Corridor. The China-Pakistan Economic Corridor would give up new prospects for agricultural engagement, enabling the transfer of fertilizer, seeds, pesticides, and agrochemical technology. According to the study, a connection has been found between the expansion of agricultural infrastructure and the growth of the agricultural sector. CPEC's impact in reducing Pakistan's agriculture industry problems is the focus of this study. It will be conducted in Pakistan [25].

### **Methodology**

The predicted impact of the CPEC projects on Pakistan's agriculture industry was the subject of research and evaluation. The effect of infrastructure on agricultural expansion and commercial development is also examined in this research. As past studies have shown, improved infrastructure has a major impact on agriculture, as was observed in this study, More than a dozen secondary sources were used to collect data on agriculture and China-Pakistan Economic Corridor infrastructure development indicators. To determine the problems facing Pakistan's agriculture sector, researchers consulted a wide range of sources. The significance of CPEC in resolving these concerns has also been examined in a comprehensive literature review.

### **Findings**

In Pakistan, agriculture has many problems that have had a significant influence on the industry and, eventually, the economy. Numerous studies have been performed to identify the most significant challenges affecting the agricultural industry. [26]. Many factors limit the productivity of smallholder farmers, such as a lack of irrigation, inadequate extension services, the use of expired insecticides, a lack of power and land reforms, the availability of quality seeds and high fertilizer prices, traditional farming methods, and the smuggling of agricultural products.

Agriculture relies heavily on irrigation using both surface water and groundwater resources. Pakistan's agricultural sector faces similar challenges to those seen in other semi-arid and dry countries. During vital periods of crop growth, farmers face a major difficulty due to a lack of water. Inequitable water distribution inside the canal and an ever-widening water demand-supply mismatch are severe issues for the country's agriculture. [27]. It is already below the country's 1000 m<sup>3</sup>/person water scarcity limit, and climate change is expected to worsen the situation [28]. Once a water-rich country, Pakistan is today one of the most water-scarce globally. Water scarcity must be addressed to avoid food shortages in the future, as current storage capabilities are rapidly depleting and new storage facilities are not being built. Water scarcity is a delicate issue that necessitates long-term and collaborative efforts from all sectors and areas of society in order to adequately address it.

Farming practices and technology of the contemporary era are insufficient to meet the needs of small-scale farmers, who are illiterate, expensive, and impractical [29]. Pakistan's agriculture sector still reflects traditional farming practices. Agriculture is losing a large number of workers to other careers. Those who are still farming have no intention of using contemporary farming methods. Many farmers will be forced to cease farming due to this decision. Furthermore, this could jeopardize the country's agricultural growth and sustainability.

Agricultural extension is one of the primary driving components responsible for raising agricultural yield by bringing modern technology to farmers, fulfilling the rising food demand of a growing population, and strengthening the national economy. Agricultural extension services' main primary purpose is to help growers adapt to new technologies and management practices [30], [31]. According to numerous studies, extension programs in the past were ineffective because they didn't have the information farmers needed [32]. For the most part, farmers in Asia have no contact with agricultural extension programs, according to research conducted by the author [33]. According to Anholt (1994) [34], a lack of financial resources, unqualified workers, and bad planning all contribute to inadequate agricultural extension services. Agricultural extension programs have often not been able to address farmers' individual site needs and difficulties [35]. Pakistan can benefit from the examples outlined above [36], [37].

Fertilizer subsidies significantly impact average yield and productivity [38]. To make fertilizer prices reasonable and affordable for smallholder farmers, subsidies are an inescapable necessity [39]. A wide range of agricultural industry experts has emphasized the importance of fertilizer use in increasing agricultural productivity, noting stunning results on experimental fields and enormous variations in crop output around the world with varied varying degrees of fertilizer use [40]. Fertilizer consumption in Pakistan has expanded significantly during the past five decades. Farmers are forced to utilize fertilizer in a balanced manner because they have become so dependent on fertilizers for their agricultural output.

Many detrimental effects on agriculture are caused by load shedding. Agricultural output, household income, and food security adversely affect load shedding. An author investigated the impact of Pakistan's energy crisis on farm families (2019) [41]. They found that lowering load shedding will increase crop production, and household income, and reduce poverty. Globally, all agriculture-dependent developing countries would substantially benefit from abundant, low-cost energy. Due to Pakistan's rapid population increase, industrial expansion, and agricultural expansion, the country is experiencing an insufficient power supply [42]. Rising energy costs and prolonged load shedding have negatively impacted the country's economic growth.

To put it another way, the absence of land reform means that private lands are being expropriated to relocate workers and tenants who have no other option but to leave their homes. When agricultural reforms were introduced in China, Taiwan, and Korea in the early 1900s, they aimed to improve the allocation of resources and income among farmers. As a result, the local economy has grown stronger, creating jobs in both the industrial and agricultural sectors, and increasing manufacturing profitability [43], [44]. As a result of the absence of land reforms and laws in Pakistan, government incentives and subsidies benefitted landowners at the expense of many lower-income families. A mere 2% of Pakistan's landmass, or around 45% of its total area, is occupied by people living in their own homes.

Seeds of poor quality have a negative impact on germination and overall plant vigor. Some of the reasons for the low output are attributed to low-yielding cultivars, inadequate management practices, and a scarcity of high-quality seeds [45]. It was found that most farmers in Uganda were relying on inferior quality seed from past harvests and conventional

markets, which was harming the entire productivity of the country. The yield per unit area is extremely low in Pakistan due to a shortage of certified seed, poor management, and lack of guidance from local seed merchants, as well as poor quality seed.

Farmer's inability to sell their products at a large scale One of the most significant obstacles to improving the socioeconomic position of poor farmers is the involvement of middlemen. Furthermore, the involvement of middlemen boosts the cost to the end user. An author (2010) studied middlemen in the agricultural supply chain[46]. According to farmers, they have to spend a lot of money on production to boost their yields, but the middlemen charge them a lot less for their products. On the other hand, the real winners are the middlemen who acquire farm products at a discount and resell them at a premium.

In recent years, the smuggling of agricultural products has increased substantially, which has had a devastating impact on the agricultural business. Products such as rice, wheat, and urea are trafficked across the Pakistani-Afghan border. Over less than six months, the price of wheat has increased by more than 30 percent. It's a perfect example of how the federal and provincial governments don't work together.

A significant decline in household income could be caused by animal losses [47]. Pakistan is one of the world's top milk producers, churning out 42 million metric tonnes of milk each year [48]. Buffaloes account for 61% of total milk production in terms of milk production, while cows account for 36%. According to a new report, the amount of buffalo milk produced each year has climbed significantly, from 14.7 million tonnes to 21.2 million tonnes. From 7.5 million tonnes in 1996 to 9.6 million tonnes of milk in 2006, the amount of milk produced by cows has steadily risen over time.

An area of 33.61 million hectares of arable land and 8.21 million hectares of cultivable wasteland make up the total arable land in Pakistan. Cropland conversion rates have been extremely low in the last few decades, and even negative in some years [49]. Increasing urbanization and industrialization are converting vast amounts of productive agricultural land into built-up regions, posing problems for food security and the urban landscape, quality of life, and the natural environment.

Post-harvest value and consumer quality attributes might be lost at any point in the harvest and consumption process. Improper harvesting and post-harvest handling practices may lead to greater losses than would otherwise be the case. The absence of appropriate storage facilities, poor infrastructure, a lack of processing units, and long transport times contribute to significant post-harvest losses in Pakistan.

Poor farmers in the country are unable to receive aid in the event of natural disasters, such as floods, droughts, desertification, fire, disease outbreaks, and insect infestations, because of a lack of coordinated crop insurance coverage throughout the country. Small landowners' losses could greatly influence the country's agriculture if they are large.

China As one of the world's most important economic projects, the Pakistan Economic Corridor benefits not only Pakistan and China but the entire region. Agriculture, which accounts for 18.9% of Pakistan's GDP, may benefit from China either directly or through its exports. Pakistan Economic Corridor: Forward and backward connection development [50]. China's Infrastructure projects in Pakistan are part of the Pakistan Economic Corridor, which might aid the country's agriculture sector. Numerous investigations into the relationship between improved infrastructure and burgeoning agricultural output have been carried out[51]–[54]. In addition, rural areas that have access to electricity benefit from increased irrigated acreage, better irrigation facilities, and increased crop yields [54], [55]. States with more sophisticated infrastructure yield more agricultural output than states with less established infrastructure. As shown by the studies described above, agricultural development is hampered by a lack of suitable infrastructure. With the

CPEC, Pakistan's agricultural sector will be transformed. Numerous ecological zones in Pakistan would boost agricultural yields due to the CPEC's passage through these areas.

To help farmers and small landowners improve or enhance their socioeconomic status, the government should develop a crop insurance scheme. Small landowners must be provided with subsidized seeds, fertilizers, and pesticides as part of this approach, which requires the government.

Importing agricultural products from other countries is illegal, and the government must do everything it can to stop this. Among the measures are border force interventions and security checkpoints.

Around 8.2 million hectares of the country's territory are classified as cultivable wasteland. The government must devise a plan to cultivate this enormous desert. In 2012, the government intended to lease 50 acres of cultivable wasteland to unemployed graduates for five years. However, the land has not yet been allocated to these students. More than 80,000 people will find work in agriculture as a result and an increase in output.

### Conclusions and Recommendations

Agricultural development is one of Pakistan's most essential industries for economic growth because it produces jobs in rural areas. Despite its importance to Pakistan's economy, the country's agricultural sector's growth rate has been steadily decreasing over the past few decades. The fall in the economy has been reversed thanks to the China-Pakistan Economic Corridor's establishment. Problems with agricultural output include a lack of contemporary post-harvest technology due to water scarcity, long-term load shedding, insufficient extension services, and expensive fertilizer prices. Agricultural productivity is also affected by disease outbreaks and the lack of modern post-harvest technologies. There is a correlation between agricultural output and infrastructure (Kamran and colleagues 2020), energy, agro-technological advancement, and increased irrigation facilities. The successful completion of CPEC's massive projects, such as energy and infrastructure development, will increase agricultural production and trade, generate more employment opportunities, and reduce poverty.

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