Rural population change in China: Spatial differences, driving forces and policy implications

Zhen Liu [a, b, c], Shenghe Liu [a, b, c, *], Haoran Jin [a, b, c], Wei Qi [a, b, c]

[a] Institute of Geographic Sciences and Nature Resources Research, Chinese Academy of Sciences, 11A Datun Road, Chaoyang District, Beijing 100101, China
[b] Key Laboratory of Regional Sustainable Development Modeling, CAS, Beijing 100101, China
[c] College of Resources and Environment, University of Chinese Academy of Sciences, Beijing 100049, China

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ABSTRACT

With the fast process of urbanization, the size of the rural population in China has changed greatly in the past few decades. This paper analyzes the trend and spatial differences of rural population change and the driving forces of this process. The main findings are summarized as follows. First, the total rural population decreased after 1995, and the size and rate of decrease follow an accelerating trend. Second, the rural population change has obvious spatial differences: some regions experience dramatic rural population decline, while others experience growth. Third, the spatial difference of rural population change is closely related to economic factors, including the per capita GDP, urbanization level, and noneconomic factors, including the rural population size and fertility level. According to our findings, we suggest that the government pay more attention to rural population change and its impacts and that narrowing the regional development gap may be the most effective way to promote sustainable development of rural areas in less developed regions.

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1. Introduction

Rural population changes are crucial for developing countries because they can affect food security, trends in poverty and the success of rural development interventions. The rural population of less developed regions worldwide increased from 2.72 billion in 1990 to 3.09 billion in 2014; however, it is expected to reach its peak in a few years and then decrease to 3.02 billion in 2050 (United Nations, 2011). This rural demographic change will have profound effects on rural environment and development. Thus, to reveal what happens demographically in rural areas of the developing regions will contribute to a successful development policy (Anríquez and Stloukal, 2008).

Rural population change in China has aroused increasing attention because of its large size and transformation over the past few decades (Anríquez, 2007; Bezemer and Hazell, 2006). Since the 1970s, China has experienced fast urbanization, with a growth rate from 17.9% in 1978 to 54.8% in 2014 (National Bureau of Statistics of China (NBSC), 2015). Rapid urbanization has produced the largest rural-to-urban migration in the world (Seeborg et al., 2000; Wu, 1994; Zhang and Song, 2003), which has led to a dramatic change of the rural population in recent decades. The size of the rural population declined from 0.86 billion in 1995 to 0.67 billion in 2010, a reduction of approximately 0.19 billion (NBSC, 2011). According to the current urbanization rate, the declining trend of the rural population will not soon stagnate.

Though rural population decline is an inevitable process with the fast urbanization, it merits attention. In China, many problems in rural areas, such as hollow villages (Jiang et al., 2014; Long et al., 2012; Liu et al., 2010), land abandonment (Liu and Li, 2006; Zhang et al., 2014), left behind elderly and children (Chang et al., 2011; He and Ye, 2014) and food security, are closely related to the decline of the rural population. Moreover, owing to economic, educational and natural environmental differences, rural-to-urban migration flows vary widely (Fan, 2005; Wang and Wang, 2014; Zhang and Song, 2003). Thus, some regions may suffer severe rural population loss, while others may suffer less. By revealing these spatial differences of rural population change and important causes, the factors behind rural population decline will have implications for initiatives aiming at the sustainable development of rural areas.

In current studies, there are two research questions related to

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* Corresponding author. Institute of Geographic Sciences and Nature Resources Research, Chinese Academy of Sciences, 11A Datun Road, Chaoyang District, Beijing 100101, China.
E-mail address: liush@igsnrr.ac.cn (S. Liu).

rural population change in China. First, many studies have investigated the increasing rural-to-urban flow since the reform in 1980s. This question contains two main aspects: one is to examine the migration flows and explain the underlying causes of such migration (Knight and Song, 1999; Seeborg et al., 2000; Wu, 1994; Wu and Zhou, 1969; Zhang and Song, 2003; Zhang, 2008; Zhang and Zhao, 1998); the other focuses on the social status of rural migrants, also called the "floating population" or "temporary population", in destinations (Fan, 2002; Shen and Huang, 2003; Wang et al., 2002). Rural-to-urban migration will inevitably lead to a change of the rural population in the emigration regions; however, these studies cannot directly show how the rural population of these regions changes. Second, some studies have noted a rural population decline and its negative effects in emigration regions (Jiang et al., 2014; Long et al., 2012; Liu et al., 2010; Liu and Liu, 2010; Li et al., 2014). These studies often use typical villages as cases to illustrate this issue and argue that rural population hollowing is becoming increasingly serious. The insufficiency of these studies is that they do not show exactly and comprehensively which regions are facing this severe rural population loss.

Therefore, though some studies related to rural population change exist, few have attempted to directly examine rural population change, especially the spatial differences of this process across the country. To fill this gap, this paper aims to 1) reveal spatial differences of rural population change at the provincial and county levels and 2) investigate the driving forces of this process by establishing an empirical model of rural population change. This paper may help to understand the processes of rural population change in developing countries and put forward a policy for the sustainable development of rural areas in these regions.

This paper is organized as follows: Section 2 is methodology which mainly introduces the explanatory framework and the empirical function of rural population change; moreover, the data and the variables are also described in this section. Section 3 analyses the trend and spatial difference of rural population change in recent decades. Section 4 presents the results of the driving forces of rural population change at the provincial and county levels. Discussion and Conclusion are presented in Section5 and section 6, respectively.

2. Methodology

2.1. Rural population change: an explanatory framework

Rural population change contains two parts: migration and natural growth. Migration, mainly rural-to-urban migration, has led to a large decline of the rural population worldwide. In addition to directly reducing the rural population, migration can affect the fertility level by changing the ratio of young to aged and of men to women and then lead to rural population decline in the long term. Natural growth has an uncertain effect: a natural growth rate above zero can increase the rural population, while a natural growth rate below zero will decrease the rural population. In developing countries, because of the high natural growth rate, the natural growth part generally has a positive effect on rural population change. In this paper, we will incorporate the factors of migration and natural growth to explain rural population change.

2.2. Empirical analyses of driving forces of rural population change

Using the explanatory framework above, we perform a concrete analysis of the factors of natural growth and migration. Regarding

natural growth, because the death rate has changed little since 1978[1], the fertility level is the most important factor that affects the natural growth of the rural population in China. Regarding migration, there are many factors affecting this process. Thus, we first review the theories of rural-to-urban migration and then propose the factors in this study.

2.2.1. Theories and empirical factors of rural-to-urban migration

Labor movement out of rural areas was first investigated by social scientists. The push–pull theory, proposed by Ravenstein (1885, 1889) and developed by Bogue (1970), noted that migration decisions were determined by two different forces: the "supply push" variables, such as land scarcity and lower income, and the "demand-pull" variables, such as higher wages, better living conditions and educational opportunities. Lee (1966) further added "intervening obstacles "and "personal factors" to the theory to make it more complete. The push–pull theory of migration has been widely recognized and applied to investigate rural-to-urban migration.

The first modern economic theory of migration in developing countries is traced to the two-sector model, developed by Lewis (1954). Though Lewis does not explicitly focus on population migration, migration plays an important role in his model. Lewis' model assumes that the supply of labor from the "noncapitalist" sector is unlimited at a fixed real wage. However, this has been questioned by Jorgenson (1966) and Schultz (1964). Ranis and Fei (1969) extended Lewis' model and developed the neoclassical two-sector model. He argued that with the disappearance of redundant labor and the emergence of the relative shortage of agricultural goods, the rural sector and the capitalist sector will compete for laborers. Inter-sectoral wage differentials become the primary factors driving rural out-migration (Jorgenson, 1966; Ranis and Fei, 1969).

Todaro (1969) further modified the neoclassical migration model starting from the assumption that rural out-migration responds to an expected income maximization objective rather than actual earnings. The source of the rural–urban income differential is "a politically determined minimum urban wage at levels substantially higher than agricultural earnings" (Harris and Todaro, 1970). Many scholars have subsequently made significant modifications of the basic Todaro's model, such as (Bhagwati and Srinivasan, 1974; Corden and Findlay, 1975; Fields, 1975; Johnson, 1971); however, it maintains its fundamental value.

As to advances in migration theory, numerous econometric studies on migration in developing countries have been conducted (Yap, 1969; Greenwood, 1971; Huntington, 1977; Carvajal and Geithman, 1974; Fields, 1979; Levy and Wadycki, 1972). For the purpose of this paper, we focus on those relevant to China's experience in the past few decades. Empirical studies in China show that the large rural-to-urban migration is a response to the widening economic development gap (Seeborg et al., 2000; Shen, 2013; Wu and Zhou, 1969; Zhang and Song, 2003; Wu and Yao, 2003; Zhu, 2002). This economic gap can be divided into two aspects: the gap between urban and rural areas within one region and the gaps among regions.[2] We use the variable of the ratio between the urban workers' average wages and per capita net income of farmers as well as the variable of the per capita GDP to reflect these two economic gaps. The growth rate of GDP may also affect rural population change because rapid economic growth can supply more jobs and better public services. The urbanization rate is also an

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[1] The highest value of the mortality rate is 7.16‰, while the lowest value is 6.25‰.

[2] Some studies show that the economic gaps among regions play a leading role in the process of migration from the west and central regions to the coastal regions (Wang and Wang, 2014; Shen, 2013).