

Institutional change and diversity in the transfer of land development rights in China: The case of Chengdu

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Abstract

Rapid urbanisation in China has led to a substantial decrease in agricultural land. To address this unsustainable form of urban development, the Chinese government has implemented the 'Linkage' Policy (*Zengjian Guagou*), which requires any increase in new urban land by local governments to be compensated for with an equivalent amount of new arable land. This paper examines the institutional changes and the implications for China's land production and development arising from this mechanism of transferring land development rights from the rural to the urban sectors. Using Chengdu as a case study, our research concludes that this institutional mechanism has conferred commodified and tradeable development rights on rural land, leading to the emergence and direct involvement of new players in village land consolidation, resettlement of affected villagers and, indirectly, in the supply of new urban land. Process efficiency has been improved with the local governments, developers and village collectives capitalising on their niches in village improvement projects. The conventional state-led model of land production is enriched with bottom-up market initiatives, and villagers have more choices to realise their land property rights under the dual land market. Land use efficiency has been enhanced by the reallocation of construction land potential. However, infringements of villagers' interests and negative impacts on balanced regional development under this policy were also found.

Keywords

China, institutions, new institutional economics, rural land, transfer of development rights

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摘要

中国城市化的快速发展导致了农业用地的大幅减少。为了应对这种不可持续的城市发展形式，中国政府实施了“增减挂钩”政策，它要求地方政府在增加新城市土地的同时用同等数量的新耕地进行补偿。本文考察了这种土地发展权从农村向城市转移的机制，以及该制度变迁对中国土地生产和开发所产生的影响。以成都为例，我们的研究得出以下结论：这种制度设计赋予了农村土地商品化的、可交易的发展权，致使新的参与者出现并直接参与乡村土地整理、受影响村民的重新安置，并使他们间接参与到新的城市土地供应中。地方政府、开发商和村集体利用其各自在村庄发展项目中的优势提高了过程效率。传统的国家主导型土地生产模式因融合了自下而上的市场主动性而更为丰富，村民在二元土地市场下拥有了更多的选择以实现其土地产权。通过重新分配建设用地潜力，土地利用效率也得以提高。然而，在这一政策下，也出现了侵犯村民利益的现象和对区域均衡发展所产生的负面影响。

关键词

中国，制度，新制度经济学，农村土地，发展权交易

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Introduction

State-led acquisition of rural land has long been the primary means to support city-based development and land-centred urbanisation in China, contributing considerably to its rapid economic growth but also tremendously damaging its environment and society, such as through urban sprawl and village oppositions (Ding and Li, 2019; Lin, 2007). Achieving inclusive urbanisation with more efficient land utilisation is of national importance in China. From 1996 to 2008, the rural population of China decreased by 129 million, whereas the rural residential land increased by 1.12 million mu (Su et al., 2013). Hollow villages have become widespread in China (Long and Liu, 2016). To make better use of the existing rural construction land, the Chinese government has experimented with several schemes promoting village land consolidation and reclamation. One of the most prominent schemes is the policy about ‘Linkage Between Urban Land Increasing and Rural Land Decreasing’ or the ‘Linkage’ Policy (*Zengjian Guagou*).

The State Council of China formally introduced the ‘Linkage’ Policy in 2004. In

essence, this policy stipulates that more cultivated land is allowed to be occupied by urban construction if the same amount of cultivated land can be generated through land consolidation (especially the rural construction land) in rural areas. Without altering the dual land system of China, the ‘Linkage’ Policy is of great significance in connecting the rural and urban land markets and maintaining the total amount of cultivated land (Zhou, 2014). It is usually believed that land development projects in rural China still follow the conventional land acquisition model completely dominated by the local governments, and villagers are deprived of the opportunity to commodify their landed property rights (Deng, 2013; He, 2013; Long et al., 2012; Tian et al., 2017). However, based on an empirical study in Chengdu Municipality, this research examines the implementation of this policy as a form of new institutional change in China’s land property rights structure and urban land supply, evaluates the resulting interaction of multiple actors in the dual land market and elucidates the institutional diversity in organising land development projects in contemporary rural China.

According to the existing literature, this policy is often characterised as a form of transfer of development rights (TDR) in China (Feng et al., 2008; Gu et al., 2015; Tan et al., 2012; Tian et al., 2017; Wang et al., 2010). However, the detailed property rights arrangement behind this policy, as well as its impacts on China's land institutions and regional development, remain inadequately explored. In the Western context, TDR operates as a market-based solution to enable development rights (and values) of a land parcel to be realised in another location. How this mechanism is implemented in a socialist political economy with strong state intervention is puzzling. This study intends to fill the research gap by answering two questions: first, does the 'Linkage' Policy change the roles and involvement of the state and other parties in the dual land market in China, and if so, how does it do so? Second, what are the institutional impacts of the 'Linkage' Policy on China's urban and regional development?

Theoretical perspective: Externality issues and institutional change

From an economic perspective, China's rapid urbanisation through excessive farmland conversion has brought negative externalities to its environment, ecology and social life (Tan et al., 2012; Wang et al., 2010). To solve the externality problems, economic theory underscores the need for decision agents to internalise external costs and benefits. Accordingly, the central government of China has adopted a command-and-control order through top-down government regulations. First, the central government issues a national directive to preserve no less than 1.8 billion mu of arable land (*hongxian*). Second, it exercises a stringent land control policy and regulates the land conversion behaviour of local governments by vetting

their Land Use Master Plans, approval of Annual Land Use Plans and allocation of construction land quotas. These quotas prescribe the maximum permissible amount of construction land, the minimum amount of farmland, and the maximum amount of newly added construction land that can be legally converted from cultivated land by the local governments during a planning period (Shi et al., 2015). Although powerful, these top-down regulations incur high transaction costs in negotiation, policing and enforcement, and are tremendously inflexible because of the centralised nature of decision making. Moreover, imposing limits on urban construction land has severely hampered China's continual economic development and urbanisation.

From the perspective of New Institutional Economics, economic development and institutions always interact with each other (Demsetz, 1967; North and Thomas, 1976). On the one hand, if the outcomes of the interaction do not correspond to the actual benefit-cost borne by each stakeholder, a possibility exists for the transformation of existing institutions (Davis and North, 1971). To tackle the externality problem, property rights development can take place to adjust the desires and behaviours of the interacting parties through the internalisation of external costs and benefits (Demsetz, 1967; North and Thomas, 1976; Webster and Lai, 2003). In some cases, the externality issue may result in the 'creation' of new property rights, that is, the socially created development potential or state-conferred development rights (Lai et al., 2016). On the other hand, the newly developed institutions provide new political/economic/social constraints and incentives for the stakeholders and alter their decision-making conditions, which further promote their interactions to achieve a new balance (North, 1990; Williamson, 1998).

Accordingly, another solution to the externality problem, under the perspective of

New Institutional Economics, is to impose limits on the rights of individuals, treat the limited rights as a tradeable asset, and allow market transactions to decide and settle on the proper allocation of this resource (Coase, 1960; Webster and Lai, 2003). This idea has been applied to address environmental problems and other externality issues in developed countries. In the 1970s, for instance, transferable discharge permits were issued with rights to transact pollutant discharges as a tradeable commodity. Similarly, to allow flexibility of land development in the USA, development rights can be transferred from an area that prohibits such development to another place that needs it, thereby resulting in an overall improvement in land use efficiency (Hahn, 1984; Johnston and Madison, 1997; Kaplowitz et al., 2008; Linkous, 2017; McConnell et al., 2006).

Under the 'Linkage' Policy, land development rights (LDR) are separated from China's public land ownership, and can be transferred across urban–rural sectors. This constitutes a significant institutional change in China's land property structure and sets a new stage for the commercialisation of rural land property rights. Over the past four decades, China has implemented a series of major institutional reforms in its socialist land property rights systems, including the separation between land contractual management rights and land ownership through the Rural Household Responsibility System (Xie and Lu, 2017), the separation between land use rights and land ownership through the urban land leasing system (Clarke, 2018), and the emergence of LDR in the urban land redevelopment process (Zhu, 2004). Implementation of the 'Linkage' Policy necessitates another rearrangement of property rights and social relations amongst the various players in the dual land market of China.

According to Williamson (1998), there are four levels in the economics of institutions, that is, embeddedness (L1), institutional

environments (L2), the governance of institutions (L3) and resource allocation and employment (L4). On the one hand, the continuous development sometimes induces new externalities and conflicts in resource allocation, which further results in changes in the institutions, ranging from informal to formal institutions. On the other hand, the institutions at the upper level have a direct/indirect influence on the institutions at the lower level, and all institutional changes will make a difference in resource allocation.

Figure 1 shows the theoretical framework of this study. This paper focuses its analysis on the influence of China's continuous urbanisation (L4) on its land institutional environment (L2), including land property rights structure and urban land supply under the dual land system. It then explains the impacts of the 'Linkage' Policy as a new institutional environment, both at the national level and local level, on the involvement of stakeholders and governance structures (L3). Finally, it examines the institutional impacts (of informal institutions, changed institutional environments, and diversified governance structures) on resource allocation (L4), including the reduction in transaction costs, the land revenue distributed to villagers, and the distribution of construction land.

Transfer of land development rights and institutional diversity in China

A new approach to urban land supply

Using land from the rural areas or less-developed localities for urban growth is not new to local governments in China. For example, in Zhejiang Province, the provincial government initiated a series of policies to encourage village land consolidation and land reclamation in the late 1990s (Wang et al., 2010; Zhang et al., 2014). Under the

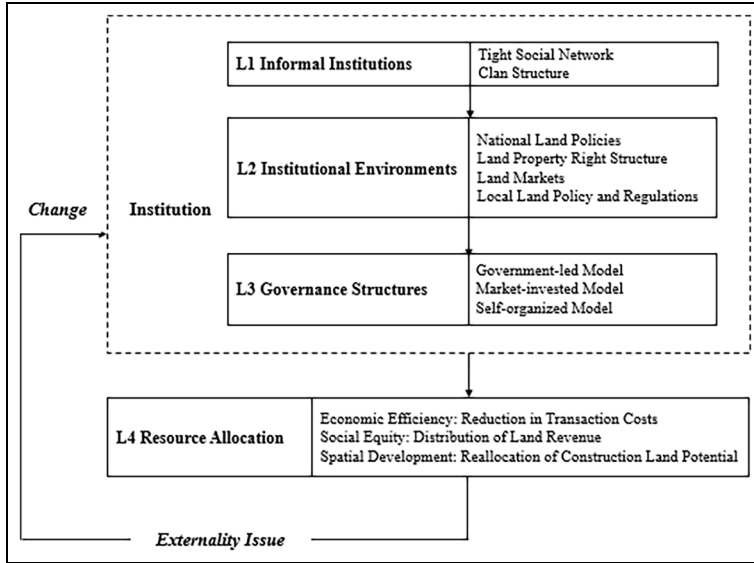


Figure 1. Theoretical framework.

‘Linkage’ Policy, the central government sets a quota for the amount of rural land for which the development rights can be transferred to allow the local government to develop an equivalent amount of urban construction land. This quota is additional to the traditional quota for annual newly increased construction land that allows direct acquisition of rural land. Local governments decide on how and where rural land consolidation, adjustment and villager resettlement should take place to ‘produce’ these transferrable development rights.

Figure 2 compares the two models of urban land supply under the conventional process of state-led acquisition (Panel A) and the ‘Linkage’ Policy (Panel B), respectively. Both models have the quotas set by the central government and require village land adjustment and resettlement of villagers. However, the institutional arrangement and spatial implications in land development are different (Table 1).

First, the conventional state-led acquisition model produces new urban land in the

same location where old villages have been removed or resettled. Under the new model, the development/redevelopment of village land occurs in two separate locations: one that produces additional agricultural land and the other new urban construction land for leasing in the primary market. Development rights must first be ‘produced’ through village land adjustment to increase arable land. With these property rights (that is, the ‘Linkage’ quota in practice), the local government is then permitted to convert an equivalent amount of cultivated land within the urban planning zones. Increases in the new supply of both urban construction land and rural arable land are thus ‘linked’ (Panel B of Figure 2). Second, buyers of newly leased land from the government in the primary market are required not only to pay the land premium (*churang jin*), but also to surrender their entitlements to such development rights. This condition creates the market demand for LDR. Third, the supply of LDR through village land consolidation provides a golden opportunity for the rural

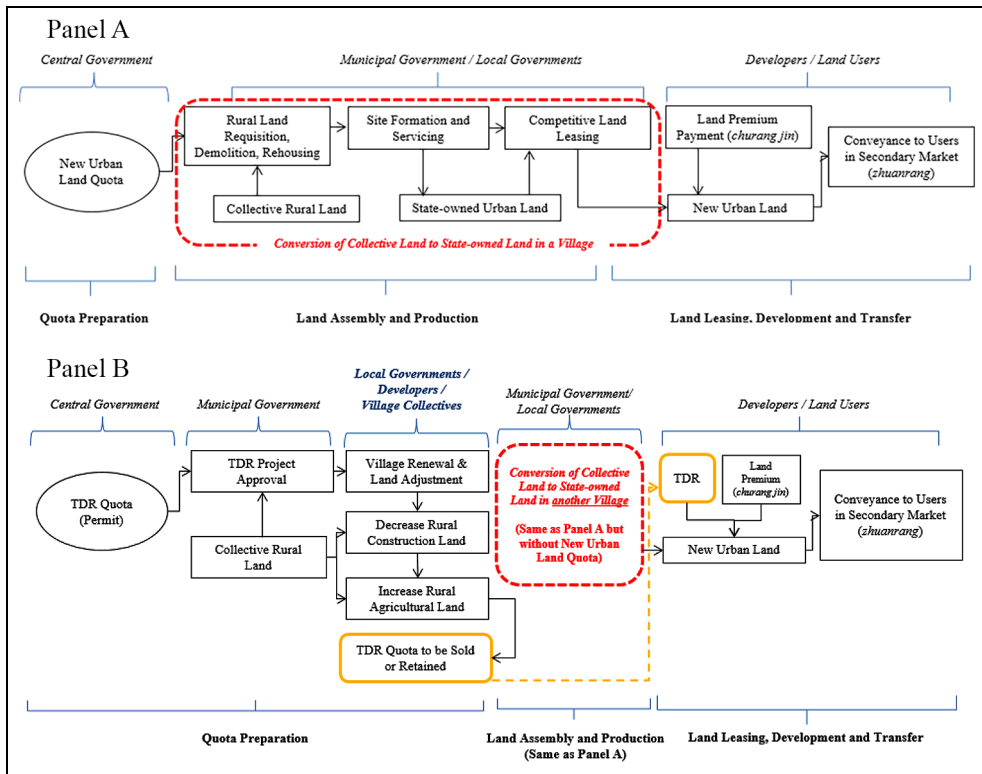


Figure 2. Comparison of urban land supply under two land quota systems. Panel A: Urban land supply under traditional land quota system. Panel B: Urban land supply under 'Linkage' Policy.

sector to connect with the urban land market. This case is particularly applicable to remote, poor villages where the land is much less attractive compared with the land in suburban areas.

Institutional constraints to the market mechanism

When organising a TDR programme, contract and trade are generally regarded as the best vehicles to improve economic efficiency and achieve superior resource allocation (Tan et al., 2012; Wang et al., 2010). However, two unique institutional characteristics of land development in China make the market mechanism less straightforward. First, it is about the ambiguity of rural land

ownership. According to the Constitution and the Land Administration Law of China, urban land is owned by the state, and rural land is collectively owned by the farmers in each village. However, the existing land institutions have failed to clearly define the status of collective land ownership, and in practice, the control of rural land is often not in the hands of the villagers or their representatives but is vested with the township-level government (He et al., 2009; Ho, 2017). Besides, the nationwide survey and property right registration of collective land has not been accomplished in China. As a result, this ambiguity in property rights tends to cause illegal rural land conversion, rent-seeking by the local state and land disputes with the villagers. Given the unclear delineation of

Table 1. Comparison of key characteristics of urban land supply models.

Characteristics	Urban land supply under state-led land acquisition model (Panel A of Figure 1)	Urban land supply under the 'Linkage' Policy model (Panel B of Figure 1)
Locations of consolidated villages and new urban land	Same location	One for the increase of arable land (sending area); another for the supply of new urban land (receiving area)
Components of the payment for the new urban land	Land premium only	Land premium and entitlement of transferred development rights
Land markets in urban land supply process	Primary market for urban construction land	Market for production, ownership and exchange of transferrable development rights of collective land; primary market for urban construction land
Transfers of land property rights	Transfer of land ownership from the rural sector to the urban sector; transfer of use rights of urban land from the local government to developers	Transfer of land development rights from the rural sector (sending area) to the urban sector (receiving area); transfer of land ownership from the rural sector to the urban sector (receiving area); transfer of right of use of urban land from the local government to developers (receiving area)
Participants in the supply of new urban land	The local state	A diverse range of players are involved in the production of transferrable development rights, which are the prerequisites for the supply of new urban land

property rights and the existence of high transaction costs, especially for resources in the public domain, the market may not generate an efficient outcome (Cheung, 1998; Webster and Lai, 2003; Williamson, 2005).

Second, it is about the dominant role of the state in China's dual land market. For a long time, state-led acquisition of collectively owned rural land has been the only means to connect urban-rural land markets. The economic value of rural land can only be realised through the land leasing system dominated by the state. Since the local government has been given some property rights (including disposal rights) over state-owned land, it becomes the *de facto* owner who can monopolise land supply in the urban land market. Fiscal reforms have further encouraged the local government to consolidate its control over urban resources or directly involve itself in local economic activities,

making it an 'entrepreneurial government' (He and Lin, 2015; Wu, 2015, 2018). Thus, the local government takes all the responsibilities in urban space production and implements all kinds of land development plans and land use quotas. State domination tends to crowd out bottom-up market initiatives in the allocation of urban land resources.

Therefore, the organisation of the TDR programme in China is totally different from that in Western countries. This research aims to expand the current knowledge about TDR practice under a public land ownership system.

New actors in a reshaped land market

To support TDR market initiatives and mechanisms, the local governments of Chongqing and Chengdu have introduced several local institutional innovations (see section 'Institutional impacts: Evidence from

Table 2. Incentives and resources of stakeholders in TDR programme.

		Incentives	Resources
Central government		Preservation of cultivated land; improvement in villagers' life	Authority to design national policies and regulations; supreme right to approve and examine pilot projects; right to distribute TDR quotas
Local Government	Provincial/municipal government	Regional economic development; social stability; good performance appraisal	Right to design local institutional environment; right to approve and examine TDR projects
	County-level government	Land profits from urban land market; urban spatial development strategy; good performance appraisal; project profits (if dominate)	Monopolistic supply of urban construction land; government information system; huge amount of earmarking of funds
Villager	Township-level government	Good performance appraisal; rent-seeking opportunities	De facto management of rural land
		Improvement in living conditions or economic compensation; increased cultivated land of high quality; other lasting income opportunities; project profits (if dominate)	De jure ownership of rural land (collectively owned)
Developer	New land users	Complete use rights of urban construction land at the lowest price	Capital
	Land reclamation companies	Project profits (if dominate)	Complete market information of TDR quota; project operation and management experience; flexible financing capacity
Village collective		Support from villagers; support from the local government; rent-seeking opportunities; certain share in project profits (if dominate)	Complete information about the rural land and villagers; De jure management rights of rural land; tight social network and the clan structure

Chengdu'). Subsequently, a commodified market begins to emerge to enable the 'production', ownership and exchange of LDR of rural land to the urban sector. This approach essentially relaxes the monopoly of the local state on the development of rural land and incentivises a diverse range of local players, such as developers, village collectives and villagers, to participate in urban land supply. Before the 'Linkage' Policy, these actors played a relatively passive role and were somewhat marginalised under the conventional urban land production model.

The opportunity to commodify rural collective land for the 'production' of LDR invigorates local players, who command different resources to participate in the supply of LDR (Table 2), leading to the implementation of three land governance structures in practice, that is, a government-led model, market-invested model and self-organised model. Using Chengdu as a case study, the section 'Institutional impacts: Evidence from Chengdu' will discuss the dynamic interactions of these key players and the impacts of these three governance structures.

Institutional impacts: Evidence from Chengdu

Local institutional environment

We selected Chengdu as a case study for three reasons. First, Chengdu is one of the Chinese cities with a fast urbanisation rate, growing from 42.8% in 2004 to 70.4% in 2014, thereby generating significant demand for urban construction land. The considerable difference between the high urban land prices and the relatively low village resettlement costs tends to generate a wide profit margin for players interested in TDR projects. Second, Sichuan Province became one of the earliest provinces to implement the 'Linkage' Policy in 2006, and Chengdu, as its provincial capital, has accumulated considerable experience in policy implementation. Last, the Chengdu municipal government initiated several institutional innovations to improve the institutional environment to facilitate rural land marketisation and reduce transaction costs in the TDR market.

To lessen the ambiguity in collective property rights and respond to the rapid appreciation of rural land values, the Chengdu municipal government commenced property rights reform in rural areas in 2008. By 2010, this reform was completed with the issuance of approximately 33,400 ownership certificates for collectively owned construction land, 1.5 million certificates of use rights for homestead land and 1.8 million certificates of contracted management rights for cultivated land (The World Bank and Development Research Centre of the State Council of the People's Republic of China, 2014). Defining the boundaries of property rights on various rural land categories, this certification programme has built a solid foundation for the transfer of land property rights in rural areas and protected the rights of villagers to earnings from their homesteads (*zhaijidi*).

The founding of the Chengdu Agriculture Equity Exchange by the municipal

government also facilitates the market transaction of entitlements to rural land. In 2016, more than 1130 rural land property right transactions were completed through this platform, involving approximately 236,400 mu of rural land and 6.58 billion yuan. Amongst these transactions, the land area involved in the TDR programme accounted for up to 13.8%, and the annual turnover accounted for up to approximately 56%. This exchange platform has reduced the costs of information and negotiations and has stimulated more potential players to participate in the TDR projects thereby increasing the supply of 'Linkage' quotas.

In Chengdu, all buyers of new urban land are required to acquire the 'Linkage' quota first either by: (1) 'producing' their own quota through a direct investment in an approved village consolidation project, or (2) purchasing the quota from the TDR market. This local policy has enhanced the demand for TDR quotas and further expanded the marketisation of TDR implementation. Companies with professional knowledge and expertise that specialise in rural land adjustment have been increasingly established, thereby further reducing the implementation cost of 'Linkage' projects.

Along with the commodification and transfer of LDR in Chengdu, village collectives are also energised in managing their collective land assets and organising rural land development. In 2009, village committees that consist of elderly and senior villagers began to emerge in some villages to resolve land disputes amongst fellow villagers. At present, the village councils, which comprise representatives from each household, are responsible for election, voting, monitoring and publicity in village affairs. Therefore, the progress in the rural governance of Chengdu has strengthened the efficiency of collective organisations, and these credible and empowered organisations can better organise villagers to realise their land

property rights and protect their economic benefits in land transactions.

Institutional diversity and economic efficiency

The transaction in the 'Linkage' projects is not only about the transfer of the 'Linkage' quota but also about the aggregation of a series of secondary transactions (Tan and Heerink, 2017). Specifically, the entirety of the 'Linkage' projects can be classified into the following stages: designation of area of quota generation, project initiation, planning design and preparation, reclamation and new construction, development rights acquisition and assembly, and the transfer of 'Linkage' quota to the 'quota receiving area'. In each stage, there are several sub-transactions to be conducted between various stakeholders, either to transfer property rights or to achieve agreements. Under various governance structures, the stakeholders cooperate in different ways and play various roles in TDR transaction, leading to diversified interactions among local governments, market players, village cadres and villagers. Based on comparative institutional analysis, this research argues that each TDR structure has its own superiorities in reducing transaction costs and improving process efficiency, especially under a specific combination of transaction attributes.

By the end of September 2016, the Chengdu Municipal Cadastral Centre has approved a total of 398 'Linkage' projects located in 166 towns in 16 counties. To examine the operational characteristics of these three TDR models, this research randomly selects 98 'Linkage' projects (located in 78 towns in 15 counties) and collects detailed information from their project completion reports. The analysis results of these 98 linkage projects indicate that less than 71.4% of the TDR projects in Chengdu were led by the local governments. More than

21.4% of the TDR projects were invested by the developers, while approximately 7.1% of them were self-organised by the village collectives.

Market-invested model. In initiating and managing TDR projects, developers and market capital have the strengths in lowering the transaction costs and construction costs, including strong market intelligence, professional fundraising channels, flexible financial arrangements, low administrative costs and efficiency of project implementation. Moreover, market-invested projects sometimes encounter less resistance from villagers because, unlike government officials, developers are less constrained by political image, performance appraisal and public pressure. However, developers encounter other difficulties in leading rural land adjustment projects, including lack of experience in dealing with administrative procedures and negotiations with villagers. Their cooperation with the village cadres and support from the local governments are important to the successful implementation of market-invested TDR projects.

Self-organised model. Rural cooperative companies established by village collectives have also been able to act as project leaders in the TDR programme in recent years. Under these self-organised TDR projects, villagers become the shareholders after they transfer their rights of use of homesteads to the rural collectives in exchange for profit sharing after the TDR transactions. Compared with the traditional principal-agent relationship between villagers and village cadres, this shareholding system can help reduce the endowment effect of rural land, which is one of the main reasons for the high negotiation costs with the villagers (Luo and Li, 2010). Moreover, under a tight social network and clan structure, villagers may encounter fewer obstacles to achieving internal agreements

and reducing the transaction costs in information collecting.

However, with limited financial capacity, self-organised TDR projects need more institutional support from the local government. Some rural collectives are disadvantaged by incomplete market information and inadequate experience in project management, resulting in high transaction costs and market risks in organising TDR projects. Our analysis of the 98 TDR projects shows that the self-organised model is more likely to be adopted under two conditions. First, when villagers have a strong, solid desire to improve their living conditions, they are more willing to participate in the TDR project and endure higher costs. Second, when villages are in better locations, villagers tend to have a higher incentive to improve land use efficiency through the TDR programme. The self-organised model enjoys a comparative advantage in lowering the transaction costs of implementing the projects in villages that have high opportunity costs and endowment effect of the homestead.

Government-led model. The ‘Linkage’ Policy and its associated institutional innovations have significantly reduced the barriers against other non-government players entering the TDR market. However, they do not totally eliminate the uncertainties arising from changes in the institutional environments and information asymmetry in land development, rural–urban planning and administrative procedures. All these exert significant constraints to thwart bottom-up initiatives in rural land governance. As a top-down hierarchical structure, the government-led model has strong administrative intensity to control the opportunistic behaviours of other stakeholders, offers a better adaptive capacity to deal with an uncertain institutional environment, endows the initiative with powerful government finance and holds a relatively complete

information database. Thus, for many ‘Linkage’ projects in practice, the government regulatory structure is the most economical option to reduce transaction costs and facilitate project implementation.

Interactions amongst stakeholders and distribution of benefits

At the policy level, the ‘Linkage’ Policy was promoted by China’s central government to achieve two objectives: the preservation of cultivated land and the improvement of villagers’ life. At the project level, however, economic returns constitute the most important consideration for all stakeholders. Competition among self-interested stakeholders in maximising their returns from the LDR projects often leads to under-achievement of the policy goals in practice (Tan and Zhou, 2015).

Developers. Developers are only interested in those TDR projects in which the market price of the TDR quotas is higher than the costs for building demolition, land reclamation and villager resettlement. In the 98 projects under study, compared with local governments and village collectives, developers are found to be most sensitive to economic profitability when investing in the TDR projects. Our interviews with developers have revealed that they generally expected a return on investment of 15% to 20%.

Villagers. From 2012 to 2018, the ‘Linkage’ programme has raised more than 275.3 billion yuan for China’s rural development, especially for the remote rural areas which can ‘produce’ LDR at a low cost. Villagers can receive most of the economic value of their land property rights, especially if they participate in the TDR projects under the self-organised model. However, compared with the high urban land prices (13,230,000 RMB/mu in April 2017) that the local

governments can achieve from sale of land in the primary market, the market value of TDR quotas (300,000 RMB/mu to 320,000 RMB/mu) remains extremely low. This indicates that only a small share of urban land revenues was transferred to the rural sector under the 'Linkage' programme.

The local governments have several criteria for approving TDR project proposals from applicants. Poverty alleviation of villagers is often a major consideration. When participating in TDR projects, villagers are required to give up the LDR of their homesteads and the ownership of original houses. In return, they receive compensation and resettlement housing. According to our interviews with villagers, the living conditions in rural areas have considerably improved through the TDR projects and, in particular, the anti-seismic quality of new construction has been strengthened in resettlement areas. In Chengdu, most villagers were resettled near their cultivated land, and this did not increase their commuting time for agricultural activities. For the villagers who were resettled farther away from their farmland, project proponents usually rented the rural land to agricultural companies and returned the rental incomes to the villagers. When market competition amongst potential project proponents was allowed, villagers tended to have more bargaining power in the negotiation process, which further protected the value of their land property rights.

However, based on the empirical study in Chengdu, infringements of villagers' interests in actual projects under each governance structure can be identified. In the 'Linkage' projects organised by local governments, villagers usually obtain higher compensation and better social welfare than those under the other two models. Nonetheless, villagers tended to have a lower degree of participation in project decisions, and the resettlement housing tended to be in less accessible locations resulting in longer commuting distances

for villagers. For the TDR projects led by developers, the provision of resettlement housing and the preserved rural construction land cannot be guaranteed in reality. Villagers sometimes need to pay extra money for new houses. In comparison, the self-organised model can protect the villagers' property rights to the greatest degree, but the varying financing capacities and leadership qualities of village collectives may create very different project performance and outcomes.

Local government. In Chengdu Municipality, local governments invested (530,000 RMB/mu to 2,410,000 RMB/mu) in all the 24 projects, the costs of which had far exceeded the market prices of the TDR quotas. This finding illustrates that, beyond project profits, local governments have other benefits and obligations behind their investment decisions in selected TDR projects. First, whether direct investments in the TDR projects were made or not, the local government can receive large land leasing revenues from leasing the new urban land in the primary urban land market (Figure 2). Second, as an 'admission ticket' to acquire urban construction land, the market values of the TDR quotas become a sunk cost to developers. To maintain their profit margins, land users tend to lower their bids in the primary urban land market. Seen in this light, TDR also plays the role of transferring payment to promote rural development and preserve cultivated land. By investing in the 'unprofitable' TDR projects, the local government actually redistributes more land revenues from the primary urban land market to the rural areas.

Reallocation of construction land potential and spatial development

Apart from land leasing revenue, a possible contribution to regional development especially in terms of spatial development strategy, is another major objective of local

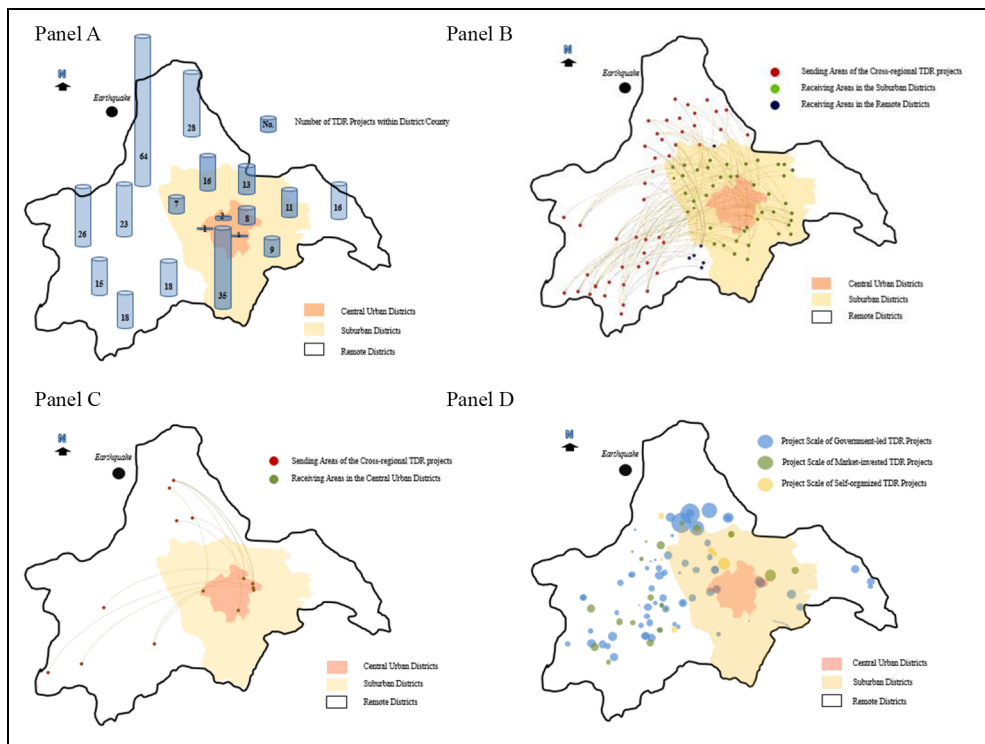


Figure 3. Spatial distribution of transfer of development rights (TDR) projects in Chengdu. Panel A: number of projects transferring land development rights within the county/district. Panel B: linkage between remote districts and suburban districts through TDR projects. Panel C: linkage between remote districts and central urban districts through TDR projects. Panel D: three governance structures and project scales.

governments in their investment in TDR projects. Chengdu generally obtains 40,000 to 50,000 mu of conventional annual land quota from the central government. Through the ‘Linkage’ projects, the municipality ‘produced’ more than 50,000 mu of construction land quota in 2010. This study further analysed the geographical distribution of the 398 TDR projects and derived the following findings.

A majority of the village consolidation projects that conducted TDR projects is located in the remote rural areas (Panel A of Figure 3). This pattern is unsurprising because it corresponded with the availability of rural construction land in the remote areas and their relatively lower villager

resettlement costs. The question now is where their development rights were transferred to, to produce the supply of new urban land. Our findings show that 60 new projects in the suburban districts received the development rights transferred from remote districts (Panel B of Figure 3), whereas only 17 new projects in the central urban areas are connected to remote TDR projects (Panel C of Figure 3). Seven TDR projects also transfer LDR across different counties in the remote areas (Panel B of Figure 3).

We provide the following explanations. Some counties in the remote locations (including Penglai, Dujiangyan, Dayi, Chongzhou and Pengzhou) were severely damaged by the Wenchuan Earthquake,

Table 3. Comparison of project locations.

Characteristics (indicators)	TDR projects with village land consolidation	Supply of new urban land	Villagers rehousing sites
Distance to city centre: (travel distance, in hours, of project site to Chengdu urban centre – Tianfu Square – by car)	1.2546	1.0911	1.3185
Public transport convenience: (travel distance, in hours, of project site to Chengdu urban centre – Tianfu Square – by public transport)	11.3746	7.5392	11.1291
Urban road accessibility: (travel distance, in hours, of project site to nearest truck road)	1.3839	0.7854	1.3083
Level of urban infrastructure: (number of urban roads within 1 km of project site, excluding village roads)	2.7121	6.4545	3.8556

thereby raising a desperate demand for the reconstruction of residential blocks and for village land adjustment in the disaster areas. To expedite post-disaster reconstruction, the central government allocated extra TDR quota to these counties and allowed cross-regional trading of TDR in these areas. This research finds that most large-scale TDR projects in these areas are invested and organised by the local governments (Panel D of Figure 3). In other counties in the remote area, such as Pujiang, the costs of village resettlement and consolidation are low. Thus, these counties tended to attract strong market interest (Panel D of Figure 3).

The supply of new urban land under the 'Linkage' Policy is mostly found in the sub-urban areas where several development zones have been established by local governments, including the Economic and Technological Development Zone of Chengdu Municipality in Longquanyi, the New Economic and Technological Development Zone of Northern Chengdu in

Qinglongjiang, the Industrial Development Zone in Xindu, the Industry Park Zone across the Straits in Wenjiang and the Air Harbour Industrial Development Zone in Shuangliu. The central urban districts of Chengdu neither consumed nor produced a large TDR quota primarily because of the limited supply of potential urban construction land and the prohibitively high costs of village land consolidation and clearance.

Table 3 shows the consolidated analysis of 217 villages that produced TDR quotas, 192 villages that consume the quotas and 176 village housing resettlement areas in our 98 TDR project samples. With regard to the average travel distance to the urban centre of Chengdu, the location of the new urban land exhibited only small differences compared with that of the villages being consolidated to supply the transferrable development rights. Major differences were found in public transport convenience and urban road accessibility. The newly supplied urban land is located in more urbanised areas with

better public transport services and urban infrastructure, which significantly improves the utilisation efficiency of the existing construction land but leaves a negative impact on balanced regional development. Besides, as indicated by the level of urban road provision, the housing conditions of villagers seemed to have improved after village land adjustment and resettlement.

Conclusion

To solve the externality problems caused by excessive farmland conversion for urbanisation, China has implemented the 'Linkage' Policy (*Zengjian Guagou*). Under this policy, the consolidation of village land to increase agricultural land 'produces' LDR that can be transferred to provide new urban land elsewhere. This policy has not only connected the segregated rural and urban land markets of China by means of TDR, but also transformed its conventional state-dominated urban land production model in the process of urbanisation. When the LDR of rural land become tradeable, new institutional economics suggests that the implementation of 'Linkage' Policy will induce institutional changes in the property rights arrangement and in the social relations amongst various players in the dual land market of China. Moreover, because of the ambiguous collective land ownership and the dominant role of the local government in the urban land market, market behaviour and market structure face tremendously high transaction costs in organising TDR projects in China.

Using Chengdu as a case study, this research examines the impacts of the new institutional environments on the governance of institutions, as well as the impacts of institutional changes on process efficiency, distribution of land revenue and spatial development in China's urbanisation. First, Chengdu has implemented a number of important institutional innovations in

reducing the transaction costs of a market mechanism for the transfer of rural LDR. These essential market tools enable the commodification of rural land assets and are of great significance in the choice of governance structures and transaction outcomes, which also provide a good reference for other provinces and municipalities.

Therefore, Chengdu has witnessed the emergence of the active participation of a diverse range of players, in addition to the local governments, in organising village land consolidation, reclamation and villager resettlement with a view to 'producing' and acquiring transferrable LDR. Three models are identified in village project implementation, namely, government-led, market-invested and self-organised models. Nearly 30% of these village projects were initiated by developers or village collectives, who contributed their respective strengths and the resources they commanded to reduce transaction costs and improve process efficiency. Moreover, resettlement housing for the villagers appears to have been improved regarding quality and services. These projects are likely to be more equity-enhancing and sustainable than the traditional land acquisition system, as they constituted what Tian et al. (2017: 895) suggested: 'a bottom-up facilitating process and a contractual approach where mutual consent rather than commands are applied'. The local government can also achieve its political missions and spatial development strategy in developing Chengdu. Outlying villages devastated by the Wenchuan Earthquake received the resources to have their village land consolidated and their housing rebuilt by transferring their LDR to the economic development zones designated by the government. New supply of urban land is located in relatively urbanised areas with better urban amenities and infrastructure and can presumably generate high land leasing revenues to the local governments.

This study illustrates that through separation and commercialisation of LDR of rural land, the 'Linkage' Policy seems to have generated a positive outcome in returning some land revenue from farmland conversation to the rural sector. However, this policy also induces some negative institutional impacts on sustainable rural development and balanced regional development. Thus, further research is necessary to investigate the long-term performance of this policy, particularly in connection with the establishment of policies regarding the use of newly created arable land and the sustainability of welfare for villagers.

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