Rural settlement changes in compound land use areas: Characteristics and reasons of changes in a mixed mining-rural-settlement area in Shanxi Province, China

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ABSTRACT

As a result of rural settlements moving and relocation for coal mining and rural settlements expansion for new village construction, the rural settlements have been dramatically changed in the mixed mining-rural-settlement area of the Pinglu District of Shuozhou City in northern Shanxi Province of China. There are few studies that assess the characteristics and reasons of rural settlement changes in this compound area. This paper used satellite data and secondary data information on social and economic development in a mixed-method case study to analyze the characteristics and reasons of rural settlement changes in Pinglu District of Shuozhou City in northern Shanxi Province of China over the period 1986–2013. Three significant research findings were: (1) There were notable changes in the distribution of the rural settlements, and the total area of rural settlements increased by 1862.28 ha between 1986 and 2013, with the transformation of cultivated land to rural settlements being the most dominant change in land use. (2) The rural settlements increased with buffer radius increased up to 6–8 km which has become the standard boundary for rural settlement distribution. (3) The influential factors that have been identified for rural settlement changes included avoiding impacts due to coal mining, an urgency to build simple houses for the compensation, the relocation of farmers, the construction of new villages and land reclamation of abandoned rural settlements. These findings are useful for resource-based rural settlement management, providing reasonable compensation and relocation options when acquiring land in mining areas both within and beyond the study area in China.

1. Introduction

Rural settlements are located in spaces between cities and consist of small groupings of buildings where residential land use and activities related to agriculture are dominant (Muilu & Rusanen, 2004). Because of the need for economic, political, social and cultural activities, farmers tend to dwell together in the same area (Muilu & Rusanen, 2004; Porta et al., 2013).

As land is limited in extent, using any of it for rural settlement is likely to be at the expense of cultivated land (Cao, Bai, Zhou, & Wang, 2013; Conrad et al., 2015; Long & Li, 2012; Tian, Qiao, & Zhang, 2012), especially in those areas with highly productive soils (Conrad et al., 2015). In China’s rural areas, using land for settlements is the second major type of land use, preceded only by using land for cultivation (Liu, Liu, Zhuang, Zhang, & Deng, 2003; Long, Liu, Wu, & Dong, 2009; Tian et al., 2012). In the area of the Loess Plateau in China, due to environmental impacts, rural settlement construction tends to be spontaneous and at the cost of cultivated land in the low and flat areas (Cao et al., 2015; Jiang, Zhang, Qin, Zhang, & Gong, 2006). Accordingly, it is important to curb the expansion of land being consumed by rural settlements to maintain the total cultivated land area in the interests of agricultural sustainability and food security of a growing population (Chen & Ye, 2014; Song & Liu, 2014; Tang, Hao, & Huang, 2016).

Changes in rural settlements reflect the relationship between humans and the land (Jiang et al., 2006; Barbosa-Brandão, Riveira, & Maseda, 2015). Certain influential factors have been identified as reasons driving land use changes in rural settlements. These factors...
include changes in the natural environment (Zhou et al., 2013), continuous rural population growth (Conrad et al., 2015; Song & Liu, 2014), urbanization (Chen, Liu, & Tao, 2013; Li, Long, Liu, & Tu, 2015; Tan & Li, 2013), housing construction (Bański & Wesołowska, 2010; Peng, Shen, Tan, Tan, & Wang, 2013), social transformation (Kiss, 2000; Chen, Liu, & Lu, 2016), and changes in employment opportunities (Cao et al., 2013; Lewis & Mrara, 1986). Meanwhile, the reconstruction of rural settlements in China has become the important new reason for driving land use changes in rural settlements (Long & Liu, 2016; Yang, Xu, & Long, 2016).

Rural settlement changes in mining areas often experience three key reasons. Firstly, rural settlements sometimes have to move in order to avoid mining disturbance. In highly disturbed mining areas, rural settlements can rapidly decrease in size as people move away (Cao, Bai, Zhou, & Zhang, 2016a; Li, 2006). Secondly, in contrast, other rural settlements can increase in size as a result of new settlement construction projects as people are attracted to the region to work in the expanding mining sector (Li, 2006). Thirdly, after mining activities cease, abandoned rural settlements can be cleaned up and reused/recycled, especially if they have good access after mining activities cease, abandoned rural settlements can be cleaned up and reused/recycled, especially if they have good access

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