Research on the Collaborative Governance of Innovation Ecosystem in Guangdong-Hong Kong-Macao Greater Bay Area

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Abstract: With the development of the Guangdong-Hong Kong-Macao Greater Bay Area, the problem of public governance in this area has been gradually transformed into a systematic governance problem. From the perspective of collaborative governance and innovation ecosystem, this paper analyzed the current situation of innovation and development in this area and proposed a framework of collaborative governance of innovation ecosystem. Based on the above research, the paper also put forward some countermeasures and suggestions for the efficient governance and collaborative innovation in Guangdong-Hong Kong-Macao Greater Bay Area.

1. Introduction

This paper belongs to the research field of innovation and development of Guangdong-Hong Kong-Macao Greater Bay Area (hereinafter referred to as GBA) . With the role of collaborative governance in innovation ecosystem more and more prominent, research on collaborative governance of innovation is a frontier topic in the field of public governance. This paper firstly analyzed the composition of the innovation ecosystem and the dilemma of collaborative governance in GBA, then proposed a theoretical framework for innovation governance, finally put forward some countermeasures and suggestions.

2. The Composition and Development Status of Innovation Ecosystem in GBA

2.1. The Innovation Subject of Species Richness and Niche Differentiation

Governments, universities, enterprises, research institutions, incubators, financial institutions, science and technology intermediaries, and the users constitute a variety of innovative species in the innovation ecosystem of GBA.

Since the reform and opening up, innovative species based on research and development, advanced manufacturing and service innovation in Hong Kong and Macao have occupied the niche center of the innovation ecology in GBA. During this period, innovative species based on manufacturing and processing in the Pearl River Delta were at the edge of the niche center. Until the concept of the GBA was proposed, the integration of the three places became a holistic regional innovation ecosystem, and the process of the integration accelerated the exchange and iterative development of innovative species in GBA. However, it couldn't be ignored that there are still competition within the region, in which four core cities consisting of Hong Kong, Macao, Guangzhou and Shenzhen still occupy the niche center.

2.2. Innovative Communities of Elements and Resources

According to the process of innovation development, the innovation community in GBA can be divided into research community, developmental community and applied community, and the applied community can be further subdivided into service community and user community[1-2].

In the stage of basic research, more than 150 universities represented by the University of Hong Kong, The University of Macau, Sun Yat-sen University, more than 40 national key laboratories, more than 60 enterprise laboratories and other individual R&D teams constitutes the research community.

In the stage of applied research, enterprises of various industries in GBA, which includes their upstream suppliers and downstream partners constitute the developmental community. In 2020, 21 companies of Internet, real estate, manufacturing, financial and other industries in GBA were listed in the World's top 500, which shows that the development trend of private economy in GBA is improving.

In the stage of commercialization, service community and user community are the important roles. Their task is to commercialize the results of basic and applied research. The former is represented by the government and intermediary organizations, which serve other communities in an official capacity. The latter is represented by the users, who provide feedback on innovative processes.

2.3. Innovation Environment of Collaborative Governance

2.3.1. The Institutional Environment

The institutional environment provides strategic guidance for innovation[3]. Under the background of "one country, two systems", Guangdong, Hong Kong and Macao, based on different institutional logic, generate institutional tension in the game and ultimately promote institutional innovation[4]. At present, the institutional environment construction in the GBA has been transformed from "local promotion and central support" to "central leadership and local coordination".

2.3.2. The Market Environment

The market is the economic foundation of innovation[5]. GBA has a large economic aggregate and a market foundation for innovation activities. According to the Reform and Innovation Report of GBA in China (2020), the overall economy in here has achieved steady growth in 2019, with the overall GDP of 11.62 trillion yuan, of which the nine cities of Guangdong province in GBA has achieve the GDP of 8.69 trillion yuan.

2.3.3. The Cultural Environment

Culture is the soul of innovation and its environment is the soil for innovation[6]. "One country, two systems" embodies the concept of harmony in Chinese culture, and an important spirit is "competition, cooperation and co-existence". The integration of Hong Kong and Macao culture which deeply influenced by Britain and Portugal, and Guang Fu culture has promoted the exchange and integration of innovative ideas in GBA.

2.3.4. The Science and Technology Environment

In regional innovation ecosystem, based on the species diversity of collaborative governance means different from natural ecosystem is the popularization and application of technology. Because efficient governance activities must implement the timely access to and perception of information. Accurate governance decisions are based on valid data and techniques like large data, cloud computing, artificial intelligence[7].

2.3.5. The Infrastructure Environment

Infrastructure environment refers to the social production and public services material engineering facilities, which is used for normal innovation ecosystem environment construction of public service[8]. The traffic infrastructure and information infrastructure play a major role in the process of collaborative governance.

3. Collaborative Governance Dilemma of Innovation Ecosystem in GBA

3.1. Regional Co-ordination Bodies have not yet been Set Up

The administrative territorial entity in GBA has not only the general administrative regions such as Guangzhou, Dongguan and Zhongshan, but also the special economic zones of Shenzhen and Zhuhai, as well as the special administrative regions of Hong Kong and Macao. The biggest problem in promoting coordinated governance is the contradiction between these areas. However, the administrative mechanism in regional coordination in GBA is still at the stage of adjustment. "one-region, two-layers and three-ranks" cross-border coordination governance program has not yet been substantially established.

3.2. The Development Level of Transportation and Information Network Still Needs to be Improved

At present, “1-hour traffic circle” in GBA has not been established. "Co-location" has also become an important reason for traffic congestion in three places. In addition, the growing population and logistics brought a large number of communications demand. But 5G information infrastructure is still in advanced layout stage in GBA.

3.3. Insufficient Application of Data in Collaborative Governance

Data sharing in GBA isn't enough. 5G, cloud computing, artificial intelligence and other technology are not well integrated with the current governance needs, which means that the existing governance pattern is still subjective, qualitative and empirical, and the collaborative governance mechanism based on data empowerment has not yet been improved.

4. Collaborative Governance Framework of Innovation Ecosystem in GBA

4.1. The influence of Regional Heterogeneity on Coordinated Governance in GBA

Regional heterogeneity refers to the difference effect of different regions because of different development foundation, and regional difference will bring a series of governance problems[9]. The innovation ecosystem of GBA has remarkable regional heterogeneity. GBA is a large area covering two administrative regions and nine cities. Among them, the development of "four core cities" is significantly better than that of other regions. The fundamental reason for these differences is that the institutional, economic, cultural, technological and educational differences.

4.2. A framework for Collaborative Governance of Innovation Ecosystems in GBA

As an endogenous attribute of GBA, regional heterogeneity is the driving force of collaborative governance of innovation ecosystems in GBA. Although the differences among regions would increase the difficulty of coordinated governance, the diversity of regional innovation elements would form a more powerful innovation development tension. Therefore, the co-governance of innovation ecosystem in GBA needs to accurately grasp regional heterogeneity and seek common ground.

The innovation ecological chain is the source power of the coordinated governance of the innovation ecosystem in GBA. Through the analysis of the composition of it, the innovation communities have formed innovation chain, industry chain, capital chain, talent chain, policy chain and service chain, and these six chains of self-coordination to promote the development of collaborative governance, and then achieve innovation-driven development. Therefore, the coordinated governance of the innovation ecosystem in GBA needs to focus on the six major chains, so as to gradually break down the barriers that hinder the coordinated innovation.

It's important to note that the collaborative governance capability is the key to improve the governance of innovation ecosystem[10]. Thus, it is particularly important to focus on governance subjects, governance networks, and governance tools.

The framework is shown in figure 1.

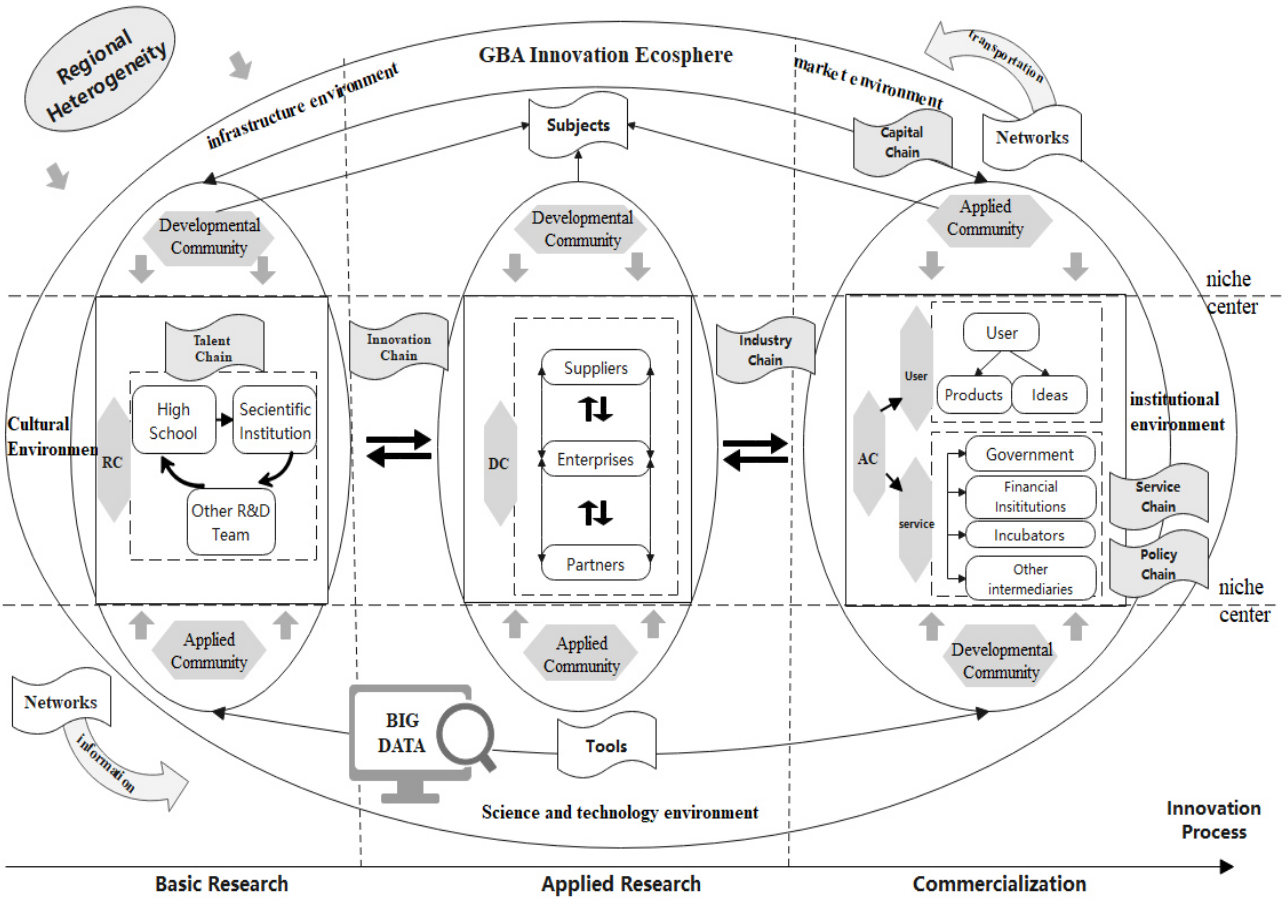

Figure 1. Collaborative governance framework of innovation ecosystem in GBA

Annotation: RC , DC, AC respectively are the abbreviations of research community, developmental community, and applied community.

5. Countermeasures and Suggestions

5.1. Accelerate the Establishment of Multi-level Collaborative Governance Mechanism

It's a urgent task to establish the GBA Development Co-operation Committee and hold committee meeting annually. In order to solve the governance problems, it should be organized for clarifying the responsibilities of Hong Kong, Macao and Guangdong governments. In addition, "one-region, two-layers and three-ranks" cross-border coordination governance plan for the coordination bodies of GBA should be affirmed in time. Free Trade Area of Nansha maybe a good place for organization mentioned above.

5.2. Focus on the Niche Center and Achieve Synergy Development of the Six Chains

Niche center is the foundation of innovation ecosystem[11], so the development of GBA can not be separated from the maintenance of innovative community. To foster rational innovation distribution, innovation chain, talent chain, capital chain, service chain and policy chain should be harmonized. It is suggested that GBA should integrate the advantages of regional resources, cultivate benefit-sharing industrial chain, transfer the industries of some big cities to the surrounding small and medium-sized cities, and build a perfect and professional industrial chain of urban agglomerations. For playing the role of six chains, priority should be given to cooperation in such fields as science and technology, industrial planning, medical care and education, and environmental protection.

5.3. Form a Highly Efficient Radiation-driven Transport and Information Network

It's suggested to accelerate the establishment of a coordinated traffic management mechanism, coordinate the planning of regional traffic systems, and support Hong Kong, Macao, and Guangdong in establishing unified traffic construction standards and service interfaces as soon as possible. Meanwhile, it's important to strengthen the construction of communications infrastructure, improve the quality of network services, and encourage the advanced deployment of 5G applications.

5.4. Enhance the Ability of Data Enabling Collaborative Governance

Cross-border data silos is the big problem for coordinated governance because the governance principal can not obtain valid information without massive data. Thus the data capabilities of coordinated governance need to be improved through the promotion and application of 5G, cloud computing and artificial intelligence. Except the hard technique, soft technique like technology foresight, science and Technology Innovation Planning and Research, technology and industry innovation road map must be taken seriously equally.

6. Conclusion

This paper is studied from the perspective of collaborative governance and innovation ecosystem, which takes into account the publicity of innovation and the systematicness of governance. However, there are still many unanswered questions in this paper, such as the mechanism and path of collaborative governance and co-innovate the elements of the ecosystem. Due to some limits, the above issues remain to be further studied.

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