

The characteristics of rural population change in China and its enlightenment to rural revitalization

-Based on the sixth and seventh census data

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Abstract

The rural population in China has shown a significant decrease. Analysis of the change characteristics of the rural population is of great significance to the implementation of the rural revitalization strategy. Based on the data of the sixth and seventh censuses, through the analysis of the characteristics of rural population changes at the national and regional levels, the paper reveals the differences in the distribution of rural populations and puts forward some thoughts on rural revitalization policies. The conclusions are as follows: (1) Most areas are facing the situation of a "double decline" in the number and proportion of the rural population, it is necessary to conceive the rural revitalization strategy and related rural planning ahead based on the changing trend of population distribution. (2) There are obvious differences in the distribution and changes of the rural population in the four major regions, and the formulation of rural revitalization policies should be regionally targeted. (3) Nearly 70% of the rural population is distributed in 19 urban agglomerations, and nearly half of the rural population is distributed in large cities with an urban population of more than 1 million. It is important to promote urban agglomerations and large cities to become the main battlefield for urban-rural integration development.

Keywords

rural revitalization, urbanization, rural population, urban-rural integration

1. Introduction

As a big agricultural country, China once had a rural population that accounted for 80% of the total population. During more than 20 years of economic development and population transformation, China's population has undergone great changes in terms of size and structure, especially in the rural population (Wang Di, Gu Baochang, 2005). Since the 1990s, China's rural population has shown a significant decrease in both the amount and proportion (Figure 1). The seventh census data shows that in 2020, the population living in rural areas in China was 509.79 million, accounting for 36.11%. Compared with it in 2010, the rural population decreased by 164.36 million, accounting for a decrease of 14.21%. According to Liu Houlian and Zhang Gang's(2001) predictions, China's rural population will be 400 million in 2035 and 340 million in 2050. This means that the rural population in China will continue to shrink in the future, by 110 million in 2035, and by 60 million in 2050. Under the trend of continuous urbanization and population reduction in the rural population, it is an important and basic work to clarify the distribution characteristics of rural population changes in China and to reveal the regional differences in rural population changes in different regions.

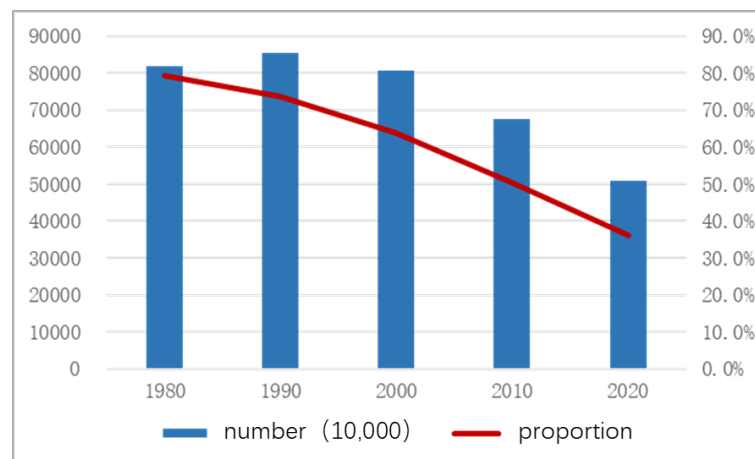


Figure 1. the number and proportion of the rural population in China. Source: 3rd, 4th, 5th, 6th, and 7th census data.

The essence of the rural revitalization strategy is to serve the rural population, and analyzing the changing characteristics of the rural population is of great significance to the implementation of strategic measures. The implementation of the rural revitalization strategy has aroused academic attention and discussion on the interaction between China's rural population change and rural revitalization (Zhao Zhouhua, 2018). Based on the background of China's rural development and urbanization, previous research focused on the transfer of rural surplus labor, the aging of agricultural labor, and the rapid aging of the rural population. However, these do not fully reflect the overall picture of China's rural population development, nor have relevant policy recommendations been put forward from the perspective of implementing rural revitalization. By grasping the characteristics and trends of China's rural population changes, we could discuss the role of China's rural population changes in the implementation of the rural revitalization strategy, and play an important role in promoting the implementation of the rural revitalization strategy and how to formulate policies from a population perspective (Zhao Zhouhua, 2018).

Therefore, based on the data of the sixth and seventh censuses, this study analyzes the factual characteristics of rural population changes in China from the aspects of quantity and spatial distribution of rural population, grasps the trend of rural population distribution changes, and then put forward some policy recommendations for revitalization strategies.

2. General characteristics of rural population change in China

2.1. Characteristics of changes in rural population

In terms of quantity, the distribution of the rural population in China conforms to the characteristics of the "Hu Huanyong Line". Taking the Hu Huanyong Line as the boundary, the rural population in the southeast area is densely distributed, and the rural population in the northwest area is sparsely distributed (Figure 2). In addition, the substantial reduction of the rural population in recent years has not changed this feature, which reflects the "first nature", that is, the important influence of natural environmental factors such as altitude, climate, and landform on the spatial distribution of China's population (Wu Ruijun, 2021). The different physical geography and human resource conditions represented by the "Hu Huanyong Line" determine that this characteristic of rural population distribution in China will exist for a long time. Provinces with a large rural population are mainly concentrated in Henan, Shandong, Sichuan, and other populous provinces all along. In 2020, the rural populations of these provinces are all around 40 million, which means that these areas will still be important battlefields for rural life and rural development in the future.

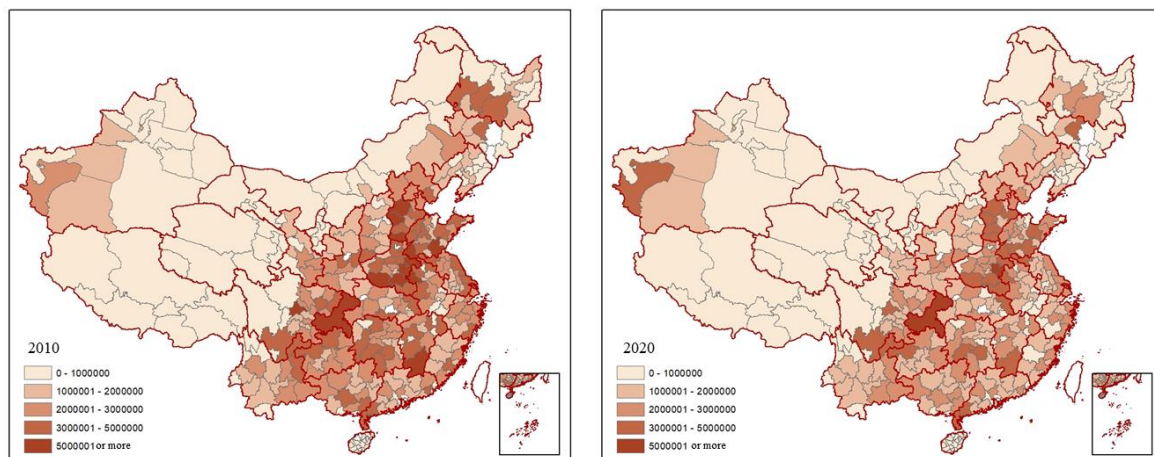


Figure 2. Changes in China's rural population in 2010 and 2020. Source: 6th and 7th census data.

In terms of cities, as shown in Figure 2, in 2010, China's rural population was mainly concentrated in the central, southwestern, and eastern regions; by 2020, the rural population is relatively concentrated in the central and southwestern regions, and the concentration has weakened in both the northeastern region and the eastern region. From 2010 to 2020, the number of rural populations in most areas has declined, and only a very small number of areas such as the northwest and southeast coastal areas have positive change rates of rural populations (Figure 3). The change rate of the rural population in a large number of areas is lower than the national average (-24.38%), and the reduction of the rural population in the central and northeastern regions is more serious than that in the western and southeastern coastal regions. It can be further explained that the southeastern coastal areas, especially the Yangtze River Delta and the Pearl River Delta, have attracted more rural population inflows due to the developed economy and social services, so the decline in the rural population has eased.

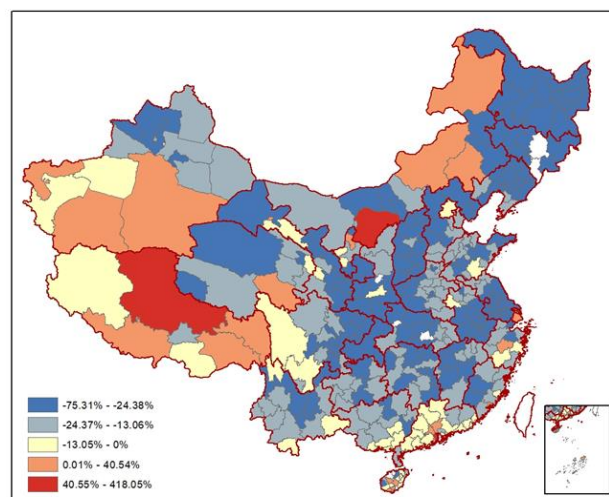


Figure 3. The change rate of China's rural population from 2010 to 2020. Source: 6th and 7th census data.
Note: change rate of rural population = (rural population in 2020 - rural population in 2010) / (rural population in 2010) * 100%.

2.2 Characteristics of changes in rural population density

The density distribution of China's rural population is further concentrated in the southeast direction relative to the number. In 2010, China's rural population density was relatively concentrated in the

central, eastern, and southwestern regions; in 2020, the degree of this agglomeration further shrink, forming more obvious agglomeration areas in Shandong, Hebei, and northwestern Henan. In addition, some areas in Sichuan and the southeast coast have also formed obvious high-value areas. Under such a trend, the high-value areas of rural population density in the central, southwestern, and eastern regions require more infrastructure and public facilities to serve the rural population.

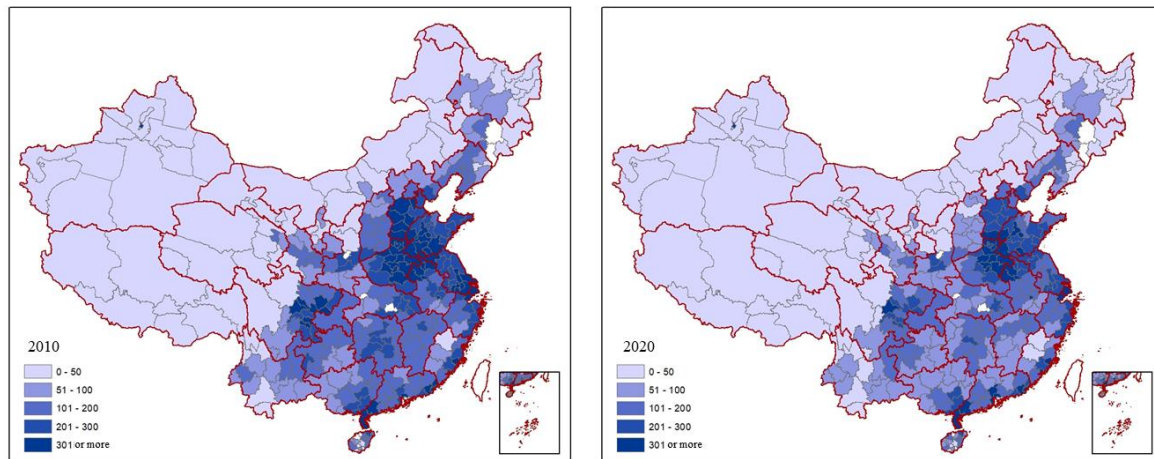


Figure 4. Changes in rural population density in China from 2010 to 2020. Source: 6th and 7th census data.

2.3 Characteristics of changes in the proportion of the rural population

Generally speaking, the distribution of the rural population in China shows the characteristics of “high in the west and low in the east”, and the characteristics in 2020 are more obvious than in 2010 (Figure 5). Compared with the rural population (Figure 2), the eastern region occupies a lower proportion of the rural population with a higher rural population, and the western region occupies a higher proportion of the rural population with a lower rural population. This is because the total population in the eastern region is large, urbanization is also more obvious, and it has entered the late stage of development. Although the proportion of the rural population is relatively low, the scale is still large; while the proportion of the rural population in the northwest region is relatively high, the total population size of each province is not large, so the size of the rural population is not large.

In 2020, a total of 125 areas had a rural population ratio lower than the national average (36.11%), while the number of such areas in 2010 was only 55. It can be seen that in this decade, the proportion of the rural population in 70 areas has further reduced to below the national average. In 2010, there were 216 areas with a rural population ratio of more than 50%, but in 2020, there were only 92 such areas, mainly in Tibet, Xinjiang, Sichuan, Yunnan, Guizhou, Guangxi, Gansu, and other areas in the west.

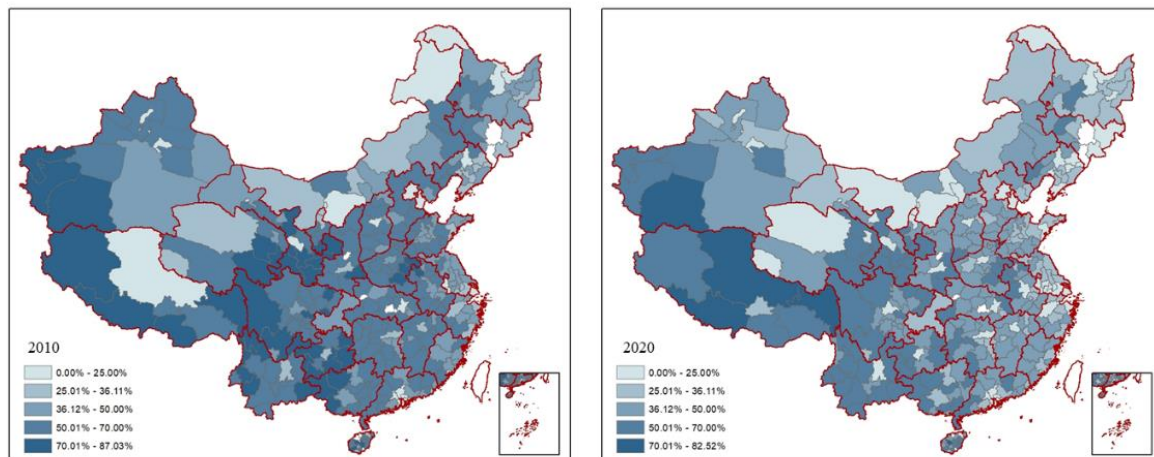


Figure 5. Changes in the proportion of the rural population in China from 2010 to 2020. Source: 6th and 7th census data. Note: Rural population ratio = rural population / permanent population * 100%.

From 2010 to 2020, the proportion of the rural population in most areas of China has declined, and only a few areas have increased in the proportion of the rural population, namely Nagqu in Tibet, Chifeng, Ordos, and Hulunbuir in Inner Mongolia, Baisha Li Autonomous County in Hainan, and Zhongshan in Guangdong (Figure 6). In terms of distribution, the areas with a change lower than the national average (-14.21%) are mainly distributed in the central and western regions, indicating that the proportion of the rural population in the central and western regions has declined more significantly than other regions. This may be caused by the migration of the population from the backward rural areas in the central and western regions to the developed urban areas in the east. This also means that the central and western regions will continue to face the process of urbanization of the rural population during the implementation of the rural revitalization strategy, and the proportion of the rural population will continue to decline; while more eastern regions have less room for future decline in the proportion of the rural population. The characteristics of the spatial distribution of rural population will be an important starting point for formulating rural revitalization and development measures tailored to local conditions in the future (Liu Houlian, Zhang Gang, 2001).

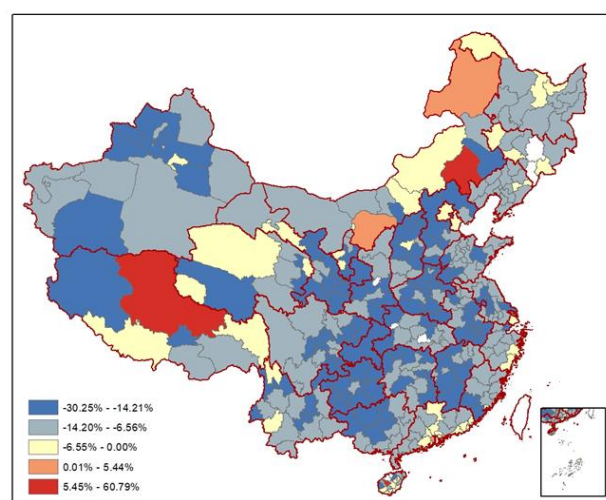


Figure 6. Changes in the proportion of the rural population in China from 2010 to 2020. Source: 6th and 7th census data. Note: Change in rural population ratio = rural population ratio in 2020 - rural population ratio in 2010.

Further, by using the rate of change in the rural population and the change in the proportion of the rural population, it is possible to identify areas where the number and proportion of the rural population "double drop" during the ten years. As shown in Figure 7, there are 321 such "double drop" areas, accounting for 92% of the country. Except for some areas in the northwest, most areas of China are facing a "double drop" in the number and proportion of the rural population, which also puts forward requirements for the formulation of goals and strategies for future rural revitalization.

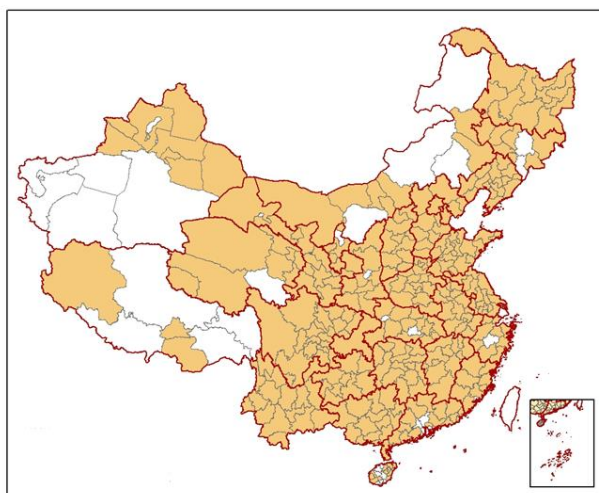


Figure 7. "Double drop" areas in rural population number and proportion from 2010 to 2020. Source: 6th and 7th census data.

3 Regional characteristics of rural population change in China

3.1 Characteristics of rural population changes in the four major regions

After clarifying the overall characteristics of China's rural population changes, we then analyze the regional distribution characteristics of rural population changes. Since the western region contains many provinces and a large area, this study refers to the research method of Wu Ruijun (2021), which divides the western region into the northwest region and the southwest region. The northwest region includes Inner Mongolia, Gansu, Qinghai, Ningxia, Xinjiang, and Tibet provinces (regions), and the southwest region includes Guangxi, Chongqing, Sichuan, Guizhou, Yunnan, Shaanxi provinces (regions, cities).

From Table 1, the rural population in Northeast China is the smallest, and the rural population growth rate is the lowest, reaching -31.40%, which is far lower than the national average (-24.38%). In 2020, the proportion of the rural population in Northeast China is about 32.29%, which is in the middle level of several major regions, but the change in the proportion of the rural population is the smallest. To further explain the difference in proportion and quantity changes, the Northeast region is the only region where the size of the resident population has decreased from 2010 to 2020. In the context of the continuous outflow of the resident population in the Northeast region, the reduction in the number of the rural population has not brought about the same degree of reduction in the proportion of the rural population but slowed down the change in the proportion of the rural population. But as China's important grain production base, the massive reduction of the rural population phenomenon cannot be ignored.

The rate of change in the rural population, the proportion of the rural population, and the amount of change in the rural population in the central and western regions are not much different. The rate of change in the rural population is about -23%, which is at the middle level, and the proportion of the rural

population is about 42%, at a relatively high level. The change in the proportion of the rural population is about -15%, which is at a relatively low level. Combined with the previous analysis, the rural population in the central and western regions has the trend of migrating to the developed eastern region, which makes the proportion of the rural population in the central and western regions decrease more obviously.

The economy of the eastern region is relatively developed, and the phenomenon of attracting foreign populations is obvious in recent years, so the decline in the number of the rural population and the proportion of the rural population is relatively insignificant. The eastern region has a relatively low proportion of the rural population but contains a more rural population, so it will become an important base for future rural revitalization.

four major regions	permanent residents(6th census)	rural population (6th census)	rural population ratio (6th census)	permanent residents(7th census)	rural population (7th census)	rural population ratio (7th census)	Rural population change rate	Change in the proportion of the rural population
Eastern Region	506191179	203980084	40.30%	563717119	164864600	29.25%	-19.18%	-11.05%
Northeast China	109513129	46372273	42.34%	98514948	31813053	32.29%	-31.40%	-10.05%
Central Region	356748794	201257394	56.41%	364694362	149510575	41.00%	-25.71%	-15.41%
Western regions(southwest)	273330160	162315164	59.38%	291156253	125361059	43.06%	-22.77%	-16.32%
Western regions(northwest)	87027607	48518042	55.75%	91696042	38244060	41.71%	-21.18%	-14.04%

Table 1. Changes in the rural population in the four major regions of China from 2010 to 2020. Source: 6th and 7th census data.

Further analyzing the changes in the urban and rural populations in each city, as shown in Figure 8, in general, most cities show the phenomenon of "increase in urban population and decrease in rural population", and the four major regions have obvious spatial differences feature. The rural populations in Northeast China's cities are all decreasing, some cities' urban populations are decreasing, and some cities' urban populations are increasing. The urban populations of most cities in the eastern region are increasing, and the rural population of a small number of cities is increasing. Cities in the central region are all in the "urban population increases, rural population decreases" quadrant. Most cities in the western region have an increasingly urban population, while a very small number of cities have an increasing rural population. The characteristics of urban and rural population changes in different regions are different, and there are different requirements for the focus of future urban and rural construction.

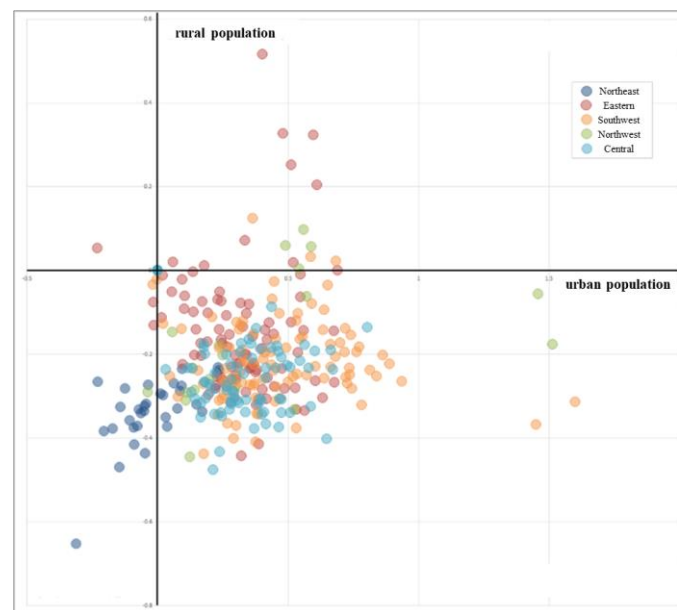


Figure 8. Changes in urban population and rural population in Chinese cities. Source: 6th and 7th census data.

3.2 Characteristics of rural population change in 19 urban agglomerations

Urban agglomerations and metropolitans are the main carriers of the national new urbanization strategy. In the future, urban agglomerations and metropolitans will gather a higher proportion of the population and use them as carriers for near-regional division of labor (Wang Kai et al., 2020). Therefore, it is necessary to discuss the changes in the rural population in urban agglomerations and metropolitan areas to clarify whether the rural population flows to urban agglomerations and metropolitan areas in the process of new urbanization. "The 14th Five-Year Plan for National Economic and Social Development of the People's Republic of China and the Outline of Vision 2035" has defined China's current 19 urban agglomerations, however, the metropolitan area has not yet been identified and is still being approved. Based on this, this study focuses on the characteristics of rural population change at the urban agglomeration level.

According to Figure 9, the number of the rural population and the proportion of the rural population in most urban agglomeration areas are decreasing, only a few urban agglomeration areas have increased, which are distributed in the northwest and southeast coastal areas. There are three different characteristics of urban agglomeration. One is that the numbers (or proportions) of rural populations in multiple cities within the urban agglomeration increase or decrease slightly, such as the Pearl River Delta urban agglomeration, the Yangtze River Delta urban agglomeration, Beibu Gulf Urban agglomerations, etc., are mostly distributed in the northwest or southeast coastal areas. The second is that there is only one city's rural population (or proportion) within the urban agglomeration that has increased or decreased slightly, and this city is mostly the core city in the urban agglomeration, such as the Beijing-Tianjin-Hebei urban agglomeration, Shandong Peninsula urban agglomeration, Lanxi urban agglomeration, etc. The third type is that the cities within the urban agglomeration are not much different, and all have a substantial reduction in the number (or proportion) of the rural population, like the Chongqing urban agglomeration, urban agglomeration in the middle reaches of the Yangtze River, and the Central Plains urban agglomeration, mostly distributed in the central and southwestern regions.

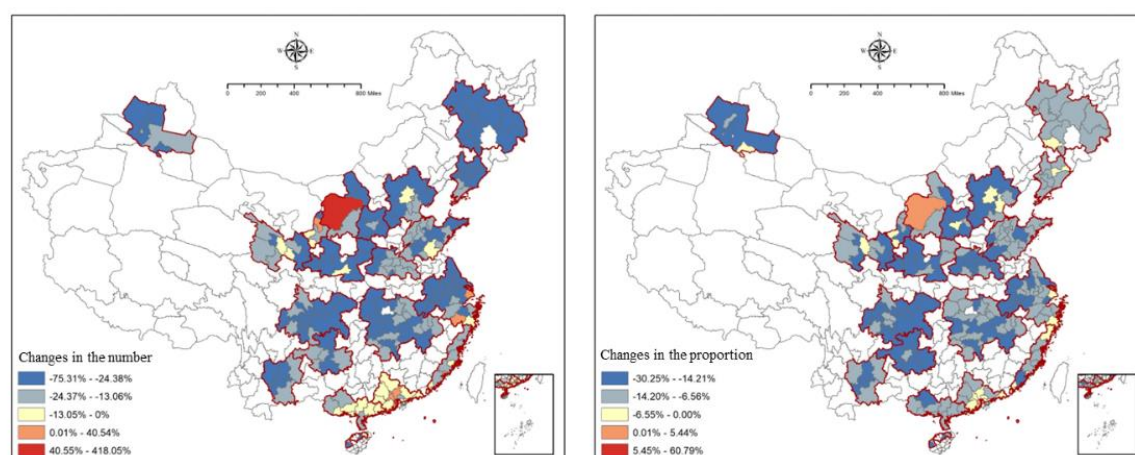


Figure 9. Changes in the number and proportion of the rural population in 19 urban agglomerations from 2010 to 2020. Source: 6th and 7th census data.

According to statistics, in 2020, the 19 urban agglomerations contain a total of 345 million rural people, accounting for 67.6% of the country, which was 431 million rural population in 2010, accounting for 63.9%. It can be seen that although the rural population has decreased significantly in the past ten years, the proportion of the rural population included in the 19 urban agglomerations has increased significantly, reaching nearly 70% so far. In other words, in the future, the 19 urban agglomerations will still be the key areas of China's rural population distribution.

3.3 Characteristics of rural population changes in cities of different scales

Planning and preparing for urban development at different scales is critical to maximizing the benefits of urbanization and promoting sustainable development. Cities of different scales will show huge differences in space and time. Therefore, this study also studies the characteristics of rural population changes in cities of different scales. Drawing on the relevant standards in 《World Urbanization Prospects: The 2018 Revision》, combined with the Chinese standards, the final determination is based on the urban population of less than 1 million, 1-3 million, 3-5 million, 5-10 million, and more than 10 million. The urban population is based on the 2020 urban population data of prefecture-level cities calculated by the United Nations database. Finally, we identified 7, 14, 32, 86, 223 cities with a population of more than 10 million, 5-10 million, 3-5 million, 1-3 million, and less than 1 million, and the rural population accounted for 4.77%, 4.95%, 6.28%, 31.15%, 52.84% of the country. It can be seen that large cities with an urban population of more than 1 million accounts for 47.16% of the country, which means large cities are undoubtedly an important starting point for rural revitalization.

Analyzing the characteristics of rural population changes in cities of different scales, it is found that the larger the city, the smaller the cumulative value and the lower the proportion of the rural population, and the lower the degree of decrease in the number and proportion between 2010 and 2020 (Table 2). With the process of urbanization, although the rural population in large cities is small and the proportion is low, the degree of reduction is lower than that in small and medium-sized cities. In the future, large cities will become better positions for rural revitalization and development with better rural population stability. But it should be noted that although the rural population of small and medium-sized cities is decreasing, its base is large and its proportion is relatively high, so it is still the focus of planning and development in these areas.

City size	permanent residents(6th census)	rural population (6th census)	rural population ratio (6th census)	permanent residents(7th census)	rural population (7th census)	rural population ratio (7th census)	Rural population change rate	Change in the proportion of the rural population
More than 10 million	122595595	28997449	23.65%	149792918	24332987	16.24%	-16.09%	-7.41%
5-10 million	116568169	31735781	27.23%	142794131	25255818	17.69%	-20.42%	-9.54%
3-5 million	113277466	41021025	36.21%	135366626	32016184	23.65%	-21.95%	-12.56%
1-3 million	406918604	207379993	50.96%	417838348	158787507	38.00%	-23.43%	-12.96%
less than 1 million	580360166	365015752	62.89%	565987977	269397505	47.60%	-26.20%	-15.30%

Table 2. Changes in the rural population in cities of different scales from 2010 to 2020. Source: 6th and 7th census data.

4 Implications for rural revitalization strategy

4.1 Planning ahead and actively responding to the "double drop" trend of the number and proportion of the rural population

Most areas in China are facing the "double drop" in the number and proportion of the rural population. It is necessary to plan ahead and formulate a rural revitalization strategy and related rural planning based on the changing trend of population distribution. The investment and construction of rural revitalization should not be limited to the existing resident population but should be considering the substantial reduction trend, and the limited funds, resources, and factors should be rationally utilized (Zhang Chen, Zhang Yunhua, 2021). From the perspective of changing trends, with the "Hu Huanyong Line" as the boundary, the eastern area has a large-scale rural population base, coupled with the strong attraction to foreign population, the rural population size will maintain a certain base in the future, and the rural population density will still be relatively high. Therefore, the rural revitalization plan for the eastern area is still a plan based on a certain population density. It is necessary to combine the innate conditions of the surrounding developed areas to strengthen the circulation of industry, capital, transportation, personnel, etc. Although the rural population in the western region is relatively small and the density is low, it has a relatively high proportion of the rural population. Therefore, for the western region, except for a few areas with an increase in the number and proportion of rural populations that need more industrial development, most areas should focus on serving the basic life of the rural population, following the improvement of the rural living environment, and strengthening the public service facilities and infrastructure, to provide a safe, clean and convenient living environment for the remaining villagers.

4.2 Adapting measures to local conditions and adopting differentiated revitalization strategies for different regions

The distribution and changes of the rural population in the four major regions of China vary greatly due to different natural geographical conditions and economic development levels. Therefore, the formulation of rural revitalization policies should be regionally targeted. There is a continuous outflow of both the resident population and the rural population in the Northeast region. The Northeast region is an important grain production base in China, and its land conditions are excellent. Facing the trend of large-scale reduction of the rural population, it is possible to explore the integration of some villages and the large-scale mechanization of agriculture, which may increase farmers' income levels while ensuring agricultural output. The economic development of the central and western regions is backward, and the rural population continues to migrate to the developed eastern regions, resulting in a significant decline in the proportion of the rural population in the central and western regions. The transfer of public expenditures can be used to increase the basic living security support for the rural population in the central and western regions (Zhao Zhouhua, 2018). The eastern region has a relatively developed economy and continues to attract rural populations from other regions. With a large base and high density of rural populations, it is an important position for China's future rural revitalization and development. It is advisable to actively rely on urban-rural integration for developing the rural economy, promote the development and growth of local industries, and explore a new model of urban-rural integration in developed areas to promote rural revitalization.

4.3 Seizing advantages and making full use of urban agglomerations and big cities to solve rural development problems

At present, nearly 70% of China's rural population is distributed in 19 urban agglomerations, and nearly half of the rural population is distributed in large cities with an urban population of more than 1 million. With the in-depth development of the urbanization process, urban agglomerations and large cities will continue to attract the population and become a better position for rural revitalization and development with better rural population stability. Therefore, grasping the advantages of urban agglomerations and big cities and making full use of these areas to solve problems in rural development have become new ideas and challenges for rural revitalization. The core cities and big cities of the urban agglomeration have a continuous attraction to the surrounding villages because of their relatively developed economy and high-quality service level, and thus also have the basic conditions for the integrated development of urban and rural areas. Promoting urban agglomerations and large cities to become the main battlefield of urban-rural integration development, and taking advantage of better location advantages and transportation connections to promote industrial integration and extension, such as the development of urban agriculture and rural tourism. In addition, urban agglomerations and villages within large cities should make full use of the existing public service resources in urban areas and make up for the truly missing service sectors, to realize the efficiency and fairness of urban and rural public resource allocation.

5 Conclusion

Based on the data of the sixth and seventh censuses, this paper analyzes the characteristics of China's rural population changes at the national and regional levels and puts forward some thoughts on rural revitalization policies. The conclusions are as follows: (1) Most areas are facing the situation of a "double drop" in the number and proportion of the rural population, it is necessary to conceive the rural revitalization strategy and related rural planning ahead based on the changing trend of population distribution. (2) There are obvious differences in the distribution and changes of the rural population in

the four major regions, and the formulation of rural revitalization policies should be regionally targeted. (3) Nearly 70% of the rural population is distributed in 19 urban agglomerations, and nearly half of the rural population is distributed in large cities with an urban population of more than 1 million. It is important to promote urban agglomerations and large cities to become the main battlefield for urban-rural integration development.

It should be noted that the spatial distribution of rural populations is closely related to natural geographical conditions and agricultural development. This paper only analyzes the characteristics of rural population change, and further in-depth research is needed to explain its internal mechanism.

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