Policy Research Journal
ISSN (E): 3006-7030 ISSN (P) : 3006-7022 Volume 3, Issue 10, 2025

AN INSIGHT OF THE CITRUS INDUSTRY IN PAKISTAN: PRODUCTION, MARKET STRUCTURE, AND THE IMPACT OF THE CHINA-PAKISTAN ECONOMIC CORRIDOR

Syed Akbar Ali[*1], Muhammad Waleed Tufail[2], Aamir Hussain Siddiqui[3], Kamil Hussain[4] Muhammad Dawar Ansari[5], Sadaf Sajjad[6], Pir Kashif Ali[7]

[*1,2,4,5,6,7]*Department of Agriculture and Agribusiness Management, University of Karachi, Karachi, Pakistan*
[3]*Applied Economics Research Center (AERC), University of Karachi, Karachi, Pakistan.*

[*1]ali.syedakber@gmail.com, [2]muhammad_waleed_tufail@outlook.com,
[3]aamir.siddiqui@aerc.edu.pk,[4]kamilhussain1993@gmail.com,
[5]dawaransari24@gmail.com,[6]sadapasha1994@gmail.com, [7]pm.razaali999@gmail.com

DOI: https://doi.org/10.5281/zenodo.17492608

Keywords
Citrus, Microeconomics, Macroeconomics, Pakistan Trade, CPEC

Article History
Received: 12 September 2025
Accepted: 18 October 2025
Published: 31 October 2025

Copyright @Author

Corresponding Author: *
Syed Akbar Ali

Abstract

The citrus industry in Pakistan is essential to the nation's economy since it creates jobs and meets the nation's nutritional needs. It becomes important to highlight the importance of citrus in the society and current challenges faced by the industry. The writers make an effort to present a thorough synopsis of the sector. The significance of the citrus sector for the economy and society of Pakistan. Citrus microeconomics in Pakistan: production, pricing, profitability, market structure, and macroeconomic variables are examined. The China-Pakistan Economic Corridor (CPEC) could have an effect on the citrus industry. Infrastructure for transportation is being built as part of CPEC. This investment may promote economic expansion and development, which may have a knock-on effect for the citrus sector. Pakistan is a major producer and exporter of citrus fruits. However, the industry faces several challenges such as limited water resources, climate change, and pest management issues. Despite these challenges, growers and processors are taking steps to address these issues and improve the sustainability of the industry. However, through the building of transport infrastructure, including roads, railroads, and ports, the China-Pakistan Economic Corridor (CPEC) has the potential to have an impact on the citrus sector and promote commerce and connection between China and Pakistan.

1. INTRODUCTION

With an estimated 2.4 million tonnes of citrus fruit production in 2020, Pakistan ranks as the 13th-largest citrus fruit producer in the world [1]. Millions of people in Pakistan, particularly in rural regions, have access to work opportunities thanks to the country's thriving citrus sector. In Pakistan, citrus species covered 156211 hectares in 2022-23. The province that produces the most citrus is Punjab, which has 145084 hectares of citrus land under cultivation. Sindh, KPK, and Balochistan are the next provinces with 5778, 3743, and 1606 hectares of citrus land each (MINFAS 2022-23). Pakistan is a major citrus grower in the globe, with over thirty different types growing there. More than thirty percent of Pakistan's total fruit production comes from the citrus industry. The Punjab province produces more than 90% of the citrus fruits that are then sold through a range of value chains both domestically and abroad [8]. In 2022-23,

the citrus fruit production of Pakistan decreased from 2.35 to 2/23 million tonnes, the average yield in 2022-23 dropped to 14,273 kg per hector which was 15,156 kg per hector in 2021-22 (MNFSR 2024).

Pakistan's citrus industry has been performing well in both domestic and international markets. The country exports citrus fruits to countries such as Russia, Indonesia, the Philippines, the United Arab Emirates, and Saudi Arabia. During 2020-2021, Pakistan's citrus exports reached 500,000 metric tons, generating revenue of USD 222 million but now on declining trend. The export quantity has been dropped to 300,000 tons and value dropped to USD 77 million only. Overall, Pakistan's citrus industry has been growing in recent years due to the government's efforts to promote exports and increase productivity. According to [6], the 60-year-old kinnow variety produces less and of lower quality since it is more prone to illnesses and the effects of climate change. Despite the Pakistan Fruit and Vegetable Exporters Association's six-year warnings.

Every country is making every effort to encourage cooperation in a variety of fields. Programs for building infrastructure, business endeavors, other relevant economic sectors are some of these fields. CPEC, or the China-Pakistan Economic Corridor, is among the best examples of such alliances [10]. Pakistan would become very important by putting these proposals into action, not just in this area but also globally. In order to begin large-scale initiatives that would benefit both China and Pakistan, both have been working very hard lately [7]. The significance of the China-Pakistan Economic Corridor (CPEC) lies in its endeavor to increase connectivity and infrastructure between China and Pakistan. CPEC may have an effect on a number of industries, including the citrus sector.

1. ECONOMY AND SOCIETY

Citrus is a vital crop for Pakistan's economy and society, giving rural areas jobs, revenue, and sustenance. According to the Pakistan Bureau of Statistics, the citrus sector employs over 235,000 people and adds about 4.4% to the agricultural GDP of the nation [12]. For small farmers, who usually own less than five acres of land and depend on citrus for their livelihoods, the business is also a significant source of income.

The importance of citrus to rural communities goes beyond economic benefits. Vitamin C, which is essential for promoting health and preventing disease, is abundant in citrus fruits. A study conducted in rural Pakistan found that the consumption of citrus fruits was positively associated with improved child health and nutrition. Additionally, citrus fruits are a popular component of traditional medicine in Pakistan, with various parts of the plant being used to treat a range of ailments.

Table 1: Production of Citrus Fruit in Pakistan (in 000 tons) [2,9]

Fiscal Year	Production (in 000 tons)
2015-16	2,344
2016-17	2,180
2017-18	2,351
2018-19	2,469
2019-20	2,369
2020-21	2,621
2021-22	2,351
2022-23	2,230

2. MICRO ECONOMICS

Citrus fruits of various types are grown throughout Pakistan. Mandarin (Kinnow), Lemon, Grapefruit, Sweet Orange, and Lime types are a few of these. Mandarin food is delicious and well-known. The majority of citrus fruits produced, produced in large quantities, and exported from Pakistan are Kinnow (Citrus Reticulata) [13]. Kinnow is often distributed to customers in a conventional manner. Most local fruit is purchased from roadside stands in villages,

small towns, and even big cities. In big urban areas, the fruit departments of department shops and super markets also sell Kinnow along with other fresh fruits [14].

Because it is the primary growing region for Kinnow, Sargodha is a significant wholesale market. Lahore The country's three most important terminal markets are in Karachi, Islamabad, and Peshawar, and 20 to 30 major firms dominate each of these markets. Most of the farmers sold their orchards to contractors with at least one year's worth of harvesting rights. Contractors are typically required to transfer to commission agents because they made the contract on their behalf. While processing industries (exporters and juice manufacturing businesses) also purchase via commission agents, through open auctions, middlemen primarily sell their produce to wholesalers. 2% or less of growers also act as exporters [3]. Wholesalers sell products to retailers, and at the end, retailer sold it to consumer.

Pricing in the citrus industry in Pakistan is subject to significant fluctuations, which can have a significant impact on farmer profitability. Citrus prices are highly volatile, with significant differences between different regions and varieties. Citrus fruit prices in Pakistan are impacted by a number of variables, including production costs, market competition, supply and demand dynamics, transportation costs, and output quality. Price volatility is one of the difficulties citrus growers confront, affecting their profitability as a result, farmers face significant uncertainty when deciding when to sell their crops, which can affect their profitability [15]. Prices on the domestic market are significantly impacted by Kinnow exports. The prices drop quickly when shipments begin to decline. Large market participants occasionally pool their resources to drive prices lower [3].

Profitability in the citrus industry depends on several factors, including the yield per hectare, production costs, market prices, and access to value-added markets. While the citrus industry contributes significantly to Pakistan's economy, there are challenges to achieving higher profitability, such as the high cost of production and price instability [4]. According to Figure 1, An expected 35 percent of the consumer rupee would go to the producer, followed by 32 percent for the contractor and 20 percent for the retailer. The returns to capital (ROC) for contractors were found to be 16%, for commission agents to be 82%, for wholesalers to be 86%, and for retailers to be 164%. There is a widespread belief that marketing intermediaries demand a high margin and take advantage of companies and consumers. Citrus orchard growers are destroyed by marketing intermediaries; farmer share is only 35% [17].

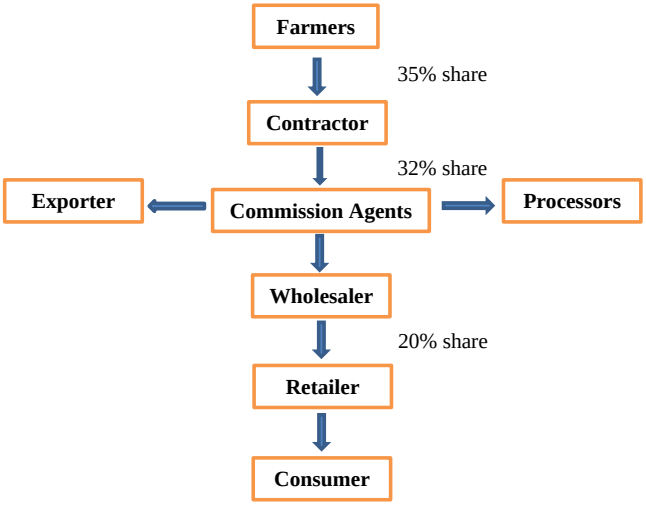


Figure 1: Citrus Market Structure

3. MACRO ECONOMICS

The macroeconomics of Pakistan are significantly influenced by the country's citrus sector, which raises the agricultural GDP and generates foreign cash. According to a study by the [23]. The citrus industry contributes around 1.5% to the country's GDP. A sizable number of individuals are also employed by the sector, including those who work in cultivation,

harvesting, transportation, and processing. Thus, the citrus industry has a considerable impact on Pakistan's macroeconomic indicators.

The contribution of the citrus industry to foreign exchange profits is a crucial component of the macroeconomics of the sector in Pakistan. Citrus exports from the nation have been rising consistently over time, supporting the expansion of the economy as a whole. Citrus exports are estimated to have brought in $222 million to the country during the 2019–20 fiscal year, according to the State Bank of Pakistan [28]. Table 4 lists Afghanistan, Russia, the Philippines, Indonesia, Saudi Arabia, Iraq, Oman, Qatar, and the Ukraine as the main export destinations for Pakistani citrus. Therefore, Pakistan's primary source of foreign exchange revenues is the citrus sector.

The macroeconomics of Pakistan's citrus industry are also influenced by laws and regulations. In order to support this industry, the government has implemented several programs, including finance facilities, R&D projects, and exporter and grower subsidies. The performance of the industry and, by extension, the macroeconomic indicators of the nation are significantly impacted by these laws and regulations.

SHARE OF CONSUMER VALUE

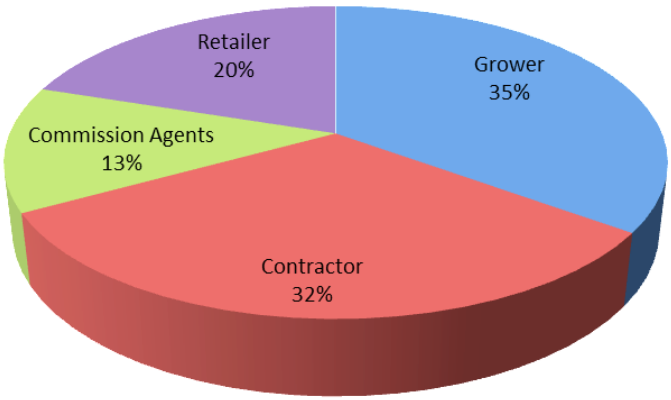


Figure 2: Percentage of Consumer Value [3].

The macroeconomics of Pakistan's citrus industry are also influenced by the dynamics of the industry's value chain. The value chain for citrus in Pakistan includes producers, processors, traders, exporters, and retailers, among other parties. The performance of the industry can be significantly impacted by the interactions between these stakeholders. For instance, producers may cut back on industry investment if they don't being paid fairly for their produce, which would restrict supply and hurt profitability for other stakeholders. Therefore, in order to guarantee the industry's growth and sustainability, policymakers and industry participants must have a thorough understanding of value chain dynamics.

4. The CHINA - PAKISTAN ECONOMIC CORRIDOR (CPEC)

The CPEC project was suggested by China during Premier Li's 2013 visit to Pakistan. In April 2015, China and Pakistan signed 51 agreements, including a Memorandum of Understanding (MOU) and five extra-large projects [18]. The China-Pakistan Economic Corridor (CPEC), a bilateral agreement between China and Pakistan, is mostly centered in Pakistan [19]. The three phases of CPEC's project completion are: the first by 2017, the second by 2025, and the third by 2030. The CPEC is a game-changer for Pakistan and has various economic advantages. It will link rural and urban areas, attract foreign investment, promote industrial growth, lower poverty,

create jobs, improve trade, help manage the nation's energy crisis, and improve the health and education of the local populace [20].

Growth in agricultural output is directly correlated with several types of infrastructure [21]. Agriculture's output undergoes significant changes as a result of the construction of irrigation infrastructure. For instance, it intensifies land use and provides farmers with incentives to use inputs that increase output [29]. Because rural electrification expands irrigated acreage and improves irrigation facilities, crop yields from underground irrigation systems are always higher than those from canal or tank irrigation [22]. The employment of modern agricultural methods is encouraged by rural highways, increasing citrus yield [24].

5. INFRASTRUCTURE UNDER CPEC

CPEC makes investments in four sectors: Gwadar Port, industry, infrastructure, and energy [25]. Pakistan has experienced major energy crises in recent years, but thanks to Chinese investment, the country has now overcome a power shortage [26]. The CPEC infrastructure includes numerous railroad and roadway projects that stretch 2500–3000 kilometers from Gwadar to Kashgar. The western route, which would go through Khunjerab, Peshawar, D. I. Khan, Zhob, and Quetta; the central route, which would go through Khunjerab, Peshawar, Kohat, D. I. Khan, D. G. Khan, and Ratodero; and the eastern route, which would go through Islamabad, Lahore, Sukkar, and Kara, are currently being built [30]. Express and motorways will connect the remaining areas of Pakistan to these routes. Similar to that, a 2.3 billion USD railroad link from Gwadar to Khunjrab has been envisaged [27]. In order to encourage industrial development, Unique Economic Zones (SEZs) with special tax breaks and economic reforms have been planned in all of Pakistan's provinces. Nine SEZ areas have been designated as priority zones, for a total of 46 SEZ locations [31].

China has set aside a sizable sum of money for the operationalization of Gwadar, which is a crucial componentAccording to Mushahid Hussain Syed, the head of the CPEC Parliamentary Committee, if CPEC is the centerpiece of the BRI, then Gwadar is its core [32].

Table 4: Pakistan's Top Export Destinations From 2018-2023. [5, 11]

Pakistan exports of Citrus

Value in US$ thousand

Importers	2018	2019	2020	2021	2022	2023
World	**178,960**	**160,700**	**205,521**	**171,579**	**118,664**	**77,257**
Afghanistan	57,363	47,849	55,540	35,994	20,880	24,074
UAE	12,940	11,903	17,348	17,072	13,987	13,166
Russian Federation	44,594	40,566	49,051	36,430	16,981	7,143
Philippines	13,392	13,572	18,038	19,839	12,672	5,484
Saudi Arabia	3,443	5,756	10,187	8,039	4,763	4,117
Kazakhstan	826	2,574	3,330	6,479	17,240	3,943
Oman	4,205	3,620	5,634	3,934	2,977	3,893
Indonesia	20,442	12,606	16,527	13,282	8,170	3,061
Sri Lanka	2,321	2,465	2,009	2,762	2,018	1,939
Qatar	2,454	3,151	3,624	3,623	2,178	1,461
Iraq	4,176	4,783	5,159	6,217	916	1,355
Ukraine	3,129	2,628	7,173	7,526	2,514	1,100
Bangladesh	1,036	694	830	706	2,017	1,040
Kuwait	2,128	1,455	1,615	1,162	607	743
Uzbekistan	2,054	2,218	3,527	3,105	1,362	619

Source: ITC, (2024)

China is expanding Gwadar Port's ability to hold 200,000 dwt of oil tankers and 100,000 dwt of dry cargo [40]. The master plan divides the construction of the Gwadar port into short- and long-term phases. It is projected that the short-term plan (2005–2020) will hold 42–65 million tonnes of dry cargo, while the long-term plan (2021–2055) will convey 321-345 million tonnes. The aforementioned CPEC projects,

with the exception of Gwadar port, are planned to be developed in all provinces, and Gwadar port is connected to virtually every area of Pakistan via road and rail networks. Both within the provinces and in the core provinces, concerns have been raised by the development of these initiatives. The federal government has planned a variety of steps, the impacts of which are analyzed in the following sections, to placate domestic players in the context of state-building in order to achieve national integration in accordance with nation-building theory.

6. CHINA THE BELT AND ROAD INITIATIVE (BRI) AND INVESTMENTS

As part of a comprehensive strategy to sustain the current rate of economic growth, China announced the Belt and Road Initiative (BRI). Though often not seen as a single trade route, China's Belt and Road Initiative (BRI) is a comprehensive strategy and economic concept to open several planned Silk Road projects in order to establish a community with shared interests, commitments, and destinies [33]. Under China's BRI, the ancient Silk Road is being reopened and expanded. The Northern Corridor, which links China and Europe via Russia, is the first of the six corridors that make up the SREB. (3) The Bangladesh-China-Myanmar-India Corridor (BCIM); (4) The China-South East Asia Mainland Corridor; (5) The China-Magnolia-Russia Corridor; and (6) The China-Pakistan Economic Corridor (CPEC). Based on both land and sea roots, the Central Corridor connects China with Europe via Iran and Turkey. At a cost of $1 trillion USD, BRI is a major initiative that will reach nearly two-thirds of the world's population [34]. Asia's rise in the upcoming years is more likely as a result of BRI. In the middle of this century, economic growth in Asia is expected to accelerate. More than 40 Asian countries are the main focus of BRI. with a $1 trillion USD projected cost [34], The Bangladesh-China-India-Myanmar corridor (BCIM) and the China-Pakistan Economic Corridor (CPEC), two SREB projects in South Asia, have the capacity to comprehend socio-politico-economic issues and foster interstate cooperation and trust among the population of the region [41].

CPEC is directly affected by this research in terms of Pakistan's national integration. According to [18], China has committed a large 62 billion USD investment package to the CPEC. Western Route was prioritized for construction by the central government in response to protests from the provinces, and it eventually became a six-lane motorway (Haider 2015–2017). This was done in an effort to keep the CPEC projects transparent. Baluchistan received 7.1 billion USD, KPK 11.6 billion USD, and Sindh province 11.5 billion USD of the CPEC funds, which were also distributed to appease the stakeholders [32]. Punjab received a total of 11.5 billion USD.

7. POTENTIAL OPPORTUNITY FOR THE CITRUS INDUSTRY

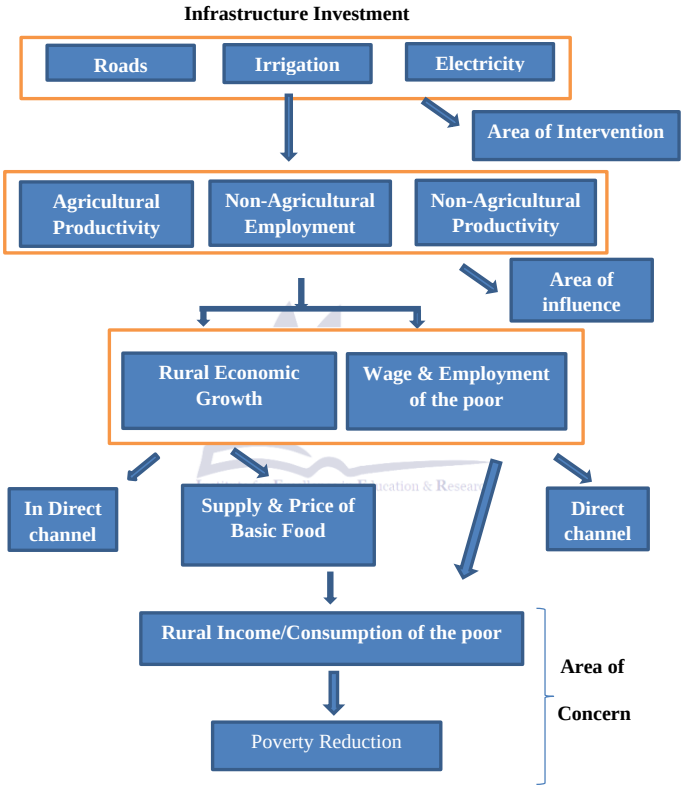
The citrus business in Pakistan has grown significantly in the last few years, and the future seems promising. To guarantee continued growth and development, there are still issues that must be resolved. Citrus fruit production in Pakistan grew from 2.2 million tonnes in 2016–17 to 2.5 million tonnes in 2019–20, according to the Pakistan Bureau of Statistics. This growth is expected to continue in the future, driven by increasing demand both domestically and internationally. The growing popularity of Pakistani citrus in international markets, such as China, is expected to drive exports and provide new opportunities for growers and exporters [37].

Several difficulties need to be overcome in order to guarantee the citrus industry's continuous growth and development in Pakistan. One of the main issues, according to [16], is the lack of modern agricultural techniques and technology, which might lead to poorer yields and lower quality. Losses in the value chain can also result from the application of antiquated methods and improper post-harvest handling [38]. Policymakers and other stakeholders must invest in contemporary agricultural methods to address these issues. They should also promote the use of highly efficient irrigation systems, such as drip irrigation systems and sprinkler systems, in order to conserve water. and the application of modern instruments to improve citrus fruit quality and production.

In the second phase of CPEC, both governments are giving importance to agricultural relationships. As a result, different combined research centers are built in the different cities in the country, which can play a vital role in the transformation of the agriculture sector in Pakistan. In 2021 intercropping research

institute was built by the link between Sichuan Agricultural University and Islamia University of Bahawalpur which produced tremendous results by producing different intercropping technologies in the season of 2022. For the development of the agriculture sector in Pakistan CPEC corporation sector was built in Rawalpindi in June 2022, this sector is making Pak-Chine policies. Both Pakistan and Chinese sectors have been working together for the enhancement of modern technology, tissue culture labs, and the agriculture environment since 2022. These actions from both countries have the potential to revolutionize many agricultural products including citrus.

Agriculture is an important sector in Pakistan which has many opportunities for employment on the other hand, China is also a big agricultural country, and good agricultural relations can be beneficial for both countries. Due to the waste availability of cultivated land Pakistan has resources and manpower in the form of farmers, these resources and manpower can be best utilized in the chines market. Seed problems irrigation issues and mechanization problems can strengthen the relations of both countries. [36]



Source: Adapted from (ALI, 2003)

Figure 3: Analytical Framework Showing Impact of Infrastructure on Agricultural Growth and Poverty Reduction [36]

Agriculture is an important sector in Pakistan which has many opportunities for employment on the other hand, China is also a big agricultural country, and good agricultural relations can be beneficial for both countries. Due to the waste availability of cultivated land Pakistan has resources and manpower in the form of farmers, these resources and manpower can be best utilized in the chines market. Seed problems irrigation issues and mechanization problems can strengthen the relations of both countries.

Another problem is a lack of infrastructure and logistics, which can increase manufacturing costs and limit access to markets. Inadequate transportation and storage techniques may result in post-harvest losses as well as lower citrus fruit shelf lives [39]. Policymakers and other interested parties must make

investments in cold storage facilities and transportation networks, among other infrastructure and logistics projects, to alleviate these issues, lower costs, and enhance mark accessibility. Through the construction of Small and Medium-Sized Enterprises (SMEs), CPEC provides opportunities for the transportation and storage of agricultural products. It also describes how Chinese companies run farms, fruit and vegetable processing plants, and other kinds of enterprises. grain value chains. The logistics firms will also run a sizable system for transporting and storing agricultural commodities. A substantial system for moving and storing agricultural commodities will also be managed by the logistics companies.

Climate change poses a threat to Pakistan's citrus sector, as it may affect the quantity and caliber of citrus fruits produced. Fruit harvests and quality may decline as a result of rising temperatures and erratic weather patterns. Policymakers and other stakeholders must make investments in climate-smart agricultural techniques, such as enhanced water management and drought-resistant cultivars, to meet these issues and boost citrus production's resistance to climate change. The 2017–30 CPEC Long-Term Plan (LTP) In the agricultural sector, biological breeding, production, processing, storage, and transportation; infrastructure development; disease prevention and control; exploitation of water resources; conservation and land development; and disease prevention and control are some of the most crucial areas of cooperation.

Pakistan's citrus sector has enormous growth and development possibilities. But a lot of problems need to be fixed in order to ensure continuing growth and development. CPEC can invest in R&D, cutting-edge agricultural technology and techniques, infrastructure and logistics, and sustainable farming practices in order to support growth and development.

8. CONCLUSIONS

The economy and society of Pakistan are greatly impacted by the citrus industry. Citrus fruits are produced and exported in large quantities by Pakistan. However, the sector has a number of difficulties, including scarce water supplies, climate change, and problems with insect control. Growers and processors are addressing these problems and enhancing the industry's sustainability in spite of these obstacles. But still. The construction of roads, railroads, and ports as part of the China-Pakistan Economic Corridor (CPEC) might have an impact on the citrus sector and promote commercial and diplomatic ties between China and Pakistan. This relationship may lead to an increase in the standard of life for Pakistani citrus growers as well as new export prospects.

9. REFERENCES

[1] FAO-UN. Citrus fruit fresh and processed statistical bulletion 2020. FAO, Accessed: https://www.fao.org /3/cb6492en/cb6492 en.pdf. (2021).

[2] FAOSTAT, "*FAO Production Year Book*" in FAOSTAT, FAO, Rome, Italy, (2018).

[3] B. Ahmed., Ed., "Value chain assessment and measuring export determinants of citrus fruits in Pakistan: Ananalysis of primary data," *Pakistan Journal of Agricultural Sciences*, 55(03): 691–698, (2018).

[4] I. A. Cheem and H. K. Jamali, "Growth of citrus fruits in Pakistan," *Revista Amazonia Investiga*, 9(35): 74–81, (2021). DOI: 10.34069/AI/2020.35.11.6

[5] Trend Economy." Pakistan | Exports | Citrus fruit | 2020." Trend Economy Open Data Portal, Available: https://trendeconomy.com/data/export_h2?time_period=2020&reporter=Pakistan &trade_flow=Export&commodity=0805, (2023).

[6] G. Abbas, "Kinnow industry faces crisis, anticipated 50% export decline," Profit by Pakistan Today, 01-Jan-2024. [Online].Available:https://profit.pakistantoday.com.pk/2024/01/01/kinnow-industry-faces. (Accessed: 22-Feb-2024).

[7] A. Iqbal, "Chinese investments dwarf American package: US media," Dawn, DAWN.COM, (21-Apr-2015).

[8] M. I. Siddique and E. Garnevska, 'Citrus Value Chain(s): A Survey of Pakistan Citrus Industry', Agricultural Value Chain. *InTech*, (Apr. 26, 2018). doi: 10.5772/intechopen.70161.

[9] Agricultural Statistics of Pakistan, "PROVINCE WISE PRODUCTION OF CITRUS,"

Amis.pk. [Online]. Available: https://www.amis.pk/agristatistics/Data/HTML%20Final/Citrus/PRoduction.html. (Accessed: 24-Feb-2024).

[10] S. Noor, S. M. A. Shah, S. M. Khan, and S. F. Ali, "Pakistan's Foreign Policy: Quarterly Survey," *Pakistan Horizon*, vol. 61, no. 3, pp. 1–9, (2008).

[11] Trade Development Authority of Pakistan, Ministry of Commerce. (TDAP MOC, GOP). PAKISTAN CITRUS. TRADE DEVELOPMENT AUTHORITY OF PAKISTAN. (2020), https://tdap.gov.pk/wpcontent/uploads/2022/05/Citrus-Brochure-compressed.pdf

[12] Pakistan Bureau of Statistics."Agriculture Statistics of Pakistan." Pakistan Bureau of Statistics, Government of Pakistan, Pakistan. (2021).

[13] N. A. Memoon, Market potential for Pakistani citrus fruit (Kinnow) in world. Available: https://www.food journal.pk/2014/Jan-March2014/PDFJan-March-2014/ Dr-Noor-Kinnow.pdf, (2014).

[14] A. Zahoor, and M. Arocha,"THE AGRIBUSINESS PROJECT (TAP) Kinnow (Citrus)- Value Chain Competitiveness Assessment (Sub Agreement TAP-ISA-013-002) USAID. https://agribusiness.org.pk/wp content/uploads/2020/12/5.-Kinnow_VCA_Report_27 Jan14.pdf, (2014).

[15] IndexBox, "Pakistan's citrus fruit market report 2023 - Prices, size, forecast, and companies." IndexBox-Market Intelligence Platform-2 Million Reports. Available: https://www.indexbox.io/store/pakistan-citrus-fruit-mark et-analysis-forecast-size-trends-and-insights/, (Accessed: 18-Apr-2023).

[16] H. M. Sabir, M. B. Khan, and Z. Hussain, "Marketing Margin of Mandarin: A Case Study of Sargodha Region, Pakistan," *Pakistan Journal of Social Sciences*, 30(2): 275–291, (2010).

[17] M. Sharif, "Citrus marketing in Punjab: Constraints and potential for improvement," *Pakistan Development. Rev*iews, pp. 673–694, (2022).

[18] M. Butt and A. A. Butt, "Impact of CPEC on Regional and Extra-Regional Actors," *Journal of Political Science*, (2015).

[19] M. S. Khan, China-Pakistan Economic Corridor: Prospects for Resolving Energy Crisis, *Pakistan Horizon*, 69(2): 79–91, (2016).

[20] R. Ahmed and H. Mi, "China-Pakistan economic corridor and its social implication on Pakistan: How will CPEC boost Pakistan's infrastructures and overcome the challenges?" *Arts and Social Sciences Journa*l, 02, (2017).

[21] J. M. Antle, "Infrastructure and aggregate agricultural productivity: International evidence," *Econ. Dev. Cult. Change*, 31(3): 609–619, (1983).

[22] T. Shah, O. P. Singh, and A. Mukherji, Some aspects of South Asia's groundwater irrigation economy: analyses from a survey in India, Pakistan, Nepal Terai and Bangladesh, *Hydrogeol. J.*, 14(3):286–309, (2006).

[23] Ministry of National Food Security & Research." YEAR BOOK 2020 - 2021." GOVERNMENT OF PAKISTAN." Available: https://www.mnfsr.gov.pk/PublicationDetail/ZWJhMzQ0Y. (2020).

[24] D. van de Walle, choosing rural road investments to help reduce poverty, *World Dev.*, 30(4): 575–589, (2002).

[25] S. A. A. Shah, Pakistan's Relations with the United States and China in the Post-9/11 Era, *Journal of Politics and International Studies*, 4(2), (2018).

[26] C.-P. Chung, what are the strategic and economic implications for South Asia of China's Maritime Silk Road initiative? *Pac. Rev.*, 31(3): 315–332, (2018).

[27] S. R. Hussain, Sino-Pakistanties: Trust, cooperation and consolidation, *Journal of South Asian and Middle Eastern Studies*, 37(4): 1–31, (2014).

[28] State Bank of Pakistan.."State Bank of Pakistan Annual Report 2019-20." State Bank of Pakistan, Available: https://www.sbp.org.pk/reports/annual/arFY20/Chapter-01.pdf, (2020).

[29] A. Narayanamoorthy and R. S. Deshpande, Where water seeps!: Towards a new phase in India's irrigation reforms. (2005).

[30] CPEC. "Transport infrastructure projects under CPEC | China-Pakistan economic corridor." CPEC MPDSI GOP, Available: https://cpec.gov.pk/infrastructure. (2021).

[31] A. Ahmed, "SEZ Act to boost investment," Dawn, DAWN.COM, (15-Jul-2012).

[32] B. K. Buzdar, and M. S. Kazmi, "One day conference: China-Pakistan Economic Corridor: Potentials and Prospects on 19th December 2016," SVI - Strategic Vision Institute - Strategic Vision Institute, (28-Dec-2016.)

[33] (NDRC) National Development and Reform Commission." Vision and Actions on Jointly Building Silk Road Economic Belt and 21st-Century Maritime Silk Road [Paper presentation]." National Development and Reform Commission, Available: https://www.fmprc.gov.cn/eng/topics_665678/2015zt/xjpcxbayzlt2015nnh/201503/t20150328_705553.html, (2015).

[34] S. O. Wolf, The China-Pakistan economic corridor of the belt and road initiative: Concept, context and assessment. *Cham: Springer International Publishing*, (2020). DOI: 10.1007/978-3-030-16198-9

[36] I. ALI "Infrastructure and Poverty Reduction - What is the Connection? (ISSN 1655-5260) + Asian Development Bank. Available" https://www.adb.org/sites/default/files/publication/28071/pb013.pdf, (2003).

[37] S. Salamat, "Pakistan has potential to earns huge foreign exchange by citrus export," Daily Times, 27-Apr-2021. [Online]. Available: https://dailytimes.com.pk/749915/pakistan-has-potential-to-earns-huge-foreign-exchange-by-citrus-export/. (Accessed: 23-Jul-2024).

[38] J. Guzman, "Citrus profiles. Agricultural marketing and investment foundation," Guinea. Available: http://www.winrock.org/reed/ftf/CitrusBul. Htm, (2004).

[39] W. A. Farooq, M. Ahmad, and Z. M. Khalid, "Post-harvest research on citrus fruit at NIAB," in *Proceedings of Florida State HForticultural Society*, (1978).

[40] W. Ishaque, "China-Pakistan Economic Corridor: Prospects, Challenges and Way Forward," *NDU Journal*, (2016).

[41] A. Ali, "China Pakistan economic corridor: Prospects and challenges for regional integration," *Arts Soc. Sci. J.*, vol. 7, no. 4, (2016).