Discussion on the Calculation Method of Forest Coverage based on Territorial Spatial Planning

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Abstract

In the context of national land spatial planning, new problems encountered in the calculation of forest coverage ratio are summarized and analyzed, and the calculation ideas of forest composition and forest coverage ratio in the context of national land spatial planning are discussed. Taking a county-level city in Jiangsu Province as an example, the forest coverage rate under the background of national land space planning was calculated, and the difference between the forest coverage rate and the forest coverage rate calculated using the "One Map" of forest resource management was analyzed. The forest coverage calculation in the planning context is discussed and prospected.

Keywords

Territory Spatial Planning; Forest Coverage; Land Use; Land Cover.

1. Introduction

Forest is the most important part of the earth's terrestrial ecosystem, and plays an irreplaceable role in conserving water sources, regulating climate, maintaining soil and water, and maintaining biodiversity. The forest coverage rate reflects the abundance of forest resources in a country or region and the degree of greening, and is one of the important evaluation indicators for the quality of the ecological environment. It has an important reference value for measuring the quality of the natural ecological environment and the level of green development in the region, and is one of the important bases for determining the policy of forest management, development and utilization.

Forest coverage is closely related to the assessment of governments at all levels, and reflects my country's commitment to the international community. By 2050, my country's forest coverage rate will reach and stabilize at more than 26%.

Territorial spatial planning is a guide for national spatial development, a spatial blueprint for sustainable development, and the basic basis for various development, protection, and construction activities. Establishing a nationally unified, scientific, and efficient territorial space planning system with clear responsibilities and rights, and scientifically arranging production space, living space, and ecological space are the key measures to accelerate the formation of green production methods and lifestyles, promote the construction of ecological civilization, and build a beautiful China. With the establishment of the territorial spatial planning system, how to calculate the forest coverage rate scientifically and accurately, and keep it consistent with the previous calculation caliber, is related to my country's fulfillment of the world's commitments and reflects the responsibility and responsibility of a major country.

2. 1 How to Calculate Forest Coverage in the Background of National Land Spatial Planning

2.1. Forest and Forest Cover

The definition of forest and the calculation method of forest cover is a topic that has existed for a long time. Today, countries around the world have different definitions of forest and calculation methods of forest cover. Relevant studies have shown that the principles of forest definition in various countries in the world can be summarized into four aspects: first, land use; second, land cover; third, administrative management; fourth, ecological needs and so on. After a statistical analysis of nearly 200 countries and regions, Lund et al. found that most countries define forests from the principles of land use or land cover, or a combination of the two. There is no precise definition of "forest" at the legal level in my country. For example, Article 83 of the newly revised "Forest Law" states: Forests include arbor forests, bamboo forests and shrub forests specially specified by the state. And my country's "Forest Law Implementation Regulations" Chapter 4, Article 24 stipulates that the forest area includes the area of arbor forest land and bamboo forest land area with a canopy density of 0.2 or more, the area of shrub forest specially stipulated by the state, farmland forest network, and the surrounding area of villages, the coverage area of trees beside the water and the house. The definition of forest in the national standard "Forest Resource Terminology" is that it consists of trees, bamboos with a diameter of more than 2cm and a canopy density of more than 0.20, and shrubs that meet the purpose of forest management and have a coverage of more than 30%.

community. Including arbor forests, bamboo forests and mangrove forests with a canopy density of 0.20 or more, shrub forests, farmland forest networks specially specified by the state, and trees beside villages, roads, waters, and houses, etc. It can be seen from this that my country defines forests mainly on land cover. At this stage, the calculation of forest coverage in various parts of my country is also mostly based on the results of forest resource surveys based on on-site investigations or annual monitoring data of forest resources to measure the actual area of arbor forest land, bamboo forest land, and shrub land specially stipulated by the state, and then the forest area and forest coverage can be obtained.

2.2. Difficulties in the Calculation of Forest Coverage in the Context of Territorial Spatial Planning

The basis of territorial spatial planning is the results of the third national territorial survey, which reflects the current state of land and land use in the country, is greatly influenced by social production methods, and includes the purpose and intention of human beings to use land. The land cover used to calculate forest cover emphasizes the natural attributes of the land and the results of human activities. There are still some differences between the two. For example, garden land and cultivated land for planting arbor or shrub-type commercial crops are garden land or cultivated land in the three national land adjustment, and when the forest coverage rate is calculated, it is regarded as arbor forest or special shrub forest.

2.3. The Problem of Land Class Refinement and Land Class Correspondence

In order to implement the unified management of natural resources across the country, the Guidelines for the Classification of Land and Sea Use for Land and Space Survey, Planning, and Use Control (Trial) are used uniformly when carrying out territorial space planning, use control, etc. The concept of "forest land" has no land use type that can directly produce "forest" area, and cannot directly use the results of national land spatial planning to produce forest coverage. Therefore, how to accurately output the current area of land cover related to "forest" in the results of the three national land and spatial planning under the framework of territorial spatial

planning is the key to solving the calculation of forest coverage under the framework of territorial spatial planning.

3. Calculation Principle of Forest Coverage Ratio under the Overall Planning of National Land and Space Planning

3.1. Under the Overall Planning of National Land and Space Planning, the Composition of Forests

In the concept of forest coverage, "forest" and "woodland" are inseparable, but the two have different meanings. The definition of forest in the newly revised "Forest Law" does not specify what kind of "forest" grows in.

Therefore, in reality, there will be "forests" within the range of woodlands and "forests" outside the range of woodlands. What has "forest" been not necessarily "woodland", and not all "woodland" is "forest".

That is, there is the concept of "ground-tree separation". Therefore, how to accurately produce the "forest" area in the results of the three national land harmony and national land spatial planning requires that on the premise of understanding the "land-tree separation" criterion, it is necessary to determine the type of land cover related to "forest" and find the "forest land". "Forest" scope vs. "Forest" for the "Non-Forest" scope. Only in this way can the real forest coverage be reflected more scientifically, and the results can be more consistent and comparable. For "forest" in "woodland", it is necessary to further subdivide the "forest land" through the three national land adjustment, and then determine the area of "tree forest land", "bamboo forest land" and "shrub forest land"; The forest requires specific analysis and extraction for different situations.

There are three main types of "forest" outside the forest area: (1) The current status is "forest", while in the three national territorial tunes, the land type is clearly not included in the "forest" range, such as "belonging to coastal mangroves" "Land for green forests within the scope of towns and villages", "Forests within the scope of land acquisition for railways and highways, and revetment forests for rivers and ditches", etc.;

Economic forest, especially the land where the "forest" such as shrub economic forest is located, is clearly defined in the three national land regulations to be divided into "garden land" alongside "forest land", that is, it does not belong to forest land;

There are clearly defined "forest lands" such as national or provincial public welfare forests, natural forests, and forests on land that have been converted from farmland to forests, but they are "non-forest lands" in the results of the three national land reconciliation and national land spatial planning results.

3.2. Calculation of Forest Coverage Ratio under the Overall Planning of National Land and Space Planning

The calculation of forest coverage should belong to the "status quo theory", not the "planning theory". Therefore, in the context of territorial spatial planning, the calculation of forest coverage does not completely copy the results of territorial spatial planning, but selectively selects, retains, subdivides and transforms. To determine the corresponding land category of "forest", it is necessary to closely follow the definition of forest in the "Forest Law": arbor forest, bamboo forest and shrub forest specially stipulated by the state. Combined with the definitions of forest land, garden land and other land types in the three national land scales, a comprehensive and systematic analysis of 13 first-level land categories and 51 second-level land categories in the three national land scales is carried out, and the relationship between each land category and "forest" is discussed one by one. Related attributes, and organize them into the following three types of land categories.

(1) Corresponding land type, that is, the land type completely corresponding to the definition of forest, including arbor forest land and bamboo forest land.

(2) Relevant land types, that is, including both forests and mixed land types that do not belong to forests, such as shrub land, garden land, urban greening land, etc.

(3) Irrelevant land types, that is, land types not related to forests. For the corresponding land type, it can be directly used as part of the calculation of the forest coverage; for the relevant land type, it is necessary to identify the corresponding land category involved in the calculation of the forest coverage rate. The part of the garden land belongs to the shrub economic forest (tea, peach, orange, etc.), the urban greening land belongs to the arbor forest and bamboo forest, the road traffic land belongs to the road protection forest, and the hydraulic construction land belongs to the bank protection Forest, part of berm forest, etc.

3.3.   Calculation Example of Forest Coverage in the Context of Territorial Spatial Planning

Taking a county-level city in Jiangsu as an example, the calculation and analysis of forest coverage under the overall planning of national land and space are carried out. The county is in the alternating area of hills and plains, and is dominated by plains, and the ratio of plains to hills is about 7:3. According to the latest statistics of "One Map" of forest resource management, the county has a land area of 104,700 hectares, of which 13,900 hectares of forest land and 9,300 hectares of forest, with a forest coverage rate of 8.88%.

3.4.   Basic Data

The selected basic data include: the county's latest "one map" results of forest resource management, the results of the three national land surveys, and the preliminary results of national land and space planning. In order to further refine the land type, it is necessary to carry out the data fusion of "one map" of the three national land adjustment and forest resource management, and assign forestry-related attribute factors to the spatial scope determined by the national land spatial planning and the three national land adjustment.

4.   Guidelines for Data Fusion

4.1.   Management Boundaries

(1) Administrative boundaries: The administrative boundaries of provinces, cities, counties, townships, and villages at all levels adopt the three-division boundary of national land, which will not be revised.

(2) Management boundary: The boundary of key state-owned forest areas and state-owned forest farms shall be implemented by adopting a "one map" boundary or referring to relevant materials.

4.2.   Boundaries of Map Spots and Small Classes

(1) On the basis of the three-tone map spot division of the country, the division of small classes is added downward.

(2) The boundary line of the figure spot. The boundary lines of the map spots of the three national land categories are adopted.

(3) Small class boundaries, according to the "one map" woodland small classes, refine and correct the small class boundaries or merge small classes within the three-tone map of the country.

4.3. Area Calculation and Adjustment

The area of the small class is calculated by taking the area of the national land three adjustment as the control area, and the adjustment of the small class area to the national land three adjustment map spot.

4.4. Calculation Results

According to the principle of data fusion, after the integration of the three national territorial adjustments and forest resource management "one picture", the various areas that belong to the forest category.

5. Conclusion

Since there are differences in the standard formulation, zoning accuracy, and investigation and identification of the "one map" results of the three national land surveys and forest resource management, when formulating the calculation method of forest coverage rate based on national land spatial planning, it is not possible to use a single map. Use a survey result. Relevant calculation methods should be both continuous and scientific, to ensure that the calculation results are true and reliable and not have a large jump from the previous period; they should also be operable and easy to produce, and can use existing data to produce forest cover more conveniently. rate indicator.

For the calculation of forest coverage rate based on national land spatial planning, the premise is to carry out the integration and connection of the results of the "one map" of the three national land surveys and forest resource management, to conduct a sufficient consistency analysis of the two sets of data, and to discuss the two sets of data in the region. The main differences and typical characteristics existing between them, and optimize the calculation method of forest cover. In this way, the accurate spatial scope and detailed information on forest cover types can be ensured, so that the forest cover rate can be scientifically produced.

With the establishment and implementation of the territorial spatial planning system and the further integration of the "one map" results of forest resource management and the results of the three national territorial adjustments, the conventional method of calculating forest coverage will no longer be applicable. The results obtained must also be different from the previous ones. Therefore, how to explain the reasons for the differences will be carefully studied and solved by the forestry authorities in order to achieve a smooth transition between different stages.

Acknowledgments

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