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Analysis on Local Government's Illegal Occupation of Cultivated Land Using Game Theory

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Abstract In order to find out reasons for local government illegally occupying cultivated land and reduce such acts to ensure China's grain security, this paper made an analysis through building the single person game model for local government's legal or illegal occupation of cultivation land. It reached the conclusion that the benefit obtained by local government from illegal occupation of cultivated land is far greater than cost and punishment of such illegal acts. Illegal act is an optimal choice of local government to maximize its benefits, which is also the major reason for its illegal occupation of cultivated land. Thus, to reduce these illegal acts of local government, it should reduce benefits of local government obtained from illegal occupation of cultivated land, and increase costs for illegal occupation of cultivated land.

Key words Illegal occupation of cultivated land, Local government, Game theory

1 Introduction

The grain security concerns healthy socioeconomic development and national independence^[1], so we must attach importance to protection of cultivated land. In reality, however, there is widespread illegal occupation of cultivated land by local government. According to survey, 80% illegal land use in China is undertaken by local government, and there is widespread act of damaging overall plan for land utilization and exceeding annual plan target of land utilization^[2]. In 2006, Suining City of Sichuan Province illegally occupied more than 20 000 mu cultivated land along the Yangtze River for building Guojundu power station^[3]. Government of Pi County in Chengdu City enclosed and relocated 7 343 mu capital farmland in the form of "rental in place of requisition" to develop urban economy^[4]. In September 2007, to invite outside investment, government of Xiuying District in Haikou City of Hainan Province signed "791 project" contract with Smart Hero (Hong Kong) Investment and Development Company, and illegally occupied 54 000 mu land^[5]. Government of Xiuning County in Anhui Province illegally expropriated land many times and approved mining companies to expropriate land at their discretion; National Land Resource Bureau of Xiuning County illegally issued *Approval of Construction Land* to sand developing companies with the illegal occupation of land up to 300 mu (including more than 170 mu cultivated land)^[6]. These show that local government is still the leading part in illegal occupation of cultivated land.

Through overview of researches of many scholars, it is clear that domestic theory circle has fully realized this point. Wang Wanmao believed that market failure leads to government intervention and regulation, but government may not be able to solve problems that can not be solved by market, accordingly leading to

"government failure"^[7]. Cao Xiaojuan analyzed government act in land benefit adjustment, and believed that local government is representative of local common benefits, directly intervenes land supply and use, and thus provokes conflict of land benefits^[8]. Zhang Yuanhong stated that no effective monitoring and management mechanism, especially no correct guidance and control of acts of local government, is a major reason for damage of cultivated land^[9]. Zhang Quanjing *et al.* believed that the direct reason for reduction of cultivated land is government act^[10]. Many scholars carried out in-depth discussion of reasons for act of local government. They believed that there are two key reasons. Firstly, the management system lacks effective restraint on acts of local government^[11–13]. Secondly, local government pursues comparative benefit to evade costs for cultivated land protection^[14]. Most scholars think when local government illegally occupies cultivated land, they not only care about themselves, but also consider reaction of central government and farmers. Only few scholars have researched act orientation of local government. Taking this as start point, we built the single person game model from the perspective of the game theory, to explain reasons for local government illegal occupation of cultivated land.

2 Building of the game model

2.1 Basic assumption (1) Assuming that central government chooses existing system supply, this model will be a single person game of local government. In other words, local government has two options; illegal and legal. (2) Local government starts mainly from partial benefits of local area, to realize maximization of economic and political income. (3) The system is complete. Namely, local government has correct understanding of utility of legal and illegal occupation of cultivated land.

2.2 Game mechanism On the condition that central government selects existing system supply, local government makes its own act choice, to realize maximal utility in balance of final

game. In this situation, local government has two act options: one is illegal, *i. e.* illegal occupation of cultivated land, the other is legal, *i. e.* protecting cultivated land. Such game is a single person game of local government, as shown in Fig. 1.

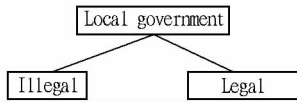


Fig. 1 Single person game model of local government

3 Game analysis on local government's illegal occupation of cultivated land

Income obtained by local government from illegal occupation of cultivated land: (1) expanding scale of construction land and increasing local GDP; (2) financial revenue; (3) increasing "personal rental" of local officials. These are collectively called illegal income (S). Cost of local government for illegal occupation of cultivated land: (1) specific implementation cost for occupation of cultivated land (C_1); (2) certain punishment cost (PC_2) (C_2 is legal punishment imposed on local government for illegal occupation of cultivated land, and P is the probability of investigation and prosecution, $0 < P < 1$). Thus, illegal or legal strategy taken by local government mainly depends on comparison between $S - C_1 - PC_2$ and 0. If $S - C_1 - PC_2 < 0$, local government will choose "legal"; if $S - C_1 - PC_2 > 0$, local government will choose "illegal".

3.1 Higher income obtained by local government from illegal occupation of cultivated land, *i. e.* higher S value

(1) Expanding scale of construction land and increasing local GDP. Driven by interests, industries and sectors with higher marginal rate of return will be provided with more resources by local government. According to the survey in He County in Anhui Province, in normal yield and conventional production mode, the net annual income of one mu farmland is only about 200 yuan, in addition to labor cost, there is nearly no profit^[15]. Therefore, to promote rapid development of local economy, local government will not rely on agriculture which has lower comparative benefit. In order to develop local economy, local government increases effort in inviting and attracting outside investment. However, due to no sufficient land use index after inviting and attracting outside investment, local government has to illegally occupy cultivated land, which leads to widespread illegal occupation of cultivated land. Besides, economic output value and economic growth rate take up a larger portion in present cadre performance assessment, while the weight is lighter in cultivation land protection. Therefore, local government often expands land use scale to promote rapid economic development and obtain higher income at the sacrifice of cultivated land.

(2) Increasing local financial revenue. Land income is the major source of local financial revenue, leading to local government preferring to operating land assets and creating financial revenue relying on land. Pillar local budgetary income of local government includes business tax, income tax and tax on land occupation imposed on building industry and real estate industry for the

purpose of expanding city and occupying cultivated land, while pillar extra-budgetary income of local government mainly refers to land transferring fee obtained from land auction. Survey report indicates that 40% of local budgetary income comes from direct land tax and indirect urban expansion, while more than 60% of extra-budgetary income comes from net income of land transferring fee^[16]. This intensifies the desire of local government to illegally turn cultivated land to construction land and fund. The above shows that local government obtains high financial income from illegal occupation of cultivated land, especially the extra-budgetary income.

(3) Increasing "personal rental" of local officials. Since central government allowed governments at different levels to manage their own finance and deal with their allocated funds independently, local government has become relatively independent subject of act and benefit. The precondition of rent-seeking is intervention of local government in market transaction activities. In China, the situation of local government's intervention in market transaction is very serious. The balance amount between different supply methods and the price difference between different land use types are major source of the rentals, which are mainly controlled by local officials because they can determine way of land supply and change land use through taking advantage of their authority. As a result, speculators fall over each other to ingratiate with local officials. Some local officials will conspire with speculators for personal interests, *i. e.* personal rental. Then, these local officials will illegally approve land, change land use purposes without authorization, such as dividing far rather than near areas, dividing barren instead of fertile land, and illegally changing cultivated land into urban construction land. This shows that local government can obtain economic growth, financial revenue and huge personal rent-seeking income from illegal occupation of cultivated land. In other words, for local government, illegal occupation of cultivated land can bring huge income.

3.2 Specific implementation cost for occupation of cultivated land is relatively low (*i. e.* C_1 is relatively low) Specific implementation cost for occupation of cultivated land includes transaction cost and land requisition compensation cost. Within the framework of existing system, cost of these two parts is relatively low.

3.2.1 Drawbacks of existing system cause relatively low transaction cost for illegal occupation of cultivated land. (1) Drawbacks of land requisition system lead to widespread illegal occupation of cultivated land. Firstly, exercise of land requisition right lacks strict stipulation of ranges. Although the constitution has stipulation on range of land requisition for public interests, there is no specific provision of public interests. In actual life, this is determined by government. Land Administration Law of the People's Republic of China stipulates that all units and individuals that need land for construction purposes shall, in accordance with law, apply for the use of state-owned land. This expands scope of expropriation specified in the *Constitution* from "demand of public

interest" to the entire economic field, and then local government can occupy much cultivated land in the name of economic construction. Secondly, land-expropriated farmers fail to take effective monitoring of illegal occupation of cultivated land of local government. In the process of land expropriation, farmers have no right to supervise act of local government. (i) Before decision of land expropriation is issued, farmers have no right to know, so their demands fail to be manifested in land expropriation policies. (ii) Farmers have no right to participate in the process of determining compensation criteria for land expropriation. The two-declaration system is just the notification of farmers to handle the formalities, because settlement program is declared after approval. Even if they are not satisfied with compensation criteria, it will be coordinated by local government, so it will not influence the implementation of land expropriation program. (iii) It is extraordinarily difficult for farmers to bring a lawsuit against local government, and to safeguard their rights and interests. These factors lead to the fact that farmers fail to take effective monitoring of local government's illegal occupation of cultivated land.

(2) Drawbacks of land use planning system causes that local government illegally occupies cultivated land in violation of overall plan for land utilization. Firstly, plan for land utilization is not harmonious with urban plan. There is certain conflict between priority protection of cultivated land in plan for land utilization and urban development in urban plan. At present, urban plan is more mature, scientific and operational than plan for land utilization. In practice, urban land use is basically limited to handling formalities in accordance with urban plan, but violation of plan for land utilization is of frequent occurrence. Secondly, formulation of plan for land utilization is, in fact, act of local government, which seriously weakens monitoring function. Government at all levels implements administration by different levels according to administrative jurisdiction. Although the administration of responsible person in land and resource management authorities is line management, the line management below provincial level is not complete. Wages and welfare of workers in land and resource management authorities at and below the county level are managed by local government. This indirectly leads to the fact that the land and resource management authorities at the county level have no right to butt in act of local government. Therefore, local government may violate plan for land utilization and occupy cultivated land illegally. Thirdly, unconnected legal provisions provide opportunity for plan adjusters. For example, *Land Administration Law of the People's Republic of China* stipulates that expropriation of capital farmland shall be subject to approval by the State Council and change to overall plan for land utilization shall be approved by the organ that originally approved the overall plan. However, provincial government generally hands over the right to change overall plan for land utilization to land and resource management authorities. In other words, it is possible to evade approval of the State Council to adjust the overall plan.

3.2.2 Compensation to farmers is relatively low. In the new

Land Administration Law, it is expressly specified that land expropriated shall be compensated for on the basis of its original purpose of use. Compensation for expropriated cultivated land shall include compensation for land, resettlement subsidies and compensation for attachments and young crops on the requisitioned land. Compensation for expropriated of cultivated land shall be 6 to 10 times the average annual output value of the expropriated land, calculated on the basis of 3 years preceding such requisition. The standard resettlement subsidies to be divided among members of the agricultural population needing resettlement shall be 4 to 6 times the average annual output value of the expropriated cultivated land calculated on the basis of 3 years preceding such expropriation. However, the total land compensation and resettlement subsidies shall not exceed 30 times the average annual output value of the expropriated land calculated on the basis of three years preceding such expropriation. For the yield of 1 000 kg per mu, calculated at 1 yuan per kilogram, the annual output per mu farmland is 1 000 yuan^[17]. Even if compensation by 30 times the annual output, it is only 30 000 yuan. Even so, some local government even fails to provide such compensation. It is clear that implementation cost for local government occupying cultivated land is relatively low.

3.3 Fine for illegal occupation of cultivated land is low, i. e. PC₂ value is low In China, legal punishment methods for illegal activities of land include restoration to the original state, fines, administrative sanction and investigating criminal responsibility. Nevertheless, these methods fail to solve the difficult law enforcement problem fundamentally. There are various problems of not strict in enforcing the law, substituting fine for law, and completing formalities. For a long term, punishment is mainly economic fines, or just party and administrative disciplinary measure. In addition, punishment of local government for illegal occupation of cultivated land is related to supervision of central government. The probability of investigation and prosecution is low. Thus, fine for illegal occupation of cultivated land is low, i. e. PC₂ value is low. In sum, under the existing system, the benefit obtained by local government from illegal occupation of cultivated land is far greater than cost and punishment of such illegal acts, i. e. $S - C_1 - PC_2 > 0$. Consequently, illegal act is an optimal choice of local government to maximize its benefits, which is also the major reason for its illegal occupation of cultivated land.

4 Major conclusions

Widespread illegal occupation of cultivated land is partly because huge illegal benefit local government can obtain from such occupation, and partly because low punishment cost possibly paid by local government for its illegal occupation of cultivated land.

5 Policy recommendations

5.1 Reducing benefits local government can obtain from illegal occupation of cultivated land (1) Reducing economic benefits local government can obtain from illegal occupation of cul-

tivated land. Firstly, it should increase compensation standard for land-expropriated farmers. When determining compensation criteria, it should not only consider compensation for land, resettlement subsidies and compensation for attachments and young crops on the requisitioned land, but also consider compensation for indirect costs resulted from employment transfer and change to living conditions of land-expropriated farmers, and establishing social security system related to them. Secondly, it is recommended to rebuild land benefit distribution system. At present, local government collects lump-sum land-transferring fee, thus they will want to maximize total supply and demand and financial revenues in the tenure of office at the sacrifice of land resource. This is also an essential reason for ineffective protection of cultivated land by local government. Therefore, it should control the scale of land benefits of current government, to realize rational distribution of land benefits between current and future government. Thirdly, it should improve financial and taxation system. A reason for local government illegally occupying much cultivated land is the great dependence of finance of local government on land benefits. Thus, it is recommended to further improve financial and taxation system, reduce dependence of local finance on land benefits, so as to reduce frequency of illegal occupation of cultivated land. Besides, it should have definite local sharing or disposable amount of land transferring fees, separate administrative and financial powers of local government, gradually make local government quit from land transaction, and promote functions of local government to return to due position, and better serve the society.

(2) Reducing political benefits local government can obtain from illegal occupation of cultivated land. To reduce political benefits local government can obtain from illegal occupation of cultivated land, it should reform performance assessment system of local government. In the cadre assessment system, it should increase weight of cultivated land protection, and take it as an important part of rigid assessment. Only through setting up awareness of scientific development, promoting comprehensive index assessment, and not providing promotion opportunity for those cadres who care only about political achievements, but ignore protection of cultivated land, may it be able to effectively protect cultivated land and settle the conflict between local economic growth and cultivated land protection.

5.2 Increasing costs of local government for illegal occupation of cultivated land (1) Increasing implementation costs of local government for illegal occupation of cultivated land. Firstly, it should improve land administration system, strictly control scope of land expropriation (or requisition), strictly define connotation of "public interest", distinguish operational land, public land and public services, and contain illegal action of local government in occupation of cultivated land; it should make clear legal status of plan, and establish law on land utilization plan, to prevent local government from violating overall plan for land utilization to occu-

py cultivated land^[18]. Secondly, it should increase compensation standard for land expropriation. Compensation standard provided in Land Administration Law shall be strictly abided by to prevent local government from not putting compensation in place.

(2) Increasing punishment for local government illegally occupying cultivated land. It should make definite liabilities of persons who illegally occupy cultivated land, especially liabilities of those cadres. The solution to this problem should not only care about facts but also individuals. It is required to investigate and affix legal liabilities of the party in the primary way of lawsuit by judicial authorities, combined with administrative internal investigation.

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