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Historical Changes in the Land Use Regulation Policy System in Beijing Since 1949

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Abstract: Since 1949, the Beijing government has launched land use regulation policies to balance pressures for releasing farmland for urban development against the requirement for farmland protection. During 60 years of development, these policies have yielded positive impacts as well as negative socioeconomics consequences. The aim of this study is to examine these impacts by studying the history of these policies. Therefore, this study used a Driving Force-State-Response (DSR) model and institutional change theory to divide the change process of land use regulation policy system from 1949-2009. Moreover, the determinant factor that policy system evolves from one phase to the next was analyzed and the current policy system was evaluated. The historical changes in the land use regulation policy system of Beijing can be divided into three phases. It evolved from one phase to the next because the government balanced the importance of promoting urbanization with farmland protection and made the strategic decision to change the policy system in a direction of increasing emphasis on farmland protection. From Phase 1 to 3, two major advances were gained. At first, the concept of land use planning was gradually added to the planning system. Secondly, a series of specialized farmland protection policies were formulated and became more detailed and complete. Nevertheless, Phase 4 is likely to be triggered in the near future, because the Farmland Requisition-compensation balance policy needs to be improved. In addition, ambiguous provisions in urban master plans and land use master plans need to be clarified.

Key words: Land use policy, Beijing, driving force-state-response model, institutional change theory

INTRODUCTION

Land conversion caused by rapid urban sprawl has placed a tremendous pressure on food security in China, especially since the political-economic reforms in 1978 (Ding, 2003; Zhao, 2011). In order to alleviate the conflicts between farmland conversion and its preservation, the Chinese government has adopted land use regulation policies such as urban master plans, land use master plans and some immediate policies for farmland protection (Wang, 1999; Yuan *et al*., 2008; Chen *et al*., 2010).

To date, studies on land use regulation policy were mainly divided into two types. Some scholars have evaluated the effect of policy implementation by using methods such as the Data Envelopment Analysis model or regression methodology (Zhang and Ou, 2004; Zhu, 2007; Tan and Zhang, 2010). Others have analyzed the determinant factors that affect the policy implementation (Zheng, 2000; Li and Lin, 2001; Pan and Zhu, 2005). Most of these studies have focused on the situation of the entire country and the limited studies on Beijing have concentrated on a rather short-term analysis after 1978. There is a lack of attention to the changes in land use regulation policy systems of Beijing over the long-term. However, this type of analysis is of great importance for two main reasons.

First, as the capital of China, both the central government and the Beijing government are located in Beijing. When the Beijing government formulates or implements a land use regulation policy, it receives much stricter supervision from the central government than other cities (Kong *et al*., 2005; Wen, 2010). Therefore, great achievements have been made in farmland protection (Liu *et al*., 2002; Huang *et al*., 2008; Zhu *et al*., 2008). However, as shown in Fig. 1, the area of farmland in Beijing continued to decrease each year from 1978-2008 (BSB, 2011). As a result, it is important to study how the land use regulation system runs in Beijing and whether it achieves or fails to achieve its objectives. This will provide information for policy makers and planners, especially to those in

Fig. 1: Area of farmland in Beijing from 1978-2008 (BSB, 2011)

other metropolises of China and eventually lead to a long-term solution of sustainable land utilization in China.

Secondly, the land use regulation policy system in Beijing has experienced qualitative change since the finding of New China in 1949, which is also the hypothesis of this study. As a result, instead of short-term analysis, we extend the study interval to 60 years (1949-2009) and analyze different characteristics of the land use regulation policy system over different time periods. This will help provide a greater understanding of the formation of the current policy system and provide reference for both the Beijing government and the central government to promote its advantages and improve its defects in the future.

Therefore, a historical analysis of 60 years on the development of the land use regulation policy was conducted in this study for Beijing. It was aimed to demonstrate how the Beijing government has made efforts to balance pressures for releasing farmland for urban development against the requirement for farmland protection by exploring the following three questions:

- What policies were the main components of land use regulation policy system in each phase and what were the characteristics of each?
- What was the background of the formulation of these policies and how did they affect land use in each phase?
- What caused the land use regulation policy system to change from one phase to another?

MATERIALS AND METHODS

Site description: The geographical boundaries of Beijing have been changed several times since 1949, of which the expansions in 1952, 1956 and 1958 are the most significant (Wang, 2010). In September 1952 the entire Wanping County as well as portions of Fangshan and Liangxiang Counties of Hebei Province were incorporated into Beijing. This resulted an increase in the area by 1,961 km^2 and an increase in the population by 0.13 million. Thereafter, Beijing absorbed a portion of the Tong County of Hebei Province in February 1956, which resulted in an increase of 1.604 km^2 in area and 0.29 million in population. The expansion of 1958 was the most significant increase, in which the area and population of Beijing increased by 11,988 km^2 and 0.95 million, respectively (BCAB, 2003). As of 2010 Beijing is composed of 4 core districts, 4 inner suburban districts and 10 outer suburban districts, with a land area of 16,410 km^2 and a population of 19.62 million (BSB, 2011). The central city in this study refers to core districts and inner sub-urban districts.

This study presents a theoretical framework based on both a model with respect to the DSR framework and a model with respect to institutional change (Fig. 2).

DSR framework: DSR is a modified framework of Pressure-State-Response (PSR) which was first proposed by David and Anthony (1979) and developed by the UNEP and OECD in the 1980 sec and 1990 sec. In the PSR framework, the P refers to "Pressure", which is used as an indication that human activities exert bad effects on natural resources. The S refers to the state of natural resources and their changes as well as its effects on humans and the ecosystem. The R represents the responses by humans to repair or prevent the damage of natural resources. This series of activities constitutes a circle of causality (Ye *et al*., 2011). However, human activities were considered neutral in this study. Therefore, the word "Pressure" is replaced with Driving Force, which refers to all of the activities that affect the environment and as a result PSR is modified to a DSR framework.

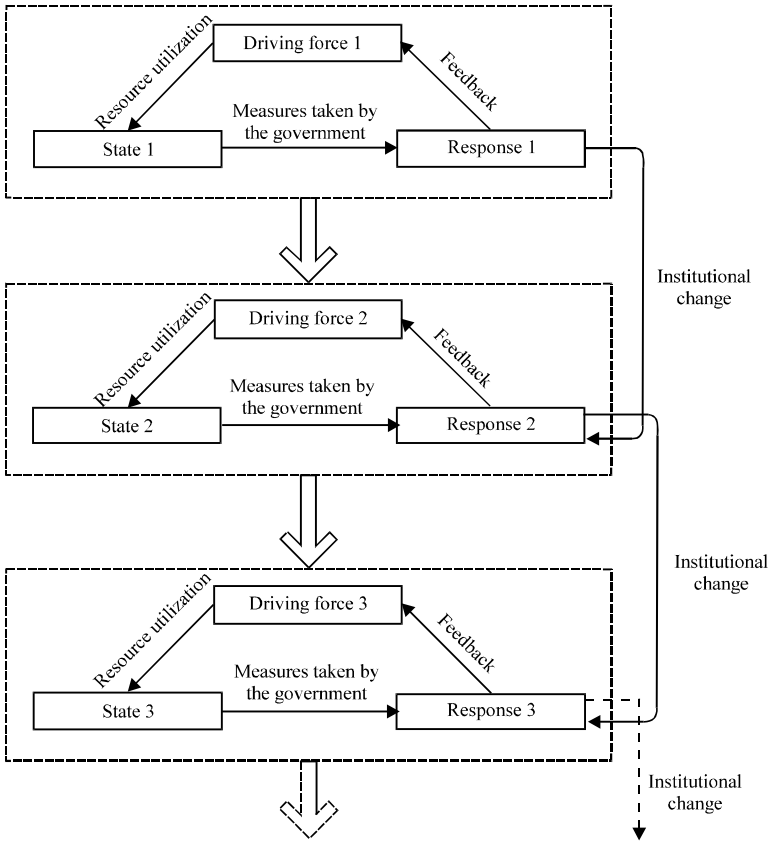

Fig. 2: The new model

DSR (PSR) is now widely used to study environmental issues. Such research often uses many independent indicators to describe the Pressure, State and Response, which is followed with a subsequent evaluation study (Senchack and Martin, 1987; Nakaguchi, 2000; Park and Lee, 2003; Ye *et al*., 2011). However, our study used this framework to illustrate the background of formulating land use regulation policies that were used by analyzing the process from the driving force to the state and that from the State to the Response. We also explored how these policies worked by analyzing the feedback from the Response to the Driving Force and the State. This study defined the three categories of this framework as follows. Driving Force represented activities of land conversion from farmland to construction land for urbanization, land conversion from farmland to the other agricultural land and reclamation and consolidation of farmland. State was defined as the change of area of construction land, farmland and other agricultural land and their effects on urbanization or food security. Response represented the land use regulation policy system, including urban plans, land use plans and farmland protection policies.

Institutional change: As one representation of New Institutional Economics, Douglas C. North developed a famous institutional change theory for which he won the Nobel Prize in 1993. North (1990) considers that institutional change refers to an innovation or a break to the existing institution and will be driven and eventually realized by the agents when the expected transaction benefits are higher than the expected transaction costs. Since North first proposed this idea, the theory of institutional change has been developed even further, however, it is beyond the scope of this study to discuss these developments in detail. Instead, this study applied institutional change theory to analyze the process of changes in the land use regulation policy system and to divide it into different phases.

According to new institutionalism, institutional change is divided into two types. One is caused spontaneously by agents such as entrepreneurs, while the other emphasizes the leading or supporting role of government. As a socialist country with a market economy, institutional change in China involves both types (Yang, 1994). However, generally speaking, government plays the most important role and has led the

institutional change in China (Yang, 1993; Chen, 2001; Hu, 2010). Government uses its authority and dominant position in the allocation of resources in order to implement a series of effective measures and promote institutional change (Dong, 2009; Xing, 2010). Specific to this study, the manner by which the Beijing government balanced the expected transaction benefits and expected transaction costs is examined. Based on this analysis, we can understand the divisions of the land use regulation policy system and its change process.

RESULTS AND DISCUSSION

Based on the methods described above, this study analyzed the development of the land use regulation policy system in Beijing since 1949 and determined that three distinct phases occurred as follows:

Phase 1: 1949-1978

Main policies: The main policies of land use regulation policy system were shown in Table 1.

Background of formulation and implementation effects: In 1949, aiming at a rapid post-war economic recovery, Beijing embarked on a large scale urban construction process in order to promote industrialization (Dong, 2006). However, because there was no master planning, urban construction at that time was too dispersed and arbitrary land conversion occurred frequently (Li, 1964).

Given the land use situation at that time, the government realized that it was necessary to institute an urban master plan as soon as possible. Thus, the first urban master plan, called the Draft Plan of Reconstruction and Expansion of Beijing, was complied in 1953. It established a construction pattern of rebuilding the core districts while expanding from the center into the suburbs at the same time and divided the spatial structure of Beijing according to its urban nature of "Political Center, Cultural Center and Economic Center of China" (BMICPD, 1953).

Following these instructions, urban construction in Beijing began to develop in order, the phenomenon of special industrial, commercial and educational zones were constructed in the suburbs (Liu, 2009). Moreover, urban infrastructures in Beijing were improved as well. By 1957, the total length of road in Beijing had reached 1,058.75 km, which was 2.7 times greater than that in 1949 (BLHCC, 2002). These urban constructions resulted in a gradual increase of construction land. However, because Beijing chose to focus on rebuilding the core districts based on the first master plan, most of the construction was accomplished by refurnishing the old ones instead of using farmland (Liu, 2009). Moreover, after the land reform, the Beijing Municipal Government promulgated several approaches to promote agricultural production, including encouraging peasants to improve the soil and awarding the reclamation of wasteland, which led to an increase of farmland area (BLHCC, 2003). As a result, conflicts between land conversion and farmland protection were not obvious.

In 1956, Beijing accomplished the Socialist Transformation and joined the ranks of China's Great Leap Forward Campaign starting in 1958. According to the guiding ideology then, the urban development emphasized both industry and agriculture (Wang, 2006). Development of water conservancy facilities and heavy industry became the focus of the urban construction in Beijing at that time, which resulted in expedited use of construction land compared to before (Chen and Su, 2006).

Because of this situation, the government formulated the second urban master plan, called the Initial Program of Urban Master Plan, which guided land use in Beijing until the Cultural Revolution in 1966. In this plan, the main objective to build Beijing into an industrial, however, in order to ease the over-concentrated land use in core districts, construction of new factories was required in outer suburbs and the construction of greenbelts was put forward. In conjunction with this plan, a spatial structure called "Decentralized-Concentration Growth Management" was launched. Based on this structure, Beijing was composed of a central city with satellite towns in the outer suburbs surrounding it. The central city was then decentralized into core districts with several groups and greenbelts built among them (BMICPD, 1958).

Table 1: Main components of land use regulation policy system in the first phase

Policy system	Detail
Three urban master plans	Draft plan of reconstruction and expansion of Beijing (1953)
	Initial program of urban master plan (1958)
	Reports on several issues of Urban Master Plan (1973)
Policies on construction land approval procedures and preventing land waste	Implementation Details of Suburban Land Requisitioned for State construction (1954)
	Implementation Measures for Suburban Land Requisitioned for State Construction (1962)
	Provisional Regulations on the Strengthening the Management of Urban Construction (1971)
	Implementation of Instructions on Land Conservation during the Basic Construction (1973)
	Notification on Solving Several Problems of Urban Construction in Beijing (1974)

Table 2: Construction of various stages in Beijing

Various stages (10,000 m^2)	Total area of construction (10,000 m^2)	Average annual area of construction (10,000 m^2)	Total area of construction for production and work (10,000 m^2)	Average annual area of construction for production and work (10,000 m^2)
1949-1952	385	96.3	179	44.8
1953-1957	1,744	348.8	822	164.4
1958-1960	1,142	380.7	698	232.7
1961-1965	1,056	211.2	522	104.4
1966-1976	1,811	164.6	880	80.0
1977-1978	743	371.5	333	166.5
1979-1981	1,913	637.7	577	192.3

BMICPD (1982)

Table 3: Planting area of main crops in Beijing from 1958 to 1965

Year	Planting area of grain crops (km^2)	Planting area of vegetables (km^2)	Planting area of oil crops (km^2)	Total (km^2)
1958	3,984.7	326.7	562.0	4,873.4
1959	3,560.0	386.7	454.6	4,401.3
1960	3,296.7	411.3	337.3	4,045.3
1961	3,642.0	299.3	291.3	4,232.6
1962	3,861.3	302.3	284.0	4,447.6
1963	3,933.3	248.7	285.3	4,467.3
1964	3,868.0	214.0	378.0	4,472.0
1965	3,782.0	178.0	395.3	4,355.3

BLHCC (2003), Due to the lack of data in this period, total area of these three kinds of crops was approximated to the area of farmland

Under these instructions, urban construction in Beijing made great progress from 1958-1960. Industry experienced substantial development and many factories were built throughout the city over the three year period, with an industrial base of complete categories forming in inner suburbs. In 1958 and 1960, more than one million square meters of factories were built in both years, which were the top two since the founding of new China (Zhang, 2001). As shown in Table 2, the average annual area of construction that occurred for production and work was the highest since 1949 and during this three year period, was almost equal to that which occurred from 1953-1957. However, during this time, although, many new construction projects occurred in outer suburbs in accordance with the urban master plan, these projects were either too dispersed or discontinued. For example, from 1958-1960, 113 projects were planned in 37 dispersed places, but less than 60 were initiated. As a result, the urbanization in the outer suburbs at that time occurred at a slow pace (Dong, 1998; Zhou, 2004). Due to the three years of natural disaster that occurred from 1959-1961 as well as the deteriorating Sino-soviet relations, urban construction in Beijing was limited. The number of afforestation projects was also decreased after 1961. Between 1960 and 1964, there was a growing concern for food production, particularly the production of grain crops and as a result an increase in the area of farmland was observed (Table 3).

After the Cultural Revolution began in 1966, only a limited number of urban construction projects were started and utilization of agricultural land was limited until 1976. As shown in Table 2, the average annual area of construction projects during that time period was the lowest since 1953. The few projects that did occur were mainly for preparation for wars and were constructed in the core districts without involving land conversion (Zhang, 2001; Dong, 2006). Furthermore, the Beijing Planning Administration Bureau was canceled in 1968 and the second urban master plan was discontinued. As a result, the urban construction in Beijing became disordered again and cases of illegal land conversion were common (Liu, 2009). It was not until 1973 that a new urban master plan, called the reports on several issues of urban master plan, was created. However, the third urban master plan was not formulated by analyzing the situation at that time, but was almost the same as the second plan and had only a few changes, such as advocating for a reduction in the urban scale (BMICPD, 1973). As a result, it did not play an important role in regulating land use at that time.

It is worth mentioning that, during the period from 1949-1978, cases of wasting farmland that sat idle for a long period of time after the requisition without any construction on it were common. In order to solve this problem, policies such as the Implementation Details of Suburban Land Requisitioned for State Construction and Implementation Measures for Suburban Land Requisitioned for State Construction was promulgated in 1954 and 1962, respectively. Provisions of land requisition procedures and necessity of handing specific project planning were formulated in order to prevent these cases of wasted land in advance. Moreover, three other policies were promulgated in 1971, 1973 and 1974, respectively which imposed penalties on those who wasted land. However, because the government did not fully realize that, the land use policy whereby state-owned

construction land could be used for free and indefinitely once the right to use the land was obtained led to no incentive for economical land use, was the main reason, problems of wasting remained.

Summary of Phase 1: In Phase 1, the main focus of land use activities (i.e., driving force) was that some of the new construction occurred in core districts and did not involve farmland conversion, while other construction in suburbs was implemented through farmland conversion. In addition, reclamation of farmland was emphasized. Cases of wasting sometimes occurred, such as when land remained unused for a long period of time after land conversion. These land use behaviors resulted in a State whereby, the conflict between land conversion and farmland protection mainly occurred in inner suburbs and was not severe. In addition, the efficiency of land use was not high. Consequently, when the government decided to initiate a Response, the concept of farmland protection was relatively vague and there were no special provisions regarding farmland protection, with the exception of placing some provisions in policies of construction land requisition. It seemed that land use under the guidance of these urban master plans with some complementary policies did not bring about many problems. As a result, prior to 1977, the government chose to slightly modify existing policies whenever facing a critical moment instead of making substantive changes to the land use regulation policy system.

Transition from phase 1 to phase 2: Starting in 1978, the Beijing government began to summarize the land use problems that had perpetuated to that point and began to actively prepare for the new situation of the Reform and Open-up. Anticipating that the process of urbanization in Beijing was bound to become faster and that land use in the suburbs, especially the inner suburbs, was most likely going to occur at a high rate which would accelerate the decline of farmland and eventually pose a threat to the security of food production, farmland protection became important to the government. Therefore, the formulation of farmland protection policies and constrain of urbanization as well as adherence to the previous guiding principles for promoting economic growth became the most significant trade-offs for the government.

In April 1980, the central government imposed important instructions on urban construction of Beijing by constraining the development of heavy industry and limiting the population to less than 10 million people at any time (Duan, 1989). In accordance with these instructions and with consideration of food security, the Beijing government eventually decided to control the construction land. As a result, the land use regulation policy system at that time evolved from Phase 1 to 2.

Phase 2: 1979-1996

Main policies: The main policies of land use regulation policy system were shown in Table 4.

Background of formulation and implementation effects: The substantive changes in the land use regulation policy system in this phase were first of all embodied in the urban master plans. In accordance with the new characteristics of land use since 1979, the forth urban master plan, called the Beijing Urban Construction Master Plan, was compiled promulgated in 1982. A land use balance table, which was a special component of land use planning, was added in this plan to constrain the urban

Table 4: Main components of land use regulation policy system in the second phase

Policy system	Detail
Two urban master plans	Beijing Urban Construction Master Plan (1982)
	Beijing Urban Master Plan (1991-2010) (1993)
Policies on construction land use procedures	Provisional Regulations of Beijing on Urban Construction Planning (1984)
	Provisional Regulations of Beijing on Rural Land for Housing (1984)
	Provisional Regulations of Beijing on Levying the Land-use Fee from Sino-foreign Joint Venture (1985)
	Provisional Regulations on National Construction Land Approval (1988)
	Implementation of Provisional Regulations of the People's Republic of China on Urban Land Use Tax in Beijing (1988)
	Provisional Regulations of the People's Republic of China on Granting and Transferring the State-owned Land-use Right in Urban Areas (1991)
	Provisions on the Land Requisition for Construction Project (1992)
Policies on farmland protection	Provisional Regulations on Strict Control of the Occupation of Vegetable Fields and Levying Construction Funds for New Vegetable Fields (1980)
	Urgent Notification on Restraining the Illegal Unauthorized Constructions of Housing (1981)
	Supplementary Notification on Restraining the Illegal Unauthorized Constructions of Housing (1982)
	Provisional Regulations on Management of Construction Funds for New Vegetable Fields (1986)
	Views on Dealing with the Problem of Illegal Land Use (1987)
	Implementation of Land Administration Law of the People's Republic of China in Beijing (1991)
	Notification on Strict Control of the Conversion from Farmland to Orchard or Fish Ponds (1993)
	Implementation of Basic Farmland Regulations in Beijing (1994)
	Views on Dealing with the Problem of Illegal Land-use (1997)

Table 5: Land use balance for 1982

	Beginning of planning (1980)		End of planning (2000)	
Classification of land use	Area (km^2)	Area (%)	Area (km^2)	Area (%)
Total	16,808.0	100.0	16,808.0	100.0
Construction land in urban area	597.5	3.5	905.3	5.6
Construction land in rural area of suburbs	564.0	3.3	595.0	3.5
Green land	8,981.3	53.5	8,981.3	53.5
Water	1,000.0	5.9	1,050.0	6.2
Farmland and others	5,665.2	33.8	5,276.4	31.2
Farmland	4,258.0		3,964.0	
Others	1,407.2		1,312.4	

BMICPD (1982)

Table 6: Land use balance for 1993

	Beginning of planning (1989)		End of planning (2010)	
Classification of land use	Area (km^2)	Area (%)	Area (km^2)	Area (%)
Total	16,808	100.00	16,808	100.00
Construction Land in urban area	1,078	6.42	1,843	10.97
Construction land in rural area of suburbs	1,020	6.01	1,200	7.14
Green land	8,870	52.77	8,870	52.77
Water	795	4.73	950	5.65
Farmland and others	5,045	30.01	3,945	23.47
Farmland	4058		3400	
Others	987		545	

BMICPD (1993)

sprawl (Table 5). As shown in Table 5, the area of each type of land use designation at both the beginning and the end of the planning period was determined. In addition, the "Decentralized-Concentration Growth Management" spatial structure was emphasized again in the plan. Housing and industrial construction in the core districts was limited and some of the residents as well as some industries located there were to be transferred to the suburbs. Moreover, inner suburban districts were divided into an urban construction zone and a rural zone. In the rural zone of the inner suburban districts, a planting area of grain crops, vegetables, fruit trees and nurseries was planned and various types of green land was arranged hierarchically as well in order to prevent rapid urban sprawl (BMICPD, 1982).

Because the fourth urban master plan was compiled in late 1970 sec, it made plans under the condition of the planned economy, which resulted in a relatively conservative estimate when projecting development for the next 20 years. As a result, the plan was soon obsolete. Taking the scale of the construction land inside the central city for example, it was supposed to increase from 346 km^2 in 1980 to 440 km^2 in 2000 according to the plan. However, by 1989, the area had already reached 422 km^2 (BMICPD, 1993) and seemed to exceed the planned scale in a short amount of time. In consideration of these problems, the fifth urban master plan, called the Beijing Urban Master Plan (1991-2010), was created in 1991 and promulgated in 1993. For the first time in the history of urban planning of Beijing, the urban master plan was compiled in accordance with China's market economic system. This version also included a land use balance table as well, but it was different from that in the fourth plan, because the new plan considered a faster urbanization process during the same planning period as the forth plan and estimated a larger area of new construction land in the central city as well as a decrease in the area of farmland. As a result, the fifth master plan was more reasonable and representative of the current conditions than the fourth plan (Table 6).

However, these urban plans did not achieve the expected goal for two reasons. First, although, the land use balance table was an unprecedented change compared to the previous master plans, it did not limit the area of farmland that could be converted to construction land. As a result, it was actually not binding when concerning the land use regulation. As shown in Fig. 1, the farmland area still decreased fast from 1982-1996.

Second, although, both the plans emphasized that new construction was supposed to be transferred to the suburbs, especially the outer suburbs, in order to shift the emphasis of urban construction, the realization of this process faced many obstacles. As shown in Table 7, from the first stage between 1949 and 1981 to the second stage between 1982 and 1992 when the fourth urban master plan was implemented, the percentage of construction projects in the inner suburbs increased and decreased in the other two areas. After 1993 when the fifth urban master plan was implemented, besides the inner suburbs, the percentage of construction projects in the core districts

Table 7: Construction projects for housing, production and work of different areas of Beijing during various planning stages

	Core districts		Inter-suburban districts		Outer-suburban districts		Total area	
Various stages	(10,000 m^2)	(%)	(10,000 m^2)	(%)	(10,000 m^2)	(%)	(10,000 m^2)	(%)
1949-1981	1,649.2	18.3	5,692.1	63.2	1,670.1	18.5	9,011.4	100
1982-1992	1,226.8	11.7	7,514.3	71.5	1,765.8	16.8	10,506.9	100
1993-1996	803.3	16.4	3,581.6	73.2	508.1	10.4	4,893.0	100

BSB (1989, 2011)

was higher than during the second stage, whereas, that in the outer suburbs continued to decline. Therefore, it can be postulated that the objective of shifting the development priorities towards the outer suburbs did not work very well.

In addition to urban master plans, other policies in this period were also substantially different from those in Phase 1 (Table 4). As a remedy for the land use waste problems that had existed for a long time, the Beijing government promulgated two policies in order to specify provisions on land use construction in urban and rural areas, respectively, in 1084. As mentioned above, because the reason behind of land use wasting had not been fully realized, these policies did not work as expected. However, in 1985, a policy called the Provisional Regulations of Beijing on Levying the Land Use Fee from Sino-foreign Joint Venture was formulated and after initiation of the policy, the wasting phenomenon seemed to improve. With the gradual realization that the previous provisions on land use rights had limited the efficiency of land use, the central government began to implement land use rights reform starting in the late 1980 sec. The Beijing government formulated several relevant policies and introduced a market mechanism in land allocation that resulted in a fundamental solution to inefficient land use. To some extent, efficient construction land use also positively affected farmland protection (Xing, 2010).

Moreover, with the rapid urbanization that had been occurring since 1979, the decreasing area of farmland had drawn the attention of the Beijing government and as a result, several policies for farmland protection were promulgated. For instance, Provisional Regulations on Strict Control of the Occupation of Vegetable Fields and Levying Construction Funds for New Vegetable Fields was published in 1980. However, after several years of implementation, it was found to be inefficient because of the low charge on converting vegetable fields. As a result, the government modified the policy in 1986 by raising the charge. Furthermore, after the publication of the Land Management Law of People's Republic of China in 1986, in accordance with the central government, the Beijing government began to place more importance on constraining urban sprawl that caused the decline of farmland and gradually formed an initial farmland protection policy system (Table 4). As a result, the rate at which farmland area was declining was controlled with these policies while at the same time urbanization was making great strides under the instructions of urban master plans.

Summary of phase 2: The main characteristic of the land use behaviors (i.e., driving force) during Phase 2 was the conversion of a substantial amount of farmland to construction land in inner suburbs, which exerted increasing pressure on farmland resources. By the end of this planning period, the rapid decrease in farmland area resulted in escalating conflicts between urbanization and farmland protection in the inner suburbs (i.e., State). In accordance with this State, the government instituted a Response by adding land use planning content in the urban master plan and formulated several policies for farmland protection in order to constrain the urban sprawl from the central city. However, despite the increasingly acute conflicts in land use, the urbanization mainly stayed in the inner suburbs instead of spreading to the food production base in the outer suburbs plain. Moreover, in contrast to the first phase, cases of land use wasting deceased and land use efficiency had improved considerably due to land use rights reform. As a result, the government did not consider it be necessary to make substantive changes to the land use regulation policy system and overall, the policy system was a reproduction of those initial policies from the beginning of the second phase. With respect to land use planning, which is the guide basis of land use regulation policies, it was not until 1996 that Beijing began to formulate its first land use master plan. Before that point, urban master plans remained the only category of land use planning in the city.

Transition from phase 2-3: In 1996, Beijing conducted the first Agricultural Census and found that between 1993 and 1996, the area of farmland area was declining at a much faster rate than before. The area of farmland in 1996 was only 3,439.3 km^2 compared to 4,082.7 km^2 in 1993 and there was a net decrease of 643.3 km^2 during that three year period (BSB, 1998). On one hand, it was important for the government to invest in more construction projects in the outer suburbs because the

inner suburbs were already very concentrated. However, on the other hand, the farmland in the inner suburbs had been almost completely removed due to the urban sprawl and therefore protection the remaining farmland, most of which was in the outer suburbs was necessary. Therefore, in the future, conflicts between land conversion and farmland protection in the outer suburbs will most likely become more severe. However, it is inevitable that the introduction of specialized land use master plan and to strengthen the farmland protection would inhibit the process of urbanization to a certain extent. The government believed that if such policies were not formulated to control urban sprawl, then the decline in farmland would certainly pose a threat to food production in Beijing. Consequently, the government instituted changes to the land use regulation policy system, which evolved to Phase 3.

Phase 3: From 1997 to present

Main policies: The main policies of land use regulation policy system are shown in Table 8.

Background of formulation and implementation effects: Referring to the fifth urban master plan of 1993, Beijing began to create the first land use master plan (Beijing Land Use Master Plan 1997-2010) in 1997 approved by the State Council in 2000. In this land-use master plan, "Strictly protect the farmland and basic farmland, constrain the transfer of farmland for construction use and resolutely implement the Requisition-Compensation Balance Policy" was set as the principle. In addition, provisions were made to increase the area of farmland to some extent by the end of 2010 (Lu, 2001). However, implementation of this provision was not as successful as expected.

In 1998, the central government made the strategic decision of expanding domestic demand in order to stimulate economic growth. Based on this strategy, the Beijing government increased their investment in infrastructure and real estate. In terms of infrastructure, the investments made between 1998 and 2003 exceeded 21.61 billion RMB compared to 7.7 billion RMB made between 1992 and 1997 (BSB, 2011). In addition, a number of subway lines, such as Line Batong and Line 13 have been built since 1998 to connect the outer suburbs and the central city. Moreover, new growth in real estate has occurred surrounding the greenbelts and the peripheral constellations in addition to the urban zone of the inner suburbs which greatly promoted the development of real estate (Cheng and Zhang, 2005). Based on the policies regarding construction in greenbelts, the rural area involved was divided into two sections. One section is used for building green space, including farmland and forest and the other section is used for urban construction, some of which is used to construct buildings for peasants that were forced to resettle. The other buildings are placed on the market for sale. However, due to the high demand for economic growth and urbanization, farmland in the suburbs has been continuously converted into urban construction land.

Moreover, in order to increase the income of peasants as well as improve the environment of the city, the Beijing government has been promoting agriculture structural adjustment since 1998. Chen and Xu (2002). This has also resulted in a decline of farmland area. For example, the major crop for food production in the Pinggu District of the outer suburbs has changed from grain crops to peach. To date, the Pinggu District has already formed several large peach production bases and is known as the "Chinese Peach Township". The agriculture structural adjustment brought about land conversion from farmland to orchards, fish ponds, forests and grassland (Gao, 2001; Chen and Xu, 2002; Ma, 2004). From 2000-2004, the National Development and Reform Commission implemented the "Grain for Green" project, which restored farmland to its original state of forest. Six of the outer suburban districts were chosen to implement the objectives and 30,666.6 ha of afforestation were created (Lu, 2009).

In order to prevent the reduction of farmland area, the government has successively promulgated many farmland protection policies since 1998 to supplement the land use master plan, of which Farmland Requisition-Compensation Balance policy is the most important one (Table 8). This policy was added to the New Land Administration Law of People's Republic of China promulgated in 1998 and stated that once farmland was converted to urban construction land, an equivalent area of farmland must be conducted. Under this policy, most farmland converted to urban construction land at that time was re-created elsewhere. However, since the Farmland Requisition-Compensation Balance policy did not impose any rules on re-creating farmland lost due to the agriculture structural adjustment, farmland area in Beijing continues to decline each (Fig. 1). The first land use master plan set the objective of achieving 3,442.7 km^2 farmland by 2010. However, the area of farmland decreased significantly between 2000-2004 and by the end of 2004, it was only 2,364.4 km^2, which was much lower than the goal set in the policy (Fig. 3). Moreover, although most of the converted farmland was located in inner suburbs or in the plains of the outer suburbs, the re-created farmland was often placed in mountainous areas, which led to a decrease in the overall quality of farmland in Beijing (Zhang, 2011).

Table 8: Main components of land use regulation policy system in the third phase

Policy system	Detail
Two urban master plans and two land use master plans	Beijing Urban Master Plan (1991-2010) (1993)
	Land-use Master Plan of Beijing (1997-2010) (1997)
	Beijing Urban Master Plan (2004-2020) (2004)
	Land-use Master Plan of Beijing (2006-2020) (2006)
Policies on construction land use procedures	Regulations of Beijing on Rural Land for Housing (modified) (1998)
	Regulations of Beijing on Supplying National Construction Land (2005)
	Regulations on Approval of Rural Land for Housing (2006)
	Regulations on Approval of Land for Township (Village) Public Facilities (2006)
	Regulations on Approval of the Collective Construction Land (2007)
Policies on farmland protection	New Land Administration Law of the People's Republic of China (1998)
	Implementation of Basic Farmland Regulations in Beijing (modified) (1999)
	Implementation of Farmland Requisition-Compensation Balance Policy in Beijing (2000)
	Disposal Measures on Idle Land in Beijing (2001)
	Management Approaches of Beijing on Land Replacement in Greenbelts (2001)
	Strengthening and Improving the Implementation of Farmland Requisition-Compensation Balance Policy in Beijing (2002)
	Regulations on Management of Farmland Reclamation Fees (2002)
	Measures on Dealing with the Cases of Violation of Land Use Provisions (2002)
	Notification on Strict Control of the Conversion from Basic Farmland to Construction Land (2003)
	Notification on Deepening the Reform and Strengthening Land Use Administration (2004)
	Views on Rectification of Land Market Order and Strengthen Land Use Administration (2004)
	Implementation of Calculating the Degree of Quantity and Quality of Re-created Farmland (2005)
	Criteria of Filing a Complaint of Illegal Land Use Cases (2005)
	Notification on Strengthening the Inspection of Enforcement of the Laws on Land Resources (2005)
	Views on Strengthening the Implementation of Basic Farmland Regulations (2005)
	Measures of Supervising the Implementation of Farmland Requisition-Compensation Balance Policy (2006)
	Notification on Strengthening the Land Use Administration (2006)
	Provisional Regulations of the People's Republic of China on Farmland Conversion Tax (2007)
	Decisions on Promoting Reforms in Rural Areas (2008)
	Notification on a Further Strengthening on Disposal Measures of Idle Land (2008)

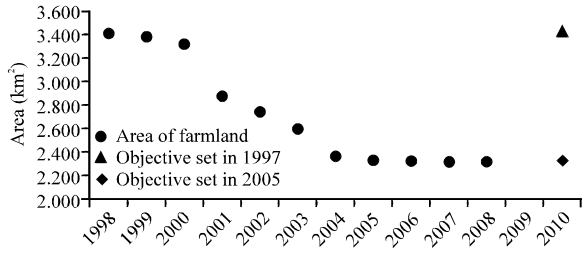

Fig. 3: Trends in the area of farmland in Beijing from 1998-2008 and projections to 2010, Lu (2001), BSB (2011) and BMPG (2009)

Based on the condition of land use at that time, a sixth urban master plan was formulated in 2004 that changed the previous development pattern of sprawling from the central city to suburbs into forming a "Two axes, Two Group and Multi-centers" constitution, which focused on the development of the outer suburbs (BMICPD, 2004). Based on the urban master plan, a second land use master plan was formulated in 2006 that consisted of building three rings of greenbelts around the entire city, strictly protecting nine areas of basic farmland and focusing on developing multi-centers of concentrated construction land in the outer suburbs (BMPG, 2009). Moreover, since 2004, the Beijing government has strengthened the importance of farmland protection and introduced more specialized policies on it than previously implemented (Table 8). Although, these new policies have slowed the rate of decline of farmland areas, the area of farmland still reached 2,316.9 km^2 by the end of 2008, which was lower than the objective of 2,330 km^2 set in 2005 (Fig. 3).

Summary of phase 3: In this phase, low efficient land use almost disappeared and two main characteristics of land use behaviors (i.e., driving force) were observed. First, urbanization as well as the agriculture structural adjustment was attributed to the reduction of farmland in Beijing, which mainly occurred in the inner suburbs and the plains of the outer suburbs. Second, under the rules of the Farmland Requisition-Compensation Balance policy, farmland reclamation took place in the mountainous area. However, because the policy does not have a stipulation for re-creating new farmland when adjustments in agricultural structure are made, the area of farmland in Beijing continues to decline each year. As a result, conflicts among ensuring the need of construction land, increasing the income of peasants and farmland protection have become severe when allocating the remaining farmland. Therefore, based on this State of land use, the government has made a different Response from the second phase and has attempted to promote more reasonable and sustainable land use by promulgating two

land use master plans. These plans are different from the urban master plan, which focuses on promoting urbanization and focus on protecting farmland. The provision in the land use master plan regarding each type of land use is not a prediction, but rather a strict limit for controlling demand. Moreover, many specialized policies on farmland protection were formulated to supplement the land use master plan. Therefore, the land use regulation policy system in this phase has focused more on farmland protection than any phases in the previous.

Will a fourth phase of the land use regulation policy system be triggered?: During the third phase, both urban master plan and land use master plan were implemented. Moreover, a considerable number of farmland protection policies were also formulated. The land use regulation policy system seems to be complete and sufficient. However, problems in the system still remain.

With respect to policy formulation, whether intended or not, there are many ambiguous provisions. For instance, the extent of each type of land use was defined differently between the urban master plan and land use master plan, even when they had the same name (You *et al*., 2006). However, the relationship between the two definitions was not clearly demonstrated (Wang and Du, 2004; Wang and Wang, 2008). Different departments of government chose different standards as a reference, which affected the implementation of these two plans (Chen *et al*., 2010). Moreover, the Farmland Requisition-Compensation balance policy did not make any provisions related to other types of agricultural land. This resulted in an indirect approach of reducing farmland, whereby the farmland was first converted to other types of agricultural land through agriculture structural adjustment and then, these agricultural land types were transferred into the urban construction land. Moreover, during these two processes, there is no requirement to replace the lost farmland through re-creating the land elsewhere (Zhang, 2011).

In addition to these defects in policy formulation, violations of policies driven by other interests sometimes occurred during the policy implementation. As a result, the government may need to impose another substantive change to the existing land use regulation policy system, thereby creating a fourth phase of the system. However, compared to the previous change, the cost increased as well. In the past, the Beijing government only had to balance urbanization and farmland protection, but in the current state, raising the income of peasants and improving the environment has to also be considered during policy development, which makes it more difficult for the government to promote the change.

CONCLUSIONS

The historical changes in the land use regulation policy system of Beijing can be divided into three phases. The determinant factor that drove the policy system to evolve from one phase to the next was that the government balanced the importance of promoting urbanization with farmland protection. During the transition from Phase 1-2, the concept of land use planning was added to the urban master plans and specialized farmland protection policies were formulated. In addition, policies on changes of state-owned construction land use rights also became the main components of the land use regulation policy system. From Phase 2-3, specialized land use master plans were formulated to coordinate the urban master plans. In addition, policies on farmland protection became more detailed and complete. By improving the policy system, there has been substantial improvement in farmland protection in Beijing. However, some problems still remain in the current policy system, which will require additional improvements as it evolves to a new phase in the near future. In Phase 4, ambiguous provisions in the land use master plans, urban master plans and Farmland Requisition-Compensation Balance policy will be modified. Moreover, the supervision on policy implementation will be strengthened.

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