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Rural land system reforms in China: History, issues, measures and prospects

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ABSTRACT

Land system reform (LSR) helps to protect farmers' rights and interests and national food security. China is a country dominated by agriculture but insufficient arable land resources. The contradiction between man and land is prominent. To alleviate the man-land contradiction, the Chinese government has carried out a series of LSRs, especially in the past half century. Extensive and in-depth studies have been done on the process and stage characteristics of China's LSRs, but the systematic analysis on the necessity, problems and key measures to deepen the land system reform is still insufficient. Based on a systematic review of the history of the evolution of China's LSRs, this study firstly analyzed the key issues and new challenges existing in or arising from China's land system, then put forward the necessity of deepening the reform of land system, and discussed specific measures taken to deepen the reform of land system in China at present and finally pointed out the future LSR's direction. The results show that China's rural LSR has gone through five stages in general since 1949. The key problems existing or arising from the current land system in China include unclear subject of land property right, serious inefficient utilization of land resources, rapid farmland conversion and conflict between farmers' interests and land system. The dual land system in urban and rural areas has severely restricted the integration of social and economic development in this country. The Chinese government is actively promoting the reforms of rural agricultural land, collective operating construction land and homestead to further remove the dual institutional barriers that hinder the establishment of an integrated land trading market. The vision is good, but there is still a long way to go for China's LSR. The direction of China's rural LSR is to make the property rights relationship clearer, the farmland rights more complete, the transfer transactions more market-oriented and the property rights' protection more equal. Deepening the rural LSRs is helpful to improve the efficiency of land resource utilization, safeguard the rights and interests of farmers, promote the coordination of human-land relationship, and inject new vitality and momentum into rural revitalization. Cooperative promotion of land resource capitalization reform and household registration system reform is the key area of land system reform in China in the future.

1. Introduction

Land is the material basis for the survival and development of human society. Land system refers to the institutions and laws that define and regulate the relationships between land and its users, which is the most important arrangement of production relations in a country and the most basic system in all systems (Lin and Ho, 2005; Han, 2018). The choice of land system is an important issue concerning farmers' livelihood, agricultural development and social stability. For a long time, land tenure/system reform has been put on the priority agenda of system reform in many countries (Pinckney and Kimuyu, 1994; Smith, 2003; Green, 2006; Peters, 2009; Liu et al., 2014; Van Leeuwen, 2014; Travers et al., 2015). When a country's land system does not meet the requirements of its productivity development, reform is imperative (Liu, 2017). The purpose of reform of land system is to make it adapt to the requirements of realizing market-oriented redistribution of land resources under the background of urbanization and industrialization at the present stage, as well as the needs of diversification of land functions and value manifestation arising from urban and socio-economic development (Yang et al., 2018). The LSR has always been an endless debate topic throughout human history, because it has played, and continues to play, a central role in political economies and the

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differences of ideologies (Feder and Feeny, 1991; Ho and Spoor, 2006; Holden et al., 2013).

Clarity of property rights, tenure security, protection of arable land, efficient utilization of resources and coordination of human-land relationship are the LSR's core objectives. Around these goals, many countries in the world have carried out or are carrying out various degrees of the LSRs (Feder and Feeny, 1991; Li et al., 1998; Ho, 2001; Toulmin, 2009; Payne, 2004; Liu et al., 2014; Holden and Ghebru, 2016; Krishna et al., 2017; Ghebru and Lambrecht, 2017; Zhou et al., 2019). Low-cost LSR can help to clarify land property rights and ensure food security (Holden and Ghebru, 2016). The LSR can help to improve the poor's access to land and alleviate poverty in developing countries (Besley and Burgess, 2000), to promote land redistribution (Pacheco, 2009) and economic growth (Pinckney and Kimuyu, 1994), and to protect grassland (Liu et al., 2019). Clear and secure land tenure rights contribute to forest conservation (Larson et al., 2013). Land tenure and associated property rights in rural China affect the production behavior of farmers (Li et al., 1998). Private land ownership tends to higher agricultural productivity in Uganda (Mwesigye et al., 2017). The LSRs adapting to the development of productive forces can stimulate farmers' enthusiasm, initiative and creativity, thus promoting the development of productive forces (Han, 2018). However, the LSR can also aggravate land fragmentation, land conflicts and gender imbalance (Hartvigsen, 2014; Jürgenson, 2016; Kalabamu, 2019; Almond et al., 2019). Generally, countries or regions with more obvious land conflicts need more LSRs, e.g., Africa (Peters, 2009; Chimhowu, 2019), Malawi (Djurfeldt et al., 2018), Rwanda (Bayisenge, 2018), Botswana (Kalabamu, 2019), Uganda (Green, 2006), Mexico (Barnes, 2009) and China (Liu et al., 2014; Liu, 2017).

China is a populous and agricultural country, and more people and less land are the country's basic national conditions (Wu, 1991). China has achieved the urban-rural land division by state-ownership and collective-ownership of land. The urban-rural dual land system determines the different land rights system, different land resource allocation and value-added income model between urban and rural areas. This has brought about a series of serious problems, such as rapid farmland conversion, farmers' rights' damage, land conflict aggravation and urban-rural gap expansion, which has attracted wide attention from all walks of life (Qu et al., 1995; Chen and Davis, 1998; Ding, 2003; Lin and Ho, 2005; Han, 2018; Liu et al., 2014; Chen, 2018; Bryan et al., 2018). To resolve these problems, the Chinese government has implemented a series of LSRs. Many studies have been carried out the purpose, measures, evolution process and existing problems of China's rural land system reform (Dong, 1996; Brandt et al., 2002; Ding, 2003; Li, 2003; Ho, 2015; Liu, 2017, 2018a, 2018b; Liu et al., 2014). The improvement of farmers' well-being, the long-term development of agricultural production and social stability are considered to be closely related to the timely reform of rural land system (Wang and Wei, 2016). These studies have strongly promoted the reform of China's rural land system. However, China's agricultural production mode is changing from traditional slash-and-burn cultivation to more dependent on mechanization, and urban-rural factors such as population, land and capital flow more frequently (Liu et al., 2014; 2018; Li et al., 2015; Liu, 2017). The old problems of rural land system still exist, and new problems gradually appear, such as abandonment of arable land, farmland conversion, inefficient use of land resources, damage to farmers' rights and interests, villages hollowing and other issues (Liu et al., 2003, 2011; 2014; 2017; Lichtenberg and Ding, 2008; Tan et al., 2009; Song and Liu, 2017; Shi et al., 2018). There is an urgent need to deepen the reform of the land system or further change the land system. To alleviate the contradiction between man and land (i.e., the phenomenon that the population is increasing and the demand for food is increasing, which leads to the insufficiency of land resources to meet the needs of the population), China is launching a new round of deepening land system reform. However, at present, the systematic understanding of the problems existing in or arising from the land system and the necessity of deepening the reform are not enough. Based on systematically reviewing the evolution of land system reform in contemporary China, this study first systematically reviewed the key problems existing or arising from the current land system, then analyzed the necessity, significance and key measures of deepening the reform of land system, and finally revealed the internal mechanism of land system reform promoting rural revitalization. The data used in this study are available from the published literature, statistical data and official documents. These findings contribute to a comprehensive and systematic understanding of China's LSR over the past half century and can provide benefic references for other countries' land system decision-making.

2. History of China's rural land system reform

2.1. China's land management system

The forms of land ownership in China include state ownership (ownership by the whole people) and collective ownership by the working people. In 1982, the Chinese Constitution, the earliest law concerning the form of land ownership, stipulates that urban land is owned by the state, and the rural land is owned by rural collectives (Fig. 1). Since then, China has formed two sets of laws and regulations concerning urban land and rural land in China, namely, the 1986 Land Management Law and the 2002 Rural Land Contract Law (RLCL). According to the Land Management Law, the state-owned land mainly includes land in urban areas, land in rural areas and suburban areas that has been legally expropriated and confiscated (National People's Congress of the PRC (NPC, 1986). Rural collective-owned land includes the contracted land, the collective operational construction land and the non-operational construction land. According to previous laws, China's rural collective land can enter the market as land for construction only if it is converted into state-owned land through land expropriation (Liu, 2017, 2018b). This has contributed to different right systems and allocation modes for urban and rural land, and thus forming different land management systems, operation modes and benefit distribution patterns (Lin and Ho, 2005).

2.2. Rural land system reforms in China

Since the Communist Party of China (CPC) took power, China's reform originated from rural reform, and rural reform originated from rural LSR (Fig. 2). Over the past seven decades, China's rural areas have gone through the establishment of household registration system (1951), collective ownership (1956), people's commune (1958) and rural social endowment insurance system (1982), and the reform and opening up (1978), the sudden emergence of township enterprises (1984), the reform of the socialist economic system (1993) and the household registration system (1997), and the economic restructuring to deal with financial crisis (1998) and tax and fee reform (2002), and the establishment of low-income insurance system (2003), food subsidy system (2004), the construction of new countryside (2005), the abolition of agricultural tax (2006), the establishment of endowment insurance system for urban and rural residents (2014), and the implementation of rural revitalization strategy (2017). Before 2014, China's rural LSR was mainly concentrated on the reform of land-use right, and it can be roughly divided into four stages.

2.2.1. Establishment of rural land system under collective ownership and unified management (1949–1977)

Before the founding of new China in 1949, China's land belonged to private property rights, and farmers had ownership of land (Ding, 2003). Farmers can dispose of land at will within the scope of law, including buying and selling, and tenancy and other forms of transactions. The feudal land system has seriously hindered the economic and social development in rural China before 1949. The vast number of

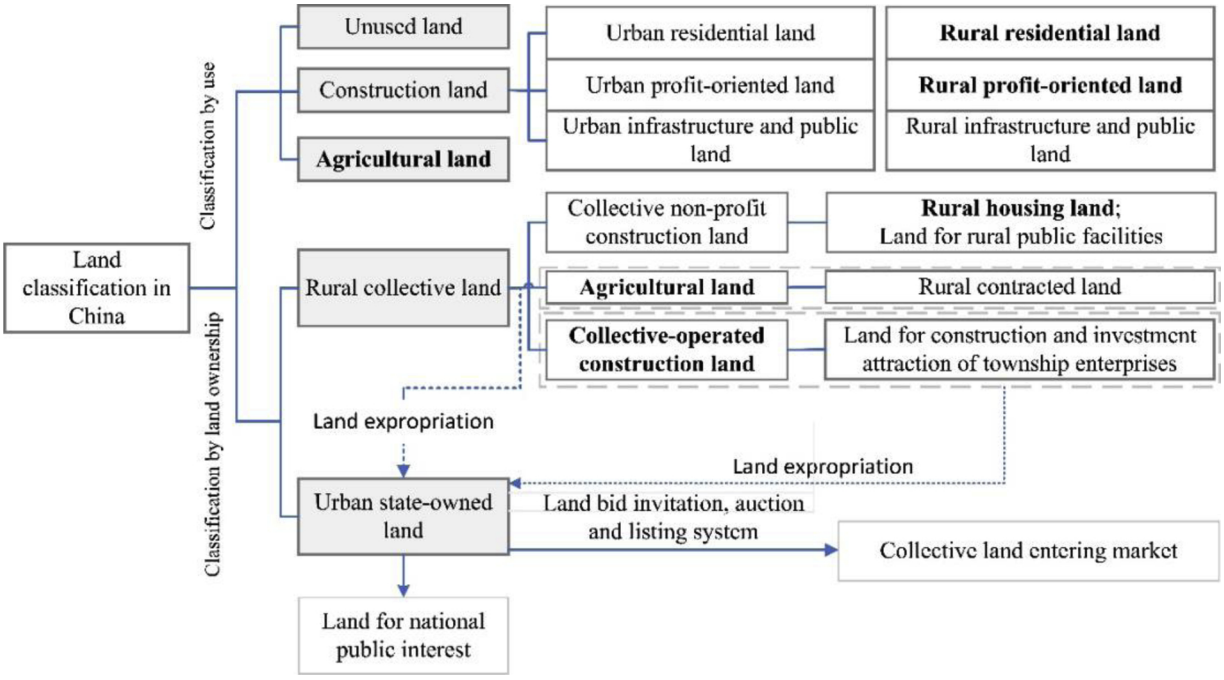
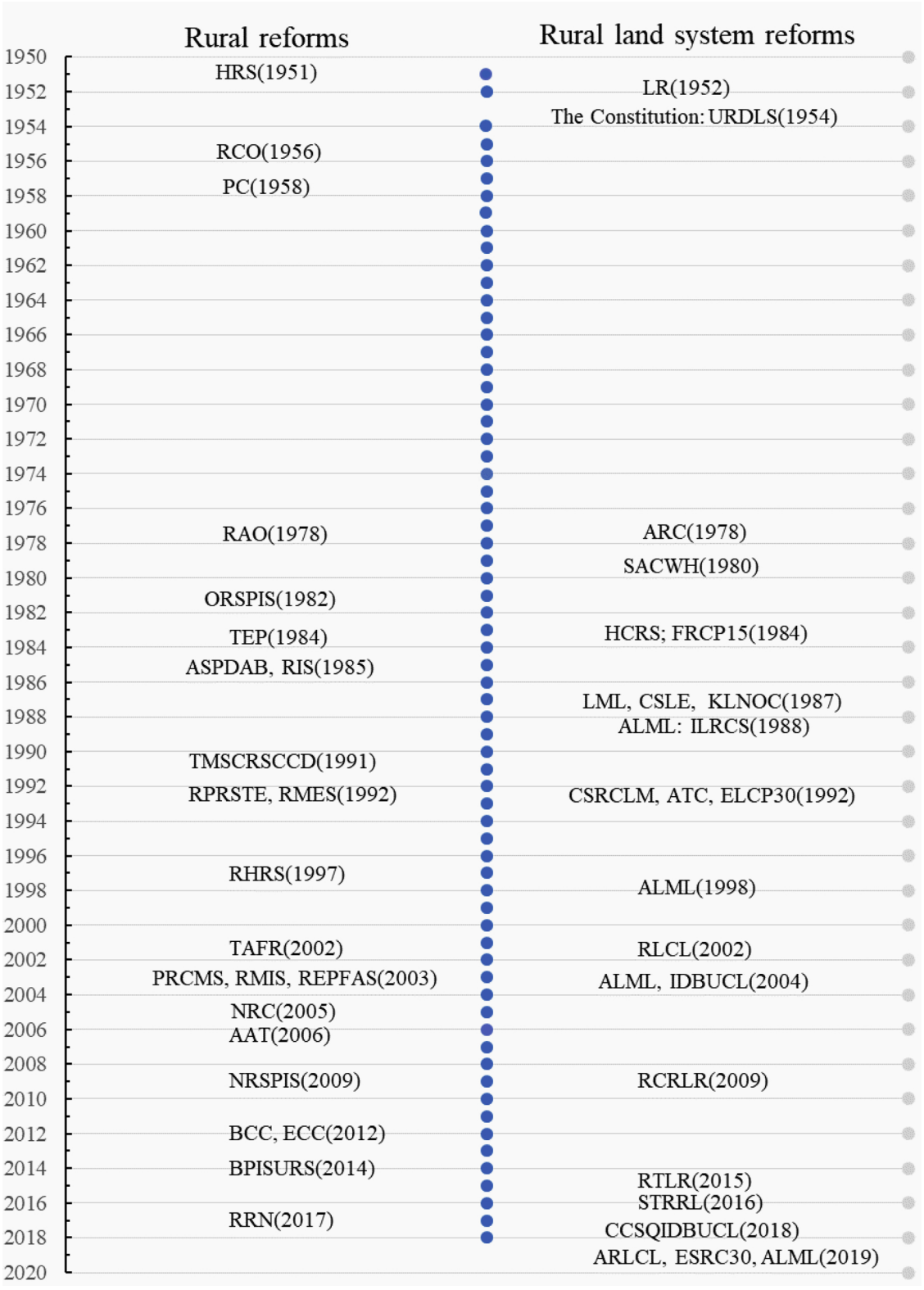


Fig. 1. China's land reclassification. Drawn by the authors.

farmers urgently needed land reform and land acquisition. To liberate rural productive forces, develop social economy and abolish land ownership exploited by the landlord class, China launched a nationwide agrarian revolution between 1949 and 1953. This land reform overthrew the private ownership of land and established the public ownership of land through land reform, which aimed to enable framers to acquire more land property and more equalization. After the reform, China's farmers still have the right to operate, sell and lease land freely. The Constitution promulgated in 1954 is the first constitution of new China, which stipulates that the state protects farmers' land ownership in accordance with the law. Land reform had greatly increased the enthusiasm of farmers who have access to land for production and contributed to a substantial increase in China's grain output. China's grain output increased from 113 million tons in 1949 to 195 million tons in 1957 (National Bureau of Statistics Rural Socio-economic Survey Team (NBSRSST, 2000). In 1958, the People's Commune (PC) was introduced, but the collective ownership of rural land inevitably led to low production efficiency and reduced grain production. In addition, the Great Leap Forward, which began in 1958 and ended in 1960, violated the objective law of economic development and followed equalitarianism, which frustrates farmers' enthusiasm for production and causes the collapse in agricultural output (Lin, 1990; Lin and Yang, 1998; Li and Yang, 2005). For example, China's grain output dropped from 197 million tons in 1958 to 169 million tons in 1959, and then to 136 million tons in 1961 (National Bureau of Statistics Rural Socio-economic Survey Team (NBSRSST, 2000). To cope with the serious agricultural economic crisis and stabilize food production throughout the country, the Chinese government has begun to adjust the rigid management system of the People's Commune. In 1962, the central government of the CPC further clarified the ownership of land by the people's communes as the three-level ownerships with the team as the base unit (*sanji suoyou, dui wei danwei,* SSDWD), that is, the collective ownership of land belonging to three entities (the commune, the brigade, and the team) and the team being the basic holder, which lasted until 1978 (Qu et al., 1995; Ho, 2001, 2015). During this period, equalitarianism had long dampened the enthusiasm of farmers in production, resulting in the long-term slow development of agricultural production. China's grain output increased from 154 million tons in 1962 to 282 million tons in 1977, with an average annual growth of 4.4% (National Bureau of Statistics Rural Socio-economic Survey Team (NBSRSST, 2000). During this period, the country formed a unique collective land ownership system for rural land by land reform. On the one hand, the country implemented the collective ownership of rural land and exercised the comprehensive political and economic control in rural areas through the people's communes and different production brigades. On the other hand, the country also exercised the collective land property rights, which led to the low enthusiasm of farmers in production due to eating from the same pot – getting an equal share regardless of the work.

2.2.2. Establishment of household contract responsibility system (HCRS) (1978–1992)

Before the reform and opening-up in 1978, the SSDWD collective ownership system carried by the PCs in rural China liberated rural productive forces to a certain extent, and made positive contributions to the country's original accumulation of industrialization. However, with the realization of the country's preliminary industrialization goal and the completion of the accumulation of primitive industry, the drawbacks of this land system had gradually emerged, frustrating farmers' enthusiasm for production (Hu, 1997; Li et al., 2009). Through grassroots innovations, official support and policy implementation, a new rural land system acceptable to the relevant agents was formed in the late 1970s. As the end of 1978, Xiaogang Village in Fengyang County of China, as the archetype of China's rural reform, took the lead in breaking through the traditional system and realized the contractual responsibility system with the main contents of "contracted production to household (*baochan daohu*)", i.e., the household contract responsibility system (HCRS) (Crook, 1985; Qu et al., 1995; Lin and Ho, 2005). Subsequently, China had promoted the pilot of the HCRS in Inner Mongolia, Gansu and other places and issued a series of relevant documents. It is worth mentioning that in 1958, for the first time, China clearly divided urban and rural residents into urban and rural household registration, which laid the basic pattern of the current household registration management system, and also created conditions for the implementation of the HCRS (Wu and Treiman, 2004). The HCRS was popularized throughout the country in 1984, and China's central document No. 1 of that year stipulated that the period of land contract was 15 years (Cheng et al., 2019). The HCRS made farmers become the



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main body in commodity production and operation activities, which mobilizes farmers' production enthusiasm and lays a good foundation for the development of market economy in China. It is no exaggeration to say that the real starting point of China's reform and opening-up is the reform of land rural land system (Lin and Ho, 2005; Liu et al., 2014). The HCRS was established and persisted in agriculture, becoming the foundation of China's agricultural growth, which realized the separation of ownership and contractual management rights, and the former belongs to village collectives and the latter to farmers, that is, "the separation of the two rights of land" (Wang and Zhang, 2017). Private land ownership can better mobilize farmers' enthusiasm and promote the increase of grain production and agricultural

Fig. 2. Evolutionary process of rural reforms and rural LSRs in China since 1949.
Notes: Land reform (LR); Rural collective ownership (RCO); People's commune (PC); Old Rural Social Pension Insurance System (ORSPIS); Reform and Opening-up (RAO); Abolish the system of purchasing and distributing agricultural and byproducts (ASPDAB); Readjusting industrial structure (RIS); Two-tier management system of Household contract responsibility system and combination of centralization and decentralization (TMSCRSCCD); Reform of property right system of township enterprises (RPRSTE); Reform of market economy system (RMES); Strategic adjustment of economic structure to deal with financial crisis (SAES); Reform of the household registration system (RHRS); Promoting the reform of household registration system in small towns (PRHRSST); Tax and fee reform (TAFR); Pilot rural cooperative medical system (PRCMS); Rural minimum insurance system and rural extremely poor families assistance system (RMIS and REPFAS); Food subsidy system (FSS); New Rural Construction (NRC); Abolish agricultural tax (AAT); New-type rural social pension insurance system (NRSPIS); Township enterprises (TEP); Beautiful China construction and ecological civilization construction (BCC and ECC); Basic pension insurance system for urban and rural residents (BPISURS), Reform and Opening (RAO), Rural revitalization (RRN), Constitution: Urban-rural dual land structure (URDLS); All-round contract (ARC); State-approved contractual work to the household (SACWH); Household contract responsibility system; First-round contracting period of 15 years (FRCP15); Land Management Law (LML); Compensated system of land expropriation (CSLE); Keeping the land area the same no matter the number of a family changes or not (KLNOC); Amendment of the Land Management Law (ALML); Improving the land requisition compensation standards (ILRCS); Compulsory state-owned for the entry of rural collective land into market (CSRCLM); Amending the Constitution (ATC); Extending the land contract period to 30 Years (ELCP30); Rural Land Contract Law (RLCL); Increasing vs. decreasing balance of urban-rural construction land (IDBUCL); Cross-regional circulation of surplus quotas for the increasing vs. decreasing balance of urban-rural construction land (CCSQIDBUCL); Amendment of Rural Land Contract Law (ARLCL); Extension of the second round of contract for another 30 years (ESRC30); Registration and certification of rural land rights (RCRLR); Rural three lands reform (RTLR).

modernization than communal management (Zhang and Donaldson, 2008; Ye, 2015).

2.2.3. Stable period of land contractual management rights (1993–2007)

The first round of land contracting in China lasted for 15 years, beginning in 1978 and ending in 1993. After the expiration of the original contractual period of arable land, the 2002 RLCL raised an extension of land contract period for another 30 years to stabilize the contractual relationship of land. During this period, China's rural land system developed towards strengthening the protection of farmers' land property rights (Guo, 2011; Liu, 2017). First, the country has clearly defined the connotation of collective ownership of land by law. The collective ownership of land by peasants is the foundation of the basic management system in rural China, and the owners have the right to possess, use, benefit and dispose of collective land according to law. Second, it protected the property rights of peasant households' land contract right. It was clear that the contracted land is the property of peasants and they enjoy the rights of contracted land use, income and transfer of contracted land management rights by law. The land contractor has the right to organize the production, operation and disposal of products independently. Third, the family agricultural management system was regarded as the basic system of the country. The Constitution of 1999 clearly states that rural collective economic organizations carry out a dual-level management system based on household contractual management and integrated with unification and decentralization.

2.2.4. Dynamic stable period of land system reform (2008–2013)

With the market-oriented reform and rapid urbanization, part of the farmers began to appear part-time and non-agricultural behavior, the transfer of rural labor to cities and towns accelerated, and the utilization rate of agricultural land began to decline (Ding, 2003; Long et al., 2012). At the same time, the consciousness of scale agricultural production for some households have been gradually established and new-type management subjects such as professional farmers and family farms have begun to emerge, which has resulted in the demand for land circulation (or transfer). Land circulation refers to the transfer of land use right, that is, the farmers who own the contractual management right of land transfer the right of land use to other farmers or economic organizations (Xu, 2014; J. Wang et al., 2018; Y. Wang et al., 2018). In October 2008, the Central Committee of CPC adopted the Decision on Several Major Issues in Promoting the Reform and Development of Rural Areas, which proposed that the land contracting relationship should be stabilized for a long time and the farmers should be given more enough and secure land management rights (Xinhua Agency, 2008). This indicates that China will carry out a new-round rural LSR.

3. Deepening rural land system reform

3.1. Key issues in current land system

As China's demographic, economic and social structures change, the land-related contradictions are becoming increasingly acute. The key issues in China's land system include unclear property rights of rural land, unobstructed land circulation, inefficient utilization of land resources and lack of rural land market mechanism (Ho, 2001; Brandt et al., 2002; Lai et al., 2014; Liu et al., 2014; Xie and Lu, 2017). Unsound practices in farmland use and management have contributed to farmland loss, rising social conflicts and deprivation of the landless, which perpetuates rural poverty and land tenure insecurity (Ho and Lin, 2004; Lin and Ho, 2005; Liu et al., 2014; Chien, 2015; Liu, 2018d; Liu et al., 2018b; Xin and Li, 2018). Restricted by land system, the residential land (RL) and the collective-operated construction land (CPCL) can't get into the market freely (Liu et al., 2014; 2018). The land requisition system, as the main way for collective land to enter the market, is meeting the needs of national economic and social development and promoting economic growth. At the same time, there are also some shortcomings, such as ambiguous land expropriation scope, irregular land expropriation procedures, unreasonable land expropriation compensation standards, which lead to serious loss of farmers' land rights and interests (Jacoby et al., 2002; Sargeson, 2013; Qun et al., 2015). Rural collective construction land is prevented from entering the market at the same price as state-owned construction land, and the usufructuary right of homesteads has not been fully put into place, which not only directly infringes the rights and interests of farmers, but also widens the urban-rural gap (Liu et al., 2014; Liu, 2017).

3.1.1. Coexistence of farmland conversion and farmland abandonment

Agricultural land conversion refers to the process of conversion of agricultural land to non-agricultural land. Since 1978, rapid urban expansion caused the loss of farmland at an unprecedented rate in China (Ding, 2003; Tan et al., 2005; Jiang et al., 2013; Liu et al., 2014). About 4.7 million hectares of farmland were converted into construction land from 1978 to 2003 and 11.56 million hectares of farmland into construction land from 2003 to 2015 (Chen et al., 2014a; Liu, 2017). Land expropriation is the main tool in the conversion of agricultural land to non-agricultural use. Influenced by the phased, structural and regional surplus of agricultural products supply and the rising cost of agricultural production, agricultural production is not as effective as non-agricultural industry in China. Low comparative benefits of planting land and marginalization of cultivated land are the fundamental reasons for abandoning cultivated land (Li et al., 2017; Li and Li, 2016). Although China has formulated a strict policy of cultivated land protection, under the background of rapid industrialization and urbanization, the rural labor force is constantly transferring to urban non-

Table 1
Rural land transfer in China between 1997 and 2017.

	Number of transferred households of contracted land (10,000 household)	Percentage of transferred households (%)	Transfer area of household contracted land (10,000 mu)	Percentage of transferred area to the total contracted area (%)
1997	316.0	1.2	1,535.0	1.2
2002	—	—	2,565.4	1.4
2005	—	—	5,469.2	3.1
2006	—	—	5,551.2	4.6
2007	—	—	6,372.0	5.2
2008	—	—	10,900.0	8.9
2009	—	—	15,100.0	12.0
2010	3,320.9	14.5	18,700.0	14.7
2011	3,877.0	16.9	22,800.0	17.8
2012	4,440.0	19.3	27,800.0	21.5
2013	5,696.0	22.9	34,100.0	26.0
2014	5,833.0	25.3	40,300.0	30.4
2015	6,542.1	28.4	44,700.0	33.3
2016	6,788.9	29.7	47,900.0	35.1
2017	7,070.6	31.2	51,200.0	37.0

Sources: Research Group on Rural Cooperative Economy of the Ministry of Agriculture (RGRCEMA, 1991; Hu and Zhang, 2007; Ministry of Agriculture (MOA, 2017; Liu, 2017.

agricultural sectors, resulting in the rural labor force outflow and arable land abandonment, especially in the mountainous areas of Southwestern China (Liu et al., 2011; Li et al., 2017; Li and Li, 2016).

3.1.2. Conflict between farmers' interests and land system

Usually, land has the functions of production, ecology, social security and social stability. Among them, the safeguard function of land is unique in China (Liu, 2017). Land expropriation has led to an increase in landless or land-lost farmers. The land-less farmers refer to those who have less than 0.3 mu (one mu equals to 0.067 ha) of farming area per capita in their households after their land is legally expropriated (Han, 2005; Liu et al., 2014; Lian et al., 2016). It is estimated that, with the expansion of cities, more than 1000 square kilometers of land have been expropriated every year since 2001 in China, most of which are arable land (Tian, 2018). Previous studies have shown that 1.5 peasants will lose their land for each acre of land requisitioned (Kong and Wang, 2004). The total number of the land-lost farmers in China has reached more than 40 million in 2011 and is expected to reach 110 million by 2030 (Editorial Board of China Urban Development Report (EBCUDR, 2011). The landless peasants have basically become the “three nothingness (*sanwu renyuan*)” people with “no arable land, no security, no employment” due to the imperfection of land expropriation security system (Han, 2005; Liu et al., 2014; Liu, 2017).

The low compensation of the expropriated-land peasants is mainly due to the lack of correct understanding of the land function and its relationship with farmers' interests, which often compensates for the production function of land, but insufficient compensation for its security function and assets function. The increasing landless farmers are facing some uncertainties in sustaining their lives, competing in the labor market and adapting to urban life, which is not conducive to social stability, nor for the long-term social and economic harmonious development (Qian, 2015; Zhang et al., 2018). From the perspective of interest pattern, China's current land allocation is generally at the expense of farmers' interests, and the market mechanism has not played its due role. Therefore, the multi-function attributes of land resources should be regarded as the starting point and basis of China's rural LSRs and the reconstruction of the benefit allocation pattern.

3.1.3. Agricultural scale management facing great challenges

China's agriculture is dominated by decentralized management (Carter and Estrin, 2001). Given the vast population and limited land, the amount of land that could be distributed to each household was minimal, resulting in decentralized, fragmented and small-scale operations (Dong, 1996; Chien, 2015; Lu and Xie, 2018). The right to use and operate of the limited cultivated land in China is allocated to 231 million households. The proportion of households with less than 0.5 ha of cultivated land per household in China exceeded 90% in 1997, increased to 92% in 2006 and remained 80% in 2016 (National Agricultural Census (NAC, 2000; 2009; National Bureau of Statistics (NBS, 2017). These results indicate that the fragmented structure of family farming remained mostly unchanged and halted the possibility of large-scale operation of agriculture. But we also need to note that scale operation is not necessarily proportional to productivity, such as Ethiopia and Mexico (Kagin et al., 2016; Paul and wa Gĩthĩnji, 2018).

3.1.4. Strong demand for land circulation

Since the implementation of the HCRS, agricultural land transfer in China has gone through four stages on the whole, i.e., limiting, allowing, standardizing and appropriate scale of circulation (Liu, 2008; Liu and Gong, 2017). In the early 1980s, with the implementation of the HCRS, China’s farmers became contractors and operators of land. At that time, the state strictly restricted the circulation of farmland (Liu, 2017). In 1984, the central government of CPC first approved the transfer of farmland from the policy level, and in 1993, it further allowed the paid transfer of farmland. In the late 1980s, the spontaneous transfer of land contractual management rights by Chinese farmers was basically maintained at 1–3% (Yu et al., 2003). In 1990, the number of rural households subcontracted and transferred reached 2.08 million, accounting for 0.9% of the total number of rural households, accounting for 0.44% of the total cultivated land area in the country (Research Group on Rural Cooperative Economy of the Ministry of Agriculture (RGRCEMA, 1991). By the end of 2003, the country began to standardize the farmland circulation procedure to protect farmers' land contractual management right from the legal level (Liu, 2008). With the acceleration of industrialization and urbanization, the scale of farmland transfer expanded rapidly after 2008. In 2010, the arable land area under household contract management was 1.273 billion mu and it was contracted to 228.8 million households, and the transfer area of farmland reached 12.47 million hectares, accounting for 14.7% (Table 1). In recent years, with the rapid progress of urbanization and the gradual increase of marginal decline effect of grain planting, the speed of land transfer has been accelerated, and the scale of land transfer has increased significantly. Compared with 2010, the scale of agricultural land transfer in China increased by 2.73 times in 2017, and the proportion of land transfer farmers to contractors increased by 16.7% (Table 1; Ministry of Agriculture (MOA, 2017; Wei et al., 2018).

In addition, farmers are gradually differentiating and the economic importance of farmland is declining. Pure peasant household (PPH) refers to the peasant household whose labor force is mainly engaged in the primary industry, whose income accounts for more than 80% of the family's net income. The proportion of the PPHs in China has dropped from 49.90% in 1993 to 39.65% in 2013 (China Rural Fixed Observation Points Office (CRFOPO, 2017). Over the past two decades, the composition of peasants’ income in China has been changing constantly, showing that the family operating income has been declining continuously, while the wage income, property income and transferable income have been increasing continuously. Statistics show that from 1978 to 2018, the proportion of Chinese peasants’ wage income to their total income has increased from 6% to 41%, while the proportion of household operating income has decreased from 80% to 37% (Fig. 3). These results demonstrate that with the rapid advancement of urbanization, the degree of differentiation of Chinese farmers has deepened, and the economic importance of agricultural land has declined (Guo, 2018).

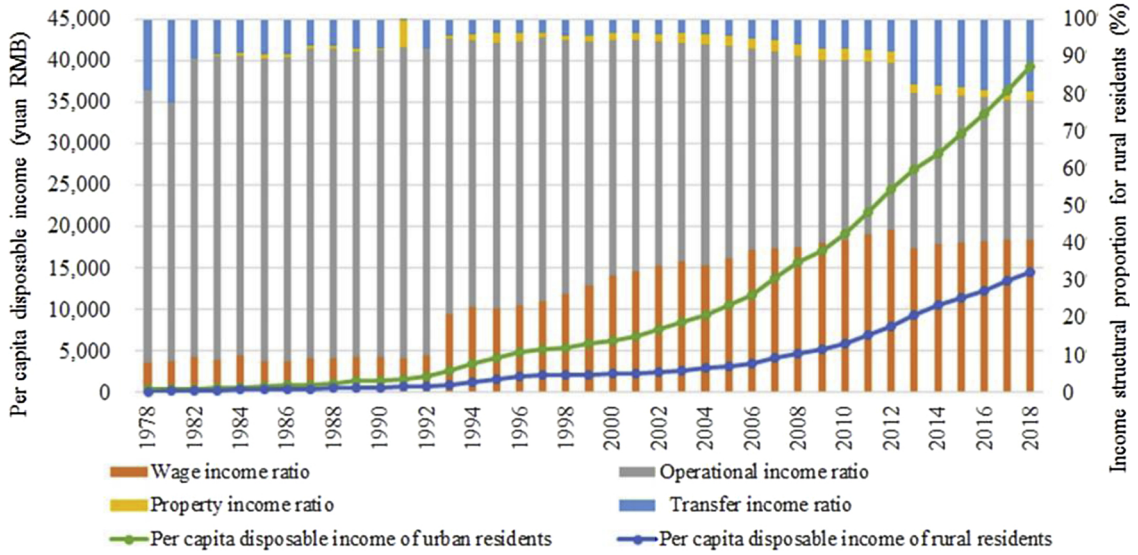

Fig. 3. Disposable income of rural residents and structural change between 1978 and 2018 in China (Sources: National Bureau of Statistics (NBS, 2018a).

3.1.5. Idle waste of rural land resources

By the end of 2015, there are 2.7 million rural settlements in China, covering an area of 287 million mu. The per capita residential land area of rural residents in China reaches 317 square meters, and the idle and wasteful residential area in the countryside is about 30 million mu (MLR and NDRC, 2017). The proportion of multi-family households is 18%–40%, and the proportion of over-standard households is more than 60%. From 2006–2014, the rural permanent population decreased by 160 million people, while the rural residential land increased by 30.45 million mu, and about 20% of the rural housing has been uninhabited for a long time (Wei et al., 2018).

The second national land survey shows that the area of urban construction land in China is 91,612 square kilometers, while that of rural construction land is 191,158 square kilometers (Zheng, 2018a, b). This indicates that the area of construction land in rural villages in China is twice as large as that in urban villages and towns. Per capita residential land use in rural areas is 2.68 times of the per capita construction land area of urban residents (MLR and NDRC, 2017). With the rapid advancement of urbanization, the total number of migrant workers and farmers in cities is 280 million, and nearly 100 million people have become urban residents, which leads to idle waste and inefficient utilization of rural construction land (Zheng, 2018a, b; Wei et al., 2018; NBS, 2018b). Previous studies have shown that about 15 million rural people enter cities and settle down every year, resulting in many idle farm houses (Liu et al., 2014; Tao et al., 2015). Before 2019, the village construction land is not allowed to transfer at the legal level, resulting in the inefficient- utilization of rural collective construction land. Thus, it is urgent to revitalize the village construction land and promote the efficient use of resources.

3.1.6. Unsustainable land finance growth model

Over the past decades, China's economic growth has been excessively dependent on land finance (J. Wang et al., 2018; Y. Wang et al., 2018). From 1998 to 2018, the total supply of construction land in China has increased from 51,500 ha to 643,000 ha with an average annual growth of 13.45%, and the land transfer fee has increased from 50.77 billion yuan to 6509.6 billion yuan with an average annual growth of 27.46% (Liu, 2017; NBS, 2018a; Table 2). During the same period, the proportion of land transfer fee in GDP increased from 0.6% to 7.24% with an average annual growth rate of 13%, and the growth rate of GDP decreased from 7.83% to 6.6% with an average annual decrease of nearly 1% (Fig. 4). The land finance growth model has contributed to excessive farmland conversion (Qun et al., 2015). However, in recent years, the growth rate of China's economy has slowed down. The mode of land finance growth not only leads to the inefficient and extensive use of land resources, but also distorts the urban housing prices, making the growth of income far behind the rise of housing prices, thus affecting people's happiness of social progress (Long et al., 2012; Liu et al., 2014; Tian, 2015; Wu et al., 2015; Glaeser et al., 2017; Liu et al., 2018a).

3.2. Necessity of deepening the rural LSR

The current land system in China is not conducive to the optimal allocation of resources, the protection of cultivated land resources, the narrowing of the gap between urban and rural areas and the protection of farmers' interests (Ding, 2003). Contrary, some of the land-expropriated peasants usually do not have the right to know completely and are forced to expropriate land. The incompatibility between the current land management system and the socialist market economy system has become increasingly prominent (Liu, 2017). There are five reasons for further deepening the reform of the current land system.

First, deepening the LSR helps to narrow the urban-rural gap and promote the urban-rural integration development. Over the past 40 years, the country's income gap between urban and rural residents has been widening (Long et al., 2010, 2011). Between 1978 and 2018, the per capita disposable income of peasants has increased from 134 yuan to 14,617 yuan, and the per capita net income of urban residents increased from 343 yuan to 39,251 yuan. The income ratio between urban and rural households has increased from 2.56:1 in 1978 to 2.69:1 in 2018 (Fig. 3). In rural areas, especially in poverty-stricken areas, the level of infrastructure and public services is lagging that in urban areas (Liu et al., 2017a, b). The current land system is considered as the biggest obstacle to urban-rural integration and unequal development (Liu, 2017). The dual land government system in urban and rural areas excludes the right of farmers to share equally the fruits of industrialization and urbanization, inhibits the growth of farmers' property income and enlarges the income gap between urban and rural residents. Revitalizing Chinese countryside and realizing urban-rural integration development need to eliminate the institutional barriers that hinder the free flow of urban and rural factors, promote the resource capitalization of rural collectives and farmers, increase farmers' income and narrow the urban-rural gap.

Second, protecting farmers' rights and benefits and enhance the competitiveness of agriculture need to deepen the reform of rural land system. With the acceleration of industrialization and urbanization,

Table 2
China's construction land supply and its contribution to GDP growth.

Year	Total supply of construction land (10^4 ha)	GDP (billion yuan)	Added value of real estate industry (billion yuan)	Land transaction fees (billion yuan)	GDP growth rate (%)	Proportion of land transaction fee to GDP (%)
1998	5.15	8,519.55	343.45	50.77	7.83	0.60
1999	8.26	9,056.44	368.18	51.43	7.62	0.57
2000	10.25	10,028.01	414.91	59.56	8.43	0.59
2001	16.70	11,086.31	471.51	129.59	8.30	1.17
2002	18.35	12,171.74	534.64	241.68	9.08	1.99
2003	42.06	13,742.20	617.27	293.78	10.03	2.14
2004	28.52	16,184.02	717.41	589.41	10.09	3.64
2005	35.07	18,731.89	851.64	550.52	11.31	2.94
2006	30.68	21,943.85	1,037.05	767.69	12.70	3.50
2007	34.20	27,023.23	1,380.97	1,221.67	14.20	4.52
2008	23.42	31,951.55	1,473.87	1,025.98	9.70	3.21
2009	36.16	34,908.14	1,896.69	1,591.02	9.40	4.56
2010	43.26	41,303.03	2,356.99	2,710.00	10.60	6.56
2011	59.33	48,930.06	2,816.76	3,150.00	9.50	6.44
2012	71.13	54,036.74	3,124.83	2,690.00	7.90	4.98
2013	75.08	59,524.44	3,598.76	4,200.00	7.80	7.06
2014	60.99	64,397.40	3,800.08	3,340.00	7.30	5.19
2015	53.36	68,905.21	4,170.10	2,980.00	6.90	4.32
2016	52.00	74,358.55	4,819.09	3,560.00	6.70	4.79
2017	60.00	82,712.17	5,385.07	4,990.00	6.80	6.03
2018	64.30	90,030.90	5,984.60	6,509.60	6.60	7.23

Notes: The data on total supply of construction land and land transaction fees are obtained from China's bulletin on land and resources (1998–2018) (Ministry of Natural Resources of CPC (MNR, 2018a), GDP and added value of real estate industry are from China Statistical Yearbook 2018 (National Bureau of Statistics (NBS, 2018a).

many peasants will leave their homeland and enter cities for employment, and the phenomenon of rural land circulation and human-land separation will be very common. It is urgent to further strengthen the protection of peasants' land rights and interests. As the owner of rural collective land and the main operator of agriculture, although the absolute value of farmers' income from land or agriculture has been increasing, their proportion in total income has been decreasing. In recent years, farmers' income has increasingly depended on non-agricultural industries (National Bureau of Statistics (NBS, 2018b; Wang et al., 2019). With China's economy entering a new normal and economic globalization facing new challenges, the growth potential of Chinese farmers' non-agricultural wage income is also facing unprecedented constraints. Furthermore, the prices of China's major agricultural products are higher than those of the international market, and the international competitiveness of agriculture is obviously behind the overall international competitiveness of the country. More importantly, China's land fragmentation, small-scale farming and the aging of the operator is obvious. Therefore, it is necessary to re-stimulate the motive force of increasing farmers' income through deepening the LSRs.

Third, deepening rural LSR is the need to promote the optimal allocation of land resources. Rural land is significantly different from urban land in terms of acquisition, use, income, disposition and other powers and management systems, thus forming a dual structure of urban and rural land. Restricted by the policy that homestead cannot be rented, transferred and sold, a large number of rural homesteads have been idle and inefficiently utilized (Liu et al., 2014, 2018b). At the same time, there are also many cultivated lands abandoned due to the low benefit of planting land. In other words, influenced by the land system, land resources between urban and rural areas cannot flow freely, resulting in inefficient use of land resources (the homestead). Deepening the LSR is aimed at breaking the urban-rural dual land use structure system and establish a unified urban-rural construction land market.

Finally, soil environmental control impels the reform of land system. Global land degradation threatens 3.2 billion people's livelihoods. Reducing land degradation and restoring degraded land are urgent priorities for protecting biodiversity and ecosystem services and ensuring human well-being (IPBES, 2018). China is one of the countries with the most serious land degradation in the world. Statistics show that in 2014, over 40% of cultivated land is degraded and 19.4% of cultivated land is polluted in China (Chen et al., 2014b; Zhou and Liu,

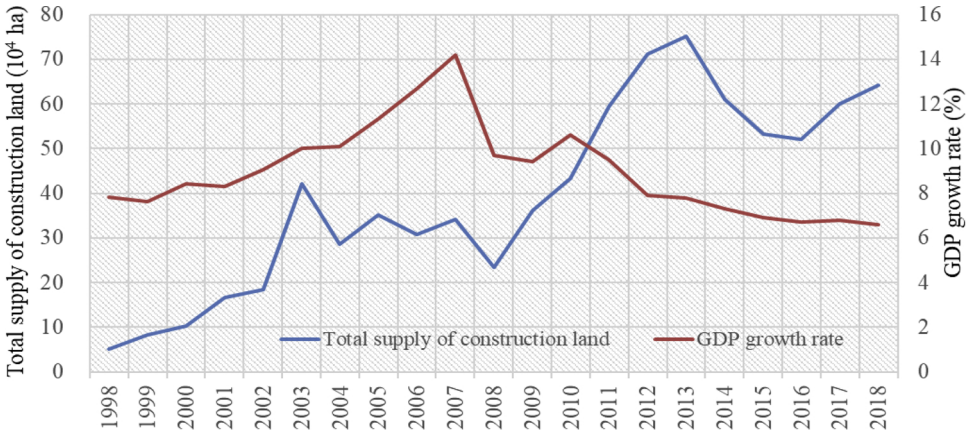

Fig. 4. Total supply of construction land and GDP growth rate. Sources: Liu, 2017; Ministry of Natural Resources of CPC (MNR, 2018b; National Bureau of Statistics (NBS, 2018a.

2018). Land degradation and soil pollution aggravate the already tense contradiction between human and land, which seriously restricts the sustainable development of China's social economy. The unreasonable human activities and imperfect land management system are the main causes of land degradation and soil pollution (Zhou and Liu, 2018). Soil pollution is closely related to the land system which is difficult to determine the person responsible for soil pollution because of the incomplete and unclear land property rights (Liu et al., 2018b). Soil pollution control needs to deepen the reform of land property rights system and achieve the unity of power and responsibility.

3.3. Key measures to deepen the reform of rural sand system

In 2013, the central government of China proposed deepening the LSR in an all-round way, and emphasized that property right is the core of ownership and focusing on giving farmers more property rights. Land tenure security and land transfer markets are once again put on the top priority of deepening the policy agenda of land reform in China. The Central Committee Document No. 1 of 2014 clearly put forward the main contents of deepening rural LSR, including improving land contract policy, guiding and standardizing rural collective operating construction land into market, improving rural residential land management system and accelerating the reform of land expropriation system (LES) (Ministry of Agriculture and Rural Affairs of China (MARAC, 2014). In 2015, the country proposed to carry out the pilot of **rural land** expropriation, **collective operational construction land (COCL)** into market and **homestead** (*three lands* or *sankuaidi*) system pilot reform in 33 cities and counties nationwide from 2015 to 2018 (Fig. 5). These pilot areas suspended the implementation of the relevant provisions of the Land Management Law and the Urban Real Estate Management Law.

The driving forces, objectives and specific measures for the reform of the three lands in rural China are shown in Fig. 6. The specific measures mainly include the confirmation and registration of rural collective land rights (CRRCLR), the reforms of the LES and entry of the COCL into market and the homestead use system, and the separation of ownership, contractual and management right of agricultural land (SOCMRAL), and the separation of ownership, qualification and use right of homestead (SOQURH). The goal of deepening rural LSRs is to optimize the allocation of land resources, establish the unified urban-rural construction land market, narrow the urban-rural gap, give farmers more property rights, promote poverty alleviation and rural revitalization as well as man-land relationship harmony. The bottom line of reform is to ensure that the nature of public ownership of land remains unchanged, the red line of cultivated land remains unchanged and the interests of farmers remain intact.

3.3.1. The confirmation and registration of rural collective land rights

The CRRCLR is the basis and guarantee for the implementation of the SOCMRAL reform and the effective protection of land and housing property rights. The CRRCLR refers to the confirmation and determination of land ownership, use right and other rights, which determines the ownership of land, the subordinate relationship of the right to use land and the content of other rights according to relevant laws. In rural China, the registration and certification of land rights mainly involve the ownership of rural collective land and the right to use collective construction land and homestead. Rural contracted land and homestead are the main contents of the CRRCLR. In principle, the CRRCLR aims to give farmers more complete land rights. After confirming their rights, the property rights of peasant workers in their homeland, such as

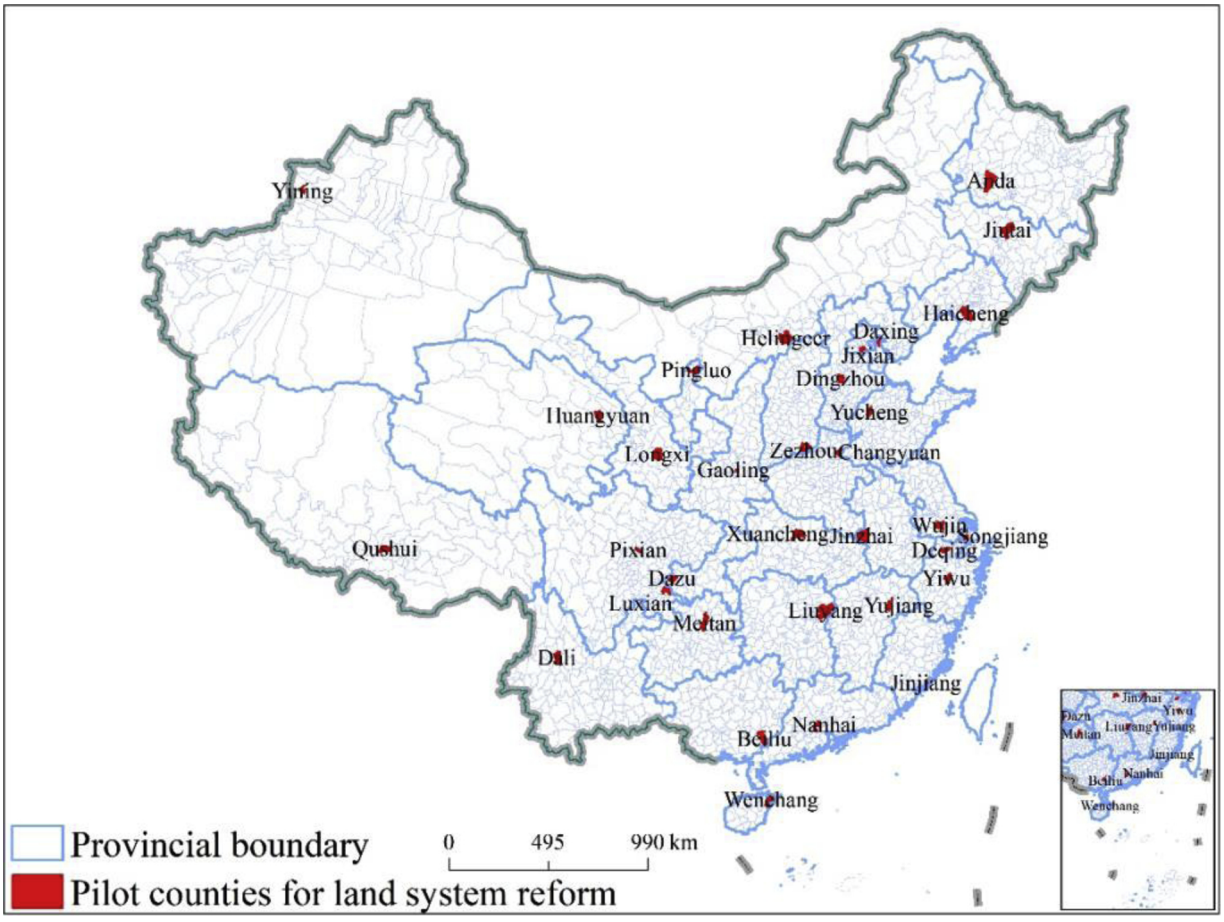

Fig. 5. 33 pilot counties for the three lands reforms in China (Source: Xinhua Agency, 2015).

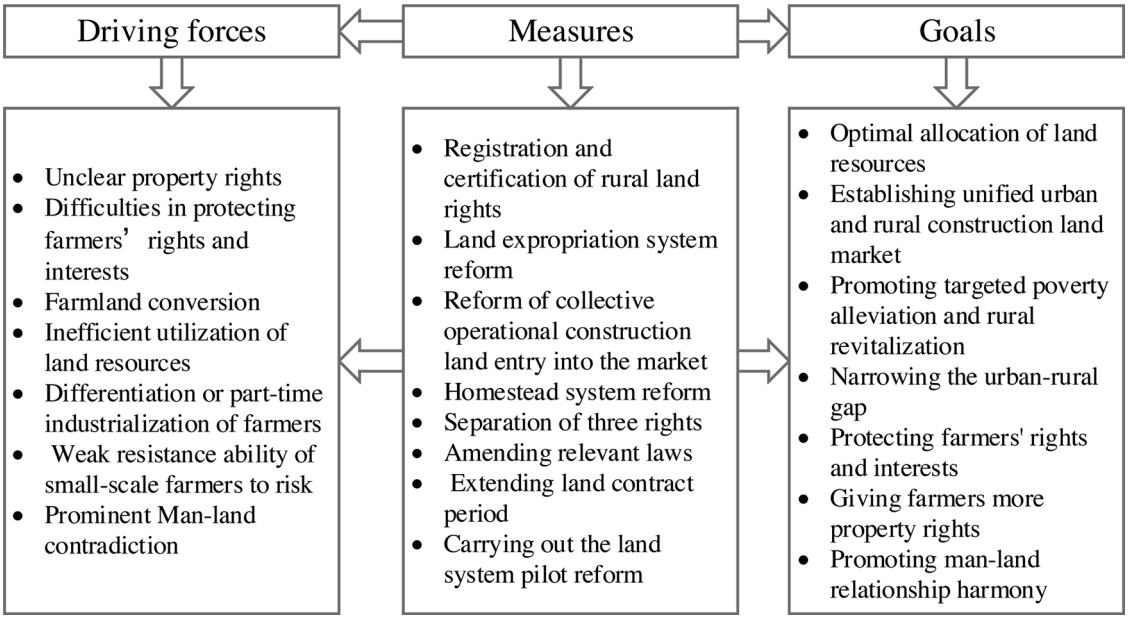

Fig. 6. Driving forces, goals and measures of the reform of rural land system. Source: Drawn by the authors.

contracted land, homestead and housing, can be solidified and protected. They are more likely to support agricultural production through farmland mortgage loans, and even bring property income to peasants through circulation, which helps them to gain a foothold in the city.

The confirmation and registration of rural contracted land is a basic work to confirm and protect farmers' contracted land management rights, ensure the security of land transfer and improve the contracted land management system in rural areas. Procedures for confirming land rights in China include the publicity and mobilization meetings, household surveys, satellite image data acquisition, farmer plot designation, two-rounds publicity of the confirming land rights' results and certification of confirming land rights (Ye et al., 2018). Farmers can get four benefits from the confirmation of land rights. First, it is conducive to the protection of farmers' land contractual rights and interests in accordance with the law. Second, after the certification, land is both resource and asset, and farmers' property income would increase through land circulation. Third, farmers can use their own certificates to mortgage loans. Finally, it is conducive to clarifying the ownership of land contractual management rights and provide a strong original basis for solving the disputes of land contractual management and safeguarding the legitimate rights and interests of farmers in land contracting. The registration and certification of contracted land confirmation in China began in 2009 and ended at the end of 2018 to enhance land tenure security and the transferability of farmland. By the end of 2018, China has completed the registration area of contracted land confirmation, which is 1.48 billion mu, accounting for 89.2% of the measured area of contracted land (People's Daily, 2019). In addition, in 2018, China has comprehensively carried out the liquidation and capital verification of rural collective assets. Undoubtedly, land ownership confirmation is a substantive measure at the national level to clarify the disposal of farmland property rights to meet the needs of the standardized flow of resources in the rural land market since the implementation of the HCRS. For quite a long time before the work, the transfer of land contractual management rights encounters obstacles in practice due to the ambiguity of farmland right, resulting in constant contradictions and conflicts, weak willingness of farmers to transfer as well as inefficient utilization of farmland.

3.3.2. Separation of the three rights of agricultural land

The SOCMRAL refers to the separation of the original contractual management rights, which is based on the unchanged collective ownership of rural contracted land (Wang and Zhang, 2017; Xu et al., 2018; Zhou et al., 2018, 2019). The SOCMRAL's primary task is to find out the family background of the contracted land and issue certificates for the confirmation of the contracted land right. It is another major institutional innovation in rural reform in China after the HCRS, which will allow farmers to retain the contract right over their allotted land and only transfer the management right if they choose to lease the land to others, mortgage it to banks or invest it in a cooperative in exchange of shares (Wang and Zhang, 2017). From the separation of ownership and contractual management right to the separation of ownership, contractual right and management right, it conforms to farmers' willingness to retain land contractual right and transfer land management right, and reflects the changes of agricultural land management mode (Fig. 7). The SOCMRAL's has persisted in collective ownership of land, stabilized farmers' contractual right and liberalized management right. It has laid the institutional foundation for guiding the orderly transfer of land management right, developing moderate scale operation of agriculture production and promoting the development of modern agriculture (Liu, 2017).

3.3.3. Reform of land expropriation system

Land expropriation refers to the legal act that the state transforms the collectively owned land of peasants into state-owned land in accordance with the procedures and powers prescribed by law for the sake of public interests, and gives reasonable compensation and proper resettlement to the expropriated rural collective economic organizations and peasants. The formation of China's current LES can be traced back to the early 1950s. The first Constitution of China in 1954 stipulates that the state can purchase, expropriate or nationalize urban and rural land to meet the needs of the public interests. Since then, the country's LES has been established. Over the past decades, the central government of China has continuously reformed the LES in terms of improving the compensation standard for land expropriation, optimizing the resettlement methods and providing the living security of land-expropriated peasants (Chen and Qu, 2002; Hui et al., 2013; Liu, 2017). Nevertheless, there are still five main problems in land expropriation in China (Chen and Qu, 2002; Chan, 2003; Hui et al., 2013; Liu, 2017; Cao and Zhang, 2018; Lin et al., 2018). First, the prominent problem is that the expropriation scope is wide (Liu, 2017). Land expropriation is for the needs of public interests, but it is not clearly defined. Second, the main body of compensation income is not clear

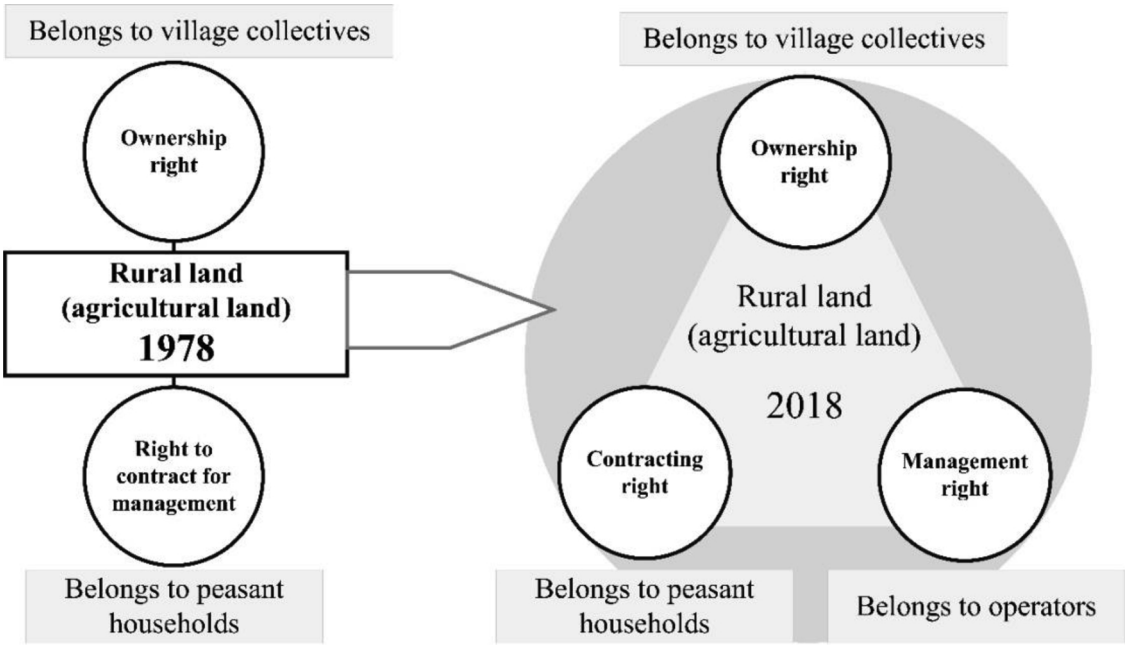

Fig. 7. The separation of the three rights of rural land. Source: Drawn by the authors.

(Qian, 2015). At present, the Constitution, the Land Management Law and the Property Law of the country clearly stipulate that the rural land belongs to the collective members of the countryside. However, these laws do not clearly define the subject of collective property rights, resulting in unclear attribution of compensation fees for land expropriation. Third, the standard of compensation for land expropriation is low and the scope is narrow, and it is difficult to guarantee the rights and interests of the land-expropriated peasants (Chen and Qu, 2002). At present, according to China's Land Management Law, the compensation fee for land and the resettlement of farmers are 10–16 times the average output value of the three years before the land expropriation, not more than 30 times. The scope of compensation is limited to a part of the loss associated with the land, and the compensation for the buildings on the expropriated land, such as rural houses, and other indirect losses are not included in the scope of compensation. Fourth, land expropriation right is abused in some places (Chen and Qu, 2002). The Land Management Law and the Constitution stipulate that the state can legally expropriate land for the needs of public interests. However, the relevant laws do not clearly define the public interest. The power of land expropriation has been granted, but no specific restrictions have been imposed. Since the implementation of the paid land use system, local governments have a special preference for the exercise of land expropriation right to increase financial revenue. At last, the procedure of land expropriation is not transparent and farmers participate little in the process of land expropriation (Ding, 2007).

In recent years, the central government of China has begun to further reform the LES. The main tasks of deepening the LES reform are to narrow the scope of land expropriation, standardize the its procedures and established a rational, standardized and pluralistic safeguard mechanism (China National People's Congress Network (CNPCN, 2018). Through this reform, the compensation for land expropriation has tended to diversity, and protecting the rights and interests of the land-expropriated farmers has been obviously enhanced.

3.3.4. Reform of entry of the COCL into market

The COCL is the construction land with the nature of production and operation in rural collective construction land, such as land for township enterprises. The entry of the COCL into market means that the transfer, lease and share of the right to use of the COCL are permitted on the premise of conforming to planning, use control and acquisition according to law. It can entry the market to use at the same price as state-owned construction land (Kong and Ma, 2014). Prior to 2000, entry of the COCL into market in China was basically in a strict control stage. Since 2000, the state has allowed some areas to carry out pilot exploration of the COCL entering the market. Subsequently, the country has implemented the policy of the increasing vs. decreasing balance of urban-rural construction land and gradually liberalized the trading of the COCL into market. In 2008, for the first time, the country put forward to establish a unified urban-rural construction land market and give equal rights and interests to rural collective land and state-owned land. In 2013, the central government made clear the provisions of "equal access to the market, equal rights and equal prices" for the COCL and the state-owned construction land. However, the entry of the COCL into market is still facing obstacles due to unclear ownership of land, planning and use control (Liu, 2017; Zheng, 2018a, b). Therefore, the main tasks of the reform of the entry of the COCL into market include improving the property right system of collective operating construction land, defining the scope and ways of entering the market, establishing the market trading rules and service supervision system (Liu, 2017; Zhang and Li, 2018; China National People's Congress Network (CNPCN, 2018). Through this reform, the use right of rural construction land in China can be sold, leased or traded for stock shares at the same price and under the same conditions as state owned construction land, which aims to break the dual land management system between urban and rural areas. Between 2014 and 2018, more than 90,000 mu of the COCL has been put into the market in 33 pilot counties (cities and districts) with a total cost of about 25.7 billion yuan and a regulation fee of 2.86 billion yuan (China National People's Congress Network (CNPCN, 2018).

3.3.5. Reform of homestead system

The key essence of homestead system reform lies in revitalizing rural sleeping, empty and idle land resources. Homestead is the land owned and used by the collective by rural farmers or individuals as residential land, including the land that has been built or decided to be used for building houses. Homestead has its special function in protecting cultivated land and ensuring social stability (Liu et al., 2018b). The Land Management Law of China prohibits rural residents from occupying cultivated land and building homesteads. Homestead is a place to protect farmers' production and living, which helps to ensure

the stability of farmers (Liu, 2018b). Ownership of the homestead belongs to collective ownership, and farmers have the right to use it, but they cannot rent, transfer and trade them (Liu, 2017).

Compared with other LSRs, China's homestead system reform started relatively late (Wu et al., 2018). Over the past three decades, the homestead ownership in China has undergone a transition from private to public ownership. During the periods 1949–1961 and 1962–1981, the ownership of Chinese homesteads was owned by farmers and the production team, respectively. Since the 1980s, the village collective has been holding the ownership of the homestead and the villagers have the right to use it. The initial qualifications of rural residential land should adhere to the principle of "one household, one house", and the area should not exceed the standard. After selling, renting and giving houses, the application for approval shall not be granted. Although the homestead is not allowed to be sold or leased, in fact, it has already entered the market to varying degrees, which has been in conflict with the current laws and policies of China (Liu, 2017). Furthermore, because of the lack of management mechanism above township level, the high cost of supervision and the weak restriction at village level, the management of rural residential land is out of control and endangers the protection of cultivated land. Importantly, over the past 20 years, the large outflow of rural population to cities in China has not only led to the decrease of rural homestead, but also to the increase of homestead (Liu et al., 2011). According to the National New-type Urbanization Plan (2014–2020), between 2000 and 2011, the rural population in China decreased by 133 million people, but the rural residential land increased by 30.45 million mu (National Development and Reform Commission (NDRC, 2014). Further studies also show that every year, 594 million cubic meters of idle housing in rural areas are added due to the transfer of rural population, which is equivalent to about 400 billion yuan of market value (Wei et al., 2018). The potential of consolidation of rural empty villages in China is about 114 million mu (Liu et al., 2014). The village construction land in China is not allowed to be transferred at the legal level, and the utilization efficiency of rural collective construction land is low (Kong et al., 2018). The Chinese government has proposed to deepen the reform of homestead system to revitalize the sleeping land resources in rural areas in recent years. There are four main tasks in the reform of the homestead system, i.e., reforming the way to protect and obtain the rights and interests of the homestead, exploring the system of paid use of homestead and the mechanism of voluntary withdrawal and improving the management system of homestead. The ultimate goal of this homestead system reform is to establish a homestead system that can be obtained fairly according to law, saved intensive use and voluntarily withdrawn with compensation (China National People's Congress Network (CNPCN, 2018).

3.3.6. Amendment of relevant laws

The achievements of land system reform need to be consolidated by amending relevant laws. For one thing, it is to transform some major arrangements, principles and policies of the state for agricultural and rural work into law in the new era. Facing the problems of agriculture and rural development, in recent years, the Chinese government has attached great importance to deepening the LSRs, which requires relevant laws to consolidate the achievements of the reform. For another thing, genuine knowledge comes from practice. Over the past few years, many places have continuously explored and innovated in the process of further deepening the LSRs and accumulated valuable experience, which needs to be summarized in time, and the experience proved effective in practice should be upgraded to law to better regulate and guide the reform of rural areas.

To this end, the country is amending or has amended land-related laws to adapt to the objective requirements of agricultural and rural development in the new era. For example, the National People's Congress (NPC) of PRC has revised the RLCL in 2018, which was promulgated in 2002 and revised in 2009, to maintain the long-term stability of rural land contractual relationship and promote the coordinated development of agriculture and rural economy. The latest RLCL has made it clear another 30 years extension of the second-round land contract period after its expiration. The new law has further separated the use right into the contract right and the management right, which offers clearer support for the transfer of management right of rural land, enabling farmers to retain contract rights over their allotted land and only transfer the management rights if they choose to lease the land to others. Another important law, the Land Management Law, has also be amended and passed based on the experience of the pilot reform of three plots of land. The 2019 Land Management Law of China has clearly stipulated that it will no longer be mandatory for non-agricultural construction land in China to be state-owned, which will clear up the legal barriers to the entry of collectively operated construction land into market.

4. Discussion and conclusion

Land is the lifeblood of peasants. The land system is an important guarantee to protect farmers' rights and interests. The unreasonable land management system will not only frustrate farmers' enthusiasm for production, but also be harmful to the healthy development of social economy (Li et al., 1998; Ding, 2003; Zhang, 2006; Zhang et al., 2018). China is a developing country with huge territory but insufficient arable land per capita, and the relationship between people and land in the country has always been in a state of tension. The country has been modifying and reforming its land systems since 1949 to alleviate the man-land contradiction. The country's rural LSR has gone through five stages, i.e., the establishment of collective ownership rural land system (1949–1977), the formation period of the dual-tier management system of combination of centralization and decentralization (1978–19932), stable period of land contractual management right (1993–2007), dynamic stable period of land system reform (2008–2013) and deepening the period of land system (since 2014).

Human-land relationship coordination is always the core of land system reforms in China. As China's demographic, economic and social structures change, the contradictions caused or reflected by land system are becoming increasingly acute. The key issues caused by or existed in current China's land system in the new period include the prominent contradiction between man and land, the main body of unclear property rights of rural land, incomplete rights and functions of land, unobstructed land circulation, lack of rural land market mechanism, the coexistence of farmland conversion and abandonment, conflict between farmers' interests and land system, scattered and fragmented agricultural management modes, serious idle waste and inefficient utilization of land resources and insufficient endogenous motivation for agricultural development. At present, China is actively exploring and deepening the rural three land reforms. Deepening China's LSRs can help to narrow the urban-rural gap, protect farmers' rights and benefits, enhance the international competitiveness of agriculture, promote cultivated land conservation and optimal allocation of land resources. The SOCMRAL in this reform will help to share the land rights among collectives, contracted farmers and new managers, prevent the abandonment of arable land and promote the division of labor and industry, increasing property income for farmers who have circulated land management rights (Zhou et al., 2018; China National People's Congress Network (CNPCN, 2018). The reform of entry of the COCL into market can help to foster market confidence, stimulate the vitality of rural land resources and promote the establishment of a unified construction land market between urban and rural areas. More importantly, deepening the rural LSRs is an important support for promoting agricultural and rural modernization, and can provide driving force and institutional guarantee for promoting China's rural revitalization strategy (Liu and Li, 2017; Liu et al., 2018b; Zhou et al., 2018, 2019; Liu, 2018c).

However, the land system reform system has the domino effect.

Facing the necessity and complexity of land system, deepening China's LSR still needs to be further and steadily promoted from the following five aspects. First, it is necessary to break down the dual system barriers between urban and rural areas and establish a unified urban-rural construction land market system to promote the integration of primary, secondary and tertiary industries. Second, further deepening the reform of farmland property rights system is also urgently needed. It is necessary to release rural labor force, promote capital investment in agricultural production and cultivate agricultural new-type operators through the SOCMRAL to promote the optimal allocation of production factors of land, capital, technology and labor forces. Capitalization of land resources and allowable circulation, leasing and market entry are the key directions of future rural construction land reform in China. Third, it must synergistically promote the reform of land expropriation, rural collective operating construction land into market and homestead systems. Deepening the LSR should be guided by solving practical problems, so as to achieve an organic combination of top-down decision-making and bottom-up practice. Fourth, China's land system reform needs to advance in the deep direction of protecting farmers' rights and interests, especially the landless peasants. The second round of land contracting started in 1993 to 1998, with a contracting period of 30 years, and it will expire around 2023. The new RLCL extends the third-round land contract period to 2053. Because of the principle of " keeping the land area the same no matter the number of a family changes or not" in China, some people born after the starting point of the contract have no land during the contract period and become the landless peasants. Thus, it is necessary to improve the right of inheritance of contracted land. Finally, the country needs to improve the rural land management system. It is necessary to explore the identification mechanism of public interests of land-use projects, improve the compensation standard for land expropriation, and establish a multi-security mechanism for the long-term livelihood of land-expropriated farmers.

The dilemma and problems faced by China's agricultural and rural development are becoming increasingly prominent. The reform of land system should be problem-oriented. In the next stage, China will insist on giving priority to the development of agriculture and countryside. The basic way to solve the contradiction of agricultural and rural development is to optimize the allocation of land and labor factors through the LSR and to give full play to the multifunctional value of land resources. Deepening the LSR will help to provide space carrier, land resources and power source for the priority development of agriculture and rural areas in China. Land system reform has been on the way. China still needs to take bigger steps if it wants to realize the coordination of man-land relations. The reform of land system needs to be coordinated with the reform of household registration system. The household registration system is the basis for the formation of urban-rural dual land management system. The key to breaking the dual structure of urban and rural areas lies in the reform of household registration system and land system.

Declaration of Competing Interest

No conflict of interest exits in the submission of this manuscript, and manuscript is approved by all authors for publication. The work described was original research that has not been published previously, and not under consideration for publication elsewhere, in whole or in part. All the authors listed have approved the manuscript that is enclosed.

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References

Almond, D., Li, H., Zhang, S., 2019. Land reform and sex selection in China. J. Polit. Econ. 127 (2), 560–585.
Barnes, G., 2009. The evolution and resilience of community-based land tenure in rural Mexico. Land Use Policy 26 (2), 393–400.
Bayisenge, J., 2018. From male to joint land ownership: women's experiences of the land tenure reform programme in Rwanda. J. Agrar. Change 18 (3), 588–605.
Besley, T., Burgess, R., 2000. Land reform, poverty reduction, and growth: evidence from India. Q. J. Econ. 115 (2), 389–430.
Brandt, L., Huang, J., Li, G., Rozelle, S., 2002. Land rights in rural China: facts, fictions and issues. China J. 47, 67–97.
Bryan, B.A., Gao, L., Ye, Y., Sun, X., Connor, J.D., Crossman, N.D., Liu, Z., 2018. China's response to a national land-system sustainability emergency. Nature 559 (7713), 193–204.
Cao, Y., Zhang, X., 2018. Are they satisfied with land taking? Aspects on procedural fairness, monetary compensation and behavioral simulation in China's land expropriation story. Land Use Policy 74, 166–178.
Carter, C.A., Estrin, A.J., 2001. Market reforms versus structural reforms in rural China. J. Comp. Econ. 29 (3), 527–541.
Chan, N., 2003. Land acquisition compensation in China–problems and answers. Inter. Real Estate Rev. 6 (1), 136–152 (in Chinese).
Chen, F., Davis, J., 1998. Land reform in rural China since the mid-1980s. Land Reform, Land Settlement, and Cooperatives 6 (2), 123–137.
Chen, J., Qu, F., 2002. Theoretical analysis of land expropriation and reform of land expropriation system in China. Jiangsu Soc. Sci. 2, 55–59 (in Chinese).
Chen, R., Alex, de S., Ye, C., Shi, G., 2014b. China's soil pollution: farms on the frontline. Science 344, 691.
Chen, R., Ye, C., Cai, Y., Xing, X., Chen, Q., 2014a. The impact of rural out-migration on land use transition in China: past, present and trend. Land Use Policy 40, 101–110.
Chen, X., 2018. Forty years of rural reform in China: retrospect and future prospects. China Agr. Econ. Rev. https://doi.org/10.1108/CAER-08-2018-0162. (in Chinese).
Cheng, W., Xu, Y., Zhou, N., He, Z., Zhang, L., 2019. How did land titling affect China's rural land rental market? Size, composition and efficiency. Land Use Policy 82, 609–619.
Chien, S.S., 2015. Local farmland loss and preservation in China? a perspective of quota territorialization. Land Use Policy 49, 65–74.
Chimhowu, A., 2019. The ??new' African customary land tenure. Characteristic, features and policy implications of a new paradigm. Land Use Policy 81, 897–903.
China National People's Congress Network (CNPCN), 2018. Summary Report of the State Council on the Pilot Reform of Rural Land Expropriation, Collective Operational Construction Land Entry Into the Market and Housing Land System. . http://www.npc.gov.cn/npc/xinwen/2018-12/23/content_2067609.htm.
China Rural Fixed Observation Points Office (CRFOPO), 2017. Compilation of Survey Data of Fixed Observation Points in Rural Areas of China. China Agricultural Publishing House, Beijing (in Chinese).
Crook, F.W., 1985. The baogan daohu incentive system: translation and analysis of a model contract. China Q. Int. Strateg. Stud. 102, 291–303.
Ding, C., 2007. Policy and praxis of land acquisition in China. Land Use Policy 24 (1), 1–13.
Ding, C., 2003. Land policy reform in China: assessment and prospects. Land Use Policy 20 (2), 109–120.
Djurfeldt, A.A., Hillbom, E., Mulwafu, W.O., Mvula, P., Djurfeldt, G., 2018. The family farms together, the decisions, however are made by the man? matrilineal land tenure systems, welfare and decision making in rural Malawi. Land Use Policy 70, 601–610.
Dong, X.Y., 1996. Two-tier land tenure system and sustained economic growth in post-1978 rural China. World Dev. 24 (5), 915–928.
Editorial Board of China Urban Development Report (EBCUDR), 2011. China Urban Development Report (2011). China City Press, Beijing, China (in Chines).
Feder, G., Feeny, D., 1991. Land tenure and property rights: theory and implications for development policy. World Bank Econ. Rev. 5 (1), 135–153.
Ghebru, H., Lambrecht, I., 2017. Drivers of perceived land tenure (in) security: empirical evidence from Ghana. Land Use Policy 66, 293–303.
Glaeser, E., Huang, W., Ma, Y., Shleifer, A., 2017. A real estate boom with Chinese characteristics. J. Econ. Perspect. 31 (1), 93–116.
Green, E.D., 2006. Ethnicity and the politics of land tenure reform in central Uganda. Commonw. Comp. Polit. 44 (3), 370–388.
Guo, Q., 2018. Small farmers: attribute, type, status of management and way of embedding modern agriculture. Issues Agr. Econ. 6, 25–37 (in Chinese).
Guo, X., 2011. China's rural land system reform: demand, predicament and development trend. China Rural Econ. 4, 4–8 (in Chinese).
Han, C., 2018. China's Rural Land System Reforms. Newsletter About Work in Rural Areas, Z1, pp. 8–19.
Han, J., 2005. Employment and social security of landless farmers. China Dev. Rev. 7 (3), 40–45.
Hartvigsen, M., 2014. Land reform and land fragmentation in Central and Eastern Europe. Land Use Policy 36, 330–341.
Ho, P., 2001. Who owns China's land? Policies, property rights and deliberate institutional ambiguity. China Q. Int. Strateg. Stud. 166, 394–421.
Ho, P., 2015. Myths of tenure security and titling: endogenous, institutional change in China's development. Land Use Policy 47, 352–364.
Ho, P., Spoor, M., 2006. Whose land? The political economy of land titling in transitional economies. Land Use Policy 23 (4), 580–587.

Ho, S.P., Lin, G.C., 2004. Non-agricultural land use in post-reform China. China Q. Int. Strateg. Stud. 179, 758–781.
Holden, S.T., Ghebru, H., 2016. Land tenure reforms, tenure security and food security in poor agrarian economies: causal linkages and research gaps. Glob. Food Secur. 10, 21–28.
Holden, S.T., Otsuka, K., Deininger, K., 2013. Land tenure reforms, poverty and natural resource management: conceptual framework. Land Tenure Reform in Asia and Africa. Palgrave Macmillan, London.
Hu, R., Zhang, Y., 2007. Theoretical and empirical analysis of cultivated land transfer under different objectives. China Rural Econ. 1, 36–44.
Hu, W., 1997. Household land tenure reform in China: its impact on farming land use and agro-environment. Land Use Policy 14 (3), 175–186.
Hui, E.C.M., Bao, H.J., Zhang, X.L., 2013. The policy and praxis of compensation for land expropriations in China: an appraisal from the perspective of social exclusion. Land Use Policy 32, 309–316.
IPBES, 2018. In: Montanarella, L., Scholes, R., Brainich, A. (Eds.), The IPBES Assessment Report on Land Degradation and Restoration. Secretariat of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services, Bonn, Germany 744 pages.
Jacoby, H.G., Li, G., Rozelle, S., 2002. Hazards of expropriation: tenure insecurity and investment in rural China. Am. Econ. Rev. 92 (5), 1420–1447.
Jiang, L., Deng, X., Seto, K.C., 2013. The impact of urban expansion on agricultural land use intensity in China. Land Use Policy 35, 33–39.
Jürgenson, E., 2016. Land reform, land fragmentation and perspectives for future land consolidation in Estonia. Land Use Policy 57, 34–43.
Kagin, J., Taylor, J.E., Yúnez-Naude, A., 2016. Inverse productivity or inverse efficiency? Evidence from Mexico. J. Dev. Stud. 52 (3), 396–411.
Kalabamu, F.T., 2019. Land tenure reforms and persistence of land conflicts in Sub-Saharan Africa–the case of Botswana. Land Use Policy 81, 337–345.
Kong, X., Liu, Y., Jiang, P., Tian, Y., Zou, Y., 2018. A novel framework for rural homestead land transfer under collective ownership in China. Land Use Policy 78, 138–146.
Kong, X., Ma, C., 2014. The reform of rural collective management construction land: connotation, existing problems and suggestions. Rural Finance Res. 9, 11–14 (in Chinese).
Kong, X., Wang, Z., 2004. Compensating land-lost farmers when urbanizing. Econ. Theory Bus. Manag. 5, 60–65 (in Chinese).
Krishna, V.V., Kubitza, C., Pascual, U., Qaim, M., 2017. Land markets, property rights, and deforestation: insights from Indonesia. World Dev. 99, 335–349.
Lai, L.W., Lorne, F.T., Chau, K.W., Ching, K.S., 2014. Informal land registration under unclear property rights: witnessing contracts, redevelopment, and conferring property rights. Land Use Policy 50, 229–238.
Larson, A.M., Brockhaus, M., Sunderlin, W.D., Duchelle, A., Babon, A., Dokken, T., Huynh, T.B., 2013. Land tenure and REDD+: the good, the bad and the ugly. Global Environ. Chang. 23 (3), 678–689.
Li, G., Rozelle, S., Brandt, L., 1998. Tenure, land rights, and farmer investment incentives in China. Agr. Econ. 19 (1-2), 63–71.
Li, H., Wei, Y.D., Liao, F.H., Huang, Z., 2015. Administrative hierarchy and urban land expansion in transitional China. Appl. Geogr. 56, 177–186.
Li, P., 2003. Rural land tenure reforms in China: issues, regulations and prospects for additional reform. Land Reform, Land Settlement, and Cooperatives 11 (3), 59–72.
Li, S., Li, X., 2016. Progress and prospect on farmland abandonment. Acta Geogr. Sin. 71 (3), 370–389 (in Chinese).
Li, S., Li, X., Xin, L., Tan, M., Wang, X., Wang, R., Jiang, M., Wang, Y., 2017. Extent and distribution of cropland abandonment in Chinese mountainous areas. Res. Sci. 39 (10), 1801–1811 (in Chinese).
Li, W., Yang, D.T., 2005. The great leap forward: anatomy of a central planning disaster. J. Polit. Econ. 113 (4), 840–877.
Li, W., Feng, T., Hao, J., 2009. The evolving concepts of land administration in China: cultivated land protection perspective. Land Use Policy 26 (2), 262–272.
Lian, H., Glendinning, A., Yin, B., 2016. The Issue of ??Land-lost' Farmers in the People's Republic of China: reasons for discontent, actions and claims to legitimacy. J. Contemp. China 25 (101), 718–730.
Lichtenberg, E., Ding, C., 2008. Assessing farmland protection policy in China. Land Use Policy 25 (1), 59–68.
Lin, G.C., Ho, S.P., 2005. The state, land system, and land development processes in contemporary China. Ann. Assoc. Am. Geogr. 95 (2), 411–436.
Lin, J.Y., 1990. Collectivization and China's agricultural crisis in 1959-1961. J. Polit. Econ. 98 (6), 1228–1252.
Lin, J.Y., Yang, D.T., 1998. On the causes of China's agricultural crisis and the great leap famine. China Econ. Rev. 9 (2), 125–140.
Lin, Q., Tan, S., Zhang, L., Wang, S., Wei, C., Li, Y., 2018. Conflicts of land expropriation in China during 2006–2016: an overview and its spatio-temporal characteristics. Land Use Policy 76, 246–251.
Liu, D., Gong, Q., 2017. The impact of de-graining on national grain security during rural land transfer and some governance suggestions. Res. Agr. Mod. 38 (4), 673–680 (in Chinese).
Liu, J., Liu, M., Zhuang, D., Zhang, Z., Deng, X., 2003. Study on spatial pattern of land-use change in China during 1995–2000. Sci. China Ser. D Earth Sci. 46 (4), 373–384.
Liu, M., Dries, L., Heijman, W., Zhu, X., Deng, X., Huang, J., 2019. Land tenure reform and grassland degradation in Inner Mongolia. China. China Econ. Rev. 55, 181–198.
Liu, S., 2008. Reform and development of rural land transfer system in China since reform and opening-up. Econ. Manag. 22 (10), 23–27 (in Chinese).
Liu, S., 2017. China's two-stage land reform. Int. Econ. Rev. (Philadelphia) 5, 29–56 (in Chinese).
Liu, S., 2018a. Investigation on China's Land Issues: Land Rights From the Civilian Perspectives. Peking University Press, Beijing, China (in Chinese).
Liu, S., 2018b. The structure of and changes to China's land system. In: Ross, G., Liang, S., Cai, F. (Eds.), China'S 40 Years of Reform and Development 1978-2018. Australia National University Press and Social Sciences Academic Press (China), pp. 427–454.
Liu, X., Wang, Y., Li, Y., Liu, F., Shen, J., Wang, J., et al., 2017a. Changes in arable land in response to township urbanization in a Chinese low hilly region: scale effects and spatial interactions. Appl. Geogr. 88, 24–37.
Liu, Y., 2018c. Research on the urban-rural integration and rural revitalization in the new era in China. Acta Geogr. Sin. 73 (4), 637–650 (in Chinese).
Liu, Y., 2018d. Introduction to land use and rural sustainability in China. Land Use Policy 74, 1–4.
Liu, Y., Fan, P., Yue, W., Song, Y., 2018a. Impacts of land finance on urban sprawl in China: the case of Chongqing. Land Use Policy 72, 420–432.
Liu, Y., Fang, F., Li, Y., 2014. Key issues of land use in China and implications for policy making. Land Use Policy 40, 6–12.
Liu, Y., Li, J., Yang, Y., 2018b. Strategic adjustment of land use policy under the economic transformation. Land Use Policy 74, 5–14.
Liu, Y., Li, Y., 2017. Revitalize the world's countryside. Nature 548 (7667), 275–277.
Liu, Y., Liu, J., Zhou, Y., 2017b. Spatio-temporal patterns of rural poverty in China and targeted poverty alleviation strategies. J. Rural Stud. 52, 66–75.
Liu, Y., Long, H., Chen, Y., Wang, J., 2011. Research Report on Rural Development in China: Rural Hollowing and Its Rehabilitation Strategies. Science Press, Beijing, China (in Chinese).
Long, H., Li, Y., Liu, Y., Woods, M., Zou, J., 2012. Accelerated restructuring in rural China fueled by ??increasing vs. decreasing balance's land-use policy for dealing with hollowed villages. Land Use Policy 29 (1), 11–22.
Long, H., Liu, Y., Li, X., Chen, Y., 2010. Building new countryside in China: a geographical perspective. Land Use Policy 27 (2), 457–470.
Long, H., Zou, J., Pykett, J., Li, Y., 2011. Analysis of rural transformation development in China since the turn of the new millennium. Appl. Geogr. 31 (3), 1094–1105.
Lu, H., Xie, H., 2018. Impact of changes in labor resources and transfers of land use rights on agricultural non-point source pollution in Jiangsu Province. China. J. Environ. Manage. 207, 134–140.
Ministry of Agriculture (MOA), 2017. Statistical Annual Report of Rural Management in China. China Agriculture Press, Beijing, China (in Chinese).
Ministry of Agriculture and Rural Affairs of China (MARAC), 2014. Central Document No. 1 of 2014: Opinions on Fully Deepening Rural Reform and Accelerating Agricultural Modernization. January 2014. http://www.moa.gov.cn/ztzl/yhwj2014/zywj/. (in Chinese). .
Ministry of Land and Resources (MLR), National Development and Reform Commission (NDRC) of China, 2017. National Land Consolidation Plan (2016-2020). January 1. in Chinese. http://www.mlr.gov.cn/zwgk/zytz/201702/t20170215_1440315.htm. (in Chinese). .
Ministry of Natural Resources of CPC (MNR), 2018a. China Land and Resources Statistical Yearbook (2005-2018). Geological Publishing House, Beijing (in Chinese).
Ministry of Natural Resources of CPC (MNR), 2018b. Statistical Bulletin of Land, Mineral and Marine Resources in China 1998-2018. MOR (in Chinese). http://www.mnr.gov.cn/sj/tjgb/.
Mwesigye, F., Matsumoto, T., Otsuka, K., 2017. Population pressure, rural-to-rural migration and evolution of land tenure institutions: the case of Uganda. Land Use Policy 65, 1–14.
National Agricultural Census (NAC), 2000. Compilation of the First National Agricultural Census Documents in China. China Statistics Press, Beijing, China (in Chinese).
National Agricultural Census (NAC), 2009. Data Compilation of the Second National Agricultural Census of China: Farmers' Volume. China Statistics Press, Beijing, China (in Chinese).
National Bureau of Statistics (NBS), 2017. Bulletin of the Third Agricultural Census of China. Last access to Mar 5, 2019. (in Chinese). http://www.stats.gov.cn/tjsj/tjgb/nypcgb/.
National Bureau of Statistics (NBS), 2018a. China Statistical Yearbook. China Statistics Press (in Chinese).
National Bureau of Statistics (NBS), 2018b. Survey Report on the Monitoring of Migrant Workers in 2017. April 27, 2018. http://www.stats.gov.cn/tjsj/zxfb/201804/t20180427_1596389.html. Last access to Mar 5, 2019. (in Chinese). .
National Bureau of Statistics Rural Socio-economic Survey Team (NBSRSST), 2000. Fifty-Years of Agricultural Statistics in New China. China Statistics Press, Beijing (in Chinese).
National Development and Reform Commission (NDRC), 2014. National New Urbanization Plan (2014–2020). March 16, 2014. http://ghs.ndrc.gov.cn/zttp/xxczhjs/ghzc/201605/t20160505_800839.html. (in Chinese). .
National People's Congress of the PRC (NPC), 1986. Land Management Law of PRC. (in Chinese). http://www.npc.gov.cn/wxzl/gongbao/2000-12/06/content_5004471.htm.
Pacheco, P., 2009. Agrarian reform in the Brazilian Amazon: its implications for land distribution and deforestation. World Dev. 37 (8), 1337–1347.
Paul, M., wa Gīthīnji, M., 2018. Small farms, smaller plots: land size, fragmentation, and productivity in Ethiopia. J. Peasant Stud. 45 (4), 757–775.
Payne, G., 2004. Land tenure and property rights: an introduction. Habitat Int. 28 (2), 167–179.
People's Daily, 2019. 1.48 Billion Mu of Contracted Land Was Registered Last Year. People's Daily January 18, 2019. http://paper.people.com.cn/rmrb/html/2019-01/18/nw.D110000renmrb_20190118_4-02.htm. (in Chinese).
Peters, P.E., 2009. Challenges in land tenure and land reform in Africa: anthropological contributions. World Dev. 37 (8), 1317–1325.
Pinckney, T.C., Kimuyu, P.K., 1994. Land tenure reform in East Africa: Good, bad or unimportant? J. Afr. Econ. 3 (1), 1–28.

Qian, Z., 2015. Land acquisition compensation in post-reform China: evolution, structure and challenges in Hangzhou. Land Use Policy 46, 250–257.
Qu, F., Heerink, N., Wang, W., 1995. Land administration reform in China: its impact on land allocation and economic development. Land Use Policy 12 (3), 193–203.
Qun, W., Yongle, L., Siqi, Y., 2015. The incentives of China's urban land finance. Land Use Policy 42, 432–442.
Research Group on Rural Cooperative Economy of the Ministry of Agriculture (RGRCEMA), 1991. An investigation on the rural land contracting management system and the operation of cooperative organizations in China. Problem of Agricultural Economy 8, 33–40.
Sargeson, S., 2013. Violence as development: land expropriation and China's urbanization. J. Peasant Stu. 40 (6), 1063–1085.
Shi, T., Li, X., Xin, L., Xu, X., 2018. The spatial distribution of farmland abandonment and its influential factors at the township level: a case study in the mountainous area of China. Land Use Policy 70, 510–520.
Smith, R.E., 2003. Land tenure reform in Africa: a shift to the defensive. Prog. Dev. Stud. 3 (3), 210–222.
Song, W., Liu, M., 2017. Farmland conversion decreases regional and national land quality in China. Land Degrad. Dev. 28 (2), 459–471.
Tan, M., Li, X., Xie, H., Lu, C., 2005. Urban land expansion and arable land loss in China? a case study of Beijing–tianjin–hebei region. Land Use Policy 22 (3), 187–196.
Tan, R., Beckmann, V., van den Berg, L., Qu, F., 2009. Governing farmland conversion: comparing China with the Netherlands and Germany. Land Use Policy 26 (4), 961–974.
Tao, R., Wang, R., Pan, R., 2015. Key reform and breakthrough choice of new urbanization. Urban Plan 1, 9–15 (in Chinese).
Tian, C., 2018. Exploring the Source of the Rise and Fall of Land System. Zhejiang University Press, Hangzhou, China (in Chinese).
Tian, L., 2015. Land use dynamics driven by rural industrialization and land finance in the peri-urban areas of China: "the examples of Jiangyin and Shunde" Land Use Policy 45, 117–127.
Toulmin, C., 2009. Securing land and property rights in sub-Saharan Africa: the role of local institutions. Land Use Policy 26 (1), 10–19.
Travers, H., Winney, K., Clements, T., Evans, T., Milner-Gulland, E.J., 2015. A tale of two villages: an investigation of conservation-driven land tenure reform in a Cambodian Protection Forest. Land Use Policy 43, 186–196.
Van Leeuwen, M., 2014. Renegotiating customary tenure reform–Land governance reform and tenure security in Uganda. Land Use Policy 39, 292–300.
Wang, J., Lin, Y., Glendinning, A., Xu, Y., 2018. Land-use changes and land policies evolution in China's urbanization processes. Land Use Policy 75, 375–387.
Wang, J., Wei, L., 2016. The existence and change of agricultural land system in Contemporary China. Chinese Soc. Sci. 2, 69–92 (in Chinese).
Wang, Q., Zhang, X., 2017. Three rights separation: china's proposed rural land rights reform and four types of local trials. Land Use Policy 63, 111–121.
Wang, X., Shao, S., Li, L., 2019. Agricultural inputs, urbanization, and urban-rural income disparity: evidence from China. China Econ. Rev. 55, 67–84.
Wang, Y., Li, X., Xin, L., Tan, M., Jiang, M., 2018. Spatiotemporal changes in Chinese land circulation between 2003 and 2013. J. Geogr. Sci. 28 (6), 707–724.
Wei, H., Yan, K., Yu, W., Cui, H., Tan, Q., 2018. China's Rural Development Report (2018): the Road to Overall Revitalization of Rural Areas in the New Era. China Social Science Press, Beijing, China (in Chinese).
Wu, C., 1991. On the research core of geography-the regional system of human-earth relations. Econ. Geogr. 11, 1–6 (in Chinese).
Wu, G.L., Feng, Q., Li, P., 2015. Does local governments' budget deficit push up housing prices in China? China Econ. Rev. 35, 183–196.
Wu, X., Treiman, D.J., 2004. The household registration system and social stratification in China: 1955–1996. Demography 41 (2), 363–384.
Wu, Y., Mo, Z., Peng, Y., Skitmore, M., 2018. Market-driven land nationalization in China: a new system for the capitalization of rural homesteads. Land Use Policy 70, 559–569.
Xie, H., Lu, H., 2017. Impact of land fragmentation and non-agricultural labor supply on circulation of agricultural land management rights. Land Use Policy 68, 355–364.
Xin, L., Li, X., 2018. China should not massively reclaim new farmland. Land Use Policy 72, 12–15.
Xinhua Agency, 2008. Decision on Several Major Issues in Promoting the Reform and Development of Rural Areas. 2018-10-19. http://www.gov.cn/jrzg/2008-10/19/content_1125094.htm. (in Chinese). .
Xinhua Agency, 2015. Decision on Authorizing the State Council to Temporarily Adjust and Implement Relevant Legal Provisions in the Administrative Regions of 33 Pilot Counties (cities and Districts) Such As Daxing District. Beijing. 2015-02-28. http://www.gov.cn/xinwen/2015-02/28/content_2822866.htm. (in Chinese). .
Xu, X., 2014. Land Circulation Can Stimulate China's Rural Reform. March 9, 2014. http://www.china.org.cn/opinion/2014-03/09/content_31708204.htm (in Chinese). .
Xu, Y., Huang, X., Bao, H.X., Ju, X., Zhong, T., Chen, Z., Zhou, Y., 2018. Rural land rights reform and agro-environmental sustainability: empirical evidence from China. Land Use Policy 74, 73–87.
Yang, Q., Liu, Y., Wang, Z., Liu, K., Zhang, Z., 2018. The Farmers' Land Property Income Under the Background of New Urbanization. Science Press, Beijing, China, pp. 19–25 (in Chinese).
Ye, J., 2015. Land transfer and the pursuit of agricultural modernization in China. J. Agrar. Change 15 (3), 314–337.
Ye, J., Feng, L., Jiang, Y., Lang, Y., Roy, P., 2018. 2016 china rural land use rights survey and research - 17 provinces survey results and policy recommendations. Manag. World 34 (3), 98–108.
Yu, H., Huang, J., Zhang, L., 2003. Stability of land rights, land transfer and sustainable utilization of agricultural land resources. Econ. Res. 9, 82–95 (in Chinese).
Zhang, Q.F., Donaldson, J.A., 2008. The rise of agrarian capitalism with Chinese characteristics: agricultural modernization, agribusiness and collective land rights. China J. (60), 25–47 (in Chinese).
Zhang, X., Li, Z., 2018. Development of the Rural Land System. China's Rural Development Road. Springer, Singapore, pp. 95–106.
Zhang, X., 2006. Retrospect and prospect of the reform of rural land system in China. Study Explor. 5, 172–189 (in Chinese).
Zhang, X., Han, J., Wei, H., He, X., Zhu, L., 2018. China's 40 years of reform and opening-up and agricultural and rural economic development. Econ. Perspect. 12, 4–16 (in Chinese).
Zheng, F., 2018a. Let the reform of "Separation of three powers" of homestead become a new grasp for vitalization of rural areas. People's Tribune 4, 75–77 (in Chinese).
Zheng, X., 2018b. Exploring methods for realizing public rural Land ownership. China's 40 Years of Economic Reform and Development. Springer, Singapore, pp. 295–300.
Zhou, Y., Guo, L., Liu, Y., 2019. Land consolidation boosting poverty alleviation in China: theory and practice. Land Use Policy 82, 339–348.
Zhou, Y., Guo, Y., Liu, Y., Wu, W., Li, Y., 2018. Targeted poverty alleviation and land policy innovation: some practice and policy implications from China. Land Use Policy 74, 53–65.
Zhou, Y., Liu, Y., 2018. China's fight against soil pollution. Science 362 (6412) 298-298.