

Value of rural ecological products: realization mode, influence mechanism and embedded planning response

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Abstract: The realization of the value of rural ecological products is an inevitable choice for the construction of ecological civilization and an effective way to promote rural revitalization. In-depth analysis of the connotation and characteristics of rural ecological products, form and transformation, attribute and classification, detailed analysis of the current understanding fuzzy "ecological products black box", combined with rural ecological products public attribute, space properties, property properties, and promote the matching of subject, put forward to "product properties as the kernel, promote the main body for representation" of the government as a whole, enterprise management, collective negotiation, individual participatory rural ecological product value realization mode classification, and matching related implementation path. In the process of "ecological resources assets, ecological assets capitalization, ecological capital capital and ecological funds redistribution", the four links of rights and interests definition, development and empowerment, operation transaction and income distribution play an important role as the influence mechanism. Innovative rural ecological product value realization process is more property products, multiple subject supply, creating multiple pattern division and multiple path coordination, and form the process of more cohesion of complex closed-loop system, and with hierarchical embedded, classification of embedded, link embedded way, put forward the spatial planning response rural ecological product value realization ideas and strategies.

Key words: countryside; ecological products; ecological products value; realization mode; influence mechanism; planning response

Ecological civilization construction is an important support for rural revitalization, and rural revitalization is an inevitable requirement of ecological civilization construction. Rural ecological product value realization is the ecological civilization and rural revitalization of the two national strategy, is the inevitable choice of the construction of ecological civilization and promote the effective path of rural revitalization, and promote the development of China transformation and the development of urban and rural integration reality means, but also to the new era of development new quality productivity of positive response and practice. To revitalize the countryside, we should not only maintain the rural ecological value, but also realize the rural economic value, and promote the maintenance and appreciation of rural natural resource assets^[1]. At the same time, relying on long-term government investment to achieve unsustainable rural revitalization, it is necessary to release the rural economic value through the efficient utilization and endogenous development of rural resources, so as to achieve long-term and long-term sustainability^[2]. Therefore, relying on the abundant natural resources and superior ecological environment in rural areas, exploring the realization path of ecological product value for the effective transformation of ecological advantages into economic advantages is an important issue and difficult problem to be solved in the new era.

1. The realization of the value of rural ecological products

1.1 Multi-line parallel Realization of exploration of ecological product value To promote the

realization of ecological product value is coordinated and high quality

Important measures and realistic paths for quantitative development and high-level protection. As an important breakthrough for green, low-carbon and high-quality development, under the urgent need of rapidly cultivating new drivers of transformation and development, the value realization of ecological products in China presents the characteristics of parallel and rapid progress in a series of work, such as concept and policy, theory and technology, pilot and practice in a short time. See Table 1.

First, a clear concept and an improved policy system (from 2010 to now). Concept level experience "ecological products-ecological product value realization, establish and improve the ecological product value realization mechanism" gradually further process, corresponding to the "good ecological environment is the most fair public products, is the most pratt & whitney well-being of the peoples livelihood" of cognition, to "make ecological advantages into development advantage" the development direction, to "establish and improve the ecological product value realization mechanism, is the key path practice of green water castle peak is the jinshan yinshan concept" thinking of deepening process. At the same time, along with the above process, the policy system with the reform and innovation of institutional mechanism as the core has been gradually constructed.

Second, theoretical exploration and technical system construction (from 2015 to now). On the one hand, on the basis of in-depth research on the connotation and path of the realization of ecological product value, how to systematically and effectively promote the realization of ecological product value from the perspective of institutional framework, policy tools, industrial theory and planning guidance. On the other hand, on the basis of the functional classification and value evaluation of ecosystem services, the accounting concept and technical method system of ecosystem gross domestic product (GEP) are put forward, and the pilot accounting demonstration is carried out at the level of provinces, cities and counties where conditions permit.

Third, pilot exploration and accumulation of practical experience (from 2016 to now). At the national level, the National Development and Reform Commission has expanded the national pilot cities for the value realization mechanism of ecological products from 2 to 12. The Ministry of Natural Resources and the China Meteorological Administration have respectively carried out national pilot projects to realize the value of ecological products in corresponding fields. At the same time, the Ministry of Natural Resources has launched 43 typical cases in four batches. At the provincial level, Jiangsu, Sichuan, Yunnan and other provinces have launched provincial-level trials, continuously expanding the coverage of the trials, and gradually expanding to more departments, such as the ecological environment, agriculture and rural areas, forestry and grass, and water conservancy.

The realization of the value of ecological products involves important national strategies and development concepts such as rural revitalization, common prosperity, expanding domestic demand and the development of new quality productive forces. On the basis of the above multi-line parallel promotion work, it is necessary to strengthen the exploration of the mode and mechanism of the realization of ecological products in rural revitalization at the present stage, and give full play to the all-round role of the realization of ecological products in promoting economic and social development, especially rural revitalization.

1.2 Research progress in realizing the value of rural ecological products

Rural areas are the main output space of ecological products, and also the main battlefield of establishing and improving the value realization mechanism of ecological products. The State Opinions on Establishing and Improving the Mechanism for Realizing the Value of Ecological Products proposes to "drive the vast rural areas to give full play to their ecological advantages to get rich locally and nearby, and form a benign development mechanism". The Opinions of the CPC Central Committee and The State Council on the Implementation of the Rural Revitalization Strategy proposed to "increase the supply of agricultural ecological products and services, transform the rural ecological advantages into the advantages of developing ecological economy, provide more and better green ecological products and services, and promote a virtuous cycle of ecology and economy". The mutual promotion and coordinated development of the value realization of ecological products and rural revitalization has become a common consensus of the society^[14]。

At present, there are few studies on the realization of the value of ecological products in the field of rural revitalization, mainly involving the mode and path of the realization of rural ecological product value, and different studies show great differences in the understanding of the connotation category and components of the realization mechanism, the difficulties faced, and the realization of the value of specific types of ecological products^[15]. Ecological product value realization mode, Zhang Linbo et al^[16]Introduce the modes of ecological compensation, ecological restoration, ecological resource property right trading, emission right trading, resource quota trading, ecological tourism, ecological product trading; Ye Youhua et al^[17]It is believed that there are ecological protection compensation, ecological resource indicators and property rights transaction, green finance, ecological agriculture industrialization, ecological tourism and characteristic culture industrialization, ecological restoration and value preservation and other modes. The value realization path of ecological products, Ye Youhua et al^[17]Put forward the path of market, government, public welfare, government + market, government + public welfare, market + public welfare; Zhang Erjin^[18]It is believed that the "foundation- -promotion-promotion- -guarantee" mechanism formed by the government, enterprises, social organizations, grass-roots governance and other factors is an effective way to realize the value of rural ecological products.

Overall, both the research on rural ecological product value focus overall less and not in-depth, for rural ecological product value realization of understanding mode, path is confused, to what is the pattern, what is the path and mode and path is not clearly defined, especially lack of rural ecological product value realization process and mechanism. At the same time, the response and support of spatial planning for the realization of the value of rural ecological products are not sufficient, and it is urgent to embed relevant requirements and measures to help realize the value of rural ecological products.

2. Connotation, form and attribute of rural ecological products

2.1 Connotation and characteristics of rural ecological products

Rural ecological products come from rural ecological resources. Rural ecological resources is the rural area within the scope of the transformation of various natural formation or human late processing of natural environment elements, including resources and environment, production environment, living environment and so on three aspects, the content involves soil, water resources, animal and plant resources and other comprehensive rural elements, with land as the center, the natural force obvious, high vegetation coverage, complex biodiversity etc.

There is no clear definition of the concept of rural ecological products. This paper compares various descriptions of ecological products in the academic circle^[19]And the understanding, the rural ecological products are defined as: rural "place" or "all" ecological resources, through its own production (ecological production) and combined with human production, with sustainable way of rural areas ecological regulation ability, maintain rural areas overall ecological security, provide rural good living environment of entity elements and the sum of additional services. At the same time, this article believes that the rural ecological product value is rural areas "ecological resources assets, ecological assets of ecological capitalization, ecological capital, ecological capital redistribution" process, ecological resources, ecological assets, ecological capital is rural ecological products in the value of different stages, different scenarios show the specific form, can be incorporated into the concept of rural ecological products.

2.2 Form and transformation of rural ecological products

Rural ecological resources are the initial form of rural ecological products, with spatial attributes and natural attributes. Ecological resources are widely distributed in every corner of the countryside, including the surface and underground, with spatial attributes. Rural ecological resources are also of natural existence and have natural attributes. The unique spatial and natural attributes of the rural ecosystem make the ecological products provided by it cannot be completely replaced by other systems, and they are irreplaceable. With the increasing demand for ecological resources in the whole society, the natural elements and services in rural areas supplying ecological products for human beings have been included in the category of rural ecological resources.

Rural ecological resources are transformed into rural ecological assets through the definition of rights and interests. As the intermediate form of rural ecological products, rural ecological assets have property rights, which is also the basic characteristic of assets, with potential market value. Clear property rights can protect the owners rights and interests of rural ecological resources, and also promote the efficient management and maintenance of rural ecological resources. The asset process of rural ecological resources needs to transform the non-exclusivity of rural ecological resources into the exclusivity of rural ecological assets. Therefore, rural ecological assets should manage input and output according to market rules, and build a management framework with rights and interests confirmation as the core, so as to promote the transformation of the rural resource management in physical form to the rural asset management in value form.

Rural ecological assets are transformed into rural ecological capital through development and empowerment. Capital is the general term of various social and economic resources where human beings create material and spiritual wealth. Ecological capital can be both a physical form, a spiritual service, and a rights and interests in the digital form, which can best reflect the conceptual connotation of ecological products as elements and services. As an advanced form of rural ecological products, rural ecological capital can meet the growing needs of urban and rural residents for a better life. It has functional attributes, and at the same time, it has the basic attribute of capital, namely value-added attribute, which can generate new value to realize value appreciation.

Rural ecological product form to rural ecological resources as the starting point, under the action of internal force, complete "ecological resources assets, ecological assets capitalization, ecological capital and ecological capital redistribution" process, finally in the form of allocated

ecological capital into the protection and restoration of rural ecological resources. This process is continuous, interlinked, and continuous, but in specific practice, it is often not indispensable. Some links may be jumped and directly into the follow-up links, which is related to the specific path and completion of the value of the realization of rural ecological products. See Figure 1.

2.3 Properties and classification of rural ecological products

The attribute of public goods is the associated attribute of ecological products, which runs through the whole process of the transformation of ecological resources, ecological assets and ecological capital. In the stage form of ecological resources, ecological assets and ecological capital, rural ecological products mainly show the explicit attributes of spatial attributes, property rights attributes and functional attributes respectively. In this way, the rural ecological products are classified.

2.3.1 Classification of rural ecological products based on public attributes

Scholars depict and classify the attributes of objects from various perspectives. Samuelson (Samuelson) [20] proposed a dichotomy of view between pure private goods and pure public goods, Buchanan (Buchanan)^[21]Points of public goods, mixed goods and personal goods, and together with Ostrom (Ostrom)^[22]Mixed items are further divided into exclusive and non-competitive club items (or natural monopoly items) and non-exclusive and competitive public pond items. So far, with exclusivity and competitiveness as the standard, the formation of pure public goods, natural monopoly goods, public pond goods and pure private goods four method of goods classification. Referring to the four-point classification, this paper divides rural ecological products into public products, natural monopoly products, public pond products from the perspective of public attributes of products and private products. See Table 2.

2.3.2 Classification of rural ecological products based on spatial attributes

The spatial and temporal scale change of the rural ecological product pattern and the value realization process is quite complex, among which the spatial scale plays a vital role. Overall consider the integrity of the ecosystem, the dependency of administrative divisions, resource types of differences and functional carrier compound factors, according to the spatial scale of rural ecological resources, roughly can be divided into large, larger, small, small four spatial scale, "big" to the regional or watershed scale of rural ecological resources, "small" to a rural settlement or a plant community. See Table 3.

2.3.3 Classification of rural ecological products based on property rights

According to the Constitution of China, the property right (ownership) of natural resource assets is divided into two kinds: ownership by the whole people and rural collective ownership. The ownership of natural resource assets includes the state (including all levels of entrusted governments) and rural collective economic organizations. After the natural assets ownership and use separation, can further use through transfer, transfer, transfer, cut and applicable way to the market main body or rural collective economic organizations, government, enterprises, collective, individual after the right to use resource assets, can develop the resource assets can assign and operating transactions. See Table 4.

2.3.4 Classification of rural ecological products based on functional attributes

Function attribute is the basic attribute of ecological capital, this paper in the material supply, cultural services, regulating services of ecological products "function method", based on the actual function of rural ecological products type, put forward rural ecological products "function method" classification, namely the rural ecological agricultural products, rural natural

resources products, rural cultural service products, rural regulation service products. See Table 5.

3. Value realization mode and path of rural ecological products

It is generally believed that the mode is the general mode of the subjects behavior, and it is the intermediary link between theory and practice, with the characteristics of generality, simplicity, structure, stability, operability and so on^[23]; Path is a specific way and road map to achieve a certain goal. It is a combination of a series of steps, decisions and actions formulated based on a specific subject, stage and goal under a specific model. Patterns are generally finite in number, while paths have infinite possibilities. In a word, the mode is the abstraction and generalization of the path, and the path is the concrete and practice of the mode.

In rural areas, the realization of the value of ecological products mainly includes the government, enterprises, village collectives and individuals. This paper combines the public attribute, spatial attribute, property right attribute of rural ecological products, and the matching degree with the promotion subject, and constructs the classification of the value realization mode of rural ecological products, with the government coordination, enterprise operation, collective negotiation and individual participation, with "product attribute as the core and the promotion subject as the representation". From the perspective of the existing research and practice of the value realization of ecological products, the value realization path of ecological products such as ecological protection compensation, resource quota transaction, ecological resource management, ecological carrier premium, resource property rights circulation, ecological rights transaction, ecological industry development and ecological capital income is representative^[24]These paths are suitable for the value realization of ecological products in rural areas, and can be included into the above four models according to their characteristics. Different paths under the same mode may be dominated by certain subjects and resources, and other subjects and resources may cooperate. Under different modes, there may be the same path or several paths, and several changes will be extended according to local conditions. See Figure 2.

3.1 Realization of the value of rural ecological products coordinated by the government

For a long time, due to the rural ecological resources property right is not clear, development subject of rural ecological resources value cognition not deep, protection measures are not proper, lack of effective as a whole, intervention and regulation, "free lunch" as "for granted", lead to ecological environment damage, the public interest. At the same time, due to the non-governmental entities "limited ability" to protect and utilize large-scale and public rural ecological resources, and mostly from the perspective of maximizing their own interests, it often leads to disorderly development and even destructive development. Therefore, it is urgent for the government to intervene and play a leading role in coordinating all parties in the process of value realization.

The realization of the value of rural ecological products by the government refers to the mode in which the government plays the leading and overall planning role, and enterprises, collectives and individuals participate together to promote the realization of the value of rural ecological products. The central government, local government and even government departments can participate in the supply of rural ecological products. Government as a whole mode, in order to achieve the goal of ecological oriented, rural ecological products generally presents a large spatial scale characteristics, show public attributes, belong to all the natural resources assets, including rural ecological agricultural products, rural natural resources products,

rural cultural services products, rural regulation service products such as type, applicable ecological compensation, resource trading quotas, ecological resources management implementation path.

3.2 Realization of the value of enterprise-operated rural ecological products

Rural revitalization in the new era cannot be separated from the support and participation of enterprises. Urban factors such as capital going to the countryside is an important driving force for rural revitalization^[25]. The participation of enterprises, especially large-scale enterprises, in the value realization of ecological products in rural areas is an important embodiment of enterprises to open up a new business track and practice corporate responsibility. Enterprises have many advantages, such as market, capital, talent, innovation and technology. Compared with the collective and the individual, they have stronger overall planning ability and economic ability, and compared with the government, they have stronger marketability, flexibility and adaptability.

The realization of the value of enterprise management rural ecological products refers to the mode of taking enterprises as the main body, under the constraints and support of the government, fully mobilizing the enthusiasm of the village collective, villagers or other social individuals, and adopting the market-oriented operation mode to promote the realization of the value of rural ecological products. Due to the "profit-seeking" attribute of an enterprise, its attention to social benefits and ecological benefits inevitably gives way to the business development of an enterprise, and it is necessary to establish a relatively perfect institutional constraint framework. Enterprise management mode, in order to achieve the goal of economic oriented, rural ecological products generally presents a larger spatial scale characteristics, show natural monopoly properties, enterprises through the way or the management of ecological resources, mainly including rural ecological agricultural products, rural natural resources products, rural cultural service products such as type, ecological rights trading, ecological capital gains, ecological industry development path.

3.3 Realization of the value of rural ecological products through collective negotiation

The full development of collective economy can optimize and integrate rural resources to a greater extent, create scale benefits, and promote the implementation of rural revitalization strategy. Since the 18th National Congress of the Communist Party of China, the development of rural collective economic organizations has entered an active period, gradually becoming the backbone of the modernization process of rural governance system and governance capacity, and the return of rural talents provides a talent guarantee for the growth of village collective economic organizations. Collective participation in the realization of the value of rural ecological products has strong practical feasibility and extensive demonstration and promotion value, and has the most vitality among the four modes.

The realization of the value of rural ecological products through collective negotiation refers to the mode of taking the village collective economic organizations as the main body, with the support and help of governments at all levels, mobilizing villagers, enterprises, social organizations and other multiple entities to promote the realization of the value of rural ecological products. Collective is the collection of villagers. In the process of protection, development and utilization of ecological resources, we should strengthen self-governance management, mobilize the enthusiasm of villagers to participate, and pay more attention to the protection and maintenance of collective interests and villagers interests. Collective consultation

mode, in order to realize the social goal as the guidance, rural ecological products generally present a small spatial scale characteristics, show the public pond properties, can include rural ecological agricultural products, rural natural resources products, rural cultural service products, rural regulation service products such as type, applicable resource trading quotas, resource property rights circulation, ecological industry development path.

3.4 Realization of the value of individual participatory rural ecological products through top-down government guidance and bottom-up guidance

Market demand jointly promotes the value realization of individual participatory rural ecological products. Individual labor, personal capital, all kinds of subjects and elements "into" country, for the individual to participate in rural ecological product value provides favorable conditions, and the value of rural ecological resources show and visible benefits, also makes the individual driven by economic interests to participate in the process of rural ecological product value realization.

The realization of the value of individual participatory rural ecological products refers to the mode of taking farmers or foreign elites as the main body, carrying out diversified management in a market-oriented way and promoting the realization of the value of rural ecological products. Under certain circumstances, the government, enterprises and collectives need to provide goods as auxiliary or supplement while providing rural ecological products. Individual provide rural ecological products, is combined with rural ecological environment, economic conditions of the most closely system design, which not only increases the economic returns of product providers, also reduce the government or other public institutions in the pressure of providing and maintaining public goods, to some extent also can better meet the individual unique preferences of some public goods. Individual participation mode, in order to achieve individualized goals as the guidance, rural ecological products generally presents a small spatial scale characteristics, show private properties, individual through the right to use rural resources assets or management, mainly including rural ecological agricultural products, rural cultural service products, applicable ecological carrier premium, resource property rights circulation, ecological industry development path.

4. Value realization process and influence mechanism of rural ecological products

Combined with the above, the value realization process of rural ecological products is a complex closed-loop system of multi-attribute products and multi-subject supply, which is a multi-loop system of multi-process connection with multi-mode division and multi-path collaboration. In the process of value realization of "ecological resources assets, ecological assets capitalization, ecological capital capital and ecological capital redistribution", the mechanisms of rights and interests definition, development and empowerment, operation transaction and income distribution play an important role, directly affecting the stage and effect of the value realization of rural ecological products. See Figure 3, Figure 4.

4.1 Asset conversion of rural ecological resources: definition of rights and interests

The most important premise for the asset of rural ecological resources is to define the property right and establish a clear property right system. The property right of rural ecological resource assets is the comprehensive embodiment of the subjects ownership, use, possession, disposal and income of specific rural natural resources, including ownership determination, use right transfer, management right transfer, usufruct right negotiation and other specific ways. Over the years, the ownership and collective boundaries is not clear, governments at all levels in the

exercise of ownership, different collective ownership of natural resources boundaries and different kinds of natural resources boundaries problems such as different degree, led to the natural resources ownership and responsibility of ambiguity and ambiguity. Complex overlapping ownership and difficult to define rights and interests, leading to idle or inefficient use of rural ecological resources. For those ecological resources with unclear property rights boundaries, their scope and quantity are vague, which makes it difficult to quantify their value and cannot be transformed into effective factors of production. In order to reflect the scarcity and value of rural ecological resources, it is necessary to clearly define the boundary of each right and ownership involved in the rights and interests of ecological resources, and clearly define the specific scope, authority and obligations of the participants in exercising their rights.

4.2 Capitalization of rural ecological assets: development and empowerment

In order to promote the unification of the responsibilities of owners and regulators and the goal of maintaining and increasing value, after the completion of the definition of rights and interests, operators and other social capital will become the developers of rural ecological assets, and develop and empower them through various investments such as capital, technology and manpower. In the process of empowerment, due to the differences in asset characteristics and suppliers, it can be divided into planning empowerment, technology empowerment, cultural empowerment, brand empowerment, policy empowerment and other ways. With the support of several enabling methods, ecological assets realize the transformation into ecological capital, and their value is greatly increased. The basis of development empowerment is information collection and development decision-making, and information collection is the basis of decision-making. The information collection and mastery of rural development, market demand and villagers demands determines the main development decision, and then affects the process and effect of value realization. Development decision is in the core position. Due to the differences in the demands of different subjects in the process of realizing the value of rural ecological products, how to coordinate the demands of different subjects, especially the developers and users of rural ecological products, that is, the overall balance or coordination between supply and demand, has become the core issue of development empowerment. The capitalization of simple ecological resources brings limited benefits, which can not reflect the value of ecological resources, so it is urgent to further increase the transformation of capital.

4.3 Capital transformation of rural ecological capital: operation and transaction

Operation transaction is the follow-up of development and empowerment, and is the necessary stage of ecological capital financing. The operation and transaction mode of realizing the value of rural ecological products is established under the market rules system, which can include physical transaction, equity transaction, service realization, negotiation and other ways. Ecological product is a relatively special type of goods, with the value and use value as goods. Once users have a demand for a certain kind of ecological products, the production end will actively respond to the demand side, provide a suitable supply of ecological products, and form a supply and demand cycle through balance and game, and determine the price and transaction mode of ecological products by the market. Therefore, the realization of the value of the ecological products, especially the operational ecological products, needs to be completed through the market media, and the market is a necessary condition for the realization of the value of the operational ecological products. However, some ecological capital markets are not active enough, and their pricing has less standards for reference, and the transaction price must

be determined by negotiation. It is urgent to establish a fair and just market system and mechanism, and continuously improve the operation and trading capacity.

4.4 Redistribution of rural ecological funds: income distribution

The ecological funds obtained from the realization of the value of rural ecological products are mainly used for ecological restoration, rural revitalization and main dividends, which is related to whether the value realization of rural ecological products is sustainable. First, it is invested in ecological restoration to ensure the continuous regeneration and activation of rural ecological resources and keep vitality and vitality forever. Second, investment in rural revitalization, including supporting rural industrial development, village environment improvement, and infrastructure construction. Three is to redistribution in the main body, such as by increasing farmers income and farmland circulation income increase farmers income, by showing the rural land assets value improve farmers wealth and increase property income, by expanding the scale of collective operational construction land market increase land premium income, make farmers and village collective benefit. At the same time, explore the sustainable "benefit sharing" on the basis of the "jointly created" rural development and construction mode of rural development^[26]Accelerate the improvement of the interest connection mechanism between collectives and farmers, the government and enterprises, so that the transformation benefits obtained from the realization of the value of ecological products are linked to the welfare of farmers.

Take Jiangsu Province as an example, after experiencing the period of "rural China" and "urban China", it has entered the period of "urban and rural China", and the rural development exploration is in redefining the rural value [27]. From Lianyungang stone beam river reservoir rural area, yizheng city and administrative villages and surrounding administrative villages, liyang city qinfeng administrative villages, Nanjing soup gang natural villages four rural ecological product value implementation typical cases, respectively belongs to the value of different realization mode, the ecological product form transformation and value realization process presents different characteristics, to a certain extent, show different patterns of differentiation characteristics and implementation effect. See Figure 5.

5. Spatial planning and response to the value realization of rural ecological products

"Five-level and three-category" territorial space planning is the overall planning and specific arrangement of the whole factor space resources in the whole region, which is highly related and highly matched with the value of rural ecological products^[11]. The formulation and implementation of spatial planning need to take into consideration and balance the spatial attributes of rural ecological resources and the property rights of ecological assets, embed the requirements and measures to help realize the value of rural ecological products into the spatial planning system, and give full play to the role of discovering, capturing, reshaping and improving the value of spatial planning.

5.1 Grading of the embedding

Corresponding to the five administrative levels of country, province, city, county and town, the relevant requirements and measures are embedded according to the division of administrative responsibilities and powers. National, provincial level outstanding strategic lead, combined with the requirements of the construction of ecological civilization and rural revitalization strategy, the rural ecological product value implementation principle deployment,

focus on strategic, cross-regional ecological resources protection and utilization and value, from the regional level break through the bondage of system and mechanism, compensation for ecological protection, ecological transfer payment, cross-regional rights and interests trading innovation policy environment. City, county, town level outstanding implementation orientation and landing, to play to the initiative of administrative main body, clear money, pulse problems, clear objectives, to carry out the measures, innovation mechanism, through systematic resource development, highly efficient asset allocation, diversified capital operation, greater degree, faster pace to realize the rural ecological product value.

5.2 Classification and embedding

According to the three planning types of overall planning, special planning and village planning (detailed planning outside the urban development boundary), relevant requirements and measures are embedded according to the differences of planning positioning and key contents. The overall plan focuses on the systematic and overall arrangement of rural ecological products within the administrative jurisdiction, including the sorting out and quantitative evaluation of the background conditions of natural resources, determining or implementing the relevant target indicators of core natural resources and ecological products in rural areas and conducting them step by step. The special plan for the realization of the value of rural ecological products is compiled, the current rural natural resources are systematically sorted out and evaluated, the quality, quantity and spatial distribution of rural ecological resources are clarified, and the development direction, development goals and spatial guidance strategies of rural ecological products in a certain period are comprehensively deployed. Village planning to optimize the village classification, strengthen use control, safeguard ecological system integrity measures ensure ecological product space, through the facilities, culture can assign, landscape, ecological restoration improve ecological product quantity and quality, overall layout of ecological products surrounding land function, extend ecological product value realization of the industrial chain.

5.3 Interlink embedded

In order to fully implement the responsibility of "unification" of natural resources, in addition to planning, attention should be paid to the value of rural ecological products in different links such as investigation and monitoring, use control, development and utilization, resource protection and ecological restoration. Investigation and monitoring link, To strengthen the general survey of rural ecological resources, Determine the physical quantity, And incorporate the "one picture" digital system, Lay the material foundation for value accounting; Use control link, To be closely integrated with spatial planning, In the process of policy formulation and implementation of various land use conversion, pre-examination of land use for major construction projects, To ensure the realization of the related spatial elements of the value of rural ecological products; Development and utilization link, According to the characteristics of local rural ecological products, For the goal of expanding "quantity", "quality" and "efficiency", Select efficient and applicable methods according to local conditions; Resource protection and ecological restoration, Improving the supply capacity of high-quality rural ecological products should be taken as an important goal of protection and restoration, Comprehensive countermeasures of resource protection, ecological restoration and system management are put forward for the degraded and damaged rural ecosystem.

6 Conclusion

The indispensable of ecological products is an important development principle in the era of ecological civilization [28]. How to accumulate high-quality development momentum under the ecological advantages and promote the quality and efficiency of rural industries in the prominent characteristics is the key to rural revitalization [29]. The realization of the value of rural ecological products is a long-term and complex process. The wide range of rural background base and the foundation of rural development at different stages make the task of realizing the value of rural ecological products extremely difficult [30]. Under the background of ecological civilization construction, on the basis of protecting natural resources, it is an important issue to be studied, explored and solved to promote the continuous transformation of "resources-assets-capital" and realize the preservation and appreciation of the value of rural natural resources assets.

The mode and path proposed in this paper all have their applicability, and to a certain extent, there are "stuck neck jam" problems or key links, there is no good or bad points, only suitable or not. In the specific work of rural revitalization, it is still necessary to optimize the mode and path of rural ecological products by fully combining the local reality and the different attributes and characteristics of ecological products, so as to realize the value better and faster. In the process of selecting modes and specific paths: first, we should consider the spatial attributes of our own ecological resources, Adapthe appropriate development subjects according to spatial properties, Conduct the corresponding confirmation; Second, we should consider the goals of rural revitalization, The considerations of different realization effect and the market supply and demand of ecological products, Choose the appropriate mode and path according to the pursuit of the effect goal; Third, we should consider the property rights attributes of ecological assets, Considering the characteristics of public attributes and property rights of different forms of ecological products and the external influence of different ecological products, Minimize the external impact; Fourth, we should consider the relationship between the realization of the value of ecological products, According to the subjective initiative of different subjects, And the ability to mobilize resources accordingly, Select the corresponding pattern and path, In this process, multi-agent cooperation should be strengthened.

表 1 我国多线并行的生态产品价值实现领域探索

Table 1 Exploration of the field of multi-line and parallel ecological product value realization in China

理念明晰与政策体系完善	理论探究与技术体系构建	试点探索与实践经验积累
<ul style="list-style-type: none"> 2010年12月,《全国主体功能区规划》首次提出“生态产品”概念 2012年11月,“增强生态产品生产能力和质量”写入党的十八大报告 2016年8月,《国家生态文明试验区(福建)实施方案》首次提出“生态产品价值实现”概念 2017年10月,《中共中央 国务院关于完善主体功能区战略和制度的若干意见》首次明确“要建立健全生态产品价值实现机制” 2021年4月,首个国家层面纲领性文件《关于建立健全生态产品价值实现机制的意见》出台 2022年10月,“建立生态产品价值实现机制”写入党的二十大报告 	<ul style="list-style-type: none"> 在国外理论研究^[2-4]及欧阳志云等^[5]、谢高地等^[6]技术方法研究基础上,逐步形成生态系统生产总值(GEP)核算概念与方法 国家发改委、统计局印发《生态产品总值核算规范(试行)》 张林波等^[7]、谢花林等^[8]探讨了生态产品、生态产品价值实现的内涵和路径 刘伯恩^[9]探讨了生态产品价值实现机制的内涵、分类与制度框架 王金南等^[10]提出了生态产品第四产业理论 赵毅等^[11-12]构建了国土空间规划引领生态产品价值实现路径框架和空间评价方法体系 张琪等^[13]提出了生态产品价值实现的“五权”治理体系 	<ul style="list-style-type: none"> 2016年8月,《国家生态文明试验区(福建)实施方案》明确“生态产品价值实现先行区”的战略定位 2019年1月和9月,浙江丽水、江西抚州先后获批国家生态产品价值实现机制试点 2020年4月,自然资源部启动自然资源领域生态产品价值实现国家试点,至2023年9月,共推荐4批43个典型案例 2020年6月,贵州省启动首个建立健全生态产品价值实现机制省级试点,随后多个省份启动省级试点 2023年9月,中国气象局启动气候生态产品价值实现机制国家试点 2024年5月,12个城市获批为首批国家生态产品价值实现机制试点

图 1 乡村生态产品的形态与转化示意图

Figure 1 Schematic diagram of the morphology and transformation of rural ecological products

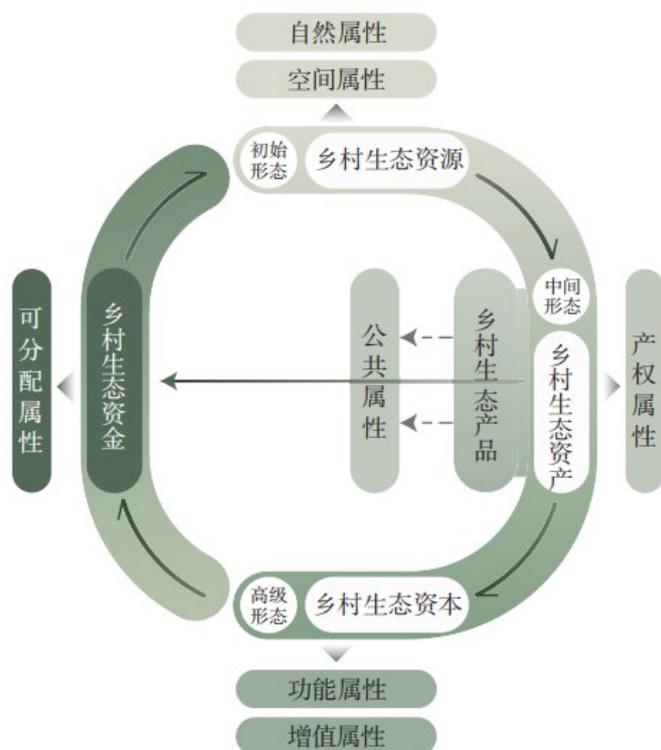


表 2 基于公共属性的乡村生态产品分类

Table 2. Classification of rural ecological products based on public attributes

基于公共属性的分类	特性特点	产品范例
乡村公共性产品	非竞争性、非排他性	宜人的气候、特色的乡土环境、清洁的空气。增加消费者不会减少单一消费者的消费量,具有非竞争性;增加消费者不增加该产品的成本耗费,具有非排他性
乡村自然垄断产品	非竞争性、排他性	乡村旅游景区和度假区、民俗文化展馆等。在游客数量未达到门槛的条件下,游客数量的增多并不会影响原有游客感受,具有非竞争性;但可通过在景点设置围墙将不买门票者拒之门外,具有排他性
乡村公共池塘产品	竞争性、非排他性	村庄水体资源等。属于村集体所有,在此范围内的所有个人都可以使用并从中获得利益,具有非排他性。但是如果超过水体的承载量,或者集体以外成员使用,水域使用就具有竞争性
乡村私有性产品	竞争性、排他性	农民承包土地上产出的各类农、林、牧、副、渔产品。属于农民个体所有、产权清晰,可以直接进行市场交易,具有竞争性和排他性

表 3 基于空间属性的乡村生态产品分类

Table 3. Classification of rural ecological products based on spatial attributes

基于空间属性的分类	空间尺度	产品范例
大尺度乡村生态产品	区域或流域尺度的乡村生态资源	跨行政区的连绵山体、河流湖泊等
较大尺度乡村生态产品	市县域、跨市县甚至更大空间尺度的乡村生态资源	大型水库及周边乡村地区
较小尺度乡村生态产品	乡镇、跨乡镇尺度乡村生态资源	宜居宜业和美乡村示范区
小尺度乡村生态产品	行政村、自然村尺度的乡村生态资源	乡村聚落、植物群落等

表 4 基于产权属性的乡村生态产品分类

Table 4 Classification of rural ecological products based on property rights

基于产权属性的分类	概念范畴	产品范例
全民所有	国务院代表国家行使全民所有自然资源资产所有权,授权自然资源部统一履行全民所有自然资源资产所有者职责。部分职责由自然资源部直接履行,部分职责由自然资源部委托省级、市地级政府代理履行	依托湖泊、河流、国有林场等产生的水产品、林产品、休闲游憩服务等
市场主体获得全民所有自然资源资产使用权	乡村自然资源资产所有权与使用权分离后,可进一步将使用权通过适用方式转移给企业主体	依托取得特许经营权的森林公园、湿地公园、国有林场等产生的水产品、林产品、旅游康养服务等
集体所有	农村集体经济组织代表集体行使所有权的,农村集体经济组织成员对这些自然资源资产享有合法的权益	依托集体所有的林地、耕地等产生的林产品、农产品等
社会个体获得集体所有自然资源资产使用权	乡村自然资源资产所有权与使用权分离后,可进一步将使用权通过适用方式转移给社会个体	通过土地流转获得使用权的集体所有的林地、耕地产生的林产品、农产品等

表 5 基于功能属性的乡村生态产品分类

Table 5. Classification of rural ecological products based on functional attributes

基于功能属性的分类	概念范畴	产品范例
乡村生态农产品	通过清洁生产、循环利用、降耗减排等途径,减少对生态资源的消耗生产出来的农产品	在土地资源上通过人类劳动形成的农产品,包括有机粮食、绿色食品、中药材、茶叶等
乡村自然资源产品	通过对自然资源的再加工,形成各类资源型产品,以满足人类日常生产生活需求	通过森林资源加工生成的木料,通过草原培植产出的草料等
乡村文化服务产品	以乡村区别于城市所独有的自然资源为基础,通过将自然资源和乡村文化资源相互结合所形成的精神文化产品	以生态休闲旅游产品为代表的农耕文化观光、乡情乡愁体验等精神产品和乡村生活方式等
乡村调节服务产品	通过乡村生态资源有机整合而形成的生态系统,为村民、动植物提供物种保育的生态空间,提供防风固沙、洪水调蓄、固碳降耗等生态安全功能	维系乡村生态可持续发展的系统性产品,包括清洁水源、安全土壤、舒适环境、物种保育和生态减灾等维系生态安全的产品

图 2 乡村生态产品价值实现模式及路径示意图

Figure 2 Schematic diagram of the value realization mode and path of rural ecological products



图 3 生态产品价值实现的复杂闭环系统解析图

Figure 3 Analysis diagram of the complex closed-loop system for the value realization of ecological products

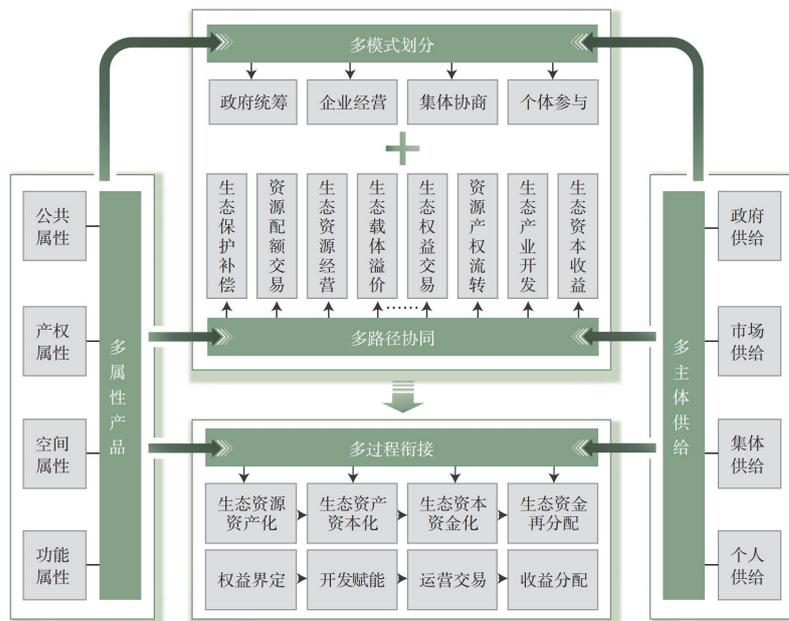


图 4 生态产品价值的实现过程和影响机制分析图

Figure 4 Analysis diagram of the realization process and influence mechanism of ecological

product value

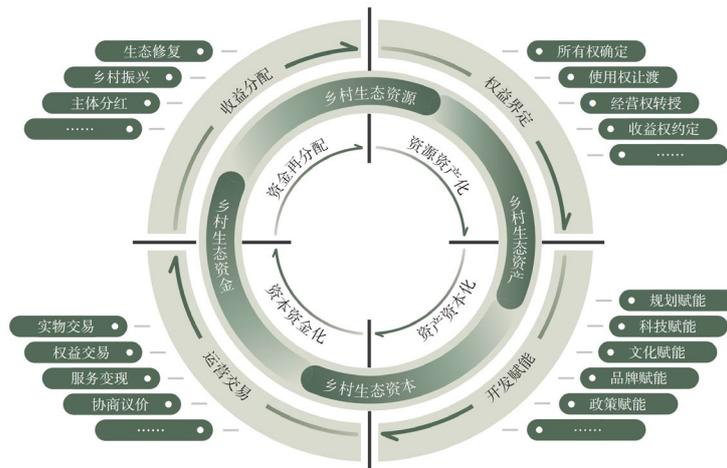
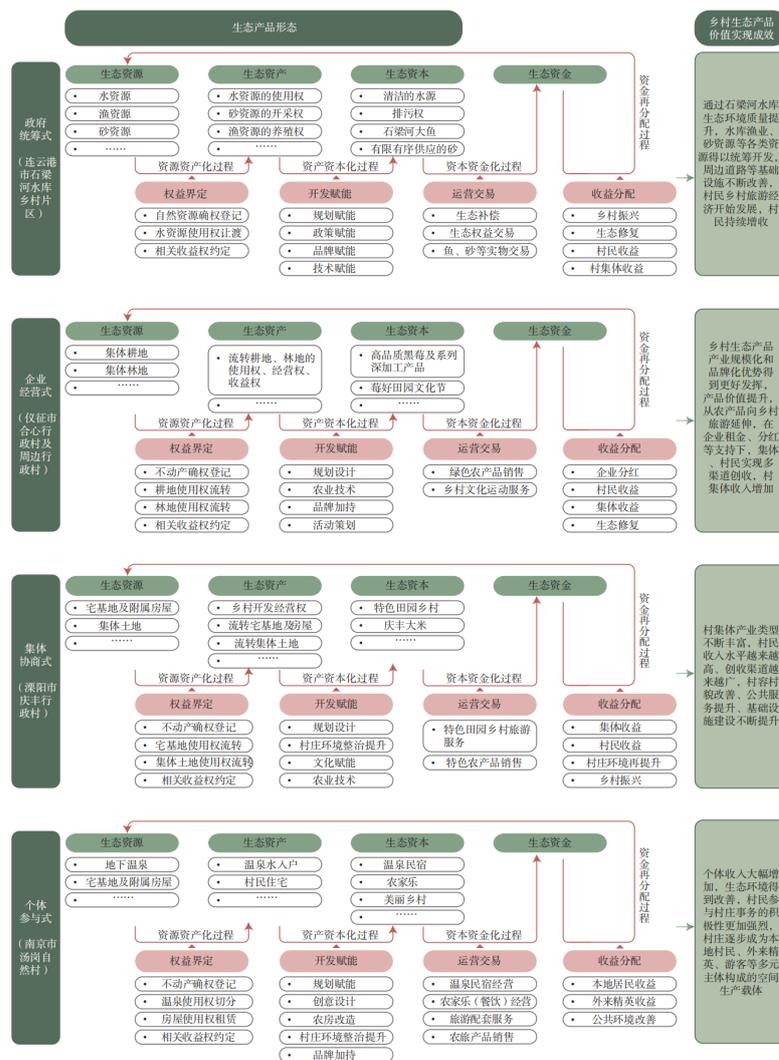


图 5 不同模式案例地乡村生态产品形态转化和价值实现过程示意图

Figure 5 Schematic diagram of the form transformation and value realization process of rural ecological products in different model cases



Reference

- [1]张尚武,李京生,栾峰,等.乡村振兴的规划议题与学科发展思考[J].城市规划,2022,46(10):18-24.
- [2]温铁军,罗士轩,董筱丹,等.乡村振兴背景下生态资源价值实现形式的创新[J].中国软科学,2018(12):1-7.
- [3] COSTANZA R, ARGE R, GROOT R, et al. The value of the world's ecosystem services and natural capital[J]. Nature, 1997, 386: 253-260 .
- [4] SERAFY S. Pricing the invaluable: the value of the world's ecosystem services and natural capital[J]. Ecological Economics, 1998, 25: 25-27.
- [5]欧阳志云,王如松,赵景柱.生态系统服务功能及其生态经济价值评价[J].应用生态学报,1999(5):635-640.
- [6]谢高地,鲁春霞,冷允法,等.青藏高原生态资产的价值评估[J].自然资源学报,2003(2):189-196.
- [7]张林波,虞慧怡,郝超志,等.生态产品概念再定义及其内涵辨析[J].环境科学研究,2021,34(3):655-660.
- [8]谢花林,陈倩茹.生态产品价值实现的内涵、目标与模式[J].经济地理,2022,42(9):147-154.
- [9]刘伯恩.生态产品价值实现机制的内涵、分类与制度框架[J].环境保护,2020,48(13):49-52.
- [10]王金南,王志凯,刘桂环,等.生态产品第四产业理论与发展框架研究[J].中国环境管理,2021,13(4):5-13.
- [11]赵毅,周秦,袁新国,等.国土空间规划引领生态产品价值的实现路径[J].城市规划学刊,2022(5):59-66.
- [12]赵毅,周秦,周文,等.生态产品开发利用适宜性评价方法及引导策略:以江苏省盐城市为例[J].规划师,2023,39(8):32-39.
- [13]张琪,罗彦,赵亮,等.“五权”治理体系构建:生态产品价值实现机制探讨[J].城市规划学刊,2022(51):267-271.
- [14]何龙斌,王海鑫.乡村产业振兴与生态产品价值实现:逻辑关系、耦合机理与协同路径[J].经济纵横,2023(11):88-94.
- [15]杨世成,吴永常.乡村生态产品价值实现:定位、困境与路径研究[J].中国国土资源经济,2022,35(11):48-55.
- [16]张林波,虞慧怡,郝超志,等.国内外生态产品价值实现的实践模式与路径[J].环境科学研究,2021,34(6):1407-1416.
- [17]叶有华,肖冰,冯宏娟,等.乡村振兴视域下的生态产品价值实现模式路径研究[J].生态环境学报,2022,31(2):421-428.
- [18]张二进.双逻辑下乡村生态产品价值实现的路径:基于 35 位乡村干部访谈文本的扎根理论研究[J].价格月刊,2024(3):1-10.
- [19]俞敏,李维明,高世楫,等.生态产品及其价值实现的理论探析[J].发展研究,2020(2):47-56.
- [20]萨缪尔森,诺德豪斯.经济学[M].北京:华夏出版社,1999.
- [21] BUCHANAN J M. Public goods in theory and practice: a note on the Minasian-Samuelson discussion[J]. Journal of Law and Economics, 1967(10): 193 -197.
- [22]埃莉诺·奥斯特罗姆.公共事物的治理之道:集体行动制度的演进[M].余逊达,陈旭东,译.上海:上海译文出版社,2012.
- [23]陈世清.经济学的形而上学[M].北京:中国时代经济出版社,2010.

- [24]张文明,张孝德.生态资源资本化:一个框架性阐述[J].改革,2019(1):10-13.
- [25]周伟,沈镭,钟帅,等.生态产品价值实现的系统边界及路径研究[J].资源与产业,2021,23(4):94-104.
- [26]陈超,赵毅,刘蕾.基于“共同缔造”理念的乡村规划建设模式研究:以溧阳市塘马村为例[J].城市规划,2020,44(11):117-126.
- [27]陈小卉,胡剑双.江苏省乡村空间治理实践:阶段、路径与模式[J].城市规划学刊,2024(1):38-45.
- [28]杨保军,陈鹏,董珂,等.生态文明背景下的国土空间规划体系构建[J].城市规划学刊,2019(4):16-23.
- [29]赵毅,陈超,许珊珊.特色田园乡村引领下的县域乡村振兴路径探析:以江苏省溧阳市为例[J].城市规划,2020,44(11):106-116.
- [30]赵毅,张飞,李瑞勤.快速城镇化地区乡村振兴路径探析:以江苏苏南地为例[J].城市规划学刊,2018(2):98-105.