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Embrace the Innovation Community

Belt & Road Science Park Development Report

2019

Great Wall Enterprise Institute

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Content

Preface

I go abroad every year, mostly to science parks, colleges and universities, and think tanks for visits and exchanges. Besides first-class parks like the Silicon Valley, the Research Triangle Park and Daedeok Valley, I most often go to science parks in B&R countries, such as Thailand, Indonesia, Malaysia, India, Pakistan and Egypt. I often tell three stories of China and its new economy: first, the entrepreneurship story of China; second, the IT story of China; and third, the science park story of China. These stories reveal the reasons and paths for China's rise and touch audiences around the world.

Over the years, Great Wall Enterprise Institute (GEI) has made a lot of efforts for B&R science park cooperation and achieved some results. The ASEAN Science Park Workshop we have held since 2013 has been upgraded to the B&R Science Park Workshop this year and has had more than 300 participants from over 30 countries so far. I feel gratified every time when we meet our participants abroad in various occasions. Many B&R countries are interested in China's entrepreneurship and science park experience and offer to study China's science park development policies, even including the National Torch Plan, which is a recognition of our work.

Science park is highly regarded because it can inject strong vitality for transforming science and technology into productivity and promoting economic and social progress. However, due to difference in economic conditions, institutional environment, development stage and social basis, science parks around the world vary in function, pattern and form. In order to comprehensively display an overall look of science parks in B&R countries and promote international exchanges between science parks, GEI publishes the report with all our resources and efforts, depicting the basic situation and characteristics of B&R science parks. In the future, science park will develop towards openness, fusion and collaboration. We propose to jointly build a B&R science park innovation community to foster innovative development together.

Hopefully, the report can help governments, science parks and all sectors of society to better understand science parks in B&R countries, and make Chinese science parks better known so that international cooperation will be more productive and inject vitality into the innovation community.

Summary

Based on a sample set of 500 science parks around the world and sufficient data available, the report screens the samples according to five criteria of a certain scale, source of sci-tech innovation, sci-tech incubation capability, industrial cluster and integration into towns, and forms a case set of 74 parks along the Belt & Road, with North America excluded. By investigating and analyzing establishment time, area, operation mode, employees, enterprises in the parks, sci-tech resources, leading industries, policies and laws, and international cooperation of the parks, the report has come to following findings:

- **Science park has become a global phenomenon.** Among the science parks in the case set, there are 11 in East Asia, 14 in Southeast Asia, 5 in South Asia, 3 in Central Asia, 7 in West Asia, 12 in Central and East Europe, 11 in West Europe, 4 in Africa and 7 in South America;

- **The Belt and Road has become the world's most active region in science park development.** Central Asia and West Asia, in particular, build the most science parks in the new century, accounting for about 24% of global increase. Recent cases include Sharjah Research, Technology and Innovation Park (SRTI Park) in UAE and Bishkek High-tech Park in Kyrgyzstan;

- **Intensification has become a trend of B&R science parks.** In the past 20 years, newly-built science parks have higher land use rate than those built earlier. Take Brazil's Porto Digital Science Park built in 2000 as an example. The number of employees and that of enterprises per unit area reached 5705/km^2 and 179/km^2 respectively;

- **B&R science parks are closely linked with universities and scientific research institutions.** We got data about the number of universities and scientific research institutions in and around 69, or 93.24%, of the 74 samples. Dubai Silicon Oasis, Software Technology Park of India and Sophia Antipolis of France have a relatively outstanding number of related universities and scientific research institutions;

- **Science parks in different regions show specific characteristics.** Science parks in East Asia, Southeast Asia and South Asia see the largest average area (90.42km^2), highest government involvement (93.1%) and most cooperation with China (47.4%), while European science parks have the highest concentration of employees (3335/km^2), represented by Turku Science Park, Kista Science City, Bio-Technopark Schlieren;

- **Governments are the primary propellants of B&R science parks.** 70, or 94.59%, of the 74 samples, have government involvement, mostly in East Asia, Southeast Asia, South Asia, and Central and Eastern Europe; those under direct management of governments generally have the largest area (87.87Km^2 on average) and create the most jobs (115650 on average);

- **High-tech industries dominate science parks.** Most common industries in B&R science parks are successively electronic and information (75.34%), bio-medicine (60.27%), new materials (38.36%), new energy (34.25%), advanced manufacturing (26.03%), resources and environment (17.81%), high-tech services (16.43%) and aerospace (13.70%);

- **Most science parks have special policies or even legislation that supports development.** Nearly 3/4 (71.62%) of the science parks enjoy preferential policies in sci-tech innovation and enterprise development; countries home to approximately 1/3 (28.38%) have published science park-related laws; over half (51.35%) have different types of cooperation with China.

Introduction

Along with relentless advance of science and technology, traditional industries continue to change while new industries spring up alternately, which produces huge and profound influence to the development and evolution of world economy, politics, society and culture and becomes the leading force for human progress. Since its birth in the 1950s, science park, a distinctive carrier of sci-tech innovation and industrial development, has injected strong vitality for transforming science and technology into productivity and promoting economic and social progress, received extensive attention and active support of governments, enterprises and academia, emerged and thrived around the world relying on sound mechanism for the transformation of sci-tech achievements, innovation and entrepreneurship ecosystem and industrial cluster effect.

With development for over half a century and in particular exploration in developing countries, science parks around the world show a trend of adaptive development based on different economic conditions, institutional environments, development stages and social bases. With their functions, modes and forms greatly enriched and expanded, science parks gradually form a community of diversity and organic unity has. Besides science and technology park, there are different terms like science/research park, technology park/techno-park, innovation park/hub, and science city/techno-pole, and different countries and regions also vary in understanding about the mode, mechanism and functions of science parks. Nevertheless, the combination of sci-tech innovation and economic development is the most fundamental characteristic and commonality of all science parks.

It is generally held that science park is a special institution founded by a particular organization like government, university or enterprise and managed by professionals, with scientific research institutions as the major source of innovation, serving social innovation, and realizing transformation of innovation achievements, acceleration of enterprise incubation and industrial cluster cultivation by providing physical space, preferential policies, financial capital and counseling, thereby injecting vitality into social and economic progress. In terms of spatial form, a science park can be a newly developed specific region or a functional entity superimposed on an existing city. In this report, we set five prerequisites for science parks: a certain scale of at least one building, source of sci-tech innovation, science and technology incubation capability, industrial cluster and close integration into towns. Only science parks up to these criteria were included in our survey.

Science parks play an important supporting role in international division and cooperation of industries, international expansion of enterprises and institutions, transnational flow of innovation elements, and the collaboration of innovation activities. According to data of International Association of Science Parks and Areas of Innovation (IASP), 350 IASP members from 78 countries constitute a global network of exchanges and cooperation. In addition to IASP, there are also regional organizations like Asian Science Park Association, small-scale organizations like World-class Science Park Union, and national level science park associations. The organizations promote international exchange of science parks and make science parks an important innovative cooperation platform in the age of global innovation.

In China, science parks play an important role in opening-up and innovation-driven development. As an excellent representative of Chinese science parks, National High-tech Industrial Development Zones (NHZs) constantly improve quality and efficiency in the past 30 years and become an important pillar of China's economy and a pioneer of high-quality development. In 2018, 168 NHZs contributed 12.0% of GOD with a total of RMB1,081 million and 10.1% of national tax revenue with RMB1.39 trillion; the number of enterprises in NHZs reached 65,900, representing 36.5% high-tech enterprises in China. By insisting on combining reform and opening-up with indigenous innovation, NHZs become highlands in technical R&D, innovation and entrepreneurship in China and even the world, and a strategic force in the development of China's high-tech industry.

As China's renowned think-tank in new economy since 1993, GEI has witnessed and participated in the grand growing course of Chinese science parks and continuously deepened communication with foreign science parks, especially those in B&R countries and regions. The ASEAN science park workshop GEI has held since 2013 is upgraded to the B&R science park management and operation workshop in 2019. It has had more than 150 participants from over 20 B&R countries and effectively promoted communication and interaction between science park managers, experts and scholars. In addition, GEI has successively visited science parks in a dozen countries including Thailand, Pakistan, Indonesia, Vietnam, Egypt, Brazil, South Africa, India, Malaysia and the Philippines, and kept sound exchanges with Silicon Valley, Sophia Antipolis, Hsinchu Science Park and Daedeok Valley.

On this basis, GEI launched the research and compilation of the B&R Science Park Development Report (hereinafter the report) in 2019, aiming to systematically comb the development history and knowledge system of global and Chinese science parks, displaying an overall look of B&R science parks through quantitative analysis, and putting forward a vision for the future development of global science parks and the suggestion to promote international practical cooperation. The report includes four chapters:

The first chapter aims to review the development history of Chinese science parks. We sort out the background, development history, results and main experience of Chinese science parks against the backdrop of global science parks so as to give the readers a glimpse into the commonality and uniqueness of Chinese science parks compared with global counterparts.

The second chapter intends to display the situation of B&R science parks. We gathered a sample size of 500 science parks around the world and got 415 along the B&R with North America excluded. From the cases with sufficient information available, we selected 74 samples for deep analysis according to the criteria of a certain scale, source of sci-tech innovation, science and technology incubation capability, industrial cluster and close integration into towns, and investigated establishment time, geographical distribution, acreage, development and operation mode, sci-tech resources, enterprise cultivation, industry development and international cooperation of the parks, and got the conclusion that reflected main characteristics of B&R science parks through data analysis.

Chapter 3 and 4 are designed to look into the innovation community. Based on latest trend of global science parks, we summarized changes in spatial form, functional essence and linkage ways of science parks, and made empirical theoretical exploration of the basis, functional essence, intrinsic logic, organization mode and development significance of the innovation community from the perspective of building a community of shared future for mankind. We held that, innovation community is an enhanced and upgraded version of global innovation network, an economic organization form of open innovation and pioneering work in global innovative governance, and science park is the main construction body and carrier of core functions of the innovation community. At last, we proposed construction path for the B&R innovation community and suggestions in key aspects.

Cooperation between science parks is a main content of international cooperation in sci-tech innovation under the Belt & Road Initiative. In recent years, more and more B&R countries put forward science park development plans, more and more enterprises and social institutions participate in science park construction, and international exchanges and cooperation increasingly become common pursuit of all parties. GEI has accumulated massive first-hand information during cooperation and exchanges at the front line over the years, so the report conforms to the new demands and new trend of international innovation cooperation, and on the basis of reflecting the overall situation of B&R science parks, proposes to jointly build a B&R innovation community based on cooperation between science parks.

Hopefully, the report will help better understand B&R science parks and carry out more fruitful international innovation cooperation. We appreciate any advice or criticism regarding our work.

1.30 Years Science Park Development in China

With the start of the Reform and Opening-up, China joined the development of science parks around the world and became a rising star in the field through speedy and effective development. Same as other countries, China also has many types of science parks: some are real estate investment projects which are many but not the most impressive in terms of sci-tech industry development; some are university science parks, and as many as 115 are national-level university science parks according to official figures, but such science parks usually focus on incubation and transformation of sci-tech achievements of the universities they are affiliated to; and some are government sponsored or involved, especially National (established with approval of the State Council) High-tech Industrial Development Zones (National High-tech Zone or NHZ for short), which are most representative both in terms of functional properties and development results. Therefore, unless otherwise stated, “Chinese science park” herein refers to National High-tech Zone.

First of all, it shall be pointed out that although the idea of National High-tech Zone is derived from international practice of developing science parks, due to different national and regional conditions, Chinese high-tech zones, instead of completely following the paths and modes of European and American countries, show clear differences in development modes, mechanism and paths, and have characteristics like government agencies as main management and operating body, local taxation as capital source for progressive development, industrial economic growth driven by factor input as starting power and gradual transformation towards a development mode that reflects sci-tech innovation capability. Therefore, notwithstanding the same goal of combining sci-tech innovation with economic development, high-tech zone is more of a realistic choice that a developing country makes to pursue industrial scale and economic benefits first in light of its late start and late development. Practice has proved that the mode of combining development zone with science park is viable and can be successful.

1.1 Background: Learning from Silicon Valley in the Wave of Technological Revolution

In the 1980s, the third technological revolution reached its climax. High and new technologies represented by micro-electronics, computer, bio-technology and new materials had significant impact on world economic and social development. A new entrepreneurship wave that originated in the Silicon Valley promoted worldwide booming of science parks. The birth of Chinese science parks couldn’t do without the influence of global environment and trend, but was more directly related to the domestic environment including the Reform and Opening-up and particularly the sci-tech system reform.

After the Third Plenary Session of the 11th CPC Central Committee in 1978, along with the "great debate" on "practice as the sole criterion for testing truth", China began to pay attention to the world's new technological revolution and the status of sci-tech development at home, and started the exploration of enabling scientific researchers to serve private enterprises in order to promote productivity. A number of researchers went abroad and returned with latest development concepts and impetus for innovation, including Mr. Chen Chunxian, who founded the first private sci-tech service entity, Beijing Advanced Plasma Technology Development Department in 1980 under inspiration of the Silicon Valley. The same year, the central government issued the strategic policy stating that "economic construction must rely on science and technology, and science and technology must be geared to serve economic construction", which acknowledged and encouraged the new trends. Companies including Stone and Science Sea were established successively. By the end of 1987, the region of Zhongguancun had 148 sci-tech enterprises and became known as the "Electronic Street".

The "*Decision of the Central Committee of CPC on the Reform of the Science and Technology Management System*" issued in 1985 analyzed the necessity of reforming the science and technology management system correspondingly with the economic system reform and explicitly pointed out "to accelerate the development of emerging industries, we shall choose a number of intelligence-intensive areas and implement special policies there to gradually form high-tech zones with different characteristics," which suggested that high-tech zone construction was put on the agenda of the Party and the state. The Decision was a landmark event in the history of China's science and technology development. It not only directly influenced China's science and technology development but also had profound influence to high-tech zones.

In May 1988, the *Decision of the State Council on Deepening the Reform of the Science and Technology Management System* pointed out again, "intelligence-intensive metropolises shall actively create conditions, try running high-tech industry development zones and establish corresponding support policies." Meanwhile, the State Sci-tech Commission together with relevant departments investigated the situation of Zhongguancun electronic street and submitted an investigation report to the State Council. In May the same year, the State Council approved the establishment of "Beijing High-tech Industry Development Pilot Zone" (namely the Zhongguancun Science Park later on) and formulated 18 preferential policies for the pilot zone, which laid the basis for Chinese high-tech zones, and it became the first high-tech zone approved by the state.

In August 1988, to comprehensively promote industrialization of sci-tech achievements and promote high-tech industry development, the Party Central Committee and the State Council approved the National Torch Plan, which mainly covered the construction of an environment for the development of high-tech industries in China, the construction of high-tech zones and innovation service centers, the implementation of the National Torch Plan, the internationalization of high-tech industries, and talent training. The National Torch Plan indicates that China starts active construction of high-tech zones from top to bottom, which greatly speeds up high-tech zone construction. Since then, high-tech zone development is carried out rapidly around the country.

1.2 History: Three Steps Towards Innovation-driven

2018 is the 40th anniversary of China's Reform and Opening-up and 30th anniversary of the establishment of National High-tech Zones. After 30 years' development, National High-tech Zone successfully found a new technological revolution development path of entrepreneurial innovation. The number of National High-tech Zones reached 169 (including Suzhou Industrial Park), and National High-tech Zone has become the main front of implementing the innovation-driven development strategy, a crucial carrier of developing high-tech industry, and a vital force in realizing high-quality development. Generally speaking, National High-tech Zones went through three development stages.

During 1988-2000, the "first entrepreneurial period" was manifested by the construction of industrial parks or industrial clusters with the gathering of production factors as the main content, and with the primary purpose to promote local or regional economic development. After the first National High-tech Zone, Beijing High-tech Industry Development Pilot Zone, the State Council approved 52 National High-tech Zones respectively in 1991 and 1992, covering major cities of Wuhan, Tianjin, Shenyang, Nanjing, Chengdu, Xi'an, Dalian and Shenzhen, which formed a sizable group of National High-tech Zones in the early stage. Meanwhile, the State Council approved the *Identification Criteria and Methods for High-tech Enterprises in National High-tech Zones* and the *Interim Provisions of Policies on National High-tech Zones* submitted by the former State Sci-tech Commission and the *Provisions of Tax Policies for National High-tech Zones* submitted by the State Administration of Taxation, which gave National High-tech Zones practical preferential policies. In 1997, the State Council gave special approval to the recognition of Yangling Agricultural High-tech Industries Demonstration Zone as the only national-level agricultural high-tech zone in China. After a decade's development, National High-tech Zones became the bellwether of China's high-tech industries by 2000. Indicators including total income from technology, industry and trade, gross export and R&D input all grew much faster than aggregate national economic indicators of the same period, and a number of high-tech enterprises with strong innovation ability and independent intellectual property products sprang up, including Lenovo, Stone, Founder, Huawei, ZTE, Haier, Hisense and Changhong, becoming the nucleus of China's high-tech industries. To a large extent, however, it was the result of preferential policies that led production factors and resources gathered rapidly towards high-tech zones. In general, high-tech zones at that time were featured by the gathering of manufacturing-oriented industries, declining proportion of income from technology, few innovative technologies and products, and the lower end of the value chain.

During 2001-2010, the "second entrepreneurial period" was characterized by a focus on technological factors, fostering technological and institutional innovation, aiming to cultivate high-tech industries, as the connotation and orientation of high-tech zones were shifted to what is commonly known as a "science park". The situation of improving manufacturing capability with relatively weak technological innovation ability in the previous ten years aroused the attention of relevant national departments. In 2001, the Ministry of Science and Technology raised the slogan of "second wave entrepreneurship" for high-tech zones, and proposed that high-tech zones shall target "five transitions", namely "the transition of driving force from land and funds to technological innovation; the transition from relying on preferential policies and stressing investment promotion to optimizing innovation and entrepreneurship environment and cultivating endogenous impetus of growth; the transition from all-inclusive industrial development to concentrating strengths in leading industries with distinctive features; the transition from hard environment construction to the construction of soft environment that optimizes allocation of sci-tech resources and provides quality services; and the transition from bringing-in to combining bringing-in and going-global." In 2002, the Ministry of Science and Technology successively issued the *Decision on Further Supporting the Development of National High-tech Zones* and the *Opinions on Reform and Innovation of National High-tech Zone Management System*, to strengthen support and guidance to National High-tech Zones, which marked the start of the "second wave entrepreneurship". In 2007, Ningbo High-tech Zone was upgraded to a National High-tech Zone; in 2009, Xiangtan High-tech Zone and Taizhou Pharmaceutical High-tech Zone were upgraded too; in 2010, the State Council approved another 27 National High-tech Zones, with the total number of National High-tech Zones reaching 84.

After the financial crisis, major countries in the world all increased input in innovation and sought impetus for endogenous growth. In China, innovation also ranked first among the five development concepts. Since 2011, NHZs tended to focus more on innovation elements and thus entered the "third entrepreneurial period" with innovation as the core driving force. At this stage, the construction of National High-tech Zones focuses on indigenous innovation, creating favorable environment for innovation and entrepreneurship, and promoting the concept of science-industry-city-human integration, transforming comprehensively towards "innovation ecosystems". In March 2009, the State Council agreed to support Zhongguancun Science Park in building a national indigenous innovation demonstration zone, and Zhongguancun became the first indigenous innovation demonstration zone in China. The construction of indigenous innovation demonstration zone has quickened since 2014, with 17 approved so far in 39 cities, involving 48 National High-tech Zones. Indigenous innovation demonstration zones have been a pivotal engine for the implementation of innovation-driven development strategy and the realization of transition from old to new economic growth drivers in China. During 2011-2018, the State Council approved 85 National High-tech Zones, including Xiaogan and Jingzhou high-tech zones, which brought the total number of high-tech zones to 169. In 2014, Premier Li Keqiang proposed the "mass entrepreneurship and innovation" strategy. As an important carrier of entrepreneurship and innovation, National High-tech Zones focus on improving indigenous innovation ability and international competitiveness, creating the ecological environment for innovation and entrepreneurship and putting sci-tech innovation at the core.

1.3 Achievements: Reform, Opening-up, Innovation and Entrepreneurship

The success of China's science park development in the past 30 years is reflected in the flood of emerging industries and prosperity of regional economy, and more importantly, in establishing and developing institutional and service systems that are based on China's national conditions, conform to the laws of innovation, geared with international practice, generate sustained development momentum, and in finding a path of combining sci-tech innovation with economic development and realizing innovation-driven development as a developing country.

(1) Reform of System and Mechanism

It is mentioned earlier that the birth of Chinese science parks couldn't do without the Reform and Opening-up and the reform of China's sci-tech system, because science park is an integral part of the regional and national innovation system, and more importantly, a part of the national economic system. The emergence and development of science park, if seen as an organizational form that suits sci-tech innovation and high-tech industry development, will certainly involve the reform of relevant systems at deeper level and in wider scope. For National High-tech Zones, the development process almost involves system innovation at all aspects of economy and society, including enterprise system, property system, financial system, foreign exchange and foreign trade system, entry and exit management system and social security system, which can't be coordinated by a high-tech zone alone but requires system supply at national level. National High-tech Zones not only demand and promote innovation but also experiment and explore new systems and mechanisms.

Take the reform and innovation of enterprise system and property system for instance. The exploration of National High-tech Zones contributes especially to supporting the development of sci-tech enterprises of different management styles (privately-run) and different ownership styles (privately-owned). The so-called private sci-tech enterprise is a special business mode born in the early years of the Reform and Opening-up in the context that various institutional arrangements still relied heavily on traditional paths to meet the new production relation and development demands of serving the society with science and technology, that is, to establish legal person property right that is capable of independent market operations through innovation of enterprise operation mechanism without affecting asset ownership, or to realize free and independent operation of an enterprise through separation of functions and rights between enterprise owner and operator. It's a dramatic change compared with traditional operation modes of state-owned enterprises. Early private sci-tech enterprises included state-owned enterprises like Lenovo and Founder, collectively-owned enterprises, joint-equity enterprises and associated enterprises, but the self-financing mode of operation not only arouses enthusiasm of sci-tech personnel towards entrepreneurship but also makes it institutionally possible. It shall be pointed out that the system was born from the practice and exploration of early sci-tech personnel and enterprises, and even earlier than the state officially established and standardized relevant property system, especially property rights of non-public sectors of the economy, through laws and regulations. In this sense, science park functioned as the soil for the birth of the new property right system.

National hi-tech zones also contributed a lot to the reform and innovation of government administration system and functions. Sci-tech enterprises broke the limitation of planned economy and were given the status of independent legal person. Enterprises became the mainstay of economic development, while government, as market regulator, incorporated administration in services and advanced towards the building of "service-oriented government" through reform. The management organizations of science parks, as agencies of local governments, are an important innovation in government management system. They shall not only make up for economic balance with market failure but also undertake the function of cultivating market and market entities in the transition phase and build a service system oriented at market demands. National High-tech Zones usually have a service center that provides one-stop enterprise services. It seems to be a shift in operation mode but is a shift in awareness from management to service in nature. Science park management commission is actually a new-type management agency that works primarily to promote industrial development alongside the function of regional economic and social management. They do not interfere in business decision of enterprises, but rather adhere to the principle of "simplified government, service first" to create a benign environment for businesses and growth of enterprises. It is the new-type management system that inspires and protects the ability of enterprises to transform sci-tech achievements and make continuous innovations, and enables a number of enterprises to rise and grow.

(2) Fostering New Driver for the Economy

NHZs build and constantly innovate the business incubation service chain of "entrepreneurship nursery/maker space-incubator-accelerator". In the pre-incubation stage, startup cafés, innovation works, science museums sprang up, becoming the nursery of emerging industries and enabling the realization of dreams from an idea to a big company. In the incubation stage, incubator has become an indispensable industrial organization form of business incubation in Chinese science parks. Since the first incubator in Wuhan in 1987, China has had more than 4000 high-tech business incubators, ranking first in the world, providing space and services for countless sci-tech personnel and returned overseas students to start a business. Among them, university science park is an important organization for business incubation. They rely on research-oriented universities or university groups, promote knowledge production, technological innovation, transformation of sci-tech achievements, incubation of high-tech enterprises, and cultivation of compound innovation and entrepreneurship talents, and become an important adhesive that facilitates close combination of science and technology with economy. Angel investment is the first step of high-tech business financing. With the rise of entrepreneurship by returned students and trans-regional entrepreneurship in Chinese science parks, angel investment grew up rapidly. Specialized organizations like club of angle investor and angel investment association sprang up and were dedicated to founding new-type incubators to promote the development of innovation enterprises with an investment and incubation-combined service mode.

NHZs cultivate a number of gazelle enterprises and unicorn enterprises to inject growth vitality for economic development. The term “gazelle enterprise” came from the Silicon Valley. It refers to enterprises in the high-tech industries which have crossed the death valley and entered the stage of rapid growth, and are marked by running fast (fast growth) and jumping high (active innovation). Unicorn enterprises are the best of gazelle enterprises with a valuation above US$1 billion within ten years from founding. In the new economy era, the number of gazelle enterprises and unicorn enterprises is an important sign of industrial development and economic prosperity, reflecting innovation vitality and development speed of a country and region. Chinese science parks treat the cultivation of gazelle and unicorn enterprises as the core work of promoting regional economic growth, and build modern enterprise accelerator, carry out training and provide oriented supports to speed up the gathering of superior resources towards high-growth enterprises. At present, the number of gazelle enterprises and that of unicorn enterprises in China are the most in the world, respectively 2857 (2017) [1] and 202 (2018)[2], and the enterprises usually lie in science parks with perfect business incubation mechanism like Zhongguancun (Beijing), Zhangjiang (Shanghai) and Donghu (Wuhan).

(3) Linking Global Innovation Network

Early science parks in China grew up rapidly as personal computers came to China and entered households. In the early 1980s, new foreign technologies and products represented by computer poured

1 Number of recognized gazelle enterprises in National High-tech Zones, source: Greatwall Strategy Consultants, *National High-tech Zone Gazelle Enterprise Development Report 2018*.

2 Number of recognized unicorn enterprises around China, source: Greatwall Strategy Consultants, *China Unicorn Enterprise Research Report 2019*.

into Zhongguancun. The earliest sci-tech enterprises there grew up by bringing in tech products and conducting secondary development in such a context, including Lenovo and other technology companies that worked to the localization of tech products. Those companies introduced IT revolution into China, integrating China into the global trend of sci-tech development. Nowadays, frontier technologies represented by AI, next-generation information communication and life science develop fast in Chinese science parks. China is even leading in some fields, from a follower to a forerunner in the coming fourth industrial revolution, thanks to the outstanding role of science parks.

From the early 1990s, Chinese science parks, especially those near the Pearl River Delta and the Yangtze River Delta, became the first to undertake international industrial transfer with significant location advantage and superior auxiliary services, began to focus on promoting joint venture cooperation with multinational enterprises, and introduced a number of foreign funded production plants of large scale, high technological level and strong industrial correlations. MNEs brought huge economic benefits to the science parks and became the strongest driver of economic growth for a time. With the increase of factor costs in the eastern region, science parks in the central and western regions also gradually became a new stage for international industrial transfer. Transfer of R&D innovation also kicked off in the meantime. MNEs successively set up R&D centers and technology centers in science parks with abundant innovation resources in Beijing and Shanghai. In recent years, as China's economy rises, it can no longer meet the development interests of MNEs to simply build manufacturing plants or R&D centers. Laying out a certain single function or link of the value chain in China gradually loses the former efficiency advantage. Many MNEs set their Greater China headquarters and even Asia-Pacific headquarters in China so as to integrate all value-chain processes from R&D to production and sales locally in the target market, in order to grasp and respond to market trends effectively. Some MNEs build industrial innovation platforms in China to lead industry development as organizer of industry innovation. For example, Microsoft not only set its Asia-Pacific R&D headquarters in China, but also established Microsoft for Startups and signed a cooperation memorandum with Beijing Municipal Science & Technology Commission and Commission of Economy and Information Technology to invest in innovation lab in Beijing and build innovation and entrepreneurship platform featuring resource aggregation and ecological sharing. A log of large MNEs including Merck & Co., ARM and Benz have laid out industrial innovation platforms in Chinese science parks.

Since the beginning of the 21st century, Zhongguancun saw an upsurge of overseas students returning home to start a business, and enterprises founded by overseas students thus became a major source of indigenous innovation in Zhongguancun at this stage. The 2008 financial crisis led to a second rise of overseas students returning home to start a business. Chinese science parks correspondingly issued a series of preferential policies for overseas high-level talents, and established startup parks for overseas students. Entrepreneurship by returned students became a vanguard in the development of Chinese science parks. In recent years, overseas political and economic environment isn't as optimistic for Chinese talents, which is reflected particularly in the immigration ban of the US, tightening of work and study visa policies, and the UK's cancellation of post-study work visa. On the other side of the world, however, China maintains economic prosperity and social stability. A new round of overseas students returning China, especially senior talents, emerges as a result, injecting new vitality into the development of science parks. In the meantime, more and more foreign innovative and entrepreneurial talents choose to start a business in Chinese science parks, becoming transnational or trans-regional entrepreneurs as "frequent flyers" that link China with their mother countries and.

(4) Supporting the Growth of National Economy

The most important and leading sci-tech enterprises in China almost all come from science parks. No matter the early pioneers like Lenovo, Founder and Huawei, or Baidu, Alibaba and Tencent, and the rising stars like Xiaomi, DJY and Sense Time, all developed considerably in science parks and grew into world-famous hi-tech enterprises. Science parks also bred a number of hi-tech industrial clusters. Zhongguancun next-generation IT and life science industrial cluster in Beijing, Zhangjiang bio-pharmaceutical industrial cluster in Shanghai, Donghu optoelectronic communication industrial cluster in Wuhan, intelligent equipment industrial cluster in Shenzhen, and Internet and intelligent security industrial clusters in Hangzhou have had a considerable scale and relatively strong international competitiveness. Zhongguancun, for instance, as a key source of sci-tech innovation and origin of emerging industries in China, has changed from a "follower" of world-leading level in sci-tech innovation and emerging industries to a "parallel runner" in various fields and even "forerunner" in certain fields. Active technological innovation and high-intensity input of sci-tech enterprises in R&D and innovation give rise to a unique "high-grade, precision and advanced" economic structure. In frontier domains like AI, intelligent hardware, VR, new materials and bio-technology, a number of world-leading original disruptive technologies have been commercialized and industrialized.

In the past 30 years, National High-tech Zones improve constantly in development quality and efficiency, becoming an important support of national economic development with significant advantage in intensive and efficient use of resources and in balance between investment intensity and benefits. In 2018, 168 National High-tech Zones contributed 12.0% of GDP with a total of RMB10.81 trillion, and 10.1% of national tax revenue with RMB1.39 trillion, up 18.1% year on year; by the end of 2018, there were 65,900 high-tech enterprises in National High-tech Zones, accounting for 36.5% of high-tech enterprises around China, while the number of employees in National High-tech Zones was only 19.41 million, accounting for 2.5% of employees throughout the country. In 2017, the energy consumption per RMB10,000 of GDP of National High-tech Zones was 0.484 ton standard coal, which was about 2/3 of national average. Hangzhou high-tech zone, for example, had an average growth in fixed assets investment of only 0.5% in the past five years, but an annual growth in GDP of 9.4%. The figures show that Chinese science parks have higher development quality and greater benefits, and are the vanguard in supporting the shift of momentum and structural transformation of the national economy.

1.4 Experience: Government and Market Combined to Develop New Economy

China's National High-tech Zones accumulate some pivotal experiences in the course of development which contribute a lot to the achievements and have great referential significance for science parks in other countries, especially in developing countries. The experience are mainly in the following aspects:

Encouraging entrepreneurship. Entrepreneurship is embodiment of economic vitality. Practice has proved that on the path of innovation driven development, the "universal problem" of transforming technology into productivity is only easy when solved through entrepreneurship, and it is the essence of the new economy development of the Silicon Valley. National High-tech Zones are places where innovation and entrepreneurship are most active in China and a vital carrier for fostering innovation and entrepreneurship forces. Instead of following the linear path from R&D to innovation and then to economic growth that science parks in developed countries normally take, or simply relying on the development path of industrial economy driven by factor input and efficiency improvement, National High-tech Zones have essentially learned market application and value realization of high technology through entrepreneurship from the Silicon Valley, that is, the entrepreneurship and innovation-driven new economy development path. From entrepreneurship by sci-tech personnel in the late 1980s to entrepreneurship by returned overseas students in the late 1990s and mass entrepreneurship in the 21st century, generations of innovative entrepreneurs write the magnificent chapter of Chinese science parks.

Implementing the National Torch Plan. National High-tech Zone has been a national project since its birth. In the 1980s, the central government made the development of high-tech zones an important issues while promoting the sci-tech system reform and eventually reflected it in the National Torch Plan. Therefore, National High-tech Zone is part of the national development strategy after the Reform and Opening-up, and an important reform attempt and development tool, thus receiving great support from the government, including legislation, policy measures and allocation of essential resources, and being given a special status. With the shortage of sufficient market conditions and innovation mechanism in early days, proactive national policies that conform to innovation laws and market rules are necessary guarantee for the success of science park development.

High-end link. In the era of innovation globalization, new ideas, technologies, modes and industries become important magnets that attracts innovation elements and essential conditions that nourish entrepreneurship. Global linkability is prerequisite for science parks to become successful. Strengthening industrial link, capital link and technological link with global innovation highlands with contacts at the core, and industrial innovation map as guidance, is important development path and impetus of Chinese science parks in the new round of globalization. The so-called high-end link means to connect with global innovation highlands in all rounds so as to receive factor spillover and industrial radiation from innovation highlands and keep pace with the world in innovation. Zhongguancun Science Park has established a close high-end link with the Silicon Valley and realized continuous flow and exchange of talents, information and capital. National High-tech Zones around the country also strengthen high-end link with innovation highlands including Tel Aviv and Sophia by building international sci-tech cooperation platforms and cross-border incubators to promote international innovation and entrepreneurship interconnection and cooperation.

Developing emerging industries. National High-tech Zones are vital fronts and core carrier for the development of hi-tech industries, the most important part of regional economic development around China, and the backbone of China's new economy, and represent the development level of high-tech industries and strategic emerging industries in China. In the course of innovation and entrepreneurship, along with dissolution and cross-border integration of industrial value chains, new industrial attributes or forms are constantly formed, which is manifested in that new industries, new business models and new technologies keep coming forth, promoting upgrading of traditional industries and replacement of old growth drivers with new ones. With continuous development of intelligent, service-oriented, flat business mode innovation, old and new industries interact and integrate across borders, gradually creating brand-new industrial system. Basic technologies like big data and IoT infiltrate into and integrate in various industries, creating new products, industry forms and demands and driving intelligentization, digitalization and networking of the industries. The next generation IT development blurs the boundaries of industries, leads to reconstruction of business modes, and generates new rules. Innovation-oriented industries keep springing up. The rise of digital economy, intelligent economy, platform economy and sharing economy stimulates rapid development of cross-border cooperation between regions, fields and technologies, and provides continuous momentum for industrial development.

Cultivating gazelle and unicorn enterprises. As a special group of high-growth enterprises, gazelle enterprises have drawn extensive attention from international community. The number of gazelle enterprises is taken by the Silicon Valley Index as a key index of entrepreneurial activity and economic prosperity of the Silicon Valley. Since Zhongguancun implemented the Gazelle Plan in 2003, National High-tech Zones around the country including Hangzhou, Xi'an, Changzhou, Wuhan and Guangzhou also launched their Gazelle Plan, and proposed a series of policies to support the development of gazelle enterprises, such as discovering and certifying gazelle enterprises, supporting and fostering gazelle enterprises and organizing gallize enterprise clubs, with good results achieved. Take Zhongguancun as an example, enterprises with explosive growth keep springing up in many industries, and in an accelerated speed. Gazelle and unicorn firms have become a new card of innovative development of Beijing. Since 2016, Zhongguancun has kept publishing the Zhongguancun Unicorn List to improve popularity and promote development of unicorn enterprises.

Creating innovation and entrepreneurship ecosystems. National High-tech Zones represent the best practice of innovation and entrepreneurship in China, and build ecosystems of innovation and entrepreneurship with startup, R&D and service at the core, with talent, technology and capital as resources, and with free culture, flexible mechanism and international livability as supports. National High-tech Zones vigorously support innovation bodies including enterprises, universities and scientific research institutions to increase R&D input, focus on the construction of innovation and entrepreneurship carriers like maker space and accelerator, build sci-tech innovation service system with reasonable structure and functions, and create ecosystem of innovation and entrepreneurship; accelerate innovation factor flow and circulation and inject vitality into the ecosystem through industrial organizers with resource integration ability such as trans-regional entrepreneurs, high-end sci-tech talents and angel investors; create an atmosphere for the birth and flourishing of new ideas, technologies and economy from the perspectives of idea, system, mechanism and living environment to arouse endogenous momentum for new economy.

2. Analysis of Belt & Road Science Parks

In May 2017, President Xi Jinping proposed to launch the Belt and Road Science, Technology and Innovation Cooperation Action Plan at the Belt and Road Forum for International Cooperation, including carrying out science & technology and cultural exchanges, jointly building laboratories, cooperation on science and technology parks, technology transfer, etc. Cooperation on science and technology parks has become the main content of the Belt and Road international science and technology innovation cooperation in the new era. There are a large number and a large variety of science and technology parks along the "Belt and Road" route. Through a quantitative analysis method, we have formed the contents for this chapter's report through three steps revolving around the aim of "objective demonstration":

Step 1: Collect and sort out the list of the science and technology parks worldwide. The list of members of the International Association of Science Parks (IASP), the list of science parks of UNESCO, the websites of the science and technology authorities of the countries around the world, web searches and other channels are mainly used to collect the basic information of science parks in the world except China and to screen and verify them, thus forming a total sample list of 500 science parks.

Step 2: Selection and in-depth study of key cases: For the parks whose sufficient information can be obtained through the web and direct contact, the selection is based on the criteria of reaching a certain scale, having the source of scientific and technological innovation, having the capability of scientific and technological incubation, forming industrial clusters, and being closely integrated into counties and towns, and excluding North America, a short list of research samples (attachments) including 74 science parks is formed. After that, in-depth information collection and analysis are carried out.

Step 3: Case information analysis and conclusion presentation. Process the information according to the purpose of the report and the characteristics of the data acquired, form the analysis results through data classification, comparison and other methods and display them visually. Eleven main conclusions are finally formed as the main content of this chapter.

2.1 Science Park Has Become a Global Phenomenon

There are altogether 500 science parks worldwide included in the statistics, of which 38 are in East Asia (excluding China) (7.6%), 45 in Southeast Asia and South Asia (9.00%), 8 in Oceania (1.60%), 49 in Central and West Asia (9.80%), 37 in Central and Eastern Europe and the CIS (7.40%), 8 in Africa (1.60%), 37 in South America (7.40%), 193 in Western Europe (38.60%), and 85 in North America (17.00%).

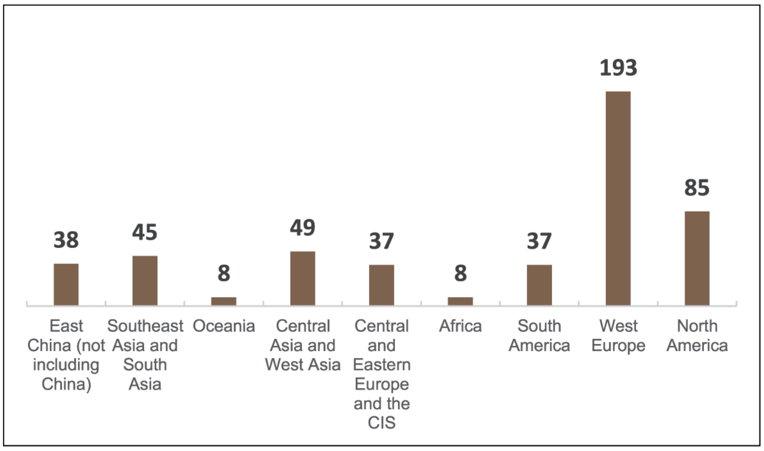

Chart 1: Distribution of Locations of Science Parks

Of all the 500 parks, 404 have provided the information of the date of establishment, accounting for 80.80% of the total. Among them, there is one science park established before the 1950s, which is less than 0.25% of the total; There are 23 science parks established between the 1950s and the 1980s, accounting for 5.69% of the total. The numbers of science parks established in the 1980s, the 1990s and the 2000s are 97 (24.01%), 107 (26.49%) and 105 (25.99%) respectively. There are 71 parks established after 2010 and under construction, accounting for 17.57% of the total.

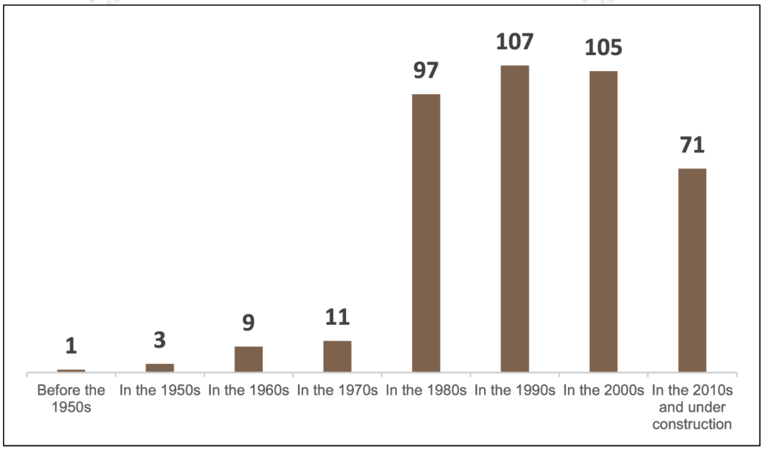

Chart 2: Time of Establishment of Science Parks

According to the establishment time and geographical distribution of the parks, among the science parks established in the 1950s, North America has the largest number of newly established parks, accounting for 75%. During the 1960s and the 1990s, Western Europe has the largest number of science parks, accounting for 44.44%, 54.55%, 69.07% and 48.60% respectively. Since the 2000s, science parks in Central Asia and West Asia have been rising rapidly, enabling these regions to lead in the number of newly established parks. Central Asia and West Asia saw 25 science parks established in the 2000s, accounting for 23.81% of the number of newly established parks in that decade, and 16 science parks established in the 2010s, accounting for 24.62% of the number of newly established parks in that decade. It can be seen that North America and Western Europe are the regions with the earliest start of science parks in the world. By the 1980s and the 1990s, they had become the regions with the largest number of science parks. However, since then, the construction of science parks has gradually shifted to the areas along the "Belt and Road" route, such as Southeast Asia, South Asia, Central Asia, West Asia, Central and Eastern Europe, and South America.

Time & region – quantity Time	North America	Oceania	Southeast Asia and South Asia	East Asia	Africa	South America	West Europe	Central and Eastern Europe and the CIS	Central Asia and West Asia
In the 1950s	3						1		
In the 1960s	3		1	1			4		
In the 1970s	2		1	2			6		
In the 1980s	16	2	2	5	1	1	67	1	2
In the 1990s	12	1	13	9		6	52	12	2
In the 2000s	9	2	12	10	3	16	20	8	25
In the 2010s	2		11	7	3	7	4	15	16

Chart 3: Analysis of Time of Establishment and Geographical Distribution of Science Parks

2.2 Intensification has been the Development Trend of Science Parks as the Density of Personnel and Businesses is on the Rise

From all 500 parks, we selected 74 cases along the route for in-depth investigation (excluding North America). Among them, 70 samples have provided the information of area, accounting for 94.59% of the total. Wherein, 32 have an area of less than 1 square kilometer, accounting for 45.71% of the total samples. Between 1 square kilometer (included) and 10 square kilometers, there are 22, accounting for 31.43%; with an area of 10 square kilometers or above, there are 16, accounting for 22.86%. Among them, the largest park is Japan's Kansai Science City, with an area of 1,300 square kilometers.

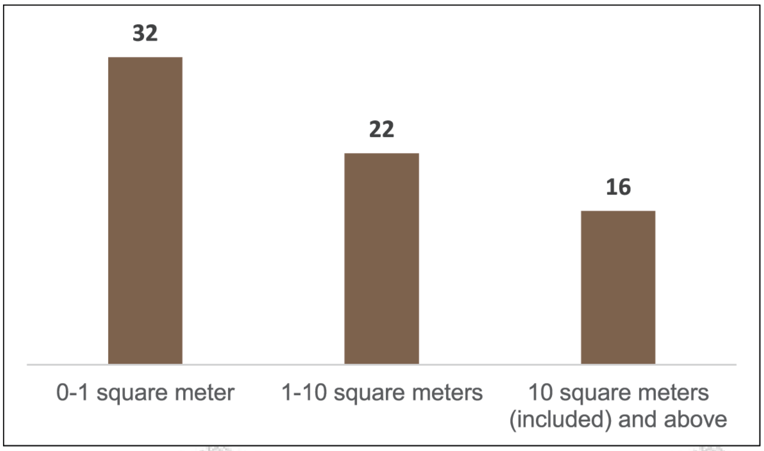

Chart 4: Areas of Science Parks

Of the 74 science parks, 41 have provided the information of the number of employees, accounting for 55.41%. Among them, there are 20 with 10,000 employees or less, accounting for 48.78% of the total data samples obtained, 9 with 10,000 (included) to 20,000 employees, accounting for 21.95%, 3 between 20,000 (included) and 30,000 employees, accounting for 7.32%, and 9 with more than 30,000 employees, accounting for 21.95%. Japan's Tsukuba Science City and Kansai Science City are the parks with the largest number of employees, both of which have a planned population of about 210,000.

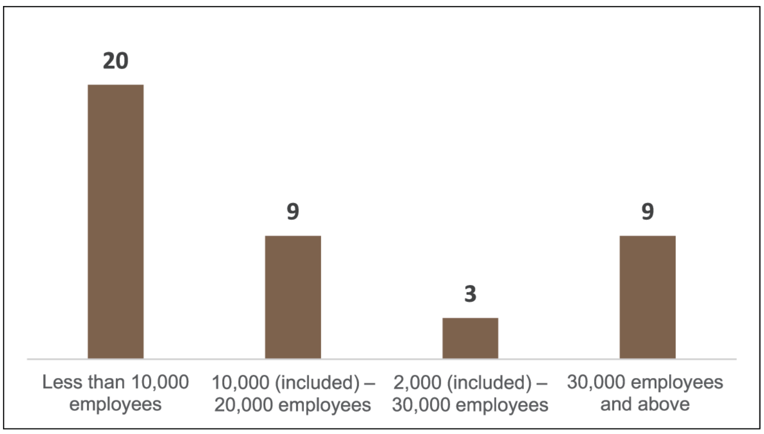

Chart 5: Information of Employees of Science Parks

Of the 74 science parks, 54 have provided the information of the total number of enterprises in the park, accounting for 72.97% of the total. Among them, there are 25 science parks with 1 to 150 enterprises, accounting for 46.30% of the data samples obtained, 12 with 151-300 enterprises, accounting for 22.22%, 6 with 301-450 enterprises, accounting for 11.11%, 1 with 451-600 enterprises, accounting for 1.85%, and 10 with more than 600 enterprises, accounting for 18.52%.

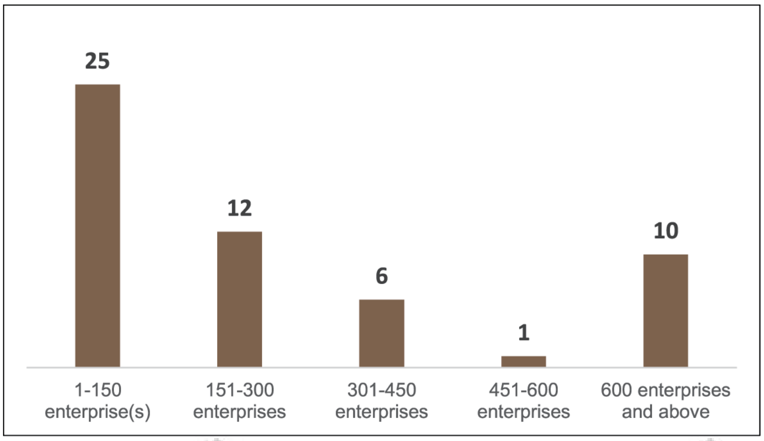

Chart 6: Distribution of Number of Enterprises in the Park

Based on the above data, information reflecting the degree of intensification of park construction and development can be obtained, such as the number of employees per unit area and the number of enterprises per unit area. Considering the establishment time of the parks, the science parks established in the 2000s has the highest number of employees per unit area (an average of 1,495 persons/km^2) and the number of enterprises per unit area (an average of 81.1 enterprises/km^2), followed by the science parks established in the 2010s, with the two figures reaching 1,296 persons/km^2 and 28 enterprises/km^2 respectively. The degree of intensification of the science parks established in 1980s and the 1990s is relatively low, mainly due to the relatively large average floor area of science parks in the two decades, reaching 145.82 km^2 and 43.63 km^2 respectively. It can be seen that although the degree of intensification declined in the 1980s and the 1990s under the background of the large-scale expansion of science parks, with the accumulation and exchange of experience, the science parks newly built in the past 20 years have been more efficient in the use of land space, with more employees and enterprises concentrated, even surpassing the early-established science parks, which reflects the trend of intensive development of BR science parks.

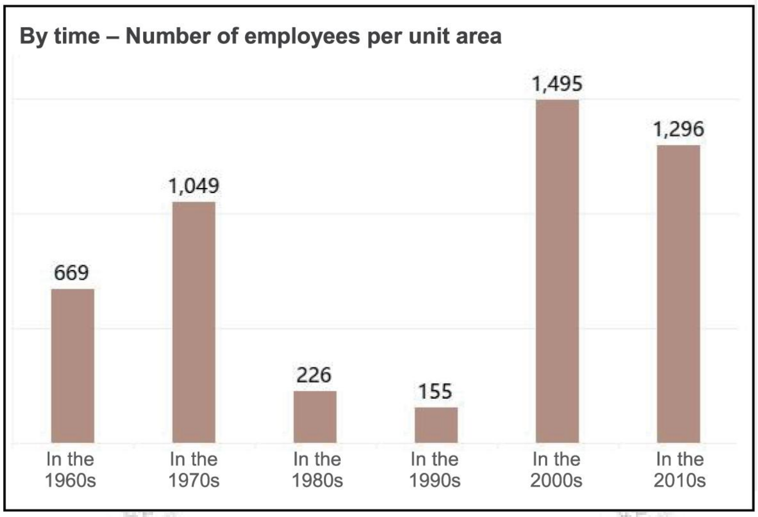

Chart 7: Comparison of the Number of Employees per Unit Area in Science Parks in Different Years

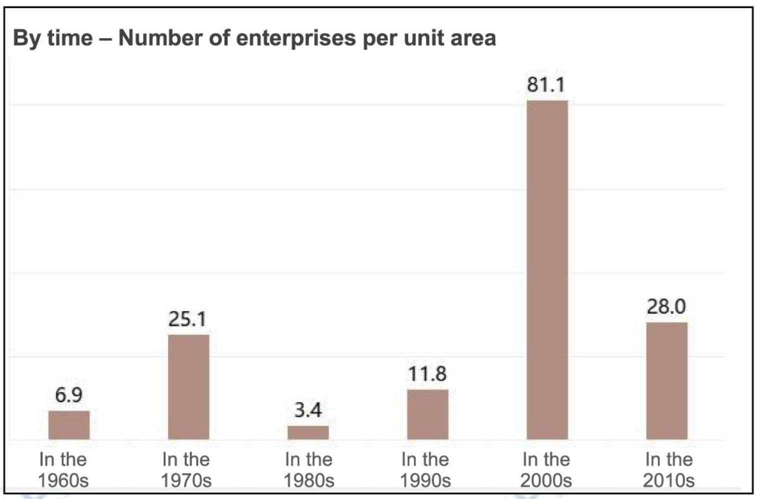

Chart 8: Comparison of the Number of Enterprises per Unit Area in Science Parks in Different Years

2.3 BR Science Parks are Closely Linked with Universities and Scientific Research Institutions

Of the 74 science parks, 69 have provided the number of colleges and universities in and around the park, accounting for 93.24% of the total. Among them, there are 28 science parks with 1 to 5 colleges and universities in and around the park, accounting for 40.58% of the total sample data obtained, 16 with 6 to 10 colleges and universities in and around the park, accounting for 23.19%, 11 with 11 to 15 colleges and universities in and around the park, accounting for 14.63%, 5 with 16 to 20 colleges and universities in and around the park, accounting for 7.25%, 9 with more than 20 colleges and universities in and around the park, accounting for 13.04%. Japan's Tsukuba Science City logy City has the largest number of colleges and universities in and around the park, reaching 300.

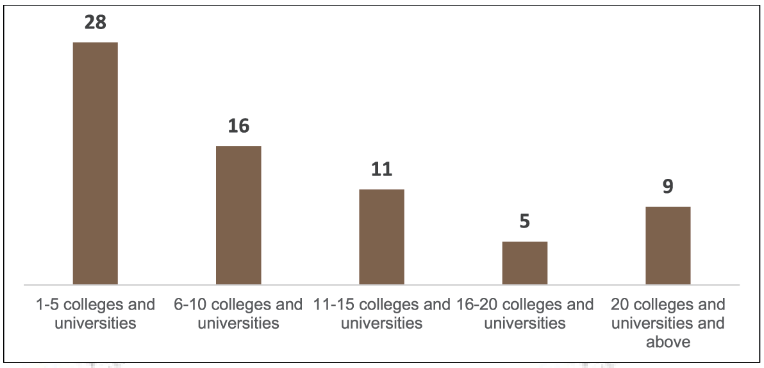

Chart 9: Distribution of Number of Universities in and around the Park

2.4 East Asia and Southeast Asia Boasts the Largest Average Area of Science Parks, Nearly 30 Times that of Other Regions

According to the classified statistics on the regional distribution and area of the parks, East Asia has the largest area of science parks, with an average area of 173.09 km^2, followed by Southeast Asia and South Asia, with an average area of 46.91 km^2. In addition, the average area of science parks in South America is 4.60 km^2, that in Western Europe is 4.03km^2, that in Central Asia and Western Asia is 3.41 km^2, and that in Central and Eastern Europe and the CIS is 1.90 km^2. The average area of science parks in Africa and Oceania is less than 1 km^2, being 0.88 km^2 and 0.29 km^2 respectively. If East Asia and Southeast Asia are taken as a whole, the average area of its science parks is nearly 30 times that of the rest regions.

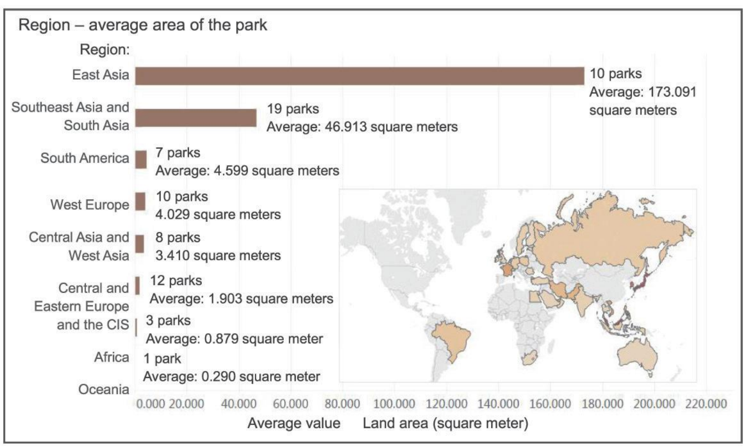

Chart 10: Comparison of Area of Science Parks in Different Regions

2.5 The Science Parks in Europe Boasts the Highest Employee Density, Averaging 3,335 Employees/KM^2

According to the arrangement and grouping of the number of employees per unit area in the park by region, the science parks in Western Europe have the highest employee density, averaging 3,335 employees/km^2, followed by Central and Eastern Europe and the CIS regions, with an average of 2,370 employees/km^2. The third is Oceania, with 1,500 employees/km^2. As the density of employees in the science parks in these three regions is obviously higher than that in other regions, they have constituted the first echelon, indicating that their science parks have more concentrated labor force factors and stronger strength. The following regions are Central Asia and West Asia (537 employees/km^2), East Asia (344 employees/km^2), South America (339 employees/km^2) and Southeast Asia and South Asia (128 employees/km^2).

Chart 11: Comparison of Number of Employees per Unit Area in Science Parks in Different Regions

A comparison of the number of employees per unit area in science parks by country shows that countries with an average number of more than 10,000 employees per unit area include Finland (13,500) and Sweden (12,000); Countries with an average number of 5,000 to 10,000 employees per unit area include Turkey (8,023), Britain (7,500), Germany (5,999) and India (5,344); Countries with an average number of 1,000 to 5,000 employees per unit area include Estonia (4,000), Russia (3,939), Ireland (1,901), France (1,892), Australia (1,500), South Korea (1,181) and Switzerland (1,000); Countries with an average number of less than 1,000 employees per unit area include Lithuania (546), Vietnam (347), Brazil (339), Japan (269), Poland (166), Singapore (164), Thailand (144) and Malaysia (73).

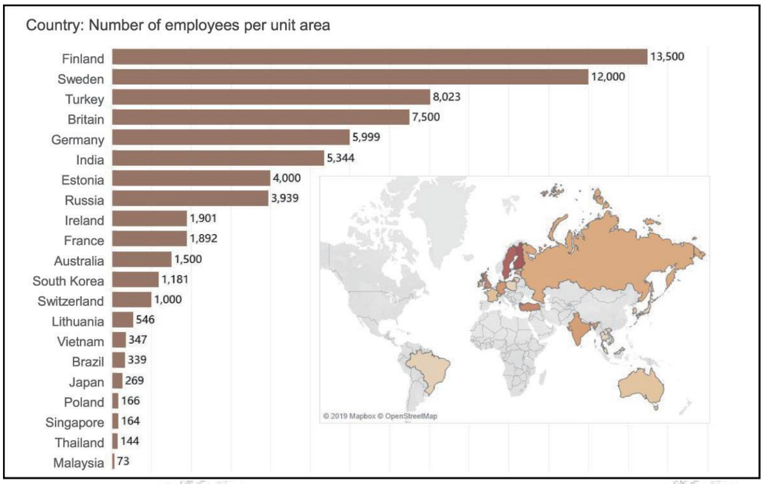

Chart 12: Comparison of Number of Employees per Unit Area in Science Parks in Different Countries

2.6 The Government-managed Science Parks Create the Most Jobs, Averaging 115,000

We divide the operation patterns of science parks into four categories: direct management by government, direct management by universities, management by operating companies, and management by social institutions (foundations, NGO, etc.). Of the 74 park cases, there are 19 that are directly managed by the government, accounting for 25.68%, 8 that are directly managed by universities, accounting for 10.81%, 28 that are managed by operating companies, accounting for 37.84%, and 19 that are managed by social organizations, accounting for 25.68%.

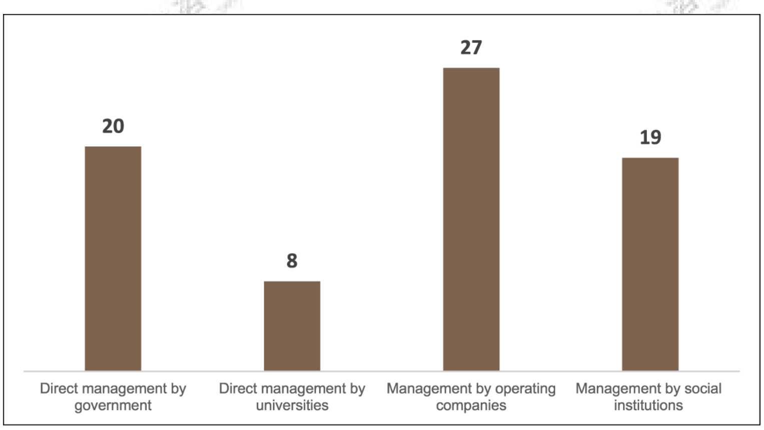

Chart 13: Comparison of Number of Science Parks of Different Operation Patterns

There are different development characteristics among science parks with different operation patterns, such as different park areas, the number of employees, and the number of enterprises in the park: the parks directly managed by the government have the largest area (averaging 87.87 km^2) and employment size (averaging 115,650), but the number of enterprises (averaging 280) is relatively small, which can reflect that such parks are generally home to larger enterprises.

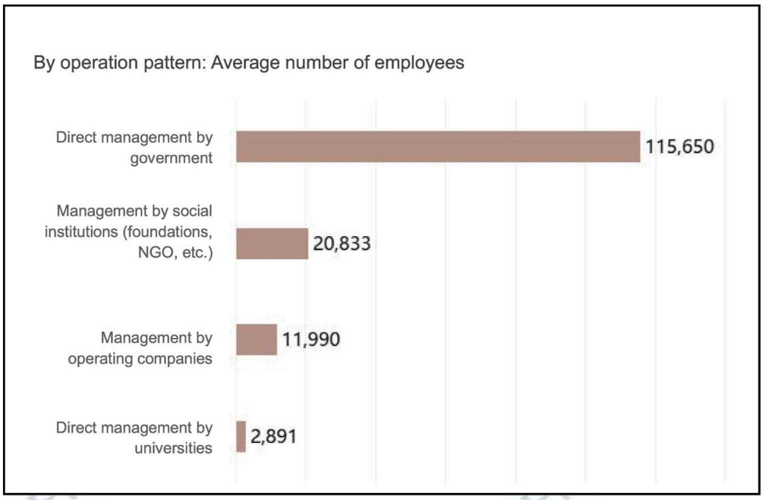

Chart 14: Comparison of Average Number of Employees in Science Parks with Different Operation Patterns

2.7 Enterprise- and Social Institution-operated Science Parks Have the Largest Number of Enterprises, Averaging 600 and above

The science parks managed by operating companies and social institutions has a relatively balanced scale in the average floor area (managed by operating companies: 32.12 km^2, managed by social institutions: 12.23 km^2) and employees (managed by operating companies: 11,900, managed by social institutions: 20,833), but has larger average number of enterprises than other types of operation patterns (managed by operating companies: 623.7, managed by social institutions: 653). On the other hand, the science parks managed by universities are characterized by small size, with the smallest average floor area (0.45 km^2), the smallest average number of enterprises (62.6) and the average number of employees (2,891).

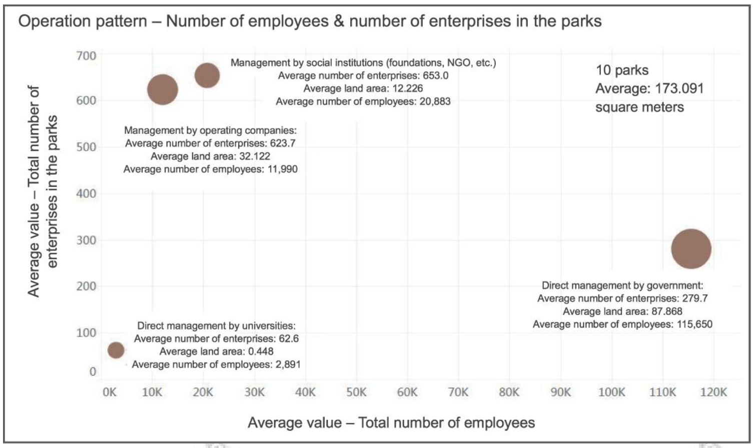

Chart 15: The Relationship between Operation Patterns and Number of Employees and of Enterprises

2.8 Governments are a Major Participant in the Development of B&R Science Parks, with a Participation Rate of up to 94%

In 74 park cases, there are 70 science parks with government participation in development, accounting for 94.59%. among them, there are 14 only with government advocacy, accounting for 20.00% of the total number of science parks with government participation. There is only 1 park only with government funding, accounting for 1.43%. There are 4 only with government participation in management, accounting for 5.71%. There are 18 with government advocacy and participation in construction rather than in management, accounting for 25.71%. And there are 33 with both government advocacy and funding and participation in management, accounting for 47.14%.

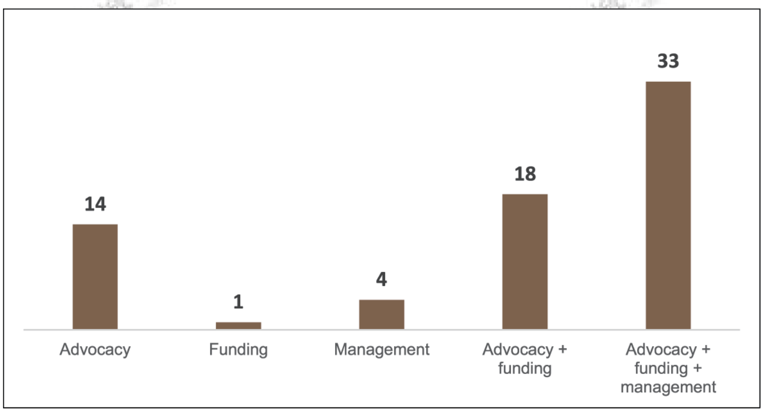

Chart 16: Government Participation in the Development of the Park

Among the 74 park cases, 73 science parks have provided the accurate information of development patterns, accounting for 98.65%. There are 41 science parks with a single development entity, accounting for 56.16% of the total number of the development pattern samples. Among them, 29 parks (accounting for 39.73%) are developed solely by the government, 5 (accounting for 6.85%) by enterprises and 7 (accounting for 9.59%) by universities. There are 32 science parks with multiple development entities (accounting for 43.84%). Among them, 26 parks (accounting for 35.62%) are of PPP mode (cooperation between government and social capital) and 6 parks (accounting for 8.22%) are funded by multiple non-governmental organizations.

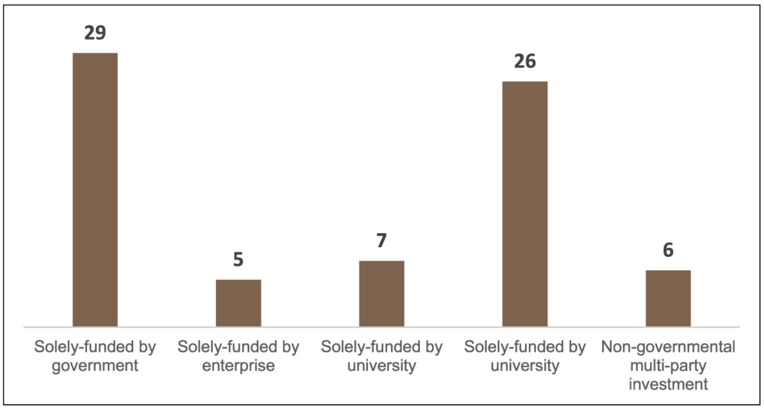

Chart 17: Development Patterns of the Science Parks

Statistics on the sample number of science parks with different development patterns show that the government has participated in the development of the vast majority (55, accounting for 75.34% of the total sample number) of science parks. The development patterns include independent development and PPP (i.e. cooperation between the government and social capital). The parks developed by PPP mode and managed by an operating company are the most, accounting for 22%, followed by the parks directly developed and managed by the government, accounting for 19.75%, and the parks developed by PPP mode and managed and operated by social institutions, accounting for 10.96%. In addition, there are 7 science parks developed solely by universities, accounting for 9.46% of the total sample. There are 6 parks jointly developed by multiple non-governmental entities, accounting for 8.11% of the total sample. And there are 5 parks developed solely by enterprises, accounting for 6.76% of the total sample.

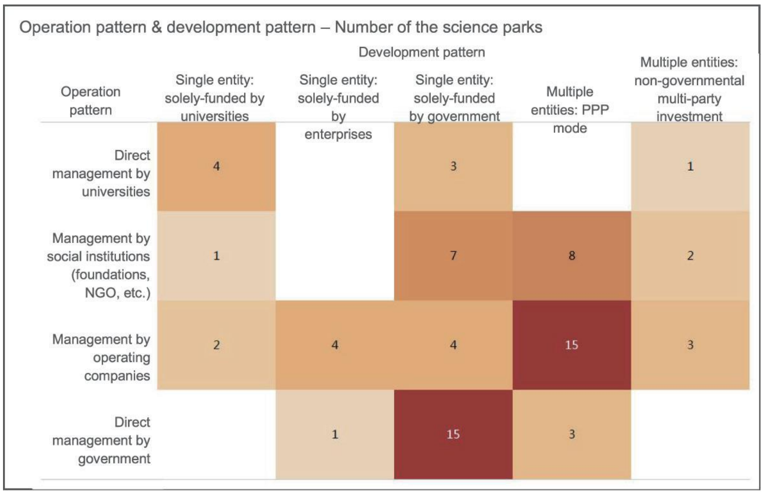

Chart 18: The Development and Operation patterns of the Science Parks

Statistical analysis of the regional distribution around the park development patterns shows that government participation of science parks exceeds 50% in all regions, and the science parks with the highest degree of government participation are mainly concentrated in the regions of developing countries. Among them, East Asia is the most prominent, with 10 cases involving government participation in development, accounting for 100% of the total number of samples in the region, followed by Southeast Asia and South Asia, with 17 cases involving government participation in development, accounting for 89.47% of the total number of samples in the region. In addition, there are 9 cases involving government participation in development in Central and Eastern Europe and the CIS, accounting for 75% of the total number of samples in the region. There are 7 cases involving government participation in development in Western Europe, accounting for 63.64% of the total number of samples in the region. In South America, there are 4 cases involving government participation in development, accounting for 57.14% of the total number of samples in the region. There are 5 cases involving government participation in development in Central Asia, accounting for 50% of the total number of samples in the region. And there are 2 cases involving government participation in development in Africa, accounting for 50% of the total number of samples in the region.

Region & development pattern – number of the science parks

Region	Development pattern: Single entity: solely-funded by universities	Single entity: solely-funded by enterprises	Single entity: solely-funded by government	Multiple entities: PPP mode	Multiple entities: non-governmental multi-party investment
East Asia			2	8	
Southeast Asia and South Asia		2	13	4	
Central and Eastern Europe and the CIS	1		4	5	2
Central Asia and West Asia	3	1	2	3	
Africa	1		1	1	1
South America	2	1	3	1	
West Europe		1	3	4	3
Oceania			1		

Chart 19: Distribution of Development Patterns of Science Parks in Different Regions

2.9 Electronic & Information and Bio-medicine are the Most Widely Developed Industries, Accounting for over 60%

Of the 74 science parks, 73 have provided industrial information. Among them, there are 55 parks that develop electronic & information industry, accounting for 75.34% of the total samples obtained, 44 that develop biological and new pharmaceutical industries, accounting for 60.27%, 10 that develop aerospace, accounting for 13.70%, 28 that develop new materials industry, accounting for 38.36%, 12 that develop high-tech services, accounting for 16.43%, 25 that develop new energy and energy conservation, accounting for 34.25%, 13 that develop resources and environment, accounting for 17.81%, and 19 that develop advanced manufacturing and automation, accounting for 26.03%.

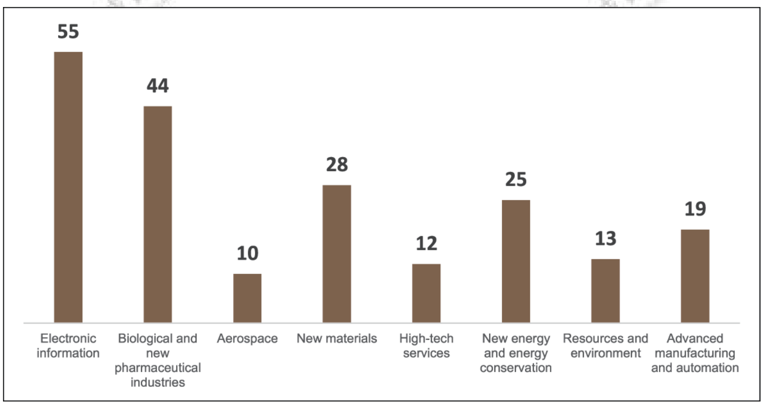

Chart 20: Statistics of Industrial Types in Parks

2.10 The Science Parks with Legislative Support are mainly Located in Developing Countries along the Route, Accounting for 28.4%

Of the 74 park cases, there are 21 in which the country where the park is located has enacted laws related to the development of science parks, accounting for 28.38%, involving 10 countries such as Singapore, India, Indonesia, Vietnam, South Korea, Japan, Brazil, the UAE, Turkey, Kyrgyzstan, etc. And there are 53 science parks enjoying preferential policies in terms of scientific and technological innovation and enterprise development, accounting for 71.62%.

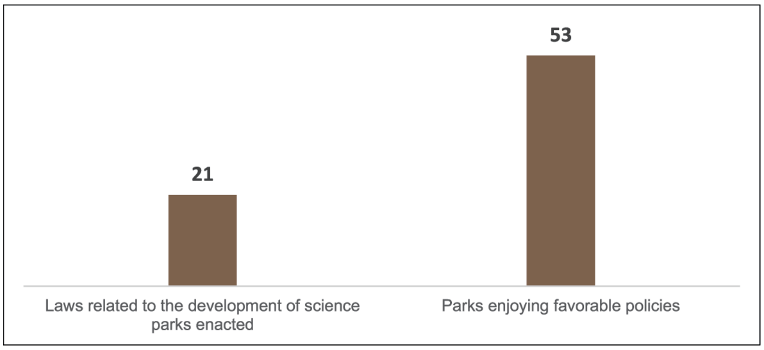

Chart 21: Relevant Legislation and Preferential Policies in the Park

According to the regional distribution, the analysis of the park's legislative support shows that the countries where the parks are located has park-related legislation are mainly concentrated in Asia. Among them, East Asia boasts the most science parks with legislative support, reaching 9, accounting for 42.86% of the total number of legislative support samples, followed by East Asia and Southeast Asia, where 8 science parks have legislative support, accounting for 38.10%. Central Asia and West Asia have 3 science park samples with legislative support, accounting for 14.29%.

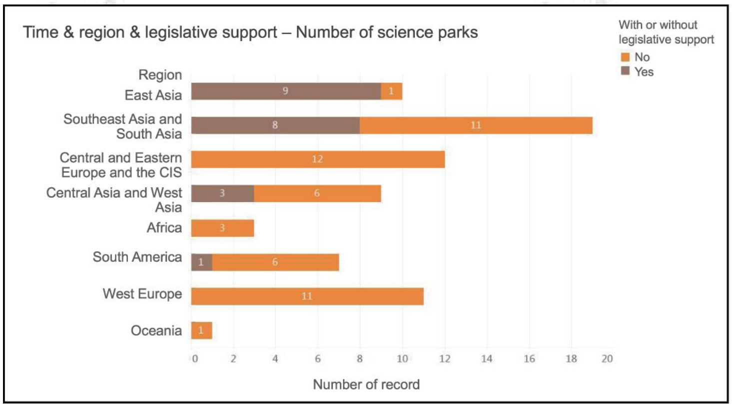

Chart 22: Legislative Support to Science Parks in Different Regions

2.11 Over Half of the Science parks have Established Cooperation with China, mainly in East and Southeast Asia

Of the 74 science parks, to our knowledge, 68 parks have carried out international cooperation, accounting for 91.89%. Among them, 38 parks have established cooperation with China, accounting for 51.35% of the total.

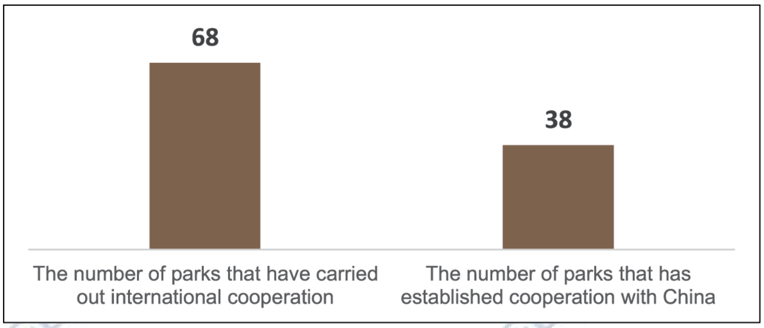

Chart 23: Number of Science Parks Carrying out International Cooperation and Cooperation with China

Due to geographical factors, science parks which are located in areas close to China cooperate more closely with China. Among the parks that, to our knowledge, have established cooperation with China, the largest number of parks is located in Southeast Asia and South Asia, reaching 13, accounting for 34.21% of the total number of samples and 72.22% of the total number of cases in the region, followed by East Asia and Oceania, with 6 parks cooperating with China, accounting for 85.71% of the total number of cases in the region. In addition, there are 6 parks in Central and Eastern Europe and the CIS that cooperate with China, accounting for 85.71% of the total number of cases in the region. Western Europe has 5 parks that cooperate with China, accounting for 55.56% of the total number of cases in the region. In Africa, there are 3 parks that cooperate with China, accounting for 75% of the total number of cases in the region. In South America, there are 3 parks that cooperate with China, accounting for 42.86% of the total number of cases in the region. In Central Asia and West Asia, there are 3 parks that cooperate with China, accounting for 33.33% of the total number of cases in the region.

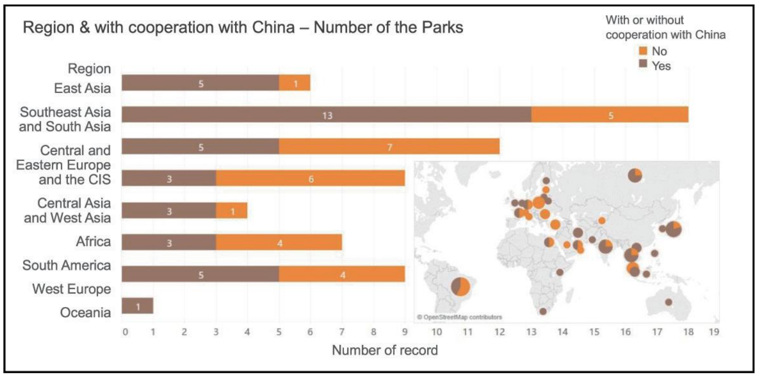

Chart 24: International Cooperation by Science Parks in Different Regions

3. Development Trend of Science Parks around the World

Since 2010, the number and scale, concept scope, organizational logic and development pattern of the science parks around the world have shown a changing trend, reflecting the characteristics of blending and transformation. In general, under the background of the post-global financial crisis, the number and scale of science parks around the world have changed from rapid growth to stable adjustment; construction and operation patterns have further diversified; reorganization and integration have become frequent; the concept scope of science parks has continued to expand; the beneficial development experiences accumulated by each country have been more exchanged and disseminated; more emphasis has been placed on planning and design and green, sustainable development; the internationalization process and international cooperation of science parks have received unprecedented attention and promotion, and science parks have been further integrated in a diversified way. To sum up, there are mainly the following trends.

3.1 Spatial Form: From Urbanization of Parks to "Park-ization" of Cities

The urbanization of parks mainly refers to the process of early science parks gradually developing into emerging cities. After years of development, some early science parks in developed countries, especially those located in the suburbs, have gradually evolved into new innovative cities, such as the North Carolina's Scientific Research Triangle Park in the United States, with the increase of population density and congregation of living facilities such as catering and retail. What is more typical is that some science parks that started late in developing countries, such as China's National High-tech Zones, have followed the blueprint of sci-tech new towns from the beginning of planning and construction. They are not only the carrier of the combination of science and technology and industry, but also the important contributors and promoters of the development of their cities, leading the development direction of modern urbanization through rational planning, advanced design of city infrastructure, scientific and technological innovation and integration of production and city. The urbanization of parks has existed for a long time and evolved gradually, but in recent years there has been a transition from quantitative change to qualitative change, reflecting the overall development trend of science parks together with the rise of park cities.

The "park-ization" of cities reflect the trend of traditional cities or urban areas enhancing their development vitality by creating innovative and entrepreneurial ecosystems, especially after the financial crisis. In recent years, the concept "innovation area" has gradually caught on. In fact, it is an expansion and upgrade of the concept scope of science parks. It includes any city group, city, city district or town that has innovative features and development vitality in science and technology and culture, and has clear strategic intention and management measures for innovative development. Innovation areas usually take science parks as the core, or have innovation sources, service systems, policy environments and management systems similar to science parks. Their geographical coverage is much larger than that of traditional science parks, but their asset scale, core carriers, management organizations and operation processes are often more streamlined and flexible. The concept of "innovation district" put forward by the US Brookings Institution in 2014, which also belongs to an area of innovation and is an expression of the "park-ization" of the city, holds that the geographical characteristics of innovation and entrepreneurship are undergoing fundamental changes, and the dominant position of the Silicon Valley-style suburban science park characterized by decentralized layout, spatial isolation and emphasis on confidentiality is challenged. On the other hand, an "innovation district" is emerging, which is located in the traditional city and gathers high-end R&D institutions, incubators and business promotion institutions, high-tech enterprises and start-up enterprises, characterized by compact physical space, accessible transportation, network technology, etc., and has high-quality supporting facilities for residential purpose, office and retail.

3.2 Fundamental Functions: From Industrialization of Innovation to New Economic Ecosystem

Industrialization of innovation is the innovation path under the logic of industrial economy. In the past, the core function of science parks was to promote the transformation of scientific and technological achievements into commodities. Whether it was led by laboratories of colleges and universities and driven by enterprises in the market or bridged by public government departments whose goal was to speed up this process. In the era of industrial economy, innovation is the continuous application and industrialization of new knowledge in Joseph Schumpeter's economic sense. It is often the process that technology becomes a product and is pushed to the market. Therefore, innovation and technology life cycle are closely linked, reflecting the stylized characteristics from basic research, applied research, commodity development to mass production. At the same time, the value process of R&D-production-consumption also features the irreversibility of cause and effect. More often than not, R&D determines production and production determines consumption. Hence, the focus of early science parks was to give priority to R&D while also taking production into consideration, thus influencing and even leading consumption and shaping industrial and economic forms. It is such logic that gave birth to a number of science parks in the 1970s and the 1980s that paid too much attention to R&D while ignoring the principles of combining production with research and integrating production with city. Facts have shown that the value division separated from the industrial division is of no significance, and innovation chain can produce the expected outcome only by focusing on the industrial chain. It took decades for the science parks around the world to perfect their knowledge and application of the laws of innovation.

The new economy ecosystem is a mature form of innovation-driven economy and the best embodiment of the endogeneity of new growth. New economy ecosystem includes innovation and entrepreneurship ecosystem and industrial ecosystem. Innovation and entrepreneurship ecosystem is the source of new economic development, and industrial ecosystem is the result of sustainable development of innovation and entrepreneurship. The new economy mainly includes the vertical evolution and horizontal interweaving of economic forms, economic patterns and industrial formats, which not only reflects the changes in the internal logic of the new economy, but also embodies the innovation of its overall development structure and organizational pattern. In the new economy era, industries are transitioning from different categories to cross-border integration. Production determines the direction of consumption and consumption impacts production. The characteristics of the organization pattern are changing from “systematization, structure and stratification” to “flat, decentralized and networked”. The social production and life style in the industrial era is facing a comprehensive and profound adjustment. In the past, closed and stylized innovation processes were gradually replaced by open and ubiquitous innovation dynamics. Creative talents replacing capital has become the most important innovation resource. Hence, innovation is no longer limited to the economic significance from the laboratory to the market, but extends to the social and cultural significance, as evidenced by the fact that innovation becomes a spiritual value and its failure is tolerated. Under this background, the unique function of science parks is to create a new economy ecosystem. By providing necessary functional facilities, supporting conditions, service environment and gathering related resources, spontaneous, random and ubiquitous innovations are bred instead of the past stylized innovations, and various innovations are stimulated, nurtured and effectively transformed, thus resulting in new technologies, new products, new models and new industries.

3.3 Connection Mode: From International Value Chain to Global Innovation Network

The international value chain dominated by large multinational corporations was the main way for the early science parks to establish international link. Under the condition of industrial economy, the formation of international industrial division pattern or urban division system is mainly dominated by large multinational enterprise groups. Their headquarters and global R&D centers are often located in the major cities or science parks of developed countries. At the same time, industrial distribution is carried out to other countries and regions around the world in the order from the high end to the low end of the value chain, forming an inter-country, inter-city and inter-park industrial division system from the center to the periphery. Due to their relatively backward innovation and competitiveness, science parks established later by developing countries often realize international development by undertaking the functional layout of large foreign-funded multinational enterprises and integrating into international industrial division of labor, gradually crawling their way up from the low end of the value chain, and usually featuring the functions of production and manufacturing, R&D, regional headquarters, etc. Under such conditions, multinational corporations and large enterprise groups are almost the core carriers and channels for the flow and allocation of innovative factors such as international capital, technology and talents, while the driving force for the flow of factors comes from the potential difference of comparative advantages between countries and regions. In such an international industrial organization system and the factor movement rule, the early science parks began to develop internationally and established their initial international links.

With the deconstruction and reconstruction of traditional industries by the new economy, the main driving force of international flow has changed from large multinational corporations to ecological global innovation peak areas. Under the new economy conditions, innovation have shown new characteristics such as cross-border open source in various fields, popularization of participants and networking of organizational structures. The cross-regional allocation of innovation factors is more efficient, and innovation cooperation and competition worldwide are more frequent. The core of global flow is no longer production factor and material products, but innovation factors and information resources with spontaneous, multidirectional and flexible features. Its flow constitutes a global innovation network including several hubs and nodes. At the same time, with the new round of scientific and technological revolution and industrial transformation, all regions and cities, taking the creation of high-quality innovation and entrepreneurship ecosystem as their new development logic, have contributed to the accelerated emergence of new ideas, new models, new technologies, new formats and new industries. Supported by information economy, knowledge economy, innovation economy, entrepreneurship economy and creative economy, they are striving to become a new “innovation peak” in the global economy and urban division of labor system and an important node in the global innovation network. The core factors of the global innovation network are not limited to the micro-level innovation subject, nor are they highly dependent on the medium-level multinational corporations and large enterprise groups. Instead, it is replaced by the innovation regions with good innovation ecosystem and strong innovation functions, which are known as the “global innovation peak regions”. Such innovation areas often refer to science parks, especially international metropolises that combine science parks and integrate with science, production, and people.

4. Outlook: Innovation Community

4.1 Vision: Building B&R Science Park Innovation Community

Science parks are the main force of international innovation cooperation and innovation community construction in the new era. Under the historical trends of globalization of innovation, and cross-regional integration, it is the general trend and the will of countries to join hands in innovation, common development and common prosperity. The world needs to explore new mechanisms and new modes of international innovation and cooperation. In particular, it is necessary to integrate new methods and new paths such as cross-border innovation, open innovation, and collaborative innovation into the international innovation and competition relationship in the era of globalization of innovation, so as to spark spontaneous, multidimensional, and ecological innovation activities in a wider range of the world and promote the further prosperity of new economy and new industries. Science parks, as a pioneering effort of science and technology industrialization and the highland of innovation and entrepreneurship in the 20th century, have rapidly become an important pole of economic growth since their inception, setting off upsurges of construction and development throughout the world and spreading to almost every corner of the world. Science parks can effectively promote the prosperity and interaction of innovation and entrepreneurship ecosystem, the cultivation and aggregation of science and technology enterprises and emerging industries, the scene verification and marketing of innovation achievements, the free and efficient allocation of innovation factors, and promote the prosperity of new economy worldwide through open cooperation and collaborative innovation. Today, with the deepening evolution of globalization, science parks are bound to further play their role as hub nodes, innovation platforms and organizers of science and technology industries, and become the backbone of building an innovation community.

Building an innovation community of B&R science parks will help to further strengthen the global innovation network. Under the background of the “Belt and Road Initiative”, science parks will be taken as the main players of cooperation to build an innovation community, focusing on the principles of consultation, sharing and co-construction, giving full play to their leading role and promoting the “new five aspects” of innovation cooperation as follows.

(1) Integration of Innovation and Entrepreneurship Ecosystems

The link and integration between innovation and entrepreneurship ecosystems in science parks is the top priority in building an innovation community. Science parks should continuously expand international exchanges and cooperation around the three core components of innovation and entrepreneurship ecosystem, including R&D, entrepreneurship and service. In terms of R&D, the functions of the international communication platform of the five major R&D entities, including universities, scientific research institutions, enterprise R&D platforms, scientific apparatus and application-oriented new R&D institutions, should be brought into full play. On the basis of strengthening traditional R&D cooperation, such as joint research and exchange of scientific and technological personnel, the focus should be put on promoting industry-oriented and market-oriented international cooperation projects, advocating the cross-border transformation and application of international industry-university-research interaction and scientific and technological achievements, and establishing a new mechanism for open and collaborative innovation and cooperation. In terms of entrepreneurship, the aim is to support the innovation and development of all kinds of entrepreneurs, explore and cooperate to build international maker spaces, offshore incubators and accelerators and other entrepreneurship carriers, carry out entrepreneurship education and training, strengthen entrepreneurship exchanges, hold international entrepreneurship competitions and hackathons; create a dynamic, open and inclusive innovation and entrepreneurship culture environment, and encourage cross-border and cross-regional entrepreneurship. In terms of services, efforts should be made to promote the international development and business expansion of specialized and market-oriented scientific and technological service institutions, focusing on the development of international business consulting services, transnational venture capital services, international technology transfer services and international intellectual property consulting services in a bid to build a sound international innovation and entrepreneurship service system and serve the internationalization of local entrepreneurship and the localization of international entrepreneurship, and strengthen the ties of cooperation between transnational R&D and entrepreneurship.

(2) Connectivity of Enterprise Industrial Platforms

The cross-border distribution and interaction of enterprises and industries in science parks is the key support for the construction of an innovation community. Science parks should give full play to the fundamental role of enterprises in international economic exchanges, develop the echelons of international enterprises from start-ups, fast-growing enterprises and large multinational corporations, and encourage international innovative cooperation and business exchanges among enterprises by supporting international business associations, setting up platforms for international cooperation among enterprises, and strengthening exchanges, exhibitions and dialogues among enterprises; Support gazelle enterprises and unicorn enterprises to realize international development by taking them as windows, and radiate new models and technologies with explosive potential to more regions; Encourage large, platform-based enterprises with industrial organization capability and innovation platform functions to carry out cross-border layout with the help of science parks, and use their innovation resources to carry out innovation activities so as to promote cross-border integration, collaborative innovation, symbiosis and mutual prosperity of enterprises, customers and partners, and to activate innovation ecosystem. We advocate that science parks should not only deepen existing industrial cooperation, but also strengthen cooperation in "new production capacity" in the field of science and technology, build industrial innovation platforms, jointly stimulate the potential of innovation and entrepreneurship ecosystem to breed new industries and formats, promote cross-border coordination of new economic industries such as digital economy, intelligent economy, platform economy and sharing economy, continuously spawn new economic forms and new formats with more subdivisions, from "points" of innovation to "lines" of industry to "sides" of economy, realize full connectivity from innovation and entrepreneurship ecosystem to industrial ecosystem to new economic ecosystem, and form links and radiations of original industries.

(3) Bridging of Market Application Scenarios

International synchronization of new technology market application scenarios in science parks is the successful guarantee for the construction of innovation community. Science parks should be based on the market, combine with the market, cultivate the market, actively carry out international economic and trade investment and market cooperation, speed up the development of innovative products acceptable to the market and their entry into the international market, and focus on international exchanges in the construction of new technology application scenarios. Through the construction of scenario laboratories and application pilot projects, science parks should find the best application for new technologies and new products from around the world, leverage digitization, intelligence and networking to jointly promote the cultivation of new business models, industrial forms and lifestyles based on new scenarios in a number of fields and nurture future industries. Taking the construction of science parks or innovative urban areas as an opportunity, efforts should be made to strengthen scenario research and international exchanges, collect and apply cutting-edge digital intelligent technologies worldwide, carry out scenario innovation and pilot projects in key areas such as transportation, medical care, education and commerce, build new technology application laboratories, construct smart cities with a sense of science and technology and a sense of future, and continuously improve the service level and governance level of parks and cities.

(4) Smoothing Flow of Factors

The cross-border smooth flow of various innovation factors in science parks is a necessary prerequisite for the construction of an innovation community. Science parks should promote the mutual flow and exchange of talents, capital and goods (services) and optimize their allocation to inject power into the innovative economy. In terms of talents, efforts should be made to strengthen international exchanges through such channels as colleges and universities, business start-up service agencies, etc., speed up the creation of a service environment and institutional environment conducive to the flow and development of international innovative and entrepreneurial talents, and create an international "talent ecosystem" in the new economic era by building an international entrepreneurial talent community and providing necessary supporting facilities and services to create a good environment for talents to start their own businesses, find jobs, work and live. In terms of funds, cross-border venture capital should be encouraged, cross-border exchanges between investors and entrepreneurs should be promoted by holding roadshows for international venture projects and international venture forums, and international development of venture capital institutions should be supported. In terms of goods (services), efforts should be made to create an internationalized and convenient business environment, promote international trade and investment exchanges, ensure that science parks have first-class business facilities and supporting systems and can become an important window for international economic and trade cooperation and an important link in the international market, encourage the development of modern service trade and emerging business formats based on information technology such as the Internet, cloud computing and big data, and rely on high-tech goods and high-value services to improve the quality and level of trade and realize the goal of "the best in and the best out" in international trade.

(5) Communication of Ideas

International exchange of development concepts and management and operation experiences of science parks is an important part of the construction of innovation community. Science parks should strengthen international exchange and dialogue, actively participate in global, regional and group science park professional associations, alliances and communities, establish international friendly and cooperative partnerships such as "sister parks" and "twin parks", share development experiences and jointly promote innovation. Through organization and participation in international science park construction and management-related training courses, seminars, exchange camps, internships and other activities, the exchange and interaction between science park managers and experts and scholars in various countries should be strengthened, and the dissemination and mutual learning of different science park development concepts, models and paths promoted; Strengthen the exchange of experience and technology promotion in the construction of green, environment-friendly and eco-friendly parks; Establish international science park research funds to support joint research on park planning and policies, innovation ecosystem construction, internationalization paths and other fields, to grasp the latest developments and provide development suggestions; Explore the co-construction and cooperation of international science parks, support large multinational enterprises and park developers to design projects spontaneously based on market demand and business needs, and join hands with governments, financial institutions, professional institutions, industry organizations, universities and institutes of the two countries to provide necessary guarantees throughout the whole planning, construction and operation cycle of the projects. International communication should be carried out at the park management and operation level, and international ties between science parks could be strengthened through the establishment of representative offices and building of service platforms.

4.2 Initiative: New International Organization for Establishing Innovation Community of Science Parks

The realization of the “new five aspects” of international innovation cooperation cannot be achieved without the joint participation of science parks around the world. The science parks around the world urgently need to break the traditional obstacles and path dependence in international exchange and cooperation, and transform from exchange of experience and information to sharing of resource factors, from industrial division of labor and cooperation to cross-border collaborative innovation, from international technology transfer to high-end link and radiation, and from exchanges between parks to ecosystem interaction. This requires science parks to open up and cooperate in a wider scope and at a deeper level, to support the international development of all kinds of innovative subjects, and to provide infrastructure and first-class services in line with international standards. At the same time, a new cooperation platform to meet the needs of international innovation cooperation in the new economic era is needed to promote the formation of innovation community.

Therefore, taking science parks along the route and even around the world as the main participants and service objects, we hereby propose to create Community of International Science-Industry Parks in a bid to build an international, professional and pragmatic cooperation platform for science parks around the world, promote the international exchange of innovative and entrepreneurial talents, accelerate the construction of cross-border innovation ecosystem, support the international development of high-tech industries, strengthen knowledge sharing and resource sharing, jointly deal with challenges, promote the high-quality and sustainable development of science parks around the world, and make contributions to the innovation road of the “Belt and Road Initiative” and the construction of innovation community.

Conclusion

Looking back on the past, the history of human progress fully shows that the source of prosperity comes from people's desire to participate in innovation and creation, explore the unknown and meet challenges. It is this kind of value that inspires people to continuously open up new development space outside the original economic activities and social daily life, thus igniting the endogenous vitality of innovative development and sustainable development.

Under the background of the third scientific and technological revolution and the initial entry of innovation economics into the human knowledge system, the science park is an organization mechanism and system arrangement of economic activities that is created to purposefully promote the industrialization of scientific and technological innovation and is an important innovation in promoting economic development through innovation. After more than half a century of evolution and expansion, the construction of science parks has become a worldwide movement, spreading the spirit of the new economic era, which encourages innovation and entrepreneurship to every corner of the world, making it a synonym for progress and fashion, greatly reducing the economic, social and cultural distance between countries around the world. Today, even if we have not visited any country or region or have had no in-depth understanding of it, as long as we know that there are science parks here, we will naturally develop an impression of openness, progress and vitality.

Looking ahead, the prosperity of the new economy makes the vitality of such innovation more important. Entrepreneurial innovation is the embodiment of endogenous economic vitality in the new economic era, and is also the power source of innovative development patterns. Conforming to this trend, the external form and internal function of the science park have further evolved. As the gestation, discovery, cultivation and amplification of creativity and innovation become the core of all operations, the service and environment of the park will be built around the comfortable life of "people", social interaction, inspiration and entrepreneurial innovation. Innovative regions, innovative urban areas and other new forms will emerge as the times require.

The internal demand and necessity of international exchange and cooperation of science parks are based on the global linkage of innovation activities. The history of the 20th century fully shows that the process of innovation globalization is unlikely to be hindered by the unfavorable situation in international politics and economy as science is an international undertaking without national boundaries. Although innovation activities feature certain monopoly and exclusiveness in commercial sense and property rights to obtain necessary economic returns, in the long run, the value of innovation will eventually be reflected in its sharing to the whole society and even its contribution to the progress of all mankind. As the saying goes, “One single drop of water cannot make a sea, and one piece of wood cannot make a forest”. Only by moving from being closed and isolated to being open and connected, and taking open innovation and collaborative innovation as basic concepts, can innovation vitality and development potential of each country and region be released to the maximum extent.

We firmly believe that science parks will continue to serve as an important node and hub of the global innovation network and lead the pace of human innovation and development at present and in future. As a special tool and system explorer of innovation-driven development, the core operation logic and governance pattern of science parks are being rapidly replicated and expanded to a wider range of fields, gradually penetrating into the core development concepts of countries, regions and cities, and producing a comprehensive and profound impact on politics, economy, society and culture. Science parks will continue to strengthen the links of international innovative talents, venture capital, and link, radiation and diffusion of knowledge and information, and lead innovation-driven and high-quality development with new economic production factors such as scene, intelligence, data, platform, ecosystem and flow.

In conclusion, we once again propose that the construction of innovation community based on science parks should be viewed as an important issue for the international community in the 21st century so as to strengthen international cooperation in innovation and development, stimulate the underlying power of the world economy, and open up a road to win-win cooperation and common prosperity for the human community of shared destiny.

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