Research on Models of Overall Land-use Planning Based on Ecological Protection Thought

Dandan Zeng¹, Long Chen², Zhenhua Song², *
¹Economic School, Wuhan Donghu University, Wuhan, China
²Wuhan Hongyufei Planning Technology Limited Company, Wuhan, China
*Corresponding Author: Zhenhua Song

Abstract: Environmental problems and climate change are the severe challenges facing the mankind today. Ecological protection has become the new element that the overall land-use planning should take into account. In this paper, the land use ecosystem is divided into six types: forest, grassland, farmland, wetland, water area and the land difficult to use. After investigation and research, the equivalent table of ecological service value of unit square of terrestrial ecosystem in China is obtained. Based on the theory of ecosystem service value and combined with the characteristics of regional land, this paper revised the equivalent value. At the same time, we should pay attention to land consolidation work, including strengthening ecological protection objective of land-use planning, optimizing the current situation of land ecology evaluation, reinforcing influence evaluation of ecological environment after planning implementation, setting up management department of land resources protection and perfecting ecological protection laws of land-use planning to ensure the scientific and effective development of land use planning in China and the sustainable development of land ecology.

1. Introduction
Accompany with the rapid development of economy, the negative effect of severe environmental problems becomes obvious. Soil erosion is serious and the land desertification is intensifying. The quality of cultivated land is also decreasing. The ecological environment in China is generally deteriorating as there has not been a complete, systematic and scientific land resource sustainable utilization plan in the past, and people's ecological environment consciousness is too weak. The general land use planning, as the commanding of the protection and utilization of land resources, should not only consider economic and social benefits, but also consider ecological benefits and sustainability. Therefore, the study of the current overall land use planning in China and the discussion of the ecological concept in the new round of land use overall planning will help to establish the concept of ecological value, improve the quality of the new round of land use overall planning, and strengthen the protection of the overall land use planning, which is of great significance.

China has established the five-level land use planning system of country, province, city, county and town, which has important guidance and reference for the future planning. However, due to the lag of planning formulation and the restriction of social and economic environment, the first round of planning has not been effectively implemented. During the implementation of the second round of planning, due to rapid social and economic development and rapid expansion of various construction, several planning indicators have been broken, and the problems of land supply and demand and ecological environment have become increasingly prominent. This paper analyses the necessity of implementing the ecological concept in the planning and discusses how to make the ecological concept run through the whole process
of the overall planning and implementation of the land use, and truly protect and improve the ecological environment and ensure the sustainable utilization of the land resources. Ecological security refers to the state of human life, health, happiness, basic rights, the source of life security, the necessary resources, social order and the ability of the human being to adapt to the change of the environment. The ecological security system includes natural ecological security, economic and ecological security and social security. There is no uniform definition of ecological security, and scholars have put forward various definitions of it. The overall planning of land use must be able to ensure the natural ecological security, economic and ecological security and social ecological security in the planning area. To carry out the ecological security evaluation of the land use planning is an important prerequisite to ensure the feasibility.

2. Ecological protection thought and evaluation model

2.1 Concept
The ecological environment planning means to coordinate the development of society, environment and economy, regard the three ecosystem, and make a reasonable arrangement for the time and space of the human beings and the activities of the environment. To make this reasonable arrangement effective, it is necessary to deal with the relationship between environmental planning and other related planning, especially the overall urban planning. The urban overall planning refers to the determination of the nature of the city, the scale of the city and the direction of development, the realization of the development goals of the urban economy and the society, the rational use of urban land, the balanced layout of the urban spatial structure and a series of departments for the construction of the cities. The overall planning of the city emphasizes the goal of realizing social and economic development from the perspective of urban design. The goal of the ecological environment planning is to realize the coordinated and rational development of the city's economy and society in the general rules. The two are inseparable from each other. Ecological environment planning is an important part of the overall urban planning. The urban master plan and ecological environment planning are regarded as the basis of each other, and they can also be referred to each other. The goal of eco-environmental planning is one of the main objectives of the master plan and is integrated and balanced. It will be of importance to integrate the ecological environment protection plan into the overall planning of the city and achieve the unified planning of the three projects of economic, social and environmental construction, and carry out and coordinate the development of the ecological environment. It can solve the pollution and destruction of the ecological environment in an orderly way and make the economic, social and environmental benefits unify. In the urban overall planning, the ecological environment planning can be considered, which can effectively improve the operability and science of the plan of the city, and greatly improve the level of the overall planning of the city. The concept of ecosystem service function is the natural environment condition and utility which is formed by the ecosystem and the ecological process and maintains the human survival. On the one hand, they create and maintain the earth life support system, and the other side also provides food, medicine and other necessary raw materials for human beings, which is the foundation for the survival and development of mankind and the establishment of modern civilization. We explain the functions of ecosystem services, including gas regulation, climate regulation, water conservation, soil formation and protection, waste disposal, biodiversity conservation and food production.

2.2 Evaluation model
The land use ecosystem is divided into six types according to the types of land use, which are forest, grassland, farmland, wetland, water area and the land difficult to use. After investigation and research, the equivalent table of ecological service value of unit square of terrestrial ecosystem in China is obtained.

| Item              | Fore | Grasslan | Farmland | Wetland | Water | Land hard to use |
|-------------------|------|----------|----------|---------|-------|-----------------|

Table 1. Equivalent table of ecological service value of unit square of terrestrial ecosystem in China
| Ecosystem Service | Value |
|------------------|-------|
| Gas regulation   | 1.31  |
| Climate regulation | 2.7   |
| Water conservation | 3.2  |
| Soil formation and | 3.9   |
| Waste disposal    | 1.31  |
| Biodiversity conservation | 3.26  |
| Food production   | 0.1   |
| Raw material production | 2.6  |
| Recreation & Entertainment | 1.28  |
| Sum              | 19.6  |

In the table, the economic value of annual natural grain yield is 1, and the other ecosystem service function value equivalent factor is defined as the 1 ha national average yield farmland. $E$ refers to the contribution of the ecosystem to the production of the ecological services relative to farm food production services. We can measure the annual ecosystem service value and the economic value per unit area of various land use types.

$$v_t = E \times Y \times P_m / 7$$

$E$: Equivalent factor; $Y$: Grain yield in one hectare; $P_m$: Grain price in year m.

### 3. Methods of overall land-use planning based on ecological protection thought

#### 3.1 Model updating

The ecological footprint analysis in the planning area can be used to study the ecological carrying capacity of the region, measure the sustainability of land use, evaluate the ecological feasibility of the planning target and the intensive degree of land use. Based on similar research abroad, the method of ecological footprint analysis has been applied to large scale methods and models. In the overall planning of land use, different functions should be defined. Based on the existing land use classification system, the function of land use should be extracted and merged to form the rules of different functions. The land use type is then evaluated for sustainability of the plan.

On the basis of the research conclusions of relevant scholars at home and abroad, the equivalent value of ecological service function of land ecological types which have changed greatly before and after land renovation is revised as follows: (1) woodland: forest land of ecological service equivalent values corresponding to forest; (2) Grassland: Grassland corresponding grassland; (3) cultivated land: cultivated land correspondence Farmland; (4) garden land: the 9 ecological service function equivalent values of garden land take the average value of forest and farmland corresponding service; (5) wetland: Wetland corresponding wetland; (6) water body: water body corresponding water area; (7) urban construction land and residential area: the following abbreviation for urban and rural construction, climate regulation, climate regulation, water conservation, soil The 8 items of soil formation and protection, waste disposal, biodiversity conservation, food production and raw material production were 0. The average value of the relevant services of woodland, grassland, cultivated land, garden land, wetland and water body was taken for leisure and entertainment. (8) transportation and water conservancy: gas adjustment, climate regulation, water conservation, soil formation and protection, waste treatment, and biodiversity conservation, items of the average value of the corresponding services for farmland and wasteland, and the latter three services values. (9) unused land: the unused land corresponds to the difficult land.
3.2 Calculation of service value of ecological system

The proportion and spatial distribution pattern of land ecological systems are arranged and arranged based on the results of land ecological evaluation. This kind of planning is relatively less considered for social and economic reasons, so the obtained land structure and layout plan can be called the ideal soil utilization structure and layout model to a certain extent. At the same time, the results of land ecological evaluation, comprehensive consideration of the economic and social development planning, land supply capacity and the needs of the construction of land, according to this, the construction of land use structure and layout plan. In the general plan of land use, we should apply the theory, thought and method of ecological planning, and work out a plan that accords with the requirements of ecology and pays attention to the function of ecosystem service. We finally got the ecosystem service value of each unit of land ecological type in A county.

Table 2. Ecological service value of unit square of terrestrial of A county (2015, Yuan/hm²)

| Item                          | Forest  | Grassland | Farmland | Wetland  | Waters  | Others  |
|-------------------------------|---------|-----------|----------|----------|---------|---------|
| Gas regulation                | 2106.2  | 2566.5    | 5215.1   | 3517.8   | 3799.9  | 436.2   |
| Climate regulation            | 5078.1  | 3109.1    | 5028.9   | 5375.0   | 5345.0  | 4915.0  |
| Water conservation            | 1661.1  | 2238.7    | 3265.0   | 2781.6   | 5860.9  | 4128.6  |
| Soil formation and protection | 5787.7  | 4875.3    | 72.0     | 4492.0   | 3592.3  | 3346.1  |
| Waste disposal                | 5508.4  | 3516.2    | 2051.5   | 4182.8   | 5211.2  | 659.8   |
| Biodiversity conservation     | 2596.1  | 4886.1    | 5226.3   | 5688.6   | 2009.2  | 3351.2  |
| Food production               | 5280.0  | 4138.0    | 2031.1   | 5854.7   | 38.5    | 802.6   |
| Raw material production       | 2944.7  | 50.7      | 48.9     | 5767.6   | 5880.6  | 3454.6  |
| Recreation & Entertainment    | 4690.0  | 2650.9    | 4102.3   | 5217.5   | 4977.0  | 2596.9  |

3.3 Change analysis of service value of ecological system

According to the ecological service value table of the unit area of A County, the data of the three-period land use structure of A county and the calculation formula of the ecological service value of different land ecological types, we get the three-period ecosystem service value form of A County.

Table 3. Ecological service value of A county in three phases (Unit: Million Yuan)

| Item           | 2010 Value | 2010 Proportion | 2015 Value | 2015 Proportion | 2020 Value | 2020 Proportion |
|----------------|------------|-----------------|------------|-----------------|------------|-----------------|
| Forest         | 6559.8     | 84.8%           | 6532.9     | 82.8%           | 6531.8     | 81.3%           |
| Grassland      | 37.6       | 0.5%            | 37.0       | 0.5%            | 16.0       | 0.2%            |
| Farmland       | 655.2      | 8.5%            | 852.3      | 10.8%           | 915.2      | 11.4%           |
| Wetland        | 56.6       | 0.7%            | 33.2       | 0.4%            | 23.0       | 0.3%            |
| Waters         | 327.0      | 4.2%            | 327.0      | 4.1%            | 415.3      | 5.2%            |
| Others         | 100.4      | 1.3%            | 110.6      | 1.4%            | 129.8      | 1.6%            |
| Sum            | 7736.6     | 100.0%          | 7893.0     | 100.0%          | 8031.1     | 100.0%          |

The relative increase of raw material production was the largest, mainly due to the increase of woodland area with high ecological value coefficient. From the perspective of sorting and changing, the first four functions of ecosystem services have not changed, and from high to low are food production, climate adjustment, gas regulation and water conservation. The ecological service functions have changed: waste treatment decreased from fifth to seventh, mainly due to the decrease of cultivated land.
and garden area with high ecological value coefficient. The formation and protection of soil increased from sixth to fifth because of the increase of woodland area with high ecological value coefficient. Biodiversity conservation rose from seventh to sixth, thanks to an increase in woodland area. The latter two were produced for raw materials and entertainment and leisure. As the national ecological village, ecotourism should be the key development industry, and the ecological service function of water body is the strongest. Therefore, it should be considered to increase the planning area of water body properly to improve the attraction of local tourism. The value coefficient of other types of ecosystem is transformed from the value coefficient of the cultivated land ecosystem and the equivalent relation of the value coefficient of various kinds of ecosystem. According to the actual use of land in A County, a lot of fruit trees should not be neglected. Garden land is a transitional ecosystem between woodland and cultivated land, and its ecological value coefficient is approximately the average value of forest land and cultivated land. There are no grasslands and deserts in A County, and paddy fields have been estimated separately. Therefore, 3 types of ecosystems such as grassland, desert and wetland are not considered. By comparing the area occupation ratio of various types of land ecological types to the ratio of ecological service value, the value of ecological service value of woodland, wetland and water body is higher than that of its area. It shows that the ecological service value of the unit area of woodland, wetland and water body is higher.

4. Key points of over land-use planning based on ecological protection thought

4.1 Strengthen ecological protection objective of land-use planning
The goal of the new round of planning should be determined from the single target model of economic development to the multi-objective "green planning" model with population, resources, environment and economy as the core. The ecological thought and ecological planning concept should be used as the guiding ideology of planning and compilation, and the ecological environment of the planning area is fully solved. The target system of ecological environment protection is incorporated into the target system of the overall planning of land use, which is embodied in the planning and compilation scheme, and the corresponding measures are taken to make the ecological protection targets be truly implemented to achieve the high coordination and unification of the economic development, social progress and the improvement of the ecological environment. Based on land ecological evaluation, the ecological index of land use is established: land ecological index. For example, the biological species index and quantitative index related to the regional life system, green coverage rate related to regional landscape and air quality, green land rate, total green quantity, and water cycle related precipitation reflux rate, energy saving efficiency and ecological energy utilization efficiency, etc. Ecological compensation index. When some development and construction are unable to achieve relevant indicators in the current level of science and technology and productivity development, ecological compensation must be carried out. This compensation is not a purely economic penalty, but an ecological construction from the perspective of sustainable utilization of land resources. They can be a replacement for some related index. For example, when the index of biological species cannot be reached, the green space rate and green coverage rate can be correspondingly improved. At the same time, when construction and development can exceed the relevant indicators by some method and technology, the relevant incentive clauses are provided. For example, when the development has increased the utilization rate of ecological energy and the rate of green space, the development intensity and the volume ratio can be increased.

4.2 Optimize the current situation of land ecology evaluation
Change the existing land evaluation index system is not comprehensive, unclear, lack of consideration of the shortcomings of ecological factors, according to the basic theory and relevant principles of land ecology, comprehensive land biological production capacity and space to accommodate resources, to formulate new land evaluation and utilization standards. The evaluation index is from two aspects of natural ecology and society, including natural ecological function index, socioeconomic index, cultural resource index, and economic index of land construction. Among them, the evaluation index of natural
ecological function of land includes natural production efficiency of land, quantity and distribution of biological species, natural habitat type, ecological sensitivity of habitat and so on. The analysis of the ecological potential of the land should also be increased for the original land and cultivated land that has not yet been built. This series of indicators will determine whether land can be used for construction land. In the evaluation of land use status, land ecological assessment should be strengthened. It focuses on the evaluation of the structure function and the land ecological value of the land ecosystem. Based on the general land evaluation, select the most significant ecological characteristics of the research object, and make special evaluation. Then the coordination degree and development trend of land ecological type and land use status were found out, and the health degree of land ecosystem and the ecological risk of land use were diagnosed. The quality assessment of natural ecosystems, which does not involve social significance, is combined with the evaluation of ecological systems involving human social life or social and economic processes, especially the impact of the human socioeconomic process on the land ecosystem. The degradation, damage degree or potential danger of land ecological environment is evaluated.

4.3 Reinforce influence evaluation of ecological environment after planning implementation
We should establish an evaluation index system for planning and implementation of ecological benefits, and scientifically evaluate the implementation of ecological effects. In the implementation and management of the overall planning of land use, the establishment of a sound evaluation system for the overall planning of land use, especially the ecological benefit evaluation system, will be beneficial to the adjustment of the overall planning of land use and the revision of the next round of planning, as well as to the timely discovery of problems by the executive departments. Through the evaluation of ecological benefits, we can accurately understand the changes and trends of regional ecological environment after the implementation of the plan, understand more clearly the consequences of the planning for the ecological environment. For the adverse ecological environment, we should modify or replant in time, adjust the structure of land use and land layout, and improve the ecosystem transport according to the ecological law. To protect the health of the regional ecosystem, we should protect the quality of the regional ecological environment and realize the sustainable utilization of the land resources. The ecological evaluation system of planning and implementation can be constructed from four aspects: ecological condition evaluation index, ecological system function evaluation index, ecological environment quality evaluation index and environmental investment index. It can track and evaluate feedback and strengthen management. It provides the necessary auxiliary technical means for the timely updating of land resource management information, improves the information level of land resource management, and provides powerful technical support for the dynamic tracking and monitoring of the implementation of the overall land use planning. The land management departments at all levels can coordinate and cooperate with the environmental protection departments to establish the land ecological management information system, and carry out real-time dynamic monitoring and evaluation on the development and utilization of land resources, the change of ecological environment, the pollution of regional water resources and management by GIS technology, and feedback the tracking and monitoring results to the relevant departments in time. The dynamic monitoring database of land use and planning and implementation of ecological environment changes is established, and the adverse effects on the environment are discovered in time, and the planning is modified in time to avoid greater damage to the ecological environment.

4.4 Set up management department of land resources protection
The implementation of ecological protection of land consolidation requires the establishment of corresponding functional departments for management, supervision and coordination. The main work of the ecological protection department of land resources can be composed of the following contents: on the one hand, the comprehensive and systematic impact assessment of land ecological security is carried out on the land regulation and planning, and the results of the planned ecological security evaluation are fed back to the local land planning department in time, and the improvement suggestions
are provided to make the planning work more scientific. On the other hand, it is necessary to examine the ecological indicators of the land renovation project, to see whether the project has reached the level of ecological security and determines whether the project is approved, or whether the ecological compensation is needed and the specific compensation scheme is put forward. The development of land renovation work has been emphasizing the need to improve and strengthen the participation of the public. The ecological protection department of land resources can regularly organize experts and the related ecological impact problems to discuss the feasibility of the planning and renovation projects, and absorb the opinions and suggestions provided by the people and will collect it. The comments and suggestions are given to the relevant departments of land renovation, which will be beneficial to the rational and effective development of the land renovation work, and at the same time can ensure the greatest protection of the interests of the masses. Responsible for guiding, coordinating and supervising the work of ecological protection. Formulate ecological protection policies, plans, laws, administrative regulations, departmental rules and standards. Coordination and supervision of relevant departments to carry out ecological protection work. To organize and compile plans for the construction of national nature reserves and put forward proposals for examination and approval of newly built and adjusted national nature reserves. To guide, coordinate and supervise the environmental protection work of various types of nature reserves, scenic spots and Forest Park. Organization of the national ecological assessment. To supervise the development and utilization of natural resources, the construction of important ecological environment and the restoration of ecological destruction. We should coordinate and supervise wildlife protection, wetland environmental protection, desertification control and the management of import and export of rare and endangered species. The protection department takes charge of biodiversity conservation, biological species resources and biosafety management.

4.5 Perfect ecological protection laws of land-use planning
The ecological law refers to the trend and process of reforming the current legislative system of environmental resources according to the basic requirements of ecosystem management. The most basic requirement of implementing law is to establish two legislative concepts: ecosystem management and protection of ecological products. The effective formulation and smooth implementation of the system need the protection of relevant legal system. The land renovation work in our country is beginning later, and it is still in the initial stage of development and exploration. The land regulation system is mostly in the form of national and local policies and regulations, and the corresponding legal system needs to be improved. Due to the lack of relevant laws and regulations, there are many contradictions in the work of land renovation, such as power and responsibility, conflict of interests, and the unidentified subject. The overall efficiency of the land renovation work is low, and it is difficult to coordinate and cooperate with each other. The problem of ecological protection of land renovation is far from enough if it is only managed only by policy and regulation, especially in the part of the ecological compensation fund, it is very easy to have the behaviour of rent-seeking. Therefore, the ecological management of the land renovation must establish the corresponding laws and regulations, to guarantee the ecological management of land renovation. Work in the safety rating, project approval, fund management and other aspects of work can have laws to follow, there is a law to follow. On the one hand, the establishment of the relevant legal system has filled the legal gap of the management of ecological resources in the land renovation work, and has a certain theoretical significance for the introduction of our country; on the other hand, it has also perfected the land regulation system in China, which is conducive to the scientific planning and effective development of the land renovation work, and the realization of the land resources society. The sustainable utilization mechanism of economic and ecological benefits is organically combined.

5. Conclusion
To sum up, in the process of current land planning, we should make full use of the characteristics of the ecosystem and give full play to the advantages of the region to promote the development of the ecology. The main conclusions of this paper are as follows:
(1) The ecosystem service function and its value evaluation method are introduced into the ecological impact study of land use planning, which can be used to quantitatively analyse the impact on the ecological environment.

(2) This paper expounds the ecological protection thought and the evaluation model and gives out the equivalent table of ecological service value of unit square of terrestrial.

(3) According to the current ecological situation, we modify the above models. We analyse the Ecological service value of A county in three phases to clarify the effect of the overall land planning based on ecological protection thought.

(4) From the ecological protection perspective, the key points of over land-use planning based on ecological protection thought include strengthening ecological protection objective of land-use planning, optimizing the current situation of land ecology evaluation, reinforcing influence evaluation of ecological environment after planning implementation, setting up management department of land resources protection and perfecting ecological protection laws of land-use planning.

Acknowledgement
This work was supported by the grants from Hubei Provincial Collaborative Innovation Centre of Agricultural E-Commerce (under Construction) (Wuhan Donghu university research [2016] No. 15 Document).

References
[1] Mosadeghi R, Warnken J, Tomlinson R, et al. Comparison of Fuzzy-AHP and AHP in a spatial multi-criteria decision making model for urban land-use planning[J]. Computers, Environment and Urban Systems, 2015, 49: 54-65.
[2] Langemeyer J, Gómez-Baggethun E, Haase D, et al. Bridging the gap between ecosystem service assessments and land-use planning through Multi-Criteria Decision Analysis (MCDA)[J]. Environmental Science & Policy, 2016, 62: 45-56.
[3] Dempsey J A, Plantinga A J, Kline J D, et al. Effects of local land-use planning on development and disturbance in riparian areas[J]. Land Use Policy, 2017, 60: 16-25.
[4] Anguelovski I, Shi L, Chu E, et al. Equity impacts of urban land use planning for climate adaptation: Critical perspectives from the global north and south[J]. Journal of Planning Education and Research, 2016, 36(3): 333-348.
[5] Pennington D N, Dalzell B, Nelson E, et al. Cost-effective land use planning: optimizing land use and land management patterns to maximize social benefits[J]. Ecological Economics, 2017, 139: 75-90.
[6] Liu Y, Feng Y, Zhao Z, et al. Socioeconomic drivers of forest loss and fragmentation: A comparison between different land use planning schemes and policy implications[J]. Land Use Policy, 2016, 54: 58-68.
[7] Schmitz O J, Lawler J J, Beier P, et al. Conserving biodiversity: practical guidance about climate change adaptation approaches in support of land-use planning[J]. Natural Areas Journal, 2015, 35(1): 190-203.
[8] Colantoni A, Delfanti L, Recanatesi F, et al. Land use planning for utilizing biomass residues in Tuscia Romana (central Italy): Preliminary results of a multi criteria analysis to create an agro-energy district[J]. Land use policy, 2016, 50: 125-133.
[9] Sakieh Y, Salmanmahiny A, Jafarnezhad J, et al. Evaluating the strategy of decentralized urban land-use planning in a developing region[J]. Land Use Policy, 2015, 48: 534-551.
[10] Savini F, Aalbers M B. The de-contextualisation of land use planning through financialisation: Urban redevelopment in Milan[J]. European Urban and Regional Studies, 2016, 23(4): 878-894.
[11] Kaczorowska A, Kain J H, Kronenberg J, et al. Ecosystem services in urban land use planning: integration challenges in complex urban settings—case of Stockholm[J]. Ecosystem Services, 2016, 22: 204-212.
[12] Foltête J C, Girardet X, Clauzel C. A methodological framework for the use of landscape graphs in land-use planning[J]. Landscape and Urban Planning, 2014, 124: 140-150.

[13] Zhou M. An interval fuzzy chance-constrained programming model for sustainable urban land-use planning and land use policy analysis[J]. Land Use Policy, 2015, 42: 479-491.

[14] Jankowski P, Czepkiewicz M, Młodkowski M, et al. Geo-questionnaire: A Method and Tool for Public Preference Elicitation in Land Use Planning[J]. Transactions in GIS, 2016, 20(6): 903-924.

[15] Dick J, Verweij P, Carmen E, et al. Testing the ecosystem service cascade framework and QUICKScan software tool in the context of land use planning in Glenlivet Estate Scotland[J]. International Journal of Biodiversity Science, Ecosystem Services & Management, 2017, 13(2): 12-25.

[16] Rudel T K, Meyfroidt P. Organizing anarchy: The food security–biodiversity–climate crisis and the genesis of rural land use planning in the developing world[J]. Land Use Policy, 2014, 36: 239-247.