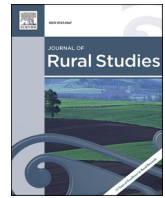




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# Comprehensive land consolidation as a development policy for rural vitalisation: Rural In Situ Urbanisation through semi socio-economic restructuring in Huai Town

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## ABSTRACT

This paper reviewed the history of the coupling relationship between land consolidation and urban-rural development in China since 1949. It found that, although land consolidation projects in non-integrated urban-rural development phases improved the quality and quantity of cultivated land, it did not improve the rural decline effectively before 2013 because it focused more on land issues and did not complement and stimulate urban and rural development. Comprehensive land consolidations in China are expected to operate as both a tool and a platform for the operation of a developmental policy that aims to promote rural vitalisation through the integration of urban-rural development. The case of Huai Town was analysed using a framework of Rural In Situ Urbanisation (RISU) through a semi socio-economic restructuring. This was done to present an innovative style of RISU in which villagers live in towns and their livelihoods, living spaces, and public services are urbanised while they still retain both their rural land rights and rural household registrations, which allowed for the integration of urban and rural resources, the protection of villagers' interests, and a smooth social transition. The key factors for these comprehensive land consolidations to help combat rural decline include a bottom-up, community-supported structure; a coordinated approach incorporating livelihood transformation, population urbanisation, and land urbanisation, with livelihood transformation serving as the foundation; and the protection of villagers' rights and interests.

## 1. Introduction

Few changes have been as significant as the dramatic shift in the population from rural to urban areas globally (Wood, 2008). This rural decline has been accompanied by increasing global levels of urban development and has affected both developing and developed countries (Liu and Li, 2017). In an effort to address this decline, Liu and Li (2017) suggested focusing on four priorities in order to revitalise the world's countryside: promotion of 'ruralisation' alongside urbanisation by the government; encouragement of bottom-up initiatives; the acceptance that villages located in places that are unsuitable for living must be relocated; and a scientific plan to guide the process of revitalisation. Many countries' governments have promoted rural development through land consolidation in order to improve rural decline which falls within one or few of the four priorities. Land consolidation is a spatial problem-solving instrument for land management that seeks to eliminate certain types of land fragmentation, enhance land productivity, and

improve rural production and living conditions (Long, 2014). It operates with the aim of coordinating urban-rural development through a process of concentration of plots or rejuvenation of failing and ageing rural settlements and abandoned industrial and mining land, which is usually accompanied by the construction of new roads, irrigation facilities, and other auxiliary services (Long, 2014). There are five types of land consolidation: cultivated land consolidation, rural construction land consolidation (RCLC), consolidation of land used for industrial and mining construction in cities, land reclamation, and the development of undeveloped land resources (Wu, 2014). It has been used as a tool in the implementation of governmental rural development projects and policies with multiple purposes and goals. Some examples include united land consolidation projects in Central and Eastern Europe (Pašakarnis and Maliene, 2010; Kupidura et al., 2014), Korea (Korthals Altes and Bong Im, 2011), and Turkey (Sayilan, 2014). The Chinese government has been trying to combat rural decline through a series of rural development policies including land consolidation and an inclusive

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urbanisation strategy, especially since 2000. However, as we observed, the main trend in China, Central and Eastern Europe, and many other land consolidation project areas continues to be rural depopulation and decline, although land consolidation has been found to contribute towards increased productivity of land (Wu et al., 2005; Hiironen and Riekkinen, 2016), better spatial restructuring (Long, 2014), social and economic benefits (Cay et al., 2010), and improved ecological functioning (Zhang et al., 2012). Thus, the relationship between land consolidation and rural decline is worth examining. As seen in Fig. 1, the evolution of land consolidation can be roughly divided into two stages, namely non-integrated and integrated urban-rural development. In the non-integrated urban-rural development stage, which extended from 1949 to 2013, China's land consolidation projects were predominantly characterised by three phases of urban-rural relationship: urban areas bred by the countryside, urban areas supported by the countryside, and countryside supported by urban areas. Since 2013, there were substantial changes in the land consolidation system in China. Its purpose shifted from the initial aim of improving cultivated land to integrating urban-rural areas and protecting ecological functions as comprehensive development projects (Fig. 1). Why have former land consolidation projects and policies been unsuccessful in vitalising the countryside in China in the non-integrated urban-rural development stage? How best can the rural decline through an integrated urban-rural development strategy be addressed through comprehensive land consolidation as a part of development policy? This paper examines the results of Chinese land consolidation since 1949 over different stages in the rural-urban relationship. It analyses the effects of land consolidation on combating rural decline and explores reasons for the unsuccessful rural vitalizations that took place through it. China is currently entering a new era of deploying rural vitalisation and integrated urbanisation as national strategies. A specific case in this context in China is analysed in order to discuss its significance for rural vitalisation and integrated urban-rural development through comprehensive land consolidations in China. (see Tables 3–9)

## 2. Land consolidation in China before 2013: reasons for the lack of success

### 2.1. The evolution of the urban-rural relationship

#### 2.1.1. 1949–1978: urban areas bred by the countryside

Land reforms between 1949 and 1954 abolished feudal private land ownership and established a peasant land ownership system. China began to promote collectivisation and cooperative agriculture in 1954 and established the People's Commune System in 1958, which ended the peasant land ownership system completely in favour of a collective land ownership system. Simultaneously, a unified food purchase–supply system, urban-rural dual household registration system (the *hukou* system), and other urban-rural employment, housing, education, and healthcare systems were established. As a result, China's central government prioritised the development of heavy industry in 1956, with the aim of building an independent and integrated industrial system. Interactions between the urban and rural sectors created a phenomenon called 'urban areas bred by the countryside' (Ye and Chen, 2008) because rural concentration released resources such as raw materials and food for industrial development.

#### 2.1.2. 1978–2000: urban areas supported by rural areas

Rural reforms characterised by the household contract responsibility system began in 1978. It established one dual-level operation system for land, combining collective land ownership and household rights to contract and use land. This rural reform ignited rapid industrialisation and urbanisation, as well as widespread, sustained economic growth. From 1978 to 2000, the barriers of the urban-rural dual structure system were partly removed, and more rural resources including labour and money flowed from rural to urban areas.

#### 2.1.3. 2000–2013: rural areas supported by urban areas

Starting in 2000, the Chinese central government adjusted the disparities in urban-rural development in the form of countermeasures to

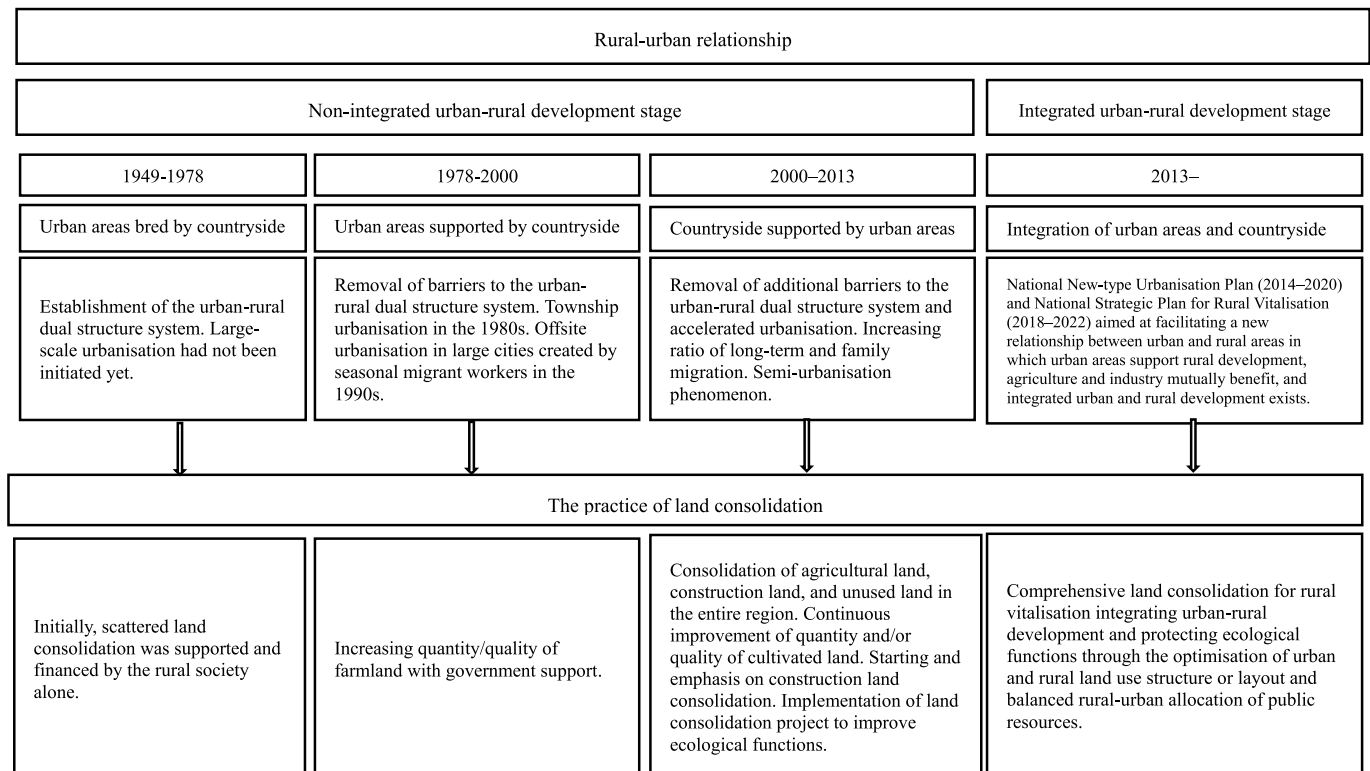


Fig. 1. Coupling relationship between land consolidation evolution and urban-rural development in China.

protect against the negative impacts of countryside degradation. Supportive policies for agricultural and rural development, including rural tax reforms, were launched in 2000 under the guideline of ‘giving more (increase in financial support for agriculture), taking less (reforms in rural taxation and fees), and deregulating’. Rural taxation and fee reforms clarified farmers’ labour obligations, abolished several unpopular charges and levies, and limited the abuse of administrative power. The provision of rural public goods, mainly education and roads, shifted from direct financing by farmers to government financing. In 2005, during the Fifth Plenum of the 16th CPC Congress, the proposal for the 11th Five Year (2006–2010) Guidelines for National Economic and Social Development was discussed. The central government proposed tasks under the larger goal of the Construction of a New Socialist Countryside, which involved coordinating rural and urban economic and social development. This led to a major increase in state expenditure on agricultural production, afforestation, irrigation, and meteorology. Treasury bonds were issued to support the construction of infrastructure in the countryside, and financial support for agriculture increased significantly (Ye et al., 2010). Furthermore, urban sectors began to support rural development.

## 2.2. A review of the results of land consolidation projects in different phases of rural-urban development

### 2.2.1. 1949–1978: simple initial land consolidation

China first explored the benefits of land reclamation during the Yin and Zhou dynasties, about 3000 years ago. After the People’s Republic of China was founded in 1949, land consolidation focused mainly on capital farmland. It was frequently implemented to strengthen the country’s agricultural foundation and food security. From 1949 to 1978, scattered land consolidation was supported and financed by rural society instead of by the central government. By the end of 1954, China began to combine land planning with the establishment of large friendship farms for the first time. Since the initiation of a campaign called ‘Learn from Dazhai’ by China’s central government in 1964, the construction of square and strip croplands, land levelling, and the integration of ditches, canals, and roads were planned and implemented in many areas to improve farmland quality and ensure high, stable yields despite drought and/or excessive rain (Land Consolidation and Rehabilitation Center [LCRC], 2014a; 2014b). Although rural policy in this period focused exclusively on agricultural production to meet prevailing scarcities, support for agricultural production and rural public services constituted a relatively low proportion of the government’s total expenditure.

### 2.2.2. 1978–2000: cultivated land consolidation financed by the government to increase the supply of cultivated land

In this period, factories and urban and rural housing began to replace cultivated land rather rapidly, causing a steady decline in the land dedicated to agriculture. To ensure food security, China’s central government began to protect cultivated land through the strict controlling of land use and implementation of cultivated land consolidation. This control was evident in governmental policies mandating the reclamation of farmland equivalent to the extent of land occupied by non-agricultural construction; such policies at the national and state levels encouraged the consolidation of mid-low yielding, abandoned, and idle land (Li et al., 2018). Land consolidation focused mainly on agricultural land consolidation. It involved making improvements to the quantity and quality of agricultural land through land levelling, irrigation, and drainage; field road construction; farmland protection; and ecological maintenance. In 1998, the LCRC was established under the former Ministry of Land and Resources of China. It played an important role in framing the National Land Consolidation Plan, directing local land consolidation projects, and participating in land legislation and technical regulation. In 1999, the Law of Land Administration of the People’s Republic of China established the regulations for implementing rural

land consolidation. From 1986 to the end of 1997, over 400 counties had conducted a small scale of land consolidation.

### 2.2.3. 2000–2013: large-scale consolidation of agricultural, construction, and unused land

In this period, financial investments in and the implementation of large-scale consolidation of agricultural, construction, and unused land increased nationwide (Table 1). Rural land consolidation is thought of as an important method for supplying cultivated land, revitalising the stock of land, optimising rural-urban land, using land intensively, and increasing land productivity (Liu et al., 2012). Its impact on rural development in this period was reflected mainly in ensuring the quality and quantity of cultivated land, improving rural production and living conditions, and beautifying urban and rural landscapes. The quantity and quality of cultivated land continued to improve. From 2001 to 2013, the average yield per hectare of cultivated land after consolidation increased by 10–20%, and grain production capacity increased by over 6.5 billion kg (Wu, 2014). Du et al. (2018) also showed that 62.90% and 58.34% of projects in 2006 and 2007, respectively, improved

**Table 1**  
Results of land consolidation during 2000–2015<sup>a</sup>.

Cultivated land consolidation	Construction land consolidation	Ecological function protection project
2001–2010: Added cultivated land: 2.761 million ha	2006–2010 : Direct investment in construction land consolidation: 239 billion yuan	2006–2010 : Cultivated land maintained for soil erosion control: 1.45 million ha
Built-up capital farmland with highly stable yields: 13.333 million ha	Rural low-efficient and abandoned construction land consolidated: 0.2 million ha	Trees planted for farmland shelterbelt project: 270 million
2001–2013:	Demolished rural construction sites: 0.152 million ha	
Built-up well-facilitated capital farmland: 26.667 million ha	Reclaimed farmland area: 0.099 million ha	
Average improvement in cultivated land quality after consolidation: 1–2 grades	Construction land area freed up: 0.061 million h)	
Average yield increase per ha of cultivated land after consolidation: 10%–20%		
Increase in grain production capacity: over 6.5 billion kg		
2011–2015: Consolidated agricultural land: 35.33 million ha	2011–2015: Consolidated unused, scattered, or extensively constructed rural land: 0.156 million ha	2011–2015: Cultivated land maintained for soil erosion control: 0.275 million ha (4.13 million mu)
Developed well-facilitated capital farmland: 26.87 million ha	Reclaimed abandoned industrial and mining land: 0.624 million ha	Trees planted for farmland shelterbelt project: 110 million
Added cultivated land: 1.84 million ha	Redeveloped inefficiently used land in towns: 0.1 million ha	
Field roads built: 8.868 million km		
Irrigation and drainage canals built: 8.674 million km		

<sup>a</sup> Data source: LCRC, 2014. National Land Consolidation Plan 2011–2015. China Geological Press. (in Chinese). MLRC, [National Development and Reform Commission](#) (2017). National Land Consolidation Plan (2016–2020) (in Chinese). Wu, H.Y., 2014. Theory, Method and Practice of Land Consolidation. China Geological Press (in Chinese).

productivity, whereas 56.51% and 52.56% stabilised productivity. Since 2006, land consolidation began to consider the ecological functions of land. Many slope modification and slope protection construction projects were implemented to control land erosion, and trees for farmland shelterbelts were planted.

In this period, the demand for construction land increased as China's economy continued to develop rapidly. The strict control of land use by a Cultivated Land Protection Red Line of 0.12 billion ha set up by the central government in 2006 led to large shortages in the supply of construction land in some areas. To ensure a steady supply of supplementary construction land, construction land consolidation began and gained greater emphasis in this period. RCLC aimed to consolidate construction land that was scattered, abandoned, idle, or inefficiently used; to improve rural infrastructure, public service facilities, rural production, and living conditions; and to raise economic and intensive use levels of rural construction land. The construction land supply freed up through the construction land consolidation could be used for infrastructure, industrial agglomeration areas, and new towns. RCLC was accelerated at the county level in 2006 because of the 'increasing vs. decreasing balance' land use policy (Long et al., 2012). In 2006, the former MLRC deployed the first urban and rural construction land pilot projects as a part of the 'increasing vs. decreasing balance' land use policy. This policy linked the increase in urban construction land with the decrease in rural construction land and aimed to achieve zero increase in the total amount of construction land and zero decrease in the area and quality of cultivated land. Under the policy, rural construction land was consolidated. Surplus quotas of rural construction land could be traded on a national platform. Local governments acting as sellers could reinvest part of the income into villages, while local governments acting as buyers could use the purchased construction land quotas for construction projects and the development of both secondary and tertiary industries.

### 2.3. Rural decline and land consolidation before 2013

China has been undergoing rapid social change since the urbanisation rate increased from 10.6% in 1949 to 58.52% in 2017 (National Bureau of Statistics of China, 2018). The mass migration of farmers to cities has lasted for almost 40 years. As a result of the migration of the rural population, rural China witnessed a comprehensive degradation of economic and social functions (Rao, 2013; Wang et al., 2005) even with support from the government including land consolidation. We think there is a mismatch among the rates of industrialisation, population urbanisation, and land urbanisation along with rural decline. In the process of urbanisation, industrialisation is a typical transformation of economic modernisation. From the villagers' perspective, economic modernisation or industrialisation means that their livelihoods are transformed from the agricultural to the non-agricultural sector. The concept of livelihoods offers a more complete picture of the complexities of making a living in rural areas in low-income countries than terms that were formerly considered adequate, such as subsistence, incomes, or employment (Ellis, 2000). 'Livelihood transformation' refers to rural migrants making a livelihood in non-agricultural sectors when sufficient and adequate non-agricultural, full-time jobs, and employment opportunities are provided. For a long time, the dual-track structure of rural-urban development in China has made it possible for rural migrants to be employed in the non-agricultural sector, to earn their livelihoods, and to relocate to cities. However, it has been difficult to change their public service provisions from rural communities to the urban sector, including areas such as primary education, medical care, and social security. For example, a rural migrant earn their salary in the urban sector and live in an urban area but their children cannot access public schools in the urban area because they do not have urban registration under the *hukou* system. The urban population increased from 0.45 billion in 2000 to 0.81 billion in 2017 (National Bureau of Statistics of China, 2018). This population included over 0.1 billion migrant

labourers who were statistically considered a part of the urban population despite having rural *hukou* registration, meaning that their social security, medical, and educational rights were limited in urban areas. We can analyse this phenomenon through a concept called 'population urbanisation', which refers to the process in which public services for farmers whose livelihoods were transformed from the agricultural to the non-agricultural sectors are transferred from the rural to urban areas. The difficulty lies in the urban-rural dual-track system. This fact that 'population urbanisation lagged behind' was a key reason especially for 'villages-in-the-city', 'floating population' (Wang, 2006), and 'left-behind populations' (Ye et al., 2013) in the countryside.

Another typical phenomenon that results from rural decline is the issue of hollowing villages (Long, 2013) wherein a large number of dilapidated houses are left uninhabited and unmanaged in villages. This is because land urbanisation lagged behind migration. Land urbanisation is the process of expansion of non-agricultural land area along with the rate of industrialisation and migration of agricultural labour to urban areas, and at the same time rural construction land use should be a way of economical intensive one, usually decreasing. However, according to the National New-type Urbanisation Plan (NNUP) (2014–2020), because of the aggravation of extensive and inefficient use of construction land, from 2000 to 2011, urban built-up area increased by 76.4%, which was far higher than the urban population growth rate (50.5%). For the same period, the rural population decreased by 133 million, while land for rural settlements increased by 2.03 million ha (30.45 million mu). RCLC was thought of as an innovative approach towards coordinating the outmigration of the rural population and the increase in rural housing land (Fang et al., 2016). However, it resulted in the phenomenon of 'farmers upstairs'. This contraction of farmer's homestead usually causes farmer protests and other negative consequences because farmers are not fully involved in the decision-making process, and besides, the consolidation project lacked broad community support (Long et al., 2012; Fang et al., 2016; Long, 2014; Li et al., 2014). Long et al. (2012) discussed the scheme's implementation through a case study of Huantai County in Shandong Province, highlighting its contested and contingent nature. Regardless of public interest in RCLC's projects, its implementation would remain unsuccessful without the cooperation of the villagers. Critically, RCLC should follow a trial-and-error approach, and villagers must have real opportunities to participate in decision-making to influence their futures (Fang et al., 2016).

Although the government increased its efforts to support rural development through funds and projects including land consolidation, rural decline continued because of the insufficient reconciliation of the rates of industrialisation and population and land urbanisation even with all government support including land consolidation policies and projects. Although land consolidation improved the quality and quantity of cultivated land and ensured food security, it focused more on land issues and did not complement and stimulate urban and rural development to enhance the quality of public service provided. It also neglected the provision of sufficient employment from the non-agricultural sector when it accelerated construction land consolidation before 2013 (Fig. 2). As a result, it did not improve the rural decline effectively before 2013.

## 3. How can comprehensive land consolidation as a tool help vitalise the countryside?

### 3.1. 2013–present: comprehensive land consolidation for rural vitalisation and integrated urban-rural development

The Report on the 18th National Congress of the CPC dated November 8, 2012, stated that integrating urban and rural development offers a solution for rural decline in general, and agricultural, rural area, and farmer issues, in particular. The policy of rural development must be expanded to boost agriculture, benefit farmers, and increase rural



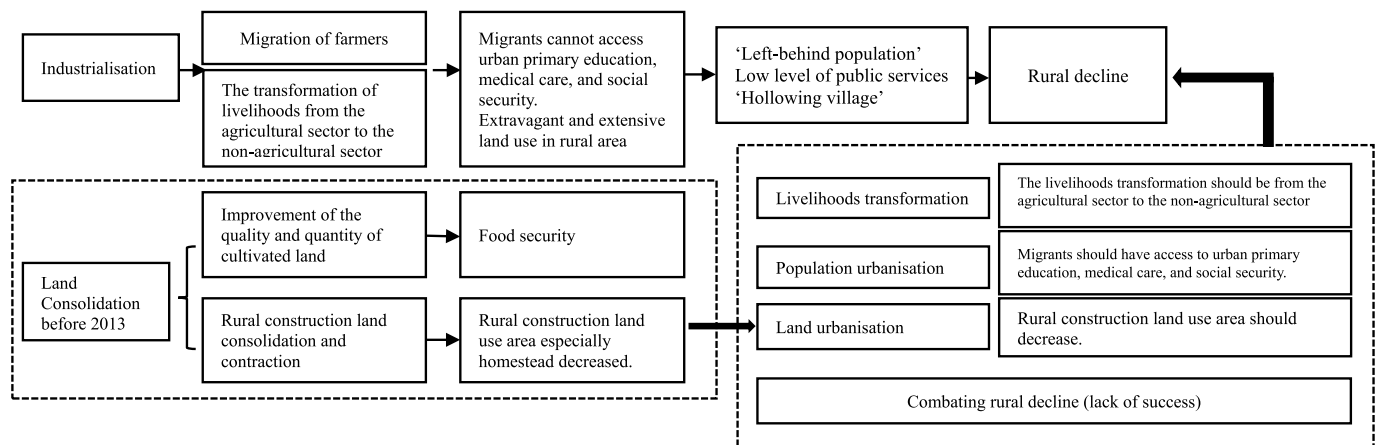


Fig. 2. Rural decline and land consolidation before 2013.

prosperity, and the rural population should be encouraged to participate equally in modernisation and share its fruits. This vision of development aimed at setting up a new relationship between industry and agriculture and between urban and rural areas in which industry promotes agriculture, urban areas support rural development, agriculture and industry benefit mutually, and urban and rural development are integrated. In March 2014, the Central Committee of the CPC and the State Council released a 'National New-type Urbanisation Plan (NNUP) (2014–2020)', which marked the first instance of urbanisation planning being presented as national policy. It analysed the background, significance, principles, targets, and measures of a new type of urbanisation characterised by population urbanisation, optimal town/city layout, and integrated urban-rural development to explore a new path towards sustainable urbanisation. In 2017, CPC General Secretary Xi Jinping introduced a rural vitalisation strategy at the 19th National Congress of the CPC (Xi, 2017). The Chinese national rural vitalisation strategy requires that sound systems, mechanisms, and policies for the promotion of integrated urban-rural development be established in order to build rural areas that refer to the idea that urban and rural development can complement and stimulate each other, instead of focusing only on the allocation and management of internal rural resources and elements.

Changes in the aforementioned strategies and policies have profoundly affected the implementation and effectiveness of the land consolidation project, thus making it a comprehensive tool for promoting rural vitalisation with the aim of increasing cultivated land, improving the quality of cultivated land, reducing the total amount of constructed land, and improving rural production, living conditions, and the environment. The widely implemented land consolidation projects in China were aimed to reverse land fragmentation, increase the quantity of farmland, and improve production, living, and ecological conditions by consolidating the fields, water, roads, forests, and villages comprehensively (Li et al., 2018). Table 2 shows the results of the comprehensive land consolidation during 2013–2018 as published by

the LCRC (see Table 3).

How can rural decline be addressed through the use of comprehensive land consolidation and through the development and implementation of an integrated urban-rural development strategy? Liu (2018) suggested that rural vitalisation should focus on promoting the reconstruction of an urban-rural integration system and the construction of a multi-level goal system including urban-rural infrastructure networks, rural development zones, village-town spaces. Long et al. (2019) suggested that it is crucial to adjust key development elements and promote coupling and coordination among various elements for both rural land consolidation and vitalisation. Understanding how to use comprehensive land consolidation as a tool to allocate and manage urban-rural resources for rural vitalisation and integrated urban-rural development is crucial. Based on the abovementioned studies, we use a case study situated in Huai Town in Sichuan Province of China to explore the process of integrated urban-rural development initiated and accelerated by comprehensive land consolidation. The case is a typical example of integrated rural-urban development by the use of comprehensive land consolidation and is expected to present the details of how the developmental elements of urban and rural regions interact to form a new type of urbanisation through comprehensive land consolidation. It analyses the key factors that make comprehensive consolidation an effective tool for combating rural decline in order to realise rural vitalisation in practice.

### 3.2. Case study

#### 3.2.1. Research methods

We used in-depth field research and the case study method as is common in the study of rural sociology. We organised group interviews with land administrative departments at five levels, namely province, city, county, township, and village and interviewed the key informants to build the profiles of land consolidation projects and policies in the area of research. We stayed in Gong Village in Huai Town for a month and conducted field research, which included activities such as semi-participatory observations, household surveys and interviews with villagers, interviews with village cadres, etc. A total of 50 villagers' questionnaires, 10 case studies of different types of villagers, and 3 interviews with village cadres were used for analysis.

#### 3.2.2. Theoretical analysis framework

**3.2.2.1. Semi socio-economic restructuring: production, livelihood, and living-space restructuring and retention of rural land rights.** Rural restructuring refers to 'the reshaping of social and economic structures in rural areas during the late twentieth century and early twenty-first century produced by various, interconnected processes of change including the

Table 2

Comprehensive Land consolidation results in China during 2013–2018.

Period	Results
2013–2018	Built-up well-facilitated capital farmland: 32 million ha
Five years after the 18th CPC National Congress	Added cultivated land: over 1.6 million ha Increase in grain production capacity: 44 billion kg Land consolidation optimises urban and rural land use structure and layout, promotes balanced rural-urban allocation of public resources, and accelerates the rational flow of production factors between urban and rural areas to promote integrated development.

**Table 3**

Huai town comprehensive land consolidation plan 2006–2020 (unit: Hectare).

Comprehensive consolidation projects	Construction land consolidation				Agricultural land consolidation		Ecological restoration
	Current rural residential area	Planned rural residential consolidation area	Planned concentrated rural residential area	Planned construction land area freed up	Consolidation scale	Increase in cultivated land	Slope protection construction
Huai Town	329.40	249.43	22.36	227.07	5455.25	473.97	3460.12

**Table 4**

Gong Village cultivated land consolidation.

	Cultivated land area	Cultivated land quality (using rice yield/mu as an example)	Concentrated cultivated land area
Pre-consolidation	400 ha	7500 kg/ha	13.333 ha
Post-consolidation	424.667 ha	9000 kg/ha	80 ha

**Table 5**

Gong Village construction land consolidation.

Village construction land area pre-consolidation	Village construction land area post-consolidation	Construction land area saved	Reclaimed land area after demolition	Demolished area
98.667 ha (1480 mu)	74 ha (1110 mu)	24.667 ha (370 mu)	24.667 ha (370 mu)	1.4 ha

**Table 6**

Gong Village housing types before and after construction land consolidation.

	Housing type	Number of households	Proportion
Pre-consolidation	Traditional village courtyard housing	899	100%
Post-consolidation	Huai Town apartments	630	70%
	Single-family housing community in the village	50	5.5%
	Retain original housing	219	24.5%

**Table 7**

Agricultural production restructuring before and after land consolidation.

	Cultivated land area	Main planting varieties	Main agribusiness entities	Proportion of small household farmers	Proportion of cultivated land transferred	Cultivated land transfer price (yuan/ha/year)
Pre-consolidation	400 ha (6000 mu)	Rice, wheat, vegetables, herbs, etc.	Small household farmers	80%	20%	0–4500
Post-consolidation	424.667 ha (6370 mu)	Olives, herbs, rice, etc.	Agricultural company; farmer cooperatives	30%	70%	5700–12,000

**Table 8**

Livelihood restructuring of villagers who had moved to Huai Town and transferred their land use rights.

	Non-agricultural job	Agricultural production	Agricultural subsidies	Rural social security system
Before consolidation	Non-farm work, business in cities/townships	Crop planting Sideline production	Grain subsidies based on contracted cultivated land Cultivated land protection subsidies based on contracted cultivated land	Rural pension, rural cooperative medical care, and Rural Minimum Living Subsidy
After consolidation	Non-farm work in urban and township areas, business Temporary agribusiness employment	None	No change after land consolidation: grain subsidies based on contracted cultivated land	No change after land consolidation: rural pension, rural cooperative medical care, and Rural Minimum Living Subsidy
	Land rents for transferring of land use rights	None	No change after land consolidation: cultivated land protection subsidies based on contracted cultivated land area	

declining economic significance of agriculture, the rise of the service sector, urban to rural migration, and so on' (Woods, 2009). Long et al. (2016) argued that rural restructuring was a process of optimising the allocation and management of the material and non-material elements affecting the development of rural areas and accomplishing structural optimisation and the functional maximisation of rural development systems and areas. It is necessary to restructure rural production and living and ecological spaces through land consolidation in order to establish a new platform to build a new countryside and realise the development of urban-rural integration in China (Long, 2014). We focused on rural restructuring from the perspective of rural inhabitants because comprehensive land consolidation causes a dramatic transformation in their daily lives. We also focused on semi socio-economic restructuring involving the restructuring of production, livelihood, and living spaces, and the retention of rural land rights. Production restructuring includes changes implemented in the form of agricultural production, plant varieties, and agricultural business entities. Livelihood restructuring refers to changes implemented in the farmers' income sources' structure. Living-space restructuring refers to changes implemented in family living spaces. The retention of rural land rights means that new town residents from the villages retained their rural household registration with rights over their collective land. Their incomes, living spaces, and public services were urbanised.

**Table 9**

Restructuring of farmers' living spaces after land consolidation.

	Living style	Spatial characteristics	Proportion of households	Basic public-service level
Before consolidation	Traditional self-built village house and courtyards	Big living spaces, private courtyards, poor planning, messy	100%	In the village: Far from downtown, as well as from medical centres, schools, and shopping; poor conditions of public services (transportation, drinking water, drainage, and sewage treatment systems).
After consolidation	High-rise apartment community	Small living spaces, common courtyards, good planning	70%	Downtown: Near the medical center, schools, and shopping; public services (transportation, basic education, drinking water, drainage sewage treatment systems, etc.) provided by town.
	Concentrated single-family housing community	Big living spaces, no private courtyards, good planning	5.5%	In the village: Far from downtown, as well as from the medical centres, schools, and shopping; improved drinking water, drainage, and sewage treatment systems
	Original houses; Non-participation in construction land consolidation	Big spaces, private courtyards, poor planning, messy	24.5%	In the village: Far from downtown, as well as from the medical centres, schools, and shopping; poor conditions of public services (transportation, drinking water, drainage and sewage treatment systems).

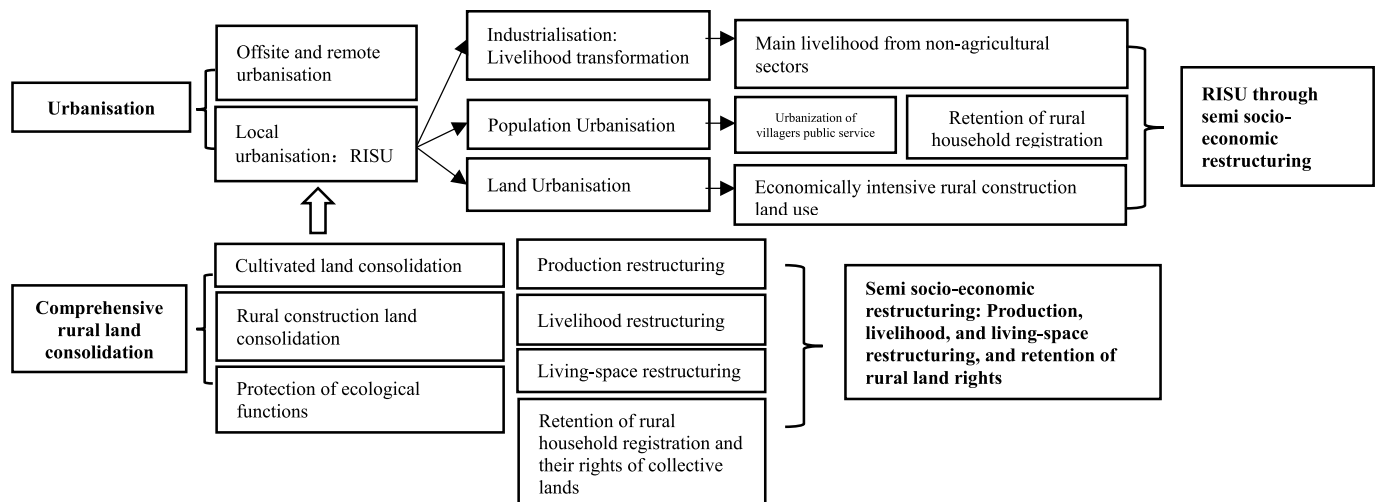
**3.2.2.2. Local urbanisation: Rural In Situ Urbanisation (RISU).** Township urbanisation began the process of urbanisation in the 1980s. It was dominated by remote offsite agglomerations of seasonal migrant workers outside big cities. Since 2000, long-term migration increased, part-time migration decreased, and family migration rose. From the perspective of population urbanisation, RISU refers to the shift made by rural inhabitants to counties and towns near their native villages, in order to fundamentally transform the way in which they produce and live, thus leading to urbanisation (Li et al., 2017). From the perspective of land use, RISU refers to a concept wherein rural settlements are considered urban while continuing to remain within the original rural settlement areas (Zhou et al., 2018). In this paper, RISU is defined as a form of urbanisation that differs from migration to big cities, focusing instead on small towns that develop as a result of rural inhabitants' non-agricultural employment and residence in small cities and towns near the original village area. To combat rural decline and achieve rural vitalisation, comprehensive land consolidation projects, especially those including RCLC, were implemented in many places to realise RISU in order to resolve the discrepancy between population and land urbanisation. This type of RISU through comprehensive land consolidation projects usually focuses on a comprehensive consolidation of rural residential land areas to promote their concentration and to develop small towns near the original village area.

**3.2.2.3. RISU through semi socio-economic restructuring.** The NNUP, which was published in 2014, accelerated the urbanisation of rural inhabitants, and this allowed more rural residents to get urban household registration in order to access urban primary education, healthcare, and

social security as a tool of a new form of urbanisation. However, more rural residents were reluctant to engage in urban household registration after they migrated to the cities because the benefits provided by the urban social security system after shifting from rural to urban household registration were far less than those that accrued from the rural cultivated land as well as the contracted homestead and use rights. Rural residents who exchanged their land for new urban household registration were likely to become the lowest urban income class. In the case of the RISU process in Huai Town shown below, the villagers retained their rural collective land ownership and rural household registration when they moved to the township in order to access better public services. The framework of analysis of RISU through semi socio-economic restructuring (Fig. 3) was constructed to describe this new type of urbanisation in which the new town residents moved from village areas that still belonged to the rural household registration system with rights over collective land, and their income, living space (concentrated in the form of a town), and public services are urbanised.

### 3.2.3. Case profile: plan and practice of comprehensive rural land consolidation in Huai Town

Huai Town is located in Jin County in Sichuan Province. As it is located by the upper reaches of the Tuo River, Huai Town's southeastern zone comprises alluvial plains, terraces, and low hills, while its north-western zone comprises mountains. The town covers 109.47 km<sup>2</sup> and administers 3 street residents' communities and 21 administrative villages. In 2017, the town's total population was 77,519, of which the rural population was 60,856. Grain fields constituted 3870.867 ha, of which the total grain output was 16,458 tonnes; the orchard area was

**Fig. 3.** Analysis framework: RISU through semi socio-economic restructuring.

502.867 ha, and comprised 13,047 fruit trees. Gong Village is an administrative village in Huai Town. It enjoys an area of 7.5 km<sup>2</sup>, of which 400 ha are cultivated land, and 300 ha are woodland. In 2017, the total population was 2,678, with 899 households and 23 agricultural production groups. Traditional subsistence crops are dominated by rice, wheat, corn, yam, and beans; cash crops mainly comprise perennial, high-quality fruits, seedlings, vegetables, and peanuts.

**3.2.3.1. Land consolidation plan in Huai Town.** Huai Town's 2006–2020 Land Consolidation Plan includes two main aspects: agricultural land and construction land consolidation. The planned agricultural land consolidation area was 5455.25 ha, the planned slope protection construction area was 3460.12 ha, and a newly added cultivated land area was 473.97 ha; the planned construction land consolidation area was 249.43 ha, which meant that 227.07 ha of construction land was available.

### 3.2.3.2. Land consolidation practice in Huai Town

**3.2.3.2.1. Agricultural land consolidation.** In practice, from 2009 to 2017, with a total investment of about 79 million yuan, Huai Town consolidated 3266.667 ha of land, including 866.667 ha of cultivated land with slope protection construction and 1133.333 ha of dry land. Simultaneously, 360 ha of cultivated land (grades 8 to 9 as defined by the National Standards of Agricultural Land Quality in China) were added. Further, 11,000 m of supporting ditches and 300 reservoirs were built, and 20 hill ponds and 69,000 m of field roads were renovated.

Over 30 million RMB was invested to consolidate 400 ha of cultivated land in the village up to 2017. Field road and irrigation facility construction improved transportation and irrigation, respectively, and reduced weather reliance. Taking rice yield as an example, yield per ha increased by 750–1500 kg. With improvements in farming conditions in the fields, land fragmentation was also resolved. As Gong Village is located in a hilly area, the land in the village was highly fragmented. Among the total 400 ha of farmland, 80 ha became open to mechanised farming after consolidation. The slope protection project of cultivated land, called 'slope-to-terrace', had improved soil erosion and strengthened the farmland's ecological functioning to some extent.

**3.2.3.2.2. Construction land consolidation.** Construction land consolidation was implemented in Gong Village under the 'increasing vs. decreasing balance' land use policy. Village construction land area amounted to 98.667 ha (1480 mu) before and 74 ha (1110 mu) after consolidation in 2017. Consolidation included two parts: demolishing 680 old houses (an area of 1.4 ha) and building new high-rise apartments in Huai Town and new houses (single-family, three-layer villas) in the original Gong Village. Construction land area post-consolidation decreased by 24.667 ha (370 mu) by 2018. After successfully reclaiming the construction land area freed up in the village, it could be transformed into construction land quotas and sold for about 0.72 million yuan/ha (48,000 yuan/mu) at the Chengdu Rural Property Exchange Center. When the transaction was completed, most of the funds were allocated to Gong Village to compensate its residents for demolishing old buildings and constructing new ones in their place. Before the funds were made available, the county government first made an advance available in order to construct high-rise apartment buildings for the villagers' residential needs. The construction land quota for this was allocated by the county and township governments. The new apartments and houses counted as rural collective construction land, so the villagers acquired collective land ownership and real estate deeds after purchasing the houses.

**3.2.3.3. How to conduct comprehensive consolidation: A bottom-up, community-supported approach.** Long (2014) argued that a bottom-up restructuring strategy accompanied by some top-down elements is helpful in the smooth promotion of rural spatial restructuring in China. Li et al. (2014) indicated that promoting community-based land

consolidation and allocation scientifically and in accordance with local conditions can create an integrated platform for increasing farmland area, facilitate the development of modern agriculture, promote the construction of a new countryside, and vitalise hollowed villages. Huai Town's land consolidation process allowed villagers to choose to live in the township or in the village and decide whether to transfer the contracted cultivated land's use rights. Land consolidation was implemented in accordance with the plan that was discussed fully with the villagers.

The construction of the apartment was led by a committee that included the apartment owners, who were villagers who had participated in the construction land consolidation. The committee had the duty to report to the county's Development and Reform Commission on matters such as tendering processes, supervision, periodic checks, and acceptance. In all its functions, the committee was guided by the town government.

In consolidating Gong Village's construction land, villagers had three choices:

- A. To live in a community of high-rise apartments in Huai Town;
- B. To live in a concentrated community comprising single-family houses in Gong Village;
- C. To not participate in the construction land consolidation and retain their original houses in Gong Village.

After construction land consolidation, 630 households chose option A, 50 chose option B, and 219 chose option C.

The villagers who participated in the construction land consolidation received the following financial support:

- A. Compensation for the demolition of old houses. The amount was calculated based on housing structures and building areas. Compensation for brick and concrete structures was 70 yuan/m<sup>2</sup>; that for brick and wood structures was 50 yuan/m<sup>2</sup>; and that for simple structures was 30 yuan/m<sup>2</sup>.
- B. Purchase of new buildings: Villagers purchased apartment buildings for 1100 yuan/m<sup>2</sup> (average of 30 m<sup>2</sup> per person) and 2200 yuan/m<sup>2</sup> (over 30 m<sup>2</sup> per person). Villagers purchased single-family houses for 3000 yuan/m<sup>2</sup>. These prices were lower than the market price because new building construction was funded by selling the construction land quotas that had been freed up by consolidation.

The construction rules for the apartments and houses were as follows:

- A. Build new houses first and demolish the old houses afterward. Old houses will be removed only after the villagers receive the keys to their new houses.
- B. If the villagers volunteer to demolish their houses first, they receive rent subsidies.
- C. Villagers can design their construction land consolidation plans and choose the layout for their own houses. Once the contract is signed, they are not allowed to back out. The owner's committee was responsible for the consolidation planning, design, demolition, rehabilitation, and other programmes pertaining to construction land. Huai's experience was effective because of the community support and bottom-up management style of handling the project.

### 3.2.4. Case analysis: rural in situ urbanisation (RISU) through semi socio-economic restructuring

#### 3.2.4.1. Production restructuring

**3.2.4.1.1. Change in agricultural production forms.** Through semi-structured focus group interviews and key informant interviews, we found the following. Before land consolidation, small household farms



were the main land divisions in Gong Village. Each household had 0.44 ha (6.6 mu) cultivated land on average, usually scattered among the hilly areas. After land consolidation, the use and operating rights of 70% of the village's cultivated land were transferred from villagers to three agricultural companies at prices ranging from 5700 to 12,000 yuan/ha/year (380–800 yuan/mu/year). After obtaining the farmland, these companies planted olives for profit. Therefore, Gong Village's agricultural production transformed after land consolidation: 30% of cultivated land was managed as before by small household farmers who planted traditional crop varieties on improved cultivated land, while 70% was operated by modern commercial companies that planted cash crops. The villagers who transferred their land obtained rent and benefited from temporary farming work employment.

**3.2.4.1.2. New agricultural business entities.** After the consolidation of cultivated land, a large-scale transfer of agricultural land use rights took place. Some capital-intensive agricultural companies obtained usage rights of the villagers' contracted cultivated land through land transfers in order to carry out large-scale agriculture. Among them, JFG agricultural company obtained use rights of 133.333 ha (2000 mu) of cultivated land in Gong Village for olive planting, and XL agricultural company obtained use rights of 106.667 ha (1600 mu) of cultivated land for olive planting by transferring from villagers. Several local farmer cooperatives developed simultaneously, including the Farmers' Cooperative of Traditional Ladybell Herb Variety and the Taoyuan Rural Tourism Cooperative. These two cooperatives were based on local resources that were organised by the farmers themselves. A total of 104 farmers had registered.

**3.2.4.1.3. Changes in crop varieties.** Before land consolidation, traditional crops such as rice, wheat, corn, yam, and beans were dominant. After land consolidation, crop varieties changed considerably. Olives were planted as cash crops, and covered two-thirds of the original cultivated land area.

**3.2.4.2. Restructuring of villagers' livelihoods.** Before land consolidation, households owned 0.44 ha (6.6 mu) farmland on average in Gong Village, where traditional and profit crops were mainly planted. The small-scale farmers' livelihood model commonly combined agricultural production with employment in surrounding cities and towns. While farming, they also migrated to work or to engage in temporary jobs nearby. Some households also transferred their lands to neighbours and other villagers. As they did not usually obtain rental income from transferred land use rights and signed no formal contracts, transferred land could be returned at any time. This practice constituted an informal mutual-aid transfer of land. Before land consolidation, most villagers' incomes came from part-time jobs, small businesses, and agricultural production. Sideline production in the yard guaranteed products for non-staple food items. All villagers received grain subsidies and cultivated land protection subsidies based on contracted cultivated land rights. Subsistence allowance under the recently created System of the Rural Minimum Living Subsidy and Rural Pension as a form of guaranteed income was available for every eligible village family and provided basic livelihood security.

After agricultural land consolidation, the quality of the contracted farmlands improved, attracting 'capital to the countryside' (*Zi Ben Xia Xiang*) in the form of large-scale land contracts for 5700–12,000 yuan/ha/year (380–800 yuan/mu/year) for agricultural production and business. New agribusiness entities were allotted nearly 70% of the village's cultivated land in 2018. The land transfer was carried out under the policy framework of 'separating rural land ownership, contract, and use rights' (*San Quan Feng Zhi*). Villagers retained their rights over their contracted land and enjoyed collective land ownership rights while agribusinesses obtained use and management rights over the transferred land. The result of questionnaires and interviews showed that the coincidence degree for households that transferred cultivated land and for households that chose to live in concentrated communities in Hai Town

was 90%. That is, 90% of the households that chose to live in concentrated communities chose to transfer the use rights of their contracted land. Such households accounted for about 63% of all the households in the village. Their livelihood structure had completely changed. After land consolidation, these farmers stopped agricultural production. Income from sideline production was also no longer available because of the concentrated living conditions. Farmers began to draw cash income from their businesses and jobs (migration work, temporary jobs and agribusiness employment) and received rent from land use rights. The land rent was 5700–12,000 yuan/ha/year (380–800 yuan/mu/year), whereas temporary agribusiness employment provided a daily salary of 70–100 yuan. Over the last five years, over 50% of a family's income (above 50,000 yuan/year) came from migration jobs or jobs around the township, county, or city. Full-time jobs that were available because of active economic development in the township and city (part of the Chengdu economic development belt) helped ensure the sustainability of farmers' non-agricultural livelihoods after the restructuring triggered by land consolidation. They continued to receive grain and cultivated land protection subsidies as well as social security income because they had retained their status as villagers.

**3.2.4.3. Restructuring of villagers' living spaces.** The restructuring of most farmers' living spaces began after land consolidation. Gong Village had 899 households and 23 villager groups in 2017. Before land consolidation, villagers' traditional houses were scattered between the road and the low hills. After the consolidation of construction land, their living spaces underwent tremendous changes. For the 630 households that moved to Huai Town's concentrated apartments, this was especially true. The newly constructed apartments included facilities such as fitness equipment, plazas, libraries, basketball courts, public wash-rooms, and day-care centres. Township and county public services such as medical care, education, transportation, and shopping centres were more conveniently located. However, the living space in each apartment was smaller. Thus, did not have space for sideline production, and the communal style of living that was common in the village disappeared. The households that did not move into the residential areas in town enjoyed the same standards and conveniences as those available in town in terms of roads, electricity, satellite TV, and Internet access. However, there were no major improvements in the drinking water, drainage, and sewage treatment systems, and public services such as medical and healthcare, education, transportation, and shopping centres were all still located rather far away from these households.

So, villagers' traditional rural style of production, livelihoods, and living spaces had changed significantly as they had encountered a new type of integrated urban-rural development. From the villagers' perspective, comprehensive land consolidation had transformed their daily lives dramatically. The following three villagers cases showed the details of the above-mentioned households, from which we found villagers chose to move and transferred their land use rights after relocation because of urbanised public service and livelihood transformation.

**Case 1:** Mr. Jiang, aged 39 years, owned 0.4 ha (6 mu) of farmland. He lived with his mother, wife, and two children, aged 9 and 5 years. There were three reasons behind his family's decision to shift to a town nearby. First, there were no schools in the village and the nearest schools were located in Huai Town, which was where his older child attended primary school. Second, his 63-year-old mother had diabetes and needed regular medical treatment and sometimes hospitalisation in Huai Town. Third, his small, cultivated land area was inefficient and thus had a low level of production and could not cover his family's expenses. The town offered more job opportunities; so his overall income from living in the town was higher than the income he earned in the village.

**Case 2:** Mr. Gong was 42 years old. He had a wife, a 16-year-old son, and a 1-year-old daughter. They had 0.2 ha (3 mu) of contracted

farmland. His son was learning a three-year-course of automobile repair at a vocational school in a neighbouring town. His tuition was over 6000 yuan/year, and the family's cost of living ranged between 200 and 300 yuan/month. Before land consolidation, the family's income mainly came from planting, breeding animals, and occasional temporary jobs. Rice and vegetables were the main crops, and they had over 10 pigs and over 20 free-range chickens and ducks. Mr. Gong participated in the construction land consolidation after he was persuaded to do so by the village cadres. He was unsure about living in the township because he was not adept at earning money from temporary work around downtown. After moving to town, family consumption rates increased because of the additional food and energy costs they incurred. Mr. Gong thought that his new residence was too far from his land, so he planned to transfer it to the agricultural business company and stop agricultural and sideline production, including raising poultry. He tried to find better jobs downtown to guarantee a comfortable lifestyle.

Case 3: Mr. Li, aged over 70 years, had four children. Both of his daughters had bought commercial apartments in Huai Town. One son worked in Huai Town and another worked in Chengdu. All of them lived away from their village home all year long, where only 0.4 ha (6 mu) of contracted cultivated land remained. They had three rural homestead accounts in the village: Li and his sons each owned one. In 2017, after land consolidation, considering Li's age and family situation, the family decided that Li should move to the high-rise apartment in the concentrated residential area in Huai Town. They transferred all their cultivated lands, and Li moved into a new apartment as decided. Li told the researchers that the commercial houses that his daughters had bought in Huai Town were 4800 yuan/m<sup>2</sup>, but resettlement apartments for the villagers cost only 1100–2200 yuan/m<sup>2</sup>. He said that many villagers worked hard when they lived in the city and aimed to buy apartments in one of the towns or cities. Now, this goal became easy for them to achieve. Life in Huai Town was convenient in several ways. Since his children also lived in Huai Town, it was more convenient for them to take care of him. Given his old age, working and living alone in the mountains was not a long-term solution. Thus, moving to Huai Town was the right choice.

**3.2.4.4. Retention of village household registration and rights over land.** As part of Huai Town's land consolidation process, all villagers who moved to Huai Town's concentrated residential areas did not change their rural household registration system. They retained their rural household registration and all collective economy rights, including cultivated land contracting rights, rural homestead land use rights, access to grain and cultivated land protection subsidies, and other benefits of a collective economy. They also reserved the right to apply for rural construction land to build their single-family houses based on their village memberships when they were ready. The social security system applied to them, and included medical care. Endowment insurance was the same, and differed from the urban system. Access to public services such as schools and hospitals improved.

### 3.2.5. Conclusions drawn from the case studies

The case studies show that comprehensive land consolidation using a bottom-up strategy restructured the villagers' agricultural production, livelihoods, and living spaces. It improved the quality of cultivated land, reduced the quantity of land for construction, and accelerated the transfer of cultivated land and agglomeration of living space. Construction land area was freed up, cultivated land was scaled through land transfer, and population urbanisation aligned with livelihood transformation and land urbanisation. The farmers' production, living spaces, and livelihoods underwent both change and restructuring. Villagers with sufficient non-agricultural work opportunities moved into concentrated high-rise apartment communities in town as a part of local urbanisation in which they retained access to the rural social security system and their rights to contracted cultivated land, although they

lived in the town. The villagers retained their rural household registration, had the same collective land rights and interests as before, and had access to the rural social security system instead of having to follow the urban household registration process. This semi socio-economic restructuring paved the way for a new form of urbanisation where villagers retained their rural household registration status while moving into towns and experiencing the urbanisation of their livelihoods, living spaces, and public services. For example, they abandoned their single-family village houses but maintained their right to apply for rural construction land to build single-family houses based on their village membership. This protected their land interests and rights while simultaneously creating a new type of urban-rural relationship in which the definitions of *urban* and *rural* were neither strictly nor clearly delimited.

We identified three key factors for comprehensive land consolidation to help combat rural decline and realise rural vitalisation in practice from the case studies. These factors are as follows:

- A. Comprehensive land consolidation should be planned and implemented using a bottom-up, community-supported approach. Relying on social organisations like owners' committees comprising RISU and stakeholders in comprehensive land consolidation is helpful.
- B. Comprehensive land consolidation should be aligned with industrialisation (for villagers, this means livelihood transformation) and population and land urbanisation. Of these, livelihood transformation is the foundation. Providing non-agricultural jobs is a necessary condition for RISU. Land and population urbanisation should not be implemented at a pace that is quicker than that of livelihood transformation. If farmers' non-agricultural employment is insufficient, housing conducive to agricultural production should be constructed to improve the village living environment and support the intensive use of construction land. RCLC for villages where villagers' whose main income comes from agricultural production should not leave for residential housing located far from the villages. Farmers would face the risk of poverty and their livelihoods would be threatened if they encounter difficulties in non-agricultural employment after leaving their villages and abandoning agricultural production. Therefore, it is necessary to strengthen employment support for this group and assess their poverty risk.
- C. The rights and interests of farmers should be protected. It is very important to think about how comprehensive land consolidation affects ordinary people and how their rights and interests can be protected. A comprehensive land consolidation effort that incorporates the protection of villagers' land rights and interests, including rights to cultivated land and homesteads, is important to achieve integrated urban-rural development. Population urbanisation refers not only to villager offsite urbanisation with urban household registration but also to a new type of RISU characterised by villagers living and working in towns and keeping their rights and interests based on their rural household registration. This innovative path would allow for the integration of urban and rural resources, the protection of villagers' interests, and smooth societal transition.

## 4. Conclusions and discussion

By reviewing the relationship between the evolution of land consolidation and the urban-rural relationship, we found that China's land consolidation projects had improved the quality and maintained the quantity of cultivated land while also ensuring food security. However, previous land consolidation projects paid more attention to the land issue and did not resolve the mismatch between the rates of livelihood transformation and population and land urbanisation sufficiently. It did not help combat rural decline either. When the development of urban-rural integrated plans began in 2013, China's central government prioritised rural vitalisation. Now, comprehensive land consolidation has been planned and carried out as a comprehensive

rural development approach for rural vitalisation that integrates urban-rural development and the protection of the ecological function through the optimisation of urban and rural land use structure and layout and balanced public resource allocation between urban and rural areas. The case study of Huai Town using the RISU framework through semi socio-economic restructuring found that this comprehensive land consolidation project promoted a form of local urbanisation, namely RISU, characterised by villagers living in town while retaining their rural household registration. This type of RISU can allow for the conciliation of the rates of livelihood transformation, population and land urbanisation, and integration of urban and rural resources to achieve rural vitalisation. This achieved the integration of urban and rural elements and resources in which villagers who lived in small towns were still within the rural household registration system with rights to collective ownership, while their livelihoods, living spaces, and public services were urbanised. Three key factors should be adhered to in practice to help combat rural decline through an integrated urban-rural development strategy comprising comprehensive land consolidation as development policy. This policy should comprise a bottom-up, community-supported structure; a coordinated approach incorporating livelihood transformation and population and land urbanisation with the former serving as the foundation; and the protection of villagers' rights and interests.

Many past studies have concluded that the successful comprehensive land consolidations for integrated urban-rural development and rural vitalisation must first follow a bottom-up and community-supported structure and protect farmers' land rights and interests (Long et al., 2012; Fang et al., 2016; Long, 2014; Li et al., 2014). Livelihood transformation should be another necessary condition for RISU through comprehensive land consolidation to promote integrated urban-rural development and rural vitalisation. A successful RISU process should ensure that rural inhabitants' livelihoods come from non-agricultural sectors and that there are sufficient non-agricultural jobs for new town inhabitants who move in from the villages. If farmers' non-agricultural employment is insufficient and non-agricultural income is unstable, RISU through comprehensive land consolidation should not be planned and practised.

We think that comprehensive land consolidation in China has been expected to operate as both a tool and a platform, and as a component of development policy to promote rural vitalisation by integrating urban-rural development through the optimisation of urban and rural land use structure/layout, and to balance public resource allocation between urban and rural areas. This study has a limitation in that it analysed only one type of local urbanisation to integrate urban-rural development elements, namely the comprehensive consolidation project, through the study of one village. It is important to study other types and practices, as well as other villages. The activation of rural internal initiatives to vitalise the countryside through comprehensive land consolidation involving integrated urban-rural development strategies would be important as well.

#### CRedit authorship contribution statement

**Jing Rao:** Conceptualization, Methodology, Investigation, Data curation, Supervision, Writing - original draft, Writing - review & editing, Visualization, Project administration, Funding acquisition.

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#### Appendix A. Supplementary data

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