自然资源资产管理与国土空间规划

NATURAL RESOURCE ASSET
MANAGEMENT AND
LAND AND SPATIAL PLANNING

1 自然环境、自然资源与自然资源资产

自然资源与自然环境是两个不同的概念，自然环境是指人类周围所有的客观自然存在物，自然资源则是人类从自身需要的角度来认识这些要素并赋予其价值后的产物。蔡运龙在《自然资源学原理》一书中将其定义为“人类能够从自然界获取以满足其需要与欲望的任何天然生成物及作用于其上的人类活动结果；或可认为自然资源是人类社会生活中来自自然界的初始投入”^[1]。任何可称为自然资源的自然物必须具备两个前提：一是能满足人类的需要，二是人类对其具有开发利

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摘要

作者首先对自然环境、自然资源，以及自然资源资产等概念进行了辨析，并指出自然资源可提供支持服务、供给服务、调节服务、文化服务等生态系统服务；进而强调，中国自然资源资产在调查与评估等方面存在权属边界不清、权责划分不明、价值不易衡量等问题，且各类自然资源粗放利用现象突出。作者认为，生态环境问题往往源于对资源的过度掠夺。整体而言，近些年中国的生态治理和修复工作并未取得显著成效，主要由于这些工作大多以散点式进行，同时执法力度不足，且公民对自然资源的保护意识还较薄弱。新一轮的国家大部制改革（如自然资源部和生态环境部的成立），以及“多规合一”政策的施行对中国的自然资源保护管理工作起到了积极推动作用。作者最后指出，在未来，国家层面应努力协调国土空间规划与国民社会经济发展规划，而城市规划者应当跳脱工程技术层面，使规划真正成为解决社会问题、提升发展质量的工具。

关键词

自然资源；自然资源资产；生态系统服务；自然资源资产调查与评估；国土空间规划；国民社会经济发展规划

ABSTRACT

At the beginning, the author examines the concepts of natural environment, natural resource, and natural resource asset and the ecological services what natural resources could provide as ecosystems, including supporting services, provisioning services, regulating services, and cultural services. The author stresses that, in China, the survey and assessment of resource assets face many difficulties in defining ownerships and tenures, rights and responsibilities, and valuation, and extensive exploitation and utilization still dominates the country's natural resource management. He argues that ecological damage and environmental degradation often resulted from over-exploitation of resources; on the whole, China's recent ecological restoration has not seen a substantial improvement, largely resulting from the separate and inconsistent practice, ill enforcement, and the weak public awareness of ecological remediation and restoration in the country. He highlights that China's new reform of a Super-Ministry System (including the establishments of the Ministry of Natural Resources and the Ministry of Ecology and Environment), as well as the implementation of the Integrated Planning policy, has facilitated an integrated management on natural resource conservation. Finally, the author underscores that, in the future, the Chinese government ought to coordinate its land and spatial planning with domestic socio-economic planning, and urban planning professionals are expected to go beyond engineering and technical explorations and realize planning approaches as tools that would truly and efficiently cope with societal challenges and improve the quality of development.

KEY WORDS

Natural Resource; Natural Resource Asset; Ecosystem Service; Survey and Assessment of Natural Resource Asset; Land and Spatial Planning; Domestic Socio-Economic Planning

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用能力；否则自然物只是“中性材料”，而不能作为人类社会生活的初始投入。然而，人类的需要与文化背景有关，自然物是否被看作自然资源，常常取决于信仰、宗教、风俗习惯等文化因素，也会随经济—社会和科学技术的发展而不断变化。^[2]

根据地理特征，自然资源分为5个类型：矿产资源（地壳）、水资源（水圈）、土地资源（地表）、生物资源（生物圈）和气候资源（大气圈）。^[2]一般而言，生物资源和地表水资源属于相对可更新资源，矿产资源与深层地下水资源属于相对不可更新资源。同时，相对可更新资源又进一步分为恒定性资源（如太阳能、潮汐、大气等）和临界性资源（如土壤、动植物等），相对不可更新资源又分为损耗性资源（如化石燃料、天然气等）和可循环资源（如金属矿物等）。

自然资源具有稀缺性、资产性、多用性等特点。自然资源的稀缺性既包括需求总量超过供给总量的绝对稀缺，也包括因分布不均、地缘政治等因素导致的相对稀缺。自然资源的资产性是指自然资源具有财产属性，在一定条件下具有自然增值和资本增值的双重特点。自然资源的多用性是指自然资源具有多种功能和用途，如耕地具有生产粮食、维持农田生态、培育农耕文化等功能，森林具有生产木材、调节气候、旅游休闲等功能。^[2]从生态系统服务的一般意义上讲，自然资源有支持服务（土壤形成、养分循环、初级生产）、供给服务（粮食、洁净水源、燃料、纤维、基因物质、生物化学物质）、调节服务（调节气候、控制疾病、调节水分、净化水源）、文化服务（精神和宗

1 Natural Environment, Natural Resource, and Natural Resource Assets

Natural environment and natural resource are two different concepts. The former is composed of all the natural beings existing in human living world and the latter refers to the natural elements valued by human beings' needs and desires. Cai Yunlong defined natural resources in his book *Principles of Natural Resources* as “any form of natural things that humans can acquire from the nature to meet their needs and desires and the resultants impacted by human activities. One can view natural resources as the initial input from the nature into human societies.”^[1] Natural beings that are considered as a kind of natural resource qualify themselves of two prerequisites: meeting human needs or desires, and being able to be detected, recognized, and utilized by humans. The rest natural beings are neutral materials which cannot be used as a sort of initial input to human societies. However, human needs are products of cultural traditions, religions, and social customs, which constantly change with social development, economic growth, and scientific and technological advancement.^[2]

Natural resources are often divided into five categories geographically, including mineral resources (crust), water resources (hydrosphere), land resources (surface), biological resources (biosphere), and climate resources (atmosphere).^[2] Specifically, biological resources and surface water resources are relatively renewable, while mineral resources and fossil groundwater resources are non-renewable. Scholars have made subdivisions of renewable and non-renewable natural resources: the former consists of constant resources (such as solar energy, tides, and atmosphere) and temporary resources (such as soil, flora, and fauna); the latter includes consumption resources (for example, fossil fuels and natural gas) and recyclable resources (for example, metal minerals).

Natural resources are characterized with values in scarcity, property, and multiple use. First, the total demand of natural resources often exceeds the total supply, often with a relative scarcity caused by uneven distribution, geo-politics, and other reasons. Secondly, the property of natural resources makes them have potentials of both natural value increment and capital appreciation, conditionally. Thirdly, the multi-functionality of natural resources is commonly recognized. For instance, cultivated lands deliver services of producing grain, maintaining farmland ecology, fostering agricultural culture, etc.; forests provide services of wood harvest, climate comfort, tourism and recreation, etc.^[2] Also, as ecosystems, natural resources offer a series of significant services, including supporting services (soil

教、娱乐旅游、美学、激励、教育、情感、文化遗产）等。

然而，并非所有的自然资源都可以称为自然资源资产，因为资产必须具备边界性或可度量性、归属性和稀缺性三个本质属性。例如，太阳能显然是一种自然资源，但其还不能被当作一种自然资源资产。此外，由于不同学科领域认识自然资源的视角不同，目前对于自然资源资产的界定也存在不少分歧。以矿产资源为例，地质学者可能认为砂石矿是一种很重要的矿石资源资产，但在其他学者眼中只是稀松平常的沙石而已。

2 自然资源和自然资源资产的调查与评估

在实践层面，自然资源和自然资源资产在调查与评估等方面也存在巨大差异。通常来说，资源统计主要涉及数量、质量及分布情况调查；资产统计还需要登记权属状态、明确权责划分、估算资产价值等。

资产的真正意义体现在其价值量，但在实际操作层面，价值量是复杂的、难以衡量的。考察资产价值量的一项重要标准就是其在中国市场中体现出来的价格。但是目前中国的自然资源市场很不健全，即便是在相对完善的土地资源市场中，能够交易的城市建设用地也只占城市用地的很小一部分，大部分城市建设用地尚未实现有偿使用，所以交易价格并不能完全体现土地资源的真正价值。再以水资源为例，虽然水是人们须臾不离的，但我们无法真正地按照市场价值对水资源进行有偿使用，目前的有偿使用也只是象征性的。

尽管目前很多资源资产存在权属边界不清、权责划分不明、价值不易衡量等问题，但建立自然资源资产调查机制仍具有重要意义，尤

formation, nutrient cycle, primary production, etc.), provisioning services (food, clean water, fuel, fiber, genes, bio-chemicals, etc.), regulating services (climate regulation, disease suppression, water circulation and purification, etc.), and cultural services (spiritual and religious faith, entertainment and tourism, aesthetics, inspiration, education, emotional resonance, cultural tradition, etc.).

However, natural resources that have no detected physical boundaries or fail in being measured, or lack an ownership or stewardship, or are not recognized of an absolute or relative scarcity cannot be defined as natural resource assets. Solar energy, for example, is undoubtedly a natural resource, but it is not a natural resource asset. In addition, definitions of natural resource asset vary among different disciplines. For instance, in terms of mineral resources, geologists may value ore gravels as an important resource asset, which, however, are nothing but stones in the eyes of other professionals.

2 Survey and Assessment of Natural Resources and Natural Resource Assets

There are big differences between natural resources and natural resource assets in terms of survey and assessment. In general, resource registration includes basic information of quantity, quality, and distribution of natural resources. Meanwhile, resource asset registration also requires explicitness of ownership or tenure status, rights and responsibilities, estimation of asset values, etc.

The true value of an asset is its worth. But, in reality, an asset’s worth is too complicated to be measured or quantified. One of the most important criteria for estimating an asset is its market price. However, at present, China’s natural resource market is unsound, even in the land resource market — tradable urban construction land only takes a small proportion of the total urban land of the country; currently, most urban construction land is under an uncompensated use and the market price does not fully represent its true value. For another example, water is a vital resource to the living of human beings, but we could never put a price tag on its true market value. People are only nominally charged for their daily water use.

Although the survey and registration of resource assets faces many difficulties in defining ownerships and tenures, rights and responsibilities, and values, it holds a great significance in evaluating governance achievements of government officials — besides assessment criteria of economic growth such as GDP, it is necessary to examine the cost and consumption of natural resource assets at the same time.

In China, national survey and registration of primary natural resource assets that have a fundamental impact on the domestic

其是在领导干部的政绩考核方面，除了衡量GDP等经济指标外，还要考核对于自然资源资产的消耗程度。

中国每年会对建设用和耕地等对国民经济具有重大影响的资源资产进行调查统计，对森林、草原以及水体等资源资产则每5~10年调查一次。近40年来，中国自然资源资产总体情况呈现逆转态势：十几年前为“局部改善，总体恶化”；当前情况是“总体改善，局部恶化”。具体而言，近年来建设用地的扩张速度明显减缓，林草植被覆盖率得到提升，耕地减少也得到了明显控制——耕地减少主要是由于农业结构调整所导致的耕地非粮化、非农化现象，以及城镇化进程引起的耕地撂荒现象。与此同时，中国各类自然资源仍存在粗放利用问题。

3 生态修复与自然资源保护意识

生态环境问题往往源于对资源的过度掠夺。整体来说，中国近些年的生态修复工作取得的成效并不显著，其中最大的问题在于生态治理和修复工作大多以散点式进行。例如，原国土资源部主抓以增加耕地和可建设用地面积为目的的土地整治，水利部主抓水土流失治理，原环境保护部主抓污染土壤修复，原林业部主抓沙漠化防治。这种分散治理模式缺乏系统性，效果也非常有限。另一个问题在于，由于法规体制不健全，许多生态修复措施无法有效落实，或者已取得的修复成效没有维持下去，这一问题在农村尤为严重。例如，许多地区因矿产开采而被变得千疮百孔、环境恶化，然而生态修复需要大量的资金和漫长的时间。虽然《中华人民共和国环境保护法》中规定“谁破坏，谁治理”，但目前在实际施行上大多只是对开采者收取较低的恢

economic development and production, such as construction land and farmland, is conducted annually, and that of forests, grasslands, and water areas is conducted every five or ten years. In the past 40 years, the overall condition of China's natural resource assets has seen an evident improvement: a dozen of years ago, most natural resource assets throughout the country were deteriorating; now more and more natural resource assets are getting remediated, restored, or enhanced. In recent years, the growth rate of construction land is largely declining, the coverage of forest and grassland keeps increasing, and the loss rate of farmland is decreasing — specifically, the reduction of total farmland is mainly caused by the increase of non-crop and non-agriculture farming in rural China due to the agricultural restructuring policy, as well as the increase of abandoned farmland due to the country's rapid urbanization. Meanwhile, extensive exploitation and utilization still dominates China's natural resource management.

3 Public Awareness of Ecological Restoration and Natural Resource Conservation

Ecological damage and environmental degradation often result from over-exploitation of resources. It is fair to say that, on the whole, China's recent ecological restoration has not seen a big improvement. One of the reasons is that ecological remediation and restoration programs have often been carried out separately and inconsistently. For example, land remediation projects by the former Ministry of Land and Resources mostly focused on land reclamation for agricultural and development uses; projects by the Ministry of Water Resources focused on water and soil management and erosion control; programs launched by the former Ministry of Environmental Protection usually concentrated on contaminated soil remediation; while the former Ministry of Forestry prioritized the projects of desertification prevention. Such practices that lack a systematic and consistent framework have a very limited effect. In addition, because of the legal absence, many ecological restoration measures have not been well implemented or maintained, especially in rural regions. For example, ecosystems of many places have been terribly destroyed due to mineral extraction, yet where an ecological restoration often requires considerable funds and a long period of time. The Environmental Protection Law of the People's Republic of China stipulates that “those who cause an environmental damage or pollution are responsible for restoration.” But, in China's reality, most exploiters are only charged a small fee of recovery, which had little helped contain destructive resource extractions and resulted in more and more unbridled activities. In addition, public awareness and engagement of natural resource conservation is much less than that

复治理费用，既没能有效制约破坏行为，也未对修复治理起到实质性帮助。此外，相较于大气污染（如雾霾），我国公民对自然资源的保护意识还比较薄弱，社会公众参与程度也较低。地下水污染和土壤污染虽然不易为人们所察觉，但目前其程度要比大气污染严重得多，同样影响着人们的整体健康福祉。

新成立的自然资源部设立了国土空间生态修复司，整合集中了自然资源保护治理的相关职能，采用山、水、林、田、草系统治理的方法，这是一种实质性的进步。同时，生态环境部也实现了气、水、土污染的综合性防治，并下设生态环境执法局，统一了环境保护执法工作，打破了原各部委各自执法的局面。

4 协调空间规划与国民社会经济发展规划

从2014年国家发展和改革委员会开始在城镇化建设中推行“多规合一”^[3]，到自然资源部设立国土空间用途管制司、国土空间规划局、国土空间生态修复司三个专职机构，全国已经从行政架构上为“多规合一”提供了保障，下一步的工作将专注于制度机制的逐步健全完善。

与此同时，空间规划与发展规划之间的关系仍需进一步协调。在中国，空间规划与国民社会经济发展规划并行，二者都以促进社会经济发展为最终目的。二者的核心区别在于：空间规划着眼长远，相对稳定（即为指令性规划），且由于空间形成或治理需要一定的周期，规划的时间跨度也较长，通常为10~20年；但经济和社会发展规划需要根据一定时期内的社会经济发展情况做出相应调整，加之市场条件的波动性，所以发展规划只能是中短期的指导性规划，而非指令性规划。

但目前，这两个规划之间尚未实现良好的协调和衔接。如何既能把空间规划的基本内容延续下去，又能促进经济社会发展，是摆在中

of air pollution problems (such as haze). Although groundwater or soil pollution is not easy to be perceived in people’s daily life, it often results in a much more serious damage than air pollutions and impacts people’s health and overall well-beings.

The newly founded Ministry of Natural Resources has established the Department of Land and Spatial Ecological Restoration, which combines all related authorities and agencies of natural resource conservation and management together, adopting integrated and consistent methods in ecological remediation of mountain, water, forest, farmland, and grassland systems, which have been proven efficient. The Ministry of Ecology and Environment has taken systematic prevention and control actions on air, water, and soil pollution. Also, the establishment of the Bureau of Ecology and Environment Enforcement in the ministry would end the history of separate governance among different agencies, unifying and strengthening the enforcement of environmental protection in China.

4 Coordinating Spatial Planning with Domestic Socio-Economic Planning

Since its introduction to China’s urbanization by the National Development and Reform Commission in 2014^[3], to the establishment of the Department of Land and Spatial Use, the Bureau of Land and Spatial Planning, and the Department of Land and Spatial Ecological Restoration in the Ministry of Natural Resources, the implementation of the Integrated Planning policy has been guaranteed with a national top-down administrative system, whose institutional mechanism needs to be improved in the future though.

Moreover, future priority also should be given to coordinating spatial planning with development planning. Now China adopts a paralleling system of spatial planning and domestic socio-economic planning, both of which are developed to guide and promote social progress and economic growth. However, spatial plans are often formulated to navigate long-term developments, which makes them relatively unalterable or mandatory directions spanning a long period of time — usually one or two decades — in line with required time for spatial construction. Socio-economic planning is expected to adapt and respond to socio-economic changes timely and developed as medium or short term guidelines because of market unpredictability.

At present, however, the two pairing planning systems are not well coordinated. It is quite challenging to continue a consistent spatial construction framework and pattern while advancing economic growth and social progress. In my opinion, it is necessary to introduce a simultaneous adjustment on the combination of

国城市建设面前的一个难题。我认为可以定期（如每5年）对空间规划和发展规划进行修订。有人质疑频繁调整显得太过随意，但我认为，根据国家发展变化及时修改规划恰恰是在用一种严肃的方式来处理现实的问题。

5 城市设计者的国土空间规划使命

总体来看，中国城市规划的主流思想脱胎于前苏联计划经济时期的主动开发型规划，通常先将要开发的土地划定出来。然而，我们对于市场未来变化发展的预测往往不够准确，而把一些重要的生态敏感性区域先保护起来是相对容易做到的——这正是俞孔坚所提出的“反规划”思想^[4]。

今天中国的社会形态在转变，社会结构在转变，主要社会矛盾也在转变；我们不仅需要关心经济增长，还需要关心生态、文化、教育等各个方面品质的提升。当前中国的城市规划需要从理念和实践层面上以空间规划转型来回应这些社会转型的需求。

城市规划的关键问题是如何提高城市发展质量。城市规划工作不应把主要精力放在寻找新的发展空间上，而应着眼于缓解建成区中生态、环境、交通等方面的问题。当前很多城市规划者在实践中往往对“城市病”避而不谈，在制定解决方案的时候也大多避实就虚。究其原因，一方面是规划从业者多为工程技术背景出身，对于中国的城市问题理解不够深入；另一方面，在短期政绩和经济利益等因素面前，规划人员缺乏时代使命感与独立判断力。未来，城市规划者应当跳出工程技术层面，使规划真正成为治理社会问题、提升发展质量的工具。**LAF**

spatial planning and socio-economic planning regularly, every five years, for example. Although one may question that such frequent revisions might impair the seriousness of laws and regulations, I believe the true seriousness of a nation’s legislation precisely lies in its in-time response to real changes and issues.

5 Urban Designers’ Mission on Land and Spatial Planning

The Soviet development mode that was put forward for planned economies with a planning priority to ambitious, extensive construction still dominates China’s urban planning. Quite often, however, gaps exist between people’s prediction on future market changes and the reality. Instead of defining areas for new urban development, it is easier and smarter to give planning priority to protection of key eco-sensitive areas, which coincides with the idea of Negative Planning Approach advocated by Yu Kongjian^[4].

Today, the form, structure, and major conflicts of China’s society have changed dramatically hand-in-hand with the domestic demands shifting from rapid economic growth towards overall improvement in ecology, culture, education, etc. China’s urban planning is expected to respond to contemporary issues and needs at both theoretical and practice levels.

The primary task of urban planning is to improve the quality of urban development and growth. Nowadays, more efforts of urban planning are anticipated to address pressing problems of ecology, environment, and transportation in built-up urban areas, rather than speculating opportunities for new development. Under the evading climate of the current urban planning in China, urban planners and designers tend to turn a blind eye to the obstinate problems in cities or provide diffuse solutions. For the reasons, most professionals on one hand have been used to employing engineering or technical methods in dealing with urban problems, and, on the other hand, they lack a mission sense and critical thinking when facing with short-term benefits or economic allures. In the future, professionals should go beyond engineering and technical explorations and realize planning approaches as tools that would truly and efficiently cope with societal challenges and improve the quality of development. **LAF**

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