

Research on the Transportation Infrastructure Construction of China-Pakistan Economic Corridor

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Abstract—As an important part of the "The Belt and Road" strategy, the China-Pakistan Economic Corridor(CPEC) occupies a very important position. After more than four years of construction of the China-Pakistan Economic Corridor, the results of the economic corridor's transportation infrastructure construction have become increasingly apparent, and positive progress has been made in railways, highways, and urban infrastructure. The transportation infrastructure construction of the China-Pakistan Economic Corridor faces many favorable conditions. Through the joint efforts of the two countries, the transportation infrastructure construction will continue to improve, and will gradually become an important carrier of China-Pakistan land transportation artery and the fate community building China and other Asian countries.

Index Terms— "The Belt and Road", China-Pakistan Economic Corridor, Transportation Infrastructure Construction

I. INTRODUCTION

The China-Pakistan Economic Corridor was proposed by Premier Li Keqiang during his visit to Pakistan in May 2013. It refers to the large-scale 3000-kilometre traffic artery from Kashgar, China to Gwadar, Pakistan, which was jointly established by China and Pakistan. It is a key hub connecting the North-South Silk Road. A trade corridor that includes highways, railways, oil and gas, and cable channels is also an important part of the "Belt and Road". This paper mainly discusses the issues of the transportation infrastructure such as roads and railways in the China-Pakistan Economic Corridor.

Transport infrastructure is the basis for the construction of economic corridors. By strengthening the construction of transport infrastructure and achieving interoperability, regional accessibility can be changed, transportation costs can be reduced, and the flow of production factors among regions can be promoted. Regional trade, division of labor, the influence of specialization and agglomeration economies will eventually promote the common development of regional economies. Therefore, China-Pakistan Economic Corridor should regard the infrastructure construction and interconnection of the transportation sector as the priority areas and breakthrough points for cooperation.

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II. PRESENT SITUATION OF TRANSPORTATION INFRASTRUCTURE CONSTRUCTION IN CHINA-PAKISTAN ECONOMIC CORRIDOR

According to the cooperation agreement signed by the China-Pakistan Economic Corridor, 11 billion dollars have been invested in the construction of transportation infrastructure between China and Pakistan. The interconnection and intercommunication was first shown in the construction of highway projects. Among them, the upgrade project of the Karakoram Highway linking China and Pakistan was completed in early 2015. After the expansion, the Karakoram Highway was changed from the original 10 meters wide to 30 meters. It can reach speeds of up to 80-100 kilometers per hour and overcome the obstacles that obstruct lakes obstruct traffic, which greatly shortens the schedule for snow closure. The former China-Pakistan Highway (Karakoram Highway) connects Kashgar, China, and Takot, the northern capital of Pakistan. The second phase of the Karakoram Highway project started construction in April 2016. The second phase of the project connects the original to Pakistan. The roads in the northern Takot town extend to the hinterland of Pakistan, and better strengthen the interconnection between China and Pakistan. The second phase of the project will link the former China-Pakistan Highway to the north hub of Pakistan's No. 1 railway from Tacot to Pakistan's Havillan. A two-way, four-lane expressway with a speed of 120 kilometers per hour will be built. In addition, in December 2015, another major highway project of the China-Pakistan Economic Corridor, the Karachi-Laher highway project (Sukol to Multan section) was officially signed and will be put into construction. It was invested 2.89 billion dollars. The completion of this project has greatly strengthened Pakistan's North-South connectivity. The construction of highway projects in Kuiper-Pakhtunkhwa province in the west of Pakistan's Balochistan is also continuing. The construction and upgrading of most sections of the West Line Highway project of the China-Pakistan Economic Corridor is nearing completion.

In addition to the highway project, there are new advances in railway interconnection and interoperability between the two countries. During President Xi's visit to Pakistan, the State Railway Administration of China and the Ministry of Railways of Pakistan signed the "About the Launch of the Trunk Line 1 (ML1) Upgrade and the framework agreement of the joint feasibility study of Harvey land port construction. According to the Pakistani plan, the Pakistan also hopes to carry out relevant feasibility studies on the upgrading of

railway 2 and 3, and Harvey's construction of the railway linking Hongqilar at the Sino-Pakistani border, planning to construct or renovate the corridor "West Line". It is a total of 1,153 kilometers of transportation projects. The Ministry of Railways also hopes to attract foreign investment, improve the maintenance and production of locomotives, and upgrade infrastructure such as railways and stations. On October 26, 2015, China International Air Lines opened the Beijing-Islamabad route, which was the first air channel opened by domestic airlines to connect Beijing and Islamabad. In addition, the Chinese company also undertook the construction of the Lahore Orange Line rail transit project, which is 27 kilometers long. China Exim Bank provided a loan of 1.61 billion U.S. dollars for the construction of the project. By the end of 2015, the project has completed infrastructure construction.

III. FAVORABLE CONDITIONS AND CONSTRAINTS IN THE CONSTRUCTION OF TRANSPORTATION INFRASTRUCTURE IN CHINA-PAKISTAN ECONOMIC CORRIDOR

A. Advantages

1. Strategic leadership

(1) "The Belt and Road" Strategy

"The Belt and Road" initiative was proposed by Chinese President Xi during his visit to Central Asia and ASEAN countries in 2013. It is a major strategic decision made by the Chinese government to actively respond to changes in the global situation and make overall plans for the domestic and international markets. "The Belt and Road" links Central Asia, South Asia, Southeast Asia, and West Asia, and connects the two major economic circles of the Asia-Pacific region and Europe. It is the world's largest and most promising economic cooperation region. The China-Pakistan Economic Corridor helps the "The Belt and Road" progress smoothly. As the leader of the "The Belt and Road" initiative, the China-Pakistan Economic Corridor is a pilot zone for international cooperation in the "Belt and Road". It shoulders heavy responsibility and the corridor construction needs to play a demonstration role. It is the implementation and promotion of other five major corridors and other projects along the Belt and Road Initiative. Smoothly set benchmarks and models. The corridor project is a reinterpretation of the traditional friendship between China and Pakistan in the new international political and economic structure. It is a new embodiment of the high trust between the Chinese and Pakistani governments and the friendly neighborliness between the people. This important "flagship" will help boost confidence of countries in the region along the route.

(2) In-depth strategic relations between China and Pakistan

In May 2013, when Premier Li visited Pakistan and proposed the concept of the China-Pakistan Economic Corridor, he hoped that through the efforts of the two countries and parties, the establishment of the China-Pakistan Economic Corridor would serve as a model project for strengthening regional cooperation and prospering the regional economy. And signed the "Joint Statement": The two governments have initially formulated a long-term plan for

the construction of roads, railways, oil and gas pipelines and optical cables covering the "four-in-one" channel for the construction of Kashgar, the southwestern port of Pakistan. In April 2015, President Xi's visit to Pakistan opened a new upsurge in the construction of the China-Pakistan Economic Corridor. With the joint efforts of the leaders of the two countries, the visit signed a total of 51 cooperation agreements valued at \$46 billion, which effectively promoted and accelerated the construction of the China-Pakistan Economic Corridor.

Chairman Jinping Xi wrote on the signature article layer published in Pakistan, "The two sides should focus on the construction of the China-Pakistan Economic Corridor, Gwadar Port, energy, infrastructure construction, and industrial cooperation as the four major priorities, forming a '1 + 4' cooperation layout. It will promote the development of various regions in Pakistan and benefit Pakistani people." The Pakistani side also eagerly hopes that China-Pakistan strategic partnership can release more economic momentum, help it get rid of growth difficulties, and achieve economic take-off. The construction of the China-Pakistan Economic Corridor has won the whole nation's consensus and is widely regarded as a key measure for "changing destiny" and even "changing the pattern". The China-Pakistan Economic Corridor runs through more than 3,000 kilometers of major traffic arteries across China and Pakistan and plays a major role in the China-Pakistan transport interconnection network. Therefore, the transportation infrastructure construction of the China-Pakistan Economic Corridor will certainly become a priority area and breakthrough point for China-Pakistan traffic construction.

2. The demand for economic and trade development between China and Pakistan

China and Pakistan established trade relations since the early 1950s. Pakistan is the first South Asian country to recognize the status of China's market economy, and is also the first country to establish a free trade zone with China. Pakistan's import and export trade with China, especially its import trade, has been rising year after year. China is Pakistan's second largest trade partners, and Pakistan is China's second largest trading partner and largest investment destination in South Asia. Thanks to the conception and promotion of the "China-Pakistan Economic Corridor" concept in 2013, the bilateral trade volume between China and Pakistan in 2014 was approximately \$16 billion, accounting for 22.14% of Pakistan's external trade volume. From 2014 to 2015, China-Pakistan trade increased by nearly 3 billion dollars. In 2015, the trade volume reached 18.985 billion dollars. It is worth mentioning that compared with 2004, the trade volume between China and Pakistan increased by 7.8 times compared to 2004, and the average annual growth rate during the 11 years was 19%, which is higher than the average annual growth rate of China's foreign trade of 15% over the same period. Higher than the average annual growth rate of Pakistan's foreign trade of 10% for the same period. In 2016, Pakistan imported a total of \$ 11.38 billion worth of Chinese products, which accounted for approximately 30% of Pakistan's total imports. China has

become Pakistan's largest importer. All indications indicate that the scale of trade between China and Pakistan has been continuously expanding, indicating that the prospects for the development of economic and trade cooperation between the two countries are optimistic. At the same time, the scale of investment has increased considerably. In 2003, China's direct investment in Pakistan was a net amount of \$10 million, and it was \$1.014 billion in 2014, more than 100 times that in 2003. Under the impetus of the development of China-Pakistan's future economic and trade cooperation, as the priority area and breakthrough point for China-Pakistan traffic interconnection construction, the pace of China-Pakistan economic corridor traffic infrastructure construction will gradually accelerate.

3. Financial support

Transportation infrastructure needs financing to protect it. The process of building an economic corridor between China and Pakistan is mainly based on the loan financing of the development banks of the two countries and international financial institutions. Among these investments and loans, before 2015, CDB has signed four projects with a loan contract totaling 680 million dollars and issuing loans of \$123 million for the construction of the China-Pakistan Economic Corridor.

In addition, China Development Bank and Pakistan signed six cooperation agreements in April 2015, involving a total amount of approximately 3.5 billion dollars, to provide financial support for China-Pakistan Economic Corridor. At the end of 2016, a consortium of China Financial Futures Exchange, Shanghai Stock Exchange, Shenzhen Stock Exchange, China National Pakistan Investment Corporation and Pakistani Habib Bank won a 40% stake in the Pakistan Stock Exchange. While China's financial industry entered Pakistan, Pakistan's commercial banks also scrambled to set up branches or offices in China. The largest bank in Pakistan, Habib Bank, has opened branches in Urumqi, becoming Pakistan's first branch in China. In short, the ever-deepening financial cooperation between the two sides provides a strong financial guarantee for the transportation infrastructure of the China-Pakistan Economic Corridor.

B. Constraints

1. The economic development of Pakistan is backward

The level of economic development in Pakistan is relatively backward. In South Asia, Pakistan is the second largest country, but its economic development is far less than that of India. Among the countries along the Silk Road Economic Belt, Pakistan's economic aggregates are at the medium-to-high level, but the overall economic development level is still relatively backward, and the World Bank has ranked as low-middle-income countries with low global competitiveness. The economy of Pakistan is dominated by agriculture, with agriculture accounting for more than 20% of GDP; industrial development levels and capabilities are low, with raw materials and primary products being the mainstay; manufacturing industry is only accounting for about 3% of industrial output, not only lower than India, even lower than

Bangladesh and Sri Lanka. The production capacity is very low. Although the natural resources are relatively abundant, the capacity for resource development is insufficient, resulting in weak resources to support economic development and it may be difficult to support the implementation of related projects.

In addition, the domestic energy supply in Pakistan also restricts its own economic development and may even become a bottleneck in the economic development of China and Pakistan. The domestic electricity supply in Pakistan has always been an important factor in the economic development of Pakistan. Its power generation mainly relies on traditional energy sources, nuclear power generation accounts for a relatively small proportion, and clean energy or renewable energy power generation has not yet reached its scale. As of 2013, Pakistan has a total of 37 large and medium-sized power plants, 4 hydroelectric plants, and 2 nuclear power plants, totaling only 6 units, accounting for a relatively small proportion. Currently Pakistan has an installed capacity of 2,000 megawatts of electricity and still has a power gap of 3,000-5,000 megawatts. The shortage of electricity supply has brought huge hidden dangers to the construction and operation of the relevant transportation infrastructure of the China-Pakistan Economic Corridor, which has seriously delayed construction progress and damaged the enthusiasm of investors.

2. Disputes about the route of China-Pakistan Economic Corridor in Pakistan

The general direction of the economic corridor, from Kashgar in Xinjiang of China to Gwadar Port in Balochistan—Pakistan has been determined. There will be no major controversy, but the specific stop-and-conquer route has caused controversy. In Pakistan, there are two kinds of programs for the specific routes of the China-Pakistan Economic Corridor: the "East Line" and the "West Line." The "East Line" program is dominated by the Pakistani government and runs through Punjab and Sindh to Gwadar Port, bypassing much of Balochistan and Khyber Pakhtunkhwa; the "West Line" program is Kashgar from the north, enters the Pakistani territory via the Red Hill Pass, enters Pakistani Kashmir Gilgit-Baltistan along the Karakoram Highway, passes Khyber Pakhtunkhwa to reach the Baluchistan province of Gwadar port.

It is not difficult to see that the focus of the dispute between the two sides is on whether to pass through Western provinces such as Khyber Pakhtunkhwa. The provinces of Punjab and Sindh in eastern Pakistan have a relatively high level of economic development. They have better infrastructure and are favored by investors. Overall investment returns and results are better. Western provinces are relatively backward in terms of economic development, the infrastructure is not perfect, and the investment conditions are relatively poor. Supporters of the "West Line" program believe that the huge investment brought by the China-Pakistan Economic Corridor is a historic opportunity to shake off the economic difficulties. The route should not be biased towards the eastern region where the development level is already relatively high, but should pass through the

relatively backward western region. It will invigorate the vitality and vitality of economic development in the impoverished areas, narrow the regional development gap, and achieve fair development and benefit sharing. Such a dispute over the route affected the efficiency of the implementation of related projects in the China-Pakistan Economic Corridor. Eventually, under the repeated urging of the China, the Pakistan settled the disputes of all parties and established a plan that included the three routes of East, Central and West. But at the same time, it also increased the scale and difficulty of construction and increased the cost of construction.

IV. COUNTERMEASURES AND SUGGESTIONS ON ACCELERATING THE CONSTRUCTION OF THE TRANSPORTATION INFRASTRUCTURE IN CHINA-PAKISTAN ECONOMIC CORRIDOR

A. Pay attention to accessibility

Accessibility is an important concept of traffic planning and it is one of the important indicators to measure the convenience of traffic. In recent years, accessibility has become more and more important for traffic planning decision makers and it has been used as an important design standard for evaluating the construction of transportation infrastructure. The traffic infrastructure construction based on accessibility planning aims to improve the passenger and freight transport capacity, and promotes a highly efficient, compact and economical transport land use model, which has attracted the attention of all countries in the world. The successful construction of transportation projects can not only improve the operational efficiency of multi-modal transportation systems, but also help to maximize the effective use of land resources, economic and social benefits. Interconnecting and interoperating transport infrastructure is an effective way to achieve transport accessibility. China and Pakistan have already regarded the construction of transport infrastructure as a priority and key area of cooperation between the two sides. Therefore, the construction of transport infrastructure in the China-Pakistan Economic Corridor should focus on The interconnection and interflow of transport networks across countries along the route has enabled the China-Pakistan Economic Corridor to maximize the accessibility of traffic within the two regions, and has become an important carrier of China's and Pakistan's transport arteries and economic and trade cooperation.

B. Accelerating the Facilities Linkage and Building a Corridor of Traffic and Business Logistics Corridors

From the perspective of regional economics, "The Belt and Road" is fundamentally a road economy, an industrial cooperation belt formed by relying on important economic channels, and a productive force layout and regional economic development system driven by road radiation. Therefore, the opening of the traffic corridor is the premise and basis for creating a commercial logistics corridor, and the transportation industry is the key to building a traffic corridor. Pakistan's railways have both geo-economic advantages and

network foundations, as well as serious road network aging problems. To build regional transportation hubs, opportunities and challenges coexist. China and Pakistan have long-term cooperation in transportation infrastructure, especially railway projects, and can play an important role in Pakistan's transportation infrastructure construction. Using the "The Belt and Road" initiative and the strategic opportunity of the China-Pakistan Economic Corridor to build on the basis of the opening of the traffic artery of China and Pakistan, we can open up links between Pakistan and India, Iran, Afghanistan, and other neighboring countries such as railways and highways. The country's economic and trade exchanges can also be linked to the railway systems of South Asia, Central Asia, Western Asia, and even Southeast Asia and Europe, linking the eastern section of the Trans-Asian Railway and linking West Asia (Europe) to Central

C. Establish an Efficient Cooperative Mechanism

To build the China-Pakistan Economic Corridor, China and Pakistan must establish an efficient cooperation mechanism. First, they must establish cooperation mechanisms at the national level, such as industrial cooperation mechanisms, energy cooperation mechanisms, investment and financing cooperation mechanisms, and legal and counter-terrorism cooperation mechanisms. The existing organization framework mechanism in Shanghai fully utilizes the financing role of the Silk Road Fund and the Asian Investment Bank and promotes cooperation between China and Brazil in the areas of economy, trade, energy, science and technology, humanities, education, and anti-terrorism to develop in a high-level and wide-ranging direction. On the basis of friendly consultations, all parties in China and Pakistan should use the platform for the long-term planning of the China-Pakistan Economic Corridor and the Joint Cooperation and Cooperation Committee to respect the reasonable interest demands of both parties and widely listen to opinions from all parties and experts at home and abroad. Scientific project planning will promote the implementation of the project in a step-by-step manner, bringing together the consensus of all political parties in Pakistan and avoiding the politicization of economic issues. In order to better play a concerted role, it is proposed to establish the China-Pakistan Economic Corridor International Friendship City Federation, and regularly hold the China-Pakistan Economic Corridor International Friendly City Cooperation Forum and China-Pakistan Economic Corridor International Friendly City Innovation Conference to promote the establishment of relevant sister cities. Long-term communication mechanism, and actively carry out friendly exchanges in the fields of humanities, science and technology, economy and trade, and gradually deepen mutually beneficial cooperation to help build China-Pakistan Economic Corridor.

D. Strengthen the communication infrastructure technical exchanges and tap new investment points

The spillover of amplification technology is one of the effective means to tap our country's potential for investment

in Pakistan's transportation infrastructure. The construction technology of transportation infrastructure has a very strong externality and multiplier effect. In the future investment process in our country, we must not only increase the investment in Pakistan's transport infrastructure, but also focus on the export of technology, the exchange of scientific and personnel training. We will expand both sides through "granting people with fishing". The new direction of investment has laid a good foundation for the cooperation of infrastructure in other areas of the two countries.

V. CONCLUSION

As the priority areas for the construction of "The Belt and Road", the transportation infrastructure interconnection needs to grasp the key channels, key nodes, and key projects of transport infrastructure, strive to improve the level of road access and aviation infrastructure, and accelerate the development of port infrastructure and ports. The construction of cooperation projects will realize the smooth and convenient transportation of land, water, and air on international transportation. To effectively promote the construction of the transportation infrastructure of the China-Pakistan Economic Corridor has a positive effect on improving the technical level of transportation between economic corridors, saving transportation costs, and facilitating the level of investment and trade facilitation.

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