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Reflections on Conducting International Scientific and Technological Innovation Cooperation and Exchange under the Belt and Road Initiative

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Abstract

The Belt and Road Initiative, as a crucial strategy for China's opening-up and international cooperation, has exerted a profound impact on scientific and technological cooperation between China and countries along the route since its proposal in 2013. Aimed at advancing five major cooperation areas, — including policy coordination, infrastructure connectivity, unimpeded trade, financial integration, people-to-people bond, in line with the principles of extensive consultation, joint contribution, and shared benefits, the Initiative further promotes the common development of countries along the route. In terms of scientific and technological cooperation, the collaboration between China and Belt and Road partner countries has covered various fields from natural sciences to humanities and social sciences.[1] This not only effectively enhances China's international image and cultural confidence but also brings tangible development opportunities to countries within the framework of this initiative.

Although the Belt and Road Initiative has created significant opportunities for international scientific and technological innovation and cooperation, with the accelerated penetration of the new round of technological revolution and industrial revolution, severe challenges still exist. Maximizing benefits while avoiding harms, seizing opportunities, and deepening international scientific and technological innovation and cooperation is an issue worthy of in-depth consideration. This article first analyzes the opportunities and challenges encountered in international scientific and technological innovation cooperation and exchange against the background of the Belt and Road Initiative. Then it puts forward specific strategies for innovative collaboration and trade. It is expected to contribute to the development trend of global scientific and technological cooperation, optimize cooperation models, and better promote China's scientific and technological innovation and social and economic development.

Keywords

the Belt and Road; International Scientific and Technological Innovation; Cooperation and Exchange

1. Introduction

Since the proposal of the Belt and Road Initiative, China's innovative capacity has been significantly improved and strengthened. A large number of cutting-edge scientific and technological achievements have emerged in many industries and fields, effectively promoting the rapid development of China's national economy.

However, it is necessary to clearly recognize that there is still a large gap between China's scientific and technological innovation level and that of developed Western countries, and this has seriously restricted the further development of China's high-tech industries.

Therefore, against the backdrop of the Belt and Road Initiative(BRI), China should adhere to the core position of independent innovation while upholding an inclusive and open attitude in its international scientific and technological innovation cooperation and exchange with countries along the route. It should take the initiative to deepen trade and cooperation with countries along the route, continuously strengthen its scientific and technological innovation capabilities, and actively release the value of scientific and technological innovation achievements, better to promote the high-quality development of China's social economy[2].

2. Opportunities and Challenges of Conducting International Scientific and Technological Innovation Cooperation and Exchange

2.1 Opportunities

2.1.1 Dual Improvement in the Frequency and Depth of International Scientific and Technological Exchange Activities

Driven by the Belt and Road Initiative, international scientific and technological innovation exchange activities between China and various countries within the framework of the BRI have become increasingly frequent. The forms of cooperation have gradually expanded from single achievement demonstrations

and experience sharing to diversified models such as regional technology transfer, joint Research and Development (R&D), and co-construction of science and technology parks.

At present, China has established scientific and technological cooperation relations with more than 160 countries and regions (Source: Press conference held by the State Council Information Office at 10:00 on June 3, 2025), and most countries along the Belt and Road have shown a strong willingness to cooperate. China has actively carried out scientific and technological innovation exchange activities with countries in this regard, which not only showcases its own scientific and technological innovation achievements to other countries but also systematically and comprehensively learns from the advanced experience and scientific research methods of other countries, thereby better promoting the development of its high-tech industries.

Additionally, China can learn from and draw on the scientific and technological achievements of different countries, as well as their relatively advanced scientific research methods, to address the shortcomings in China's scientific and technological innovation. Moreover, during the exchange activities, it is also possible to understand the detours taken by other countries in the research of a specific technology, which can help China avoid risks in similar technological research and development and save time and resource costs.

Therefore, it is necessary to make full use of every scientific and technological exchange activity carried out with countries along the route to lay a solid foundation for China's independent scientific and technological innovation.

2.1.2 Continuous Optimization of the International Scientific and Technological Cooperation Environment

Local governments have attached great importance to the BRI. They have not only introduced necessary policies one after another but also increased financial support, creating a favorable environment for scientific and technological cooperation and exchange. Furthermore, to facilitate scientific research exchange activities with countries along this path, some local governments have independently invested in constructing corresponding diversified cooperation bases, including joint laboratories and technology transfer centers, and provided complete hardware facilities [3]. At the same time, China and its bilateral partners within the framework of the BRI have made remarkable progress in the formulation of industry standards and rules. At present, China and countries along the route have made remarkable progress in the formulation of industry standards and rules. With a cooperative model where North-South Cooperation and South-South Cooperation complement each other and proceed in parallel, the fields of cooperation have become more diverse, and the depth and breadth have been significantly enhanced. This all-round optimization of the environment provides strong support for China to carry out in-depth scientific and technological cooperation with countries along the route.

2.1.3 Continuous Smoothness of International Talent Exchange Channels

With the continuous development of the Belt and Road Initiative, the multi-level exchange platforms co-constructed by China and countries along the route have been gradually improved, providing regular exchange channels for scientific researchers. International joint laboratories support Chinese and foreign scientific researchers to carry out long-term joint research. Some universities have established transnational academic alliances to promote teacher and student exchanges, carrying out more than 1,000 talent exchange activities annually and breaking geographical restrictions. The intensity of policy support has been continuously increased. The government has introduced facilitation policies such as expedited visas and special scientific research funding. Some provinces have established "green channels for scientific and technological talents" for foreign experts participating in joint R&D, providing them with living security. Scientific research institutions have set up special funds to support talents in conducting exchanges with countries in this regard. Cross-cultural adaptation services have been gradually improved. Many places have established International Scientific and Technological Talent Service Centers to provide multilingual translation, cultural etiquette training, and other services. Cooperation parks are equipped with professional translators to ensure communication. Cultural seminars for BRI partner countries have been set up to help scientific researchers understand the intricacies of cooperative countries, significantly improving the efficiency and quality of exchanges.

2.2 Challenges

2.2.1 Insufficient Cooperation Depth, Making It Difficult to Promote Breakthroughs in Innovation Capabilities

Although China has made significant progress overall, against the backdrop of the BRI, it acknowledges the challenges that abound. For instance, Beijing has initiated and carried out active scientific and technological innovation exchange and cooperation with many countries in the Global South since the launch of the BRI in 2013. the number of scientific research projects has been continuously increasing; however, most of the cooperative projects only stay at the level of academic exchanges or experience sharing. There is a lack of in-depth cooperation involving core

technologies such as joint R&D and achievement transformation. Some regional technology transfers are limited to simple technology export and have not formed a complete chain of "R&D - transformation - industrialization", which cannot effectively drive the improvement of China's scientific and technological innovation capabilities. This superficial cooperation model is insufficient to meet the needs of China's high-tech industries in breaking through the bottleneck of core technologies [4].

2.2.2 Shortage of High-Quality Innovative Talents and Imbalanced Resource Allocation

Talents are the core driving force of international scientific and technological innovation cooperation. However, China is currently facing a severe shortage of high-quality innovative talents, and the distribution of talent resources is uneven across various industries. All the scarce high-quality innovative talents in the market are attracted by some large-scale scientific research institutions with unlimited access to financial resources, making them more competitive than others, while many scientific research institutions with average conditions are seriously lacking in outstanding talents. At the same time, there are obstacles in transnational talent exchanges. Due to language and cultural differences in some countries in the high-tech and innovative sector, the communication efficiency of scientific researchers is low, and the cooperation connection is challenging, which further exacerbates the imbalance between talent supply and cooperation demand, becoming a key factor restricting international scientific and technological innovation cooperation.

2.2.3 Cooperation Obstacles Caused by Differences in External Environments

The scientific and technological innovation policies of different countries and regions are also affected by political systems. Some countries may be more inclined to nationalize scientific and technological policies, while others may initiate market-oriented scientific and technological policies. These differences have affected the efficiency and effectiveness of international scientific and technological cooperation to a certain extent. Against the backdrop of the BRI, the impact of differences in scientific and technological innovation policies on collaboration is undeniable. In promoting international scientific and technological cooperation, it is essential to consider these differences and formulate strategies that align with the actual situation to achieve a win-win outcome. At the same time, international scientific and technological cooperation must continually adapt to changes in the scientific and technological innovation policies of various countries to maintain the long-term nature and stability of cooperation.

3. Specific Strategies for Conducting International Scientific and Technological Innovation Cooperation and Exchange

3.1 Constructing Scientific and Technological Innovation Cooperation Parks with Strong Influence

3.1.1 Strengthening Multi-Party Collaboration

As part of the BRI, which aims to promote China's scientific and technological innovation, it is essential to establish influential scientific and technological innovation cooperation parks. These parks should leverage their unique advantages to enhance collaboration and exchange with other countries. This approach will contribute to improving China's overall scientific and technological innovation capabilities.

In the specific work of constructing scientific and technological innovation cooperation parks, it is necessary to strengthen cooperation with countries along the route. The Chinese government and the country’s leading high-tech enterprises should jointly take the lead in establishing scientific and technological innovation cooperation parks with a strong partnership and close collaboration, laying a foundation for the smooth development of subsequent work. In the construction of scientific and technological innovation cooperation parks, relevant government departments should encourage some parks with superior comprehensive conditions to actively carry out foreign cooperation, actively exchange the achievements and experience in scientific and technological innovation with countries along the route, and combine their own actual development conditions to absorb the essence and discard the dross, to innovate the paths of scientific and technological exchange with countries along the route.

3.1.2 Improving the Park Support System

When building scientific and technological innovation cooperation parks, government departments should enhance their policy and financial support to foster the development of related research institutions within these parks. During exchanges in scientific and technological innovation with countries in the tech and innovation sectors, it's essential to leverage the expertise of these institutions to transform technological achievements into tangible outcomes, creating greater economic benefits for high-tech enterprises.

Additionally, to encourage more companies to participate in the research and development (R&D) projects within the parks, preferential policies such as tax reductions, exemptions, and R&D subsidies should be implemented. This approach will not only help attract more enterprises to the parks but will also gradually increase their influence. As a result, more countries along the route will be encouraged to engage deeply with these initiatives.

3.2 Enhancing China's Independent Scientific and Technological Innovation Capabilities

3.2.1 Constructing a Diversified Talent Training and Introduction System

To enhance China's independent scientific and technological innovation capabilities, the focus should be on training and introducing high-quality innovative talents. China can sign talent joint training agreements with countries along the route, and determine to jointly train talents with countries along the path, to strengthen the exchange and cooperation between China and countries along the route, and also enable the latest developed scientific and technological achievements to be shared, promoting the standard progress and development of China and countries along the route.

3.2.2 Building an International Talent Service Platform and Deepening Cultural, Scientific, and Technological Exchanges

To build an International Talent Service Platform for Science and Technological exchanges, the government must first establish an international scientific and technological cooperation service platform, with the primary objective of vigorously promoting preferential policies and talent treatment proposed by China in terms of scientific and technological innovation cooperation and exchange with various countries along this frontier. This will attract the attention of outstanding foreign innovative talents and encourage them to participate in talent training programs actively. [5]. Such international scientific and technological forums and joint scientific research initiatives will enhance mutual trust between the two sides and lay a solid foundation for talent exchange and technological cooperation.

3.3Establishing an Adaptive Cooperation Coordination Mechanism

3.3.1 Formulating Differentiated Cooperation Strategies

The cooperation mechanism needs to be formulated according to the actual situation of all parties to ensure that the cooperation projects can solve the needs of the cooperative countries in a targeted manner, while also taking into account the sustainability and long-term nature of the cooperation. Differentiated cooperation plans should be formulated according to the scientific and technological development level, economic needs, and cultural background of countries along the route. For countries with weak scientific and technological foundations, the focus should be on technology promotion and capacity building; for countries with strong scientific and technological capabilities, the focus should be on joint R&D of cutting-edge technologies. Through the establishment of an effective cooperation mechanism, it can ensure that these resources are reasonably allocated and used in the cooperation, avoid the waste of resources, and improve the efficiency and effectiveness of collaboration.

3.3.2 Improving Multilateral and Bilateral Consultation Mechanisms

Establish a multilateral exchange platform involving multiple parties, such as the government, enterprises, and scientific research institutions, and conduct regular policy alignment and project consultation. For key cooperative countries, enhance the bilateral exchange mechanism by signing special scientific and technological innovation cooperation agreements. This should clarify cooperation objectives, responsibilities, profit distribution methods, and address policy and legal connection problems in cooperation. The establishment and improvement of an effective and sound international cooperation mechanism are conducive to solving problems and conflicts in collaboration. With the accelerated development of global scientific and technological innovation, the content and form of international cooperation are also constantly changing. The cooperation mechanism needs to be continuously updated and improved to adapt to new cooperation needs and challenges.

4. Conclusion

Within the context of the BRI, China's efforts in international scientific and technological innovation cooperation encounter both significant opportunities and notable challenges. The opportunities include increased exchange frequency, an improved environment for collaboration, and enhanced talent mobility. Conversely, challenges arise from a lack of depth in cooperation, a shortage of skilled professionals, and varying external conditions.

To bolster China's scientific and technological innovation capabilities, the government should actively support this initiative by not only increasing policy and financial backing but also by jointly creating high-tech cooperation parks with leading industries. It is essential to overcome cooperation barriers through initiatives such as joint talent training, technology sharing, and the establishment of adaptive coordination mechanisms. These efforts will foster deeper and higher-quality scientific and technological innovation cooperation between China and the partner countries along the route, ultimately enhancing China's innovation capabilities and its international competitiveness.

References

[1] Li H J, Zhao Y, Zhang H W. The Impact of the Belt and Road Initiative on Scientific and Technological Cooperation between China and Countries along the Route [J]. Agricultural

Library and Information, 2019,31(11):23-33. doi: 10.13998/j.cnki.issn1002-1248.2019.10.19-0876.(in Chinese)

[2] Liu X W., Fruitful Scientific and Technological Cooperation under the Belt and Road Initiative: Accelerating the Construction of an Innovative Silk Road [J]. China's Foreign Trade, 2024, (01): 72-73.

[3] Wang L H. Analysis and Prospect of the Current Situation of Scientific and Technological Cooperation with Countries along the Belt and Road [J]. Global Science, Technology and Economy Outlook, 2019, v.34; No.401: 23-29. doi:10.3772/j.issn.1009-8623.2019.05.003.(in Chinese)

[4] Bai C L. Scientific and technological innovation and cooperation support high-quality development of the Belt and Road Initiative. Bulletin of Chinese Academy of Sciences , 2023, 38(9): 1238-1245, doi: 10.16418/j.issn.1000-3045.20230710001. (in Chinese)

[5] Wang L, Zhou J, Li L Y. Enlightenments from International Cooperation of Typical Developed Countries to China's Scientific and Technological Innovation Cooperation with Belt and Road Countries [J]. Science and Technology Management Research, 2023, 43(2): 33-40. doi:10.3969/j.issn.1000-7695.2023.2.005.(in Chinese)