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Rural Digitalization in China

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ABSTRACT

The article shows how the process of the Chinese economy's digitalization, which began in urban areas, manufacturing, and rich provinces of China, now starts to engulf the rural areas. The digital gap between certain provinces and between urban and rural areas must be liquidated as part of the Chinese government's strategy to make the country a thriving innovation society by the mid-21st century. The article lays out basic directions and means of bridging the digital gap between urban and rural areas and several aspects of digital modernization in China's agriculture. A particular focus is on developing green, environmentally friendly agriculture and the birth of a green way of life in rural areas and smart villages.

Keywords: digital economy; structure of the digital economy; digital transformation; digital gap; information infrastructure; environmentally friendly agriculture; smart village; green way of life; informatization of agriculture

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INTRODUCTION

China's digital economy is on the rise, contributing to the transformation and modernization of traditional industries and adding new impetus to economic development. [1] In 2018, the contribution of the digital economy to GDP growth among other industries reached 67.9%, was a key driver of China's national economic development. From 2003 to 2018, the growth rate of China's digital economy was significantly higher than the GDP growth rate for the same period. However, the gap between the growth rate of the digital economy and GDP is increasing since 2011 (fig. 1).

As shown in Fig. 1, China's digital economy has grown steadily in recent years and its share in GDP has continued to increase. In the future, the role of the digital economy in stimulating economic growth should become increasingly visible, through digital innovations and accelerated penetration of traditional industries.

The digitization of traditional industries also increased markedly in the 10s 21st century. In 2018, the volume of this segment of the digital economy exceeded 24.9 trillion yuan with nominal growth of 23.1% and on an annual basis was 27.6% of GDP. The digital economy of industry, services and agriculture accounted for 18.3, 35.9 and 7.3% of the industry's value added, respectively.¹ (fig. 2)

Digitization is developing in a number of sectors, such as production of computers, communications and other electronic equipment, in central and provincial cities. This is particularly evident in the automobile industry in Jiangsu Province, Chongqing city, in manufacturing industries, in industrial enterprises, which production chemical raw materials and products in Guangdong, Zhejiang and others provinces, and pharmaceutical production in Guangdong,

Sichuan provinces. Other provinces and cities are also using digital technologies for digital transformation, which significantly reduces business transaction costs and improves operational efficiency. According to statistics, the digital industry, i.e. the first segment of China's digital economy in 2018, reached 6.4 trillion yuan (7.1% of GDP). Its share in the digital economy is 20.5%. As we can see, digital industries continue to dominate China's digital economy. In 2018, the scale of digitization of various industries amounted to 24.9 trillion-yuan, nominal growth compared to the same period last year, as noted above, was 23.1%. The share of digital industries in the digital economy increased from 49% in 2005 to 79.5% in 2018. The share of these activities in GDP increased from 7% in 2005 to 27.6% in 2018, and the contribution of the digital industry segment to the growth of the digital economy reached 86.4%.² Thus, the share of industrial digitization in China's digital economy is higher than that of digital production itself. This is an indication that digital technologies, products and services are actively penetrating various industries, accelerating the integration of traditional industries and ICT, by increasing of volume production and efficiency. The digitization industry of various traditional domains has become the main engine of digital economic growth, and the internal structure of the digital economy has been optimized.

China's digital economy grew rapidly in the software services, information technology and Internet industries: income in this sector rose by 14.2% and 20.3% on an annual basis, respectively. Demand for information, investment in the digital economy and e-commerce is steadily increasing, which contributes to the development of the digital economy.

While noting the undeniable success of the digital economy, it should be noted that in

¹ White Paper on China's Digital Economy Development. URL: http://www.caict.ac.cn/kxyj/qwfb/bps/201904/t20190417_197904.htm; Digital Economy Development and Cooperation Initiative. URL: http://www.cac.gov.cn/2016-09/29/c_1119648520.htm.

² White Paper on Development and Employment in China's Digital Economy. URL: http://www.caict.ac.cn/kxyj/qwfb/bps/201904/t20190417_197904.htm.

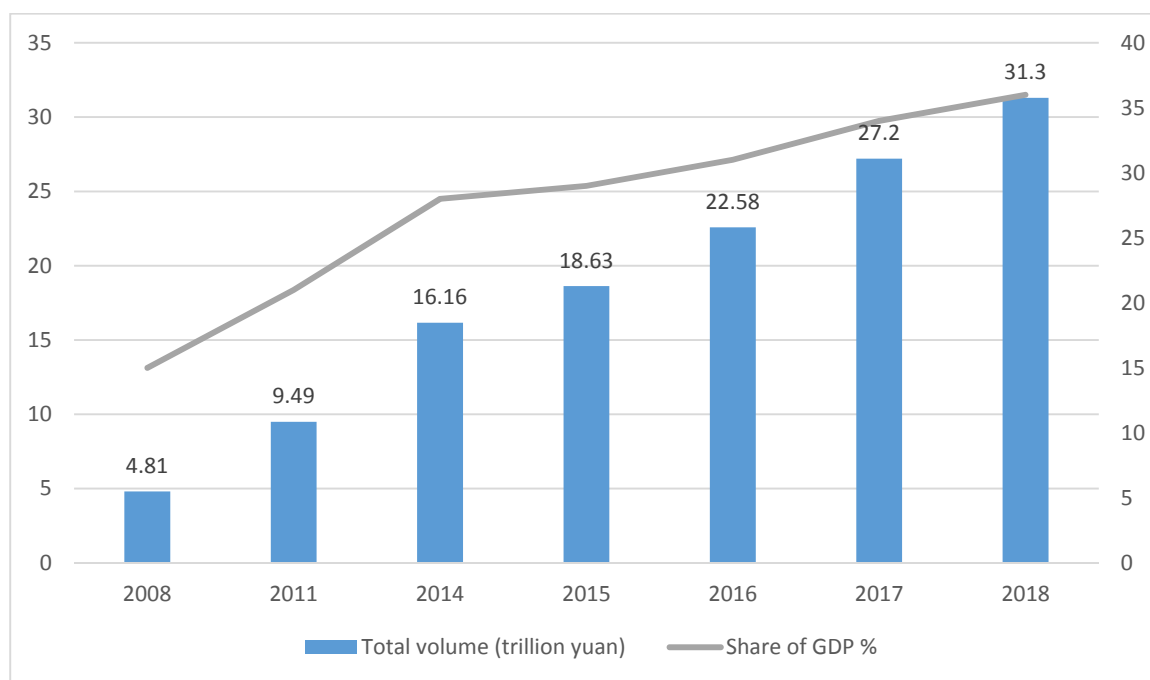


Fig. 1. The volume of China's digital economy and its share in GDP in 2008–2018

Source: URL: http://www.caict.ac.cn/kxyj/qwfb/bps/201904/t20190417_197904.htm.

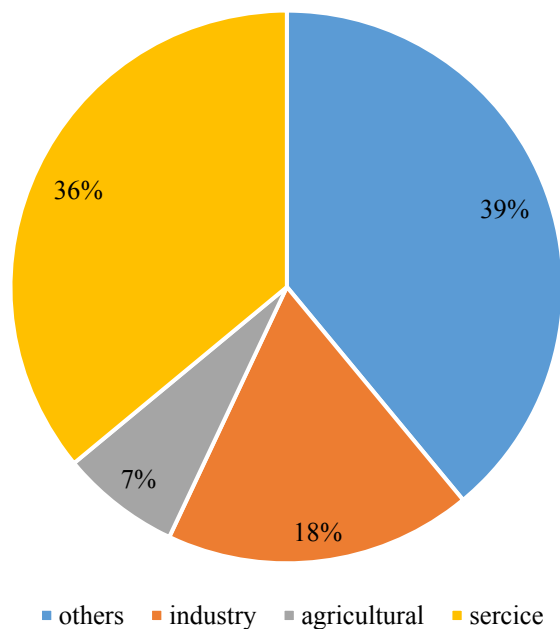


Fig. 2. The share of the digital economy in various industries in China in 2018

Source: URL: http://www.caict.ac.cn/kxyj/qwfb/bps/201904/t20190417_197904.htm.

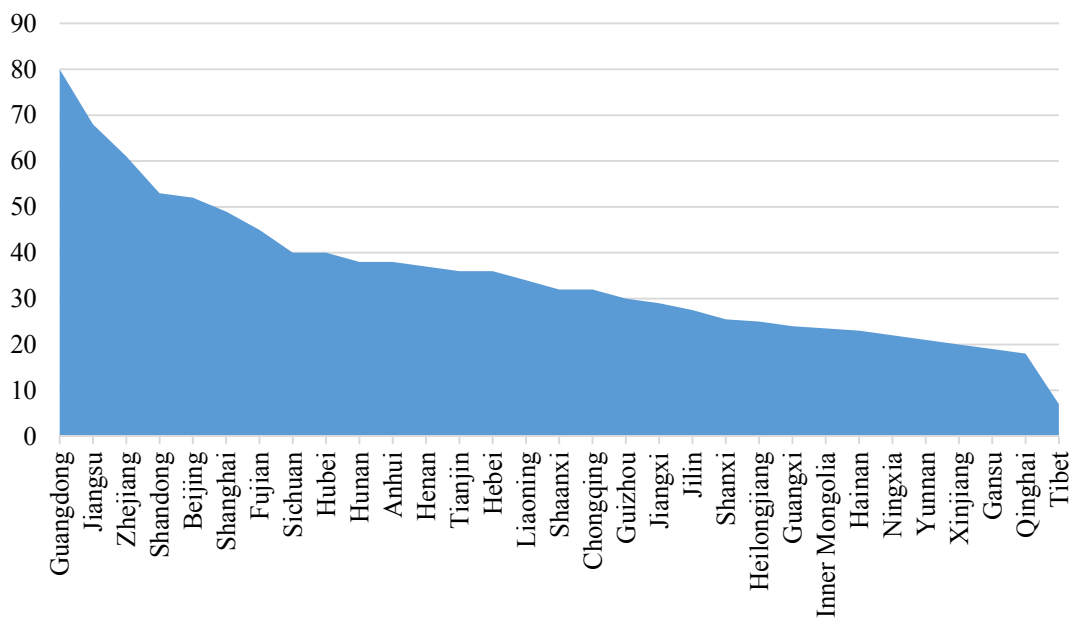


Fig. 3. DEDI China Provinces Index

Source: URL: <http://www.ccidwise.com/uploads/soft/191104/1-191104153253.pdf>.

the process of the digitization of the Chinese economy, there is an uneven distribution of the process by sector. For example, the use of big data technologies is largely concentrated in certain industries, including finance, telecommunications, and public services. The impact of big data in many other industries is less noticeable.

INEQUALITY IN DEVELOPMENT OF THE DIGITAL ECONOMY

Consider in more detail the situation of inequality in the development of the digital economy in China by geographically and industry. While China has achieved significant results, as the digital economy has developed, it faces serious challenges. Owing to differences in socio-economic and technological factors, the digital economy, represented by digital products and the Internet, has spread unevenly throughout the country. In recent years, there has been a digital divide within the country.

CCID Consulting is measured the digital economy in 31 provincial administrative districts across the country in 2016.

Specific index rating DEDI³ is shown on fig. 3. The composite index of DEDI is gradually decreasing from the east coast to the west, which largely corresponds to the GDP of these provinces, although in some regions this dependence is not absolute (http://www.caict.ac.cn/kxyj/qwfb/bps/201904/t20190417_197904.htm).

According to “Digital China Index Report” (2019) (<http://www.ccidwise.com/uploads/soft/191104/1-191104153253.pdf>), published by the Research Institute of Chinese company Tencent, the index of digital China in 2018 was generally stable and rapidly growing. The common indices of Guangdong, Jiangsu, Beijing, Zhejiang and Shandong rank 1st-5th at the provincial level. The Beijing, Shenzhen, Shanghai, Guangzhou and Chengdu rankings are among the top five.

In 2018, the digital economy accounted for more than 20% of GDP in all provinces and cities. The digital economy in Beijing and Shanghai was dominated by more than 50% of GDP. GDP of the digital economy of

³ Index DEDI — digital economy development index.

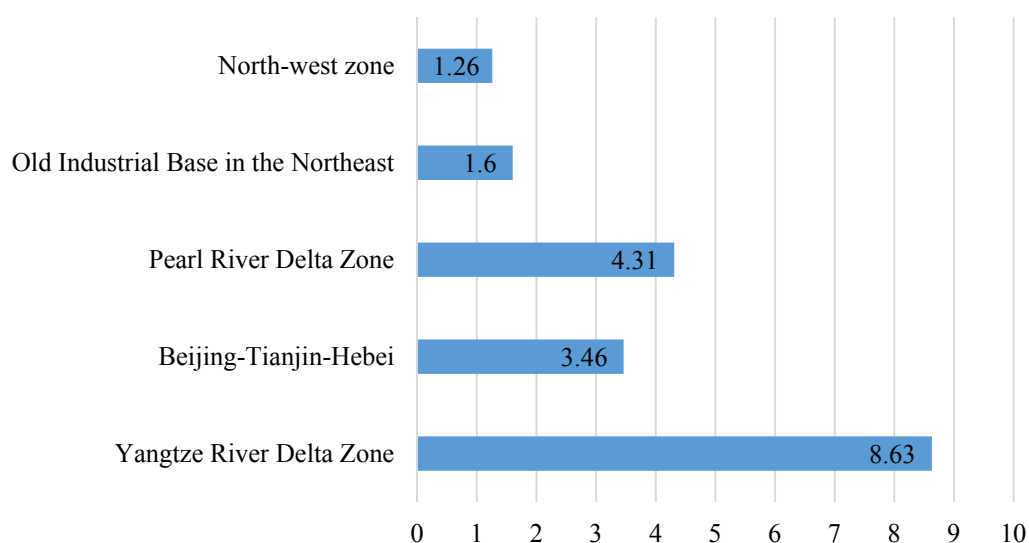


Fig. 4. The volume of the digital economy in various regions of China in 2018 (trillion yuan)

Source: Tencent Research Institute database.

Guangdong, Tianjin, Zhejiang and Jiangsu — more than 40%. The digital economy of Fujian, Shandong, Hubei, Liaoning and Sichuan and Chongqing provinces accounts for more than 30% of GDP, while the digital economy of other provinces and cities — accounts for more than 20% of GDP (<http://www.ccidwise.com/uploads/soft/191104/1-191104153253.pdf>).

The digitization process in China has obvious cluster effects, large urban agglomerations: Beijing-Tianjin-Hebei, in the Yangtze Delta, in the Zhujiang Delta, in Chengdu-Chongqing, in the middle of the Yangtze River, in the Guangzhong Plains and the Central Plain far exceed the share of other 214 cities in the total index. In 2018, the main indicators of the above-mentioned urban agglomerations in China as a whole maintained relatively rapid growth, and urban agglomerations Beijing-Tianjin-Hebei, Yangtze River Delta and Guangzhong Plains increased by more than 90%. Urban Middle Yangtze River and Central Plains Metropolitan Area followed by growth rates between 80 and 90%, above the national average, while urban agglomerations in the Zhujiang Delta and Chengdu Chongqing Delta grew somewhat

slower than these figures. This region is the last in all major urban clusters.

In 2018, the absolute size of the digital economy in the Yangtze Delta region was the largest — 8.63 trillion yuan, and followed by the Zhujiang Delta region — 4.31 trillion yuan. The development of the digital economy in the north-west has been relatively slow: 1.60 trillion yuan and 1.26 trillion yuan respectively (fig. 4).

In general, the size of the digital economy is closely linked to the level of regional economic development. In addition, factors such as social status, age, geographical location and standard of living in China have a significant impact on the development of the digital economy. First, at the socio-economic level: the higher the level of income and education of the population, the higher the number of Internet users, the higher the participation in the digital economy. Although poor and less educated people have permanent access to the Internet, the gap between them and the richer and more educated members of Chinese society in the application of digital technologies and digital products is increasing. The digital divide is

growing accordingly. Second, there is the age factor: young people are significantly more active in accessing digital content (view Internet browsing and online consumption) than older persons (http://www.caict.ac.cn/kxyj/qwfb/bps/201904/t20190417_197904.htm). In addition, young people represent a significant proportion of Internet users through school access. With the national penetration rate in China reaching 49.3%, the penetration rate for people, whom aged 55–74, is less than 10%. [2] Finally, in China there is still a significant digital divide between cities and villages, which are still “digital depressive areas”. This situation reflects unequal access to information and development opportunities for urban and rural residents, which will further widen the social gap between them. [3]

Inequality in the development of the digital economy — is not only a problem of uneven development and application of computer technologies, but also a continuing increase in social inequality. This means that more and more people across China are being excluded from the new information economy. Network backwardness in the central and western regions of China hinders the development of the local economy, thus bridging the digital divide between regions, and between urban and rural areas is an important task facing China.

BRIDGING THE GAP

In the documents: “Views the Central Committee of the Communist Party of China on implementation rural renewal strategies”⁴ and “Strategic Plan for rural renewal (2018–2022)” mentioned, that a new generation of information technology innovations is now at an unprecedented pace and continues to generate new products, business models and formats for global advancement. The profound transformation of the economic structure and industrial form has created unprecedented

opportunities for the development of digital villages. Digital village strategy must be implemented and digital agriculture must be actively promoted.⁵ In May 2019, General Chancellery the Central Committee of the Communist Party of China and the General Chancellery of the Council of State published “Digital village strategy plan”, which clearly defines them as a strategic direction for the rejuvenation of rural areas. In accordance with “Digital rural development strategy plan”,⁶ China will promote the digitization of agriculture, using the following measures to bridge the digital divide between regions, urban and rural areas and achieve balanced economic development.

To accelerate the construction of rural information infrastructure:

Strengthen the joint construction and use of infrastructure, and accelerate the development of rural broadband, mobile Internet, digital television and Internet networks of the next generation. [4]

- Improve information terminals and improve service delivery. Promote the development of information terminals, technology products and mobile Internet applications (APP). Fully implement the extension of information to villages and households for an integrated agricultural services platform.

- Accelerate the digital transformation of rural infrastructure (including its digital and intellectual transformation), such as water, highways, electricity, refrigeration chain logistics, agricultural production and rural processing. Promote the creation of the “smart” water economy, the “smart” transport, the “smart” networks and the “smart” logistics.

To develop of rural digital economy:

- Strengthen the digital agriculture framework. Improve the “unified map” for

⁴ Digital China Index Report (2019). URL: https://www.sohu.com/a/315467226_472878.

⁵ Views the Central Committee of the Communist Party of China on implementation rural renewal strategies. URL: http://www.moa.gov.cn/ztzl/yhwj2018/spbd/201802/t20180205_6136480.htm

⁶ Strategic Plan for Rural Renewal (2018–2022). URL: http://www.gov.cn/zhengce/2018-09/26/content_5325534.htm?trs=1.

natural resources monitoring by remote sensing and integrated surveillance platform, introduce dynamic monitoring of permanent main agricultural land. Promote the construction of Big Data Centers for agriculture and rural areas, and the entire production chain of important agricultural products, and — integration and exchange of basic data in agricultures и rural areas. [5]

- Promote the digital transformation of agriculture. Promote the use of cloud computing, big data, the Internet of things and artificial intelligence in agricultural production and management, as well as to promote the full and in-depth integration of the next generation of information technologies with crop, seed, animal husbandry, fisheries and the agricultural processing industry to create scientific and technical agriculture, “smart”, brand agriculture.

- Establish an innovative agricultural turnover system. Introduce the “Internet+” project to bring agricultural products from villages to cities, as well as strengthen the construction of processing facilities, packaging, a chain of refrigerators, warehousing and other agricultural products. [5] Expand the distribution of rural post offices and express delivery, and accelerate the establishment of a number of intelligent logistics distribution centers. Create a “green” supply chain and promote “green” logistics. Promote the use of artificial intelligence and big data for the development of rural shops, and promote the use of online and offline channels.

- Actively develop new rural enterprises. Promote deep connectivity between the Internet and traditional agriculture, develop new forms of business (креативное сельское хозяйство, туризм в деревне и сельское хозяйство в городах), contribute to the development of new industries such as rest and recreation, living in a rural family, and revitalizing the rural economy of shared consumption. [5]

To expand the supply of agricultural innovation technologies and science:

- Promote the intensification of the use of agricultural machinery. Facilitate the balancing a combination of next-generation information technology and the production of agricultural equipment, as well as develop and promote agricultural intellectual equipment. Encourage the development of industrial Internet and upgrading the level of agricultural intellectual machinery in agricultural engineering and equipment. Facilitate connected of informatization with agricultural equipment, agricultural machinery and management of agricultural equipment.

- Optimize agricultural science and technology information services. To create a group of innovation centers for new technologies to promote cooperation in production, education, research and design. Support the creation of an online agricultural technology exchange market. Improve the information services platform for agricultural science and technology, and encourage technical experts to solve problems of agricultural production challenges online for farmers.

To create “smart green villages” [6]:

Promote a method ecological net agriculture. [7] Establish an electronic control system for agricultural resources, contribute to reducing the use of chemical fertilizers and pesticides. Develop implementation the Internet of things in rural areas. Contribute to preserving water on agricultural land, introduce modern equipment of agricultural parks and develop “green” agriculture. Promote “green” way of life in rural area. Establish an integrated platform for monitoring the environment of rural settlements; strengthen the monitoring and protection of drinking water sources.

To develop rural networked culture:

Increase construction of rural cyber-cultural facilities. Promote construction of digital radio and television and “smart”

broadcasting. Promote the digitization of rural cultural resources, create “banks of digital cultural relics” and “digital museums” in historical and cultural cities, traditional villages, and to strengthen the protection and inheritance of traditional Chinese culture in rural areas.

To modernize rural administration:

Improve the efficiency rural management. Increase the level of improvement, modernize integrated rural management, and implement its online organization. Contributing to the dissemination “Internet+ community” in rural areas, increase level of informatization of complex services at village level and actively promote informatization of rural management. Speed up the implementation of the “Xueliang”⁷ Project in rural areas and deepen the construction of safe rural areas. Accelerate the progress of “Internet+ state legal services”. Based on a nationwide integrated online platform of government services, improve online public services.

To expand information services for rural residents:

- Promote the informatization of rural education. Develop the project “Internet+ education”, establish the link between urban high-quality educational resources and rural primary and secondary schools, and to assist rural schools in developing national courses.
- Improve public information. Facilitate the establishment of comprehensive social security and social assistance system covering rural areas. Actively develop the project “Internet+ medical health care”, support urban and rural medical institutions to increase the level of informatization, and orient urban health facilities to provide rural health facilities with distance education.

⁷ The project “Xueliang” is aimed at ensuring public safety of villagers. Thanks to technology and cooperation between the local government and the radio and television network company, the villagers can see images of several important crossroads in the village in real time by turning on the television. If a villager discovers a hidden security threat, he can immediately make a video call to the police station via the platform and call the police directly.

To stimulate endogenous motivation for rural regeneration:

- Support the development of new actors in agriculture and services. Accelerate the reduction of fees for farmers’ cooperatives, family farmers’ networks, marketing channels, financial credit and talent training.
- Support new types of professional farmers in every way. Implement the “Internet+ small farmers” plan to expand their development opportunities.
- Activate rural resources through the development of digital agriculture, smart tourism and smart industrial parks in accordance with local conditions. Use information to manage the flow of funds, technology, talent and materials.

To enhance digital development for poverty reduction:

Promote in-depth development of online anti-poverty measures, strengthen support for rural industry, and make full use of big data platforms to consolidate the results of aid to the poor.

To implement a general plan to promote the integrated development of information in cities and villages:

- Coordinate the development of digital villages and “smart” cities. Promote the digital, networked and intellectual development of urban and rural production, daily life and environmental space. To direct the development of the digital economy between the city and the village in order to meet the needs of the urban and rural population at all times.
- Enhance integration and sharing of information resources. Through the national system of data-sharing platforms, to facilitate open and effective integration of information resources related to rural governance in the various departments. Promote international exchanges and cooperation in digital villages.

CONCLUSION

The State policy for the digitization of rural areas defines the goals, objectives and

measures for the development of the digital economy in rural areas. It has three main components.

First, a new development concept and requirements for the quality development of rural areas. The Strategic Plan of the new concept of development is based on the generation and use of innovation, coordinated action, environmental friendliness, openness and sharing of resources. In order to meet the requirements of qualitative development, public policy is aimed at improving digital productivity, accelerated development of new kinetic energy through informatization, active promotion of the digital transformation of agriculture. At the same time, actively developing new rural business formats and using information resources to stimulate the flow of capital, materials, technology and talent, various rural opportunities and improvements in agriculture and rural areas need to be fully developed.

Second, a comprehensive implementation of China's innovation strategy. This strategy fully covers the main decisions of the central government and their implementation in the area of rural renewal and informatization policy. In the area of renewal policy, the strategic rollout of the "five updates" is under way: industrial, cultural, environmental, and then organizational and talent renewal. This strategy realistically reflects the construction plan of "digital China" and fully reveals the leading role of informatization in the modernization of rural areas.

Third, priority for agricultural and rural development. In the light of the general economic problem and concerning the development of agricultural informatization, rural areas and farmers, overall planning is strengthen, political support is enhance, and resource priorities are prioritize in investment guarantees in project fund, in public service and financial arrangements. The guiding role of the government is to use financial and social capital to invest in digital agriculture, increase investments with the most efficient use of them.

In the context of the digital wave that has engulfed the whole world, countries have started the "digital revolution" and are developing the digital industry in every possible way. The Chinese leadership is aware of the problems of planning at the national level, the lack of overall planning of resources, the weakness of infrastructure and the obvious differences in the digitization of cities and villages. China is shaping a strategy of "digital village" and building digital villages as one of the priority areas of development.

The strategy aims to accelerate the intensification of agricultural production, popularize rural information services and improve the livelihood of farmers. "Digital village" is an endogenous process of agricultural development and transformation, accompanied by the application of network, information and digitization, as well as improving farmers' modern information skills. Currently, a new generation of information technology innovations is becoming more active than ever, constantly generating new technologies, products and models, and contribute to a profound transformation of the global economic structure of industry. In the future, accelerated construction of rural information infrastructure, integration of modern agriculture in online and offline mode is planned, rapid improvement of rural information services, adoption of fourth- and fifth-generation broadband and mobile networks in rural areas, as well as alleviating some rural problems. The development of information technology, products, applications and services would help to popularize telemedicine and distance education, bridging the digital divide between urban and rural areas.

China has contributed to the development of world economic civilization. China's digital economy is trying to contribute to global economic growth with its own experience. These efforts should contribute to quality and more sustainable development of the world economy.

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