Promoting the Development of Conservation Engineering Technology for Scarce Medicinal Plants to Support Yunnan in Winning the "Battle for Biodiversity"

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Abstract: The construction of ecological civilization is a fundamental plan for the sustainable development of the Chinese nation. The Chinese nation has always respected and loved nature, and the Chinese civilization that has lasted for more than 5,000 years has bred a rich ecological culture. Many concepts emphasize the unity of heaven, earth and man, and link natural ecology with human civilization, act according to the laws of nature, use resources in a timely manner and in moderation, expressing our ancestors' important understanding of dealing with the relationship between man and nature. This paper analyzes the conservation engineering technology of scarce medicinal plants from the perspective of ecological civilization construction and proposes a series of actions to protect Yunnan's biodiversity.
***Keywords*:** ecological civilization, medicinal plants, Yunnan, biodiversity, measures

1. Introduction

The prosperity of ecology means the prosperity of civilization, and the decline of ecology means the decline of civilization. This is the historical basis of our country's ecological civilization construction. Many profound lessons in history show that only by respecting the laws of nature can we effectively prevent detours in the exploitation and utilization of nature. The Hexi Corridor and the Loess Plateau were once lush with water and grass, but due to deforestation and reckless logging, the ecological environment was seriously damaged, exacerbating the economic decline at that time. Our country's environment has limited capacity, the ecological system is fragile, and the situation of heavy pollution, large losses, and high risks has not been fundamentally reversed. This is a very important content of the basic national conditions.

In recent years, China has vigorously promoted theoretical innovation, practical innovation, and institutional innovation in ecological civilization, creatively proposed a series of new concepts, new ideas, and new strategies that are rich in Chinese characteristics, reflect the spirit of the times, and lead the progress of human civilization, accelerating the promotion of the top-level design and institutional system of ecological civilization. It provides the fundamental follow-up and action guidelines for the construction of ecological civilization in our country in the new era.

China advocates promoting green development and promoting harmonious coexistence between man and nature. Over the past decade, the construction of a beautiful China has taken major steps, ecological civilization thinking has penetrated the hearts of the people, insisting on harmonious coexistence between man and nature, coordinating the management of mountains, rivers, forests, fields, lakes, grass and sand systems, and the concept of "green water and green mountains are gold and silver mountains" has become a consensus and action in the whole society. Over the years, the construction of ecological civilization has been placed in a strategic position that "relates to the fundamental plan of the sustainable development of the Chinese nation". The Yangtze River and the Yellow River have both implemented the principle of "joint protection and no major development", comprehensive implementation of the "river chief system" and "lake chief system", and instructions and instructions have been issued for many typical events. The construction of ecological civilization in our country has undergone historical, transformative, and comprehensive changes from cognition to practice. In June 2020, the National Development and Reform Commission and the Ministry of Natural Resources issued the "Overall Plan for the Protection and Restoration of Major Ecological Systems Nationwide (2021-2035)", which became the general program for promoting the protection and restoration of important ecological systems nationwide for a period of time.

The southwestern region is a concentrated area of ethnic minorities in China, and Yunnan alone is home to 25 ethnic minorities. Due to various factors such as difficult transportation development in mountainous areas and fragile ecology, the economic development of ethnic minority areas in the southwest has always been relatively backward, and a large population is still below the poverty line. Poverty alleviation has always been a key and difficult point of local work. How to protect the natural ecology while relying on the mountain and water terrain for precise poverty alleviation, economic

development, and achieving a well-off life for all is a problem that needs to be solved urgently. The establishment of the National Research Center for Conservation Engineering Technology of Scarce Medicinal Plants can target the problems of small varieties of medicinal materials and small total quantities, which grow in complex environments such as mountainous and hilly areas and are not suitable for large-scale cultivation; combining the current situation of desertification and low land efficiency per unit area, carry out technical research on artificial planting in wild-like habitats of medicinal resources and artificial supplementary planting intervention under natural conditions, establish the best techniques and models for artificial cultivation of medicinal materials, and break through the production difficulties of medicinal materials. Based on the specific or suitable growth areas of medicinal materials, targeted small-scale planting is carried out to assist local areas in creating brands of certain characteristic medicinal materials, thereby achieving the development of the local economy and the social benefits of serving agriculture, rural areas, and farmers. This will promote stability in border areas and national unity among different ethnic groups. Therefore, the construction of scarce medicinal plant conservation engineering technology research is the focus of solving poverty alleviation in ethnic minority areas and maintaining national stability.

2. Development Requirements of Conservation Engineering Technology for Scarce Medicinal Plants

The Proposal of the Communist Party of China Central Committee on Formulating the Thirteenth Five-Year Plan for Economic and Social Development explicitly points out that the "Thirteenth Five-Year Plan" period is the decisive stage for a comprehensive well-off society. To achieve the development goals of the "Thirteenth Five-Year Plan" period, it is necessary to firmly establish the development concept of innovation, coordination, green, open, and shared. Therefore, promoting the sustainable development of the traditional Chinese medicine industry, consolidating its development advantages, urgently requires the establishment of conservation engineering technology for scarce medicinal plants[2].

China is a big country with medicinal resources and has excellent technology for planting, producing, and researching traditional Chinese medicine. With the rapid development of the global health industry, the consumption of health resources is increasing. As a large country that traditionally uses medicinal resources, the rapid development of the health industry brings great pressure to China's medicinal resources. ASEAN countries have rich medicinal resources, but their technology in planting, production, etc., is relatively backward, the research level is low, and industry development is relatively lagging. How to fully utilize China's technical advantages in planting, production, and research of medicinal materials, and fully utilize the late-development advantages of ASEAN countries in the development of medicinal resources, to achieve a win-win situation of technical and resource complementarity is an urgent problem to solve.

Under the background of the national "Belt and Road" development strategy, Yunnan Province is the frontier and important gateway for China's open cooperation with ASEAN. It has a similar climate environment and is close to ASEAN's folk culture. By establishing the national conservation engineering technology research for scarce medicinal plants, attracting advanced resource management and scientific research technologies from abroad and the advanced development experience of China's eastern regions to be shared with ASEAN countries, while allowing China's advantages in planting and producing traditional Chinese medicine to enter ASEAN, a strong technical platform is provided for the protection and utilization of ASEAN medicinal resources.

Traditional Chinese medicine plays a crucial role in solving the problems of expensive and difficult medical treatment for the people. With the development and deepening of the medical system reform, the state has issued a series of policy measures in recent years to promote the development of traditional Chinese medicine. In April 2015, the General Office of the State Council issued the "Chinese Medicinal Materials Protection and Development Plan (2015-2020)", which clearly stated that traditional Chinese medicine is a strategic resource related to national economy and people's livelihood. The protection and development of traditional Chinese medicine are of great significance for deepening the reform of the medical and health system, improving people's health, developing strategic emerging industries, increasing farmers' income, and promoting ecological civilization construction.

China commonly uses nearly 600 types of traditional Chinese medicine, of which about 10% need to be imported. In the "Chinese Pharmacopoeia" (2020 edition), 165 of the 255 standard prescriptions and methods listed for Chinese patent medicines contain traditional imported medicinal materials. The input of imported medicinal materials greatly enriches China's medicinal resources and promotes the development of traditional Chinese medicine[2].

China attaches great importance to imported medicinal materials. Since 1960, departments such as the Ministry of Health have successively formulated related standards for imported medicinal materials, which have played a vital role in the supervision and management of imported medicinal materials. In recent years, China has actively promoted reform and opening up, implemented the "Belt and Road" initiative, and under the support of a series of preferential policies for border

trade, the import of medicinal materials through various channels such as small-scale border trade, border economic and technological cooperation, and border residents' mutual market trade has gradually increased. [3]However, there has not yet been a systematic survey of the types and origins of imported medicinal materials introduced by border trade in China for a long time. In order to understand the current status of imported medicinal materials at China's border ports, the Chinese Medicine Resource Center of the China Academy of Chinese Medical Sciences conducted the first market survey of imported medicinal materials at China's border ports on the basis of the fourth national survey of Chinese medicinal resources, in conjunction with many national units, in hopes of providing a reference for the scientific research and supervision of imported medicinal materials by clarifying the current market situation and understanding the origins of imported medicinal materials.

A report released by the Yunnan Provincial Department of Commerce stated: From a global perspective, the annual sales of traditional Chinese medicine and botanical medicine should be around 20 billion US dollars. However, in recent years, Yunnan's exports of ASEAN medicines have only been 100 million US dollars per year, and the vast majority are traditional Chinese medicines and Chinese medicinal materials. Therefore, the ASEAN pharmaceutical market is practically unlimited for Yunnan pharmaceutical companies.

3. Measures to Protect Biodiversity in Yunnan

3.1 Strengthen the Protection of Germplasm Resources

Focus on eight prefectures (cities) including Kunming, Dali, Baoshan, Pu'er, Honghe, Lijiang, Xishuangbanna, and Deqin, relying on state-owned forest farms, state-owned forest areas and related universities and research institutes, construct endangered wild medicinal plant resource collection and preservation gardens, carry out breeding, return, and domestication research of endangered and scarce Chinese medicinal germplasm resources, and improve the construction of medicinal plant germplasm resource banks. According to the existing laws and regulations on the protection of wildlife resources, increase the protection of wild Chinese medicinal germplasm resources to lay a foundation for the sustainable development of underforest Chinese medicinal planting and the creation of a highland for the Chinese medicinal industry[4].

3.2 Build Good Breed Breeding Bases

3.2.1 Carry Out Good Breed Selection

Actively carry out the review (recognition) of good breeds of underforest medicinal materials such as Panax Notoginseng, Gastrodia, Polygonatum sibiricum, Dendrobium (Dendrobium officinale and Dendrobium huoshanense, the same below), Polyporus umbellatus, Salvia miltiorrhiza, Paris polyphylla, Tsaoko, and Amomum villosum, to accelerate the good breed process. Encourage relevant universities and research units, operating entities to carry out good breed selection of underforest medicinal materials, carry out research and development of new varieties and fast breeding technology research, and improve the use rate of good breeds in base construction and the contribution rate of science and technology.

3.2.2 Construct Good Breed Breeding Bases

Focus on expanding and promoting the construction of good breeds of underforest medicinal materials such as Panax Notoginseng, Gastrodia, Polygonatum sibiricum, Dendrobium, Polyporus umbellatus, Salvia miltiorrhiza, Paris polyphylla, Tsaoko, and Amomum villosum. Cultivate a batch of high-quality underforest medicinal material seedling professional production and operation enterprises, ensure the supply of good breeds to the planting bases through the construction of new or upgrading existing seedling breeding bases.

3.3 Construct Underforest Medicinal Planting Base

With the county as the unit, unify the planning of base construction plots, and actively, prudently, and orderly promote the planting of underforest medicinal materials. Strictly in accordance with the "Yunnan Province Underforest Planting Forest Land Use Standards" requirements, select artificial commercial forest land, returned farmland to forest land, encourage the compound operation of forest medicine under economic forests. Strive to construct bases that are "standardized, large-scale, facility-based", production that is "green, organic", and management that is "digitalized".[5]

3.4 Construct High-standard Demonstration Base

With seven varieties such as Panax Notoginseng, Gastrodia, Polygonatum sibiricum, Dendrobium, Paris polyphylla, Tsaoko, and Amomum villosum as the focus, select to construct comprehensive demonstration bases for planting underforest medicinal materials in some key counties, and the demonstration base area is not less than 300 acres. The construction of the demonstration base strictly implements the technical procedures for underforest planting (improving quality and efficiency), highlights high standards, to guide the active, prudent, and orderly advancement of standardized, standardized planting of

each single variety, and actively apply for demonstration bases to the state and province.

3.5 Construct the Primary Processing Base at the Place of Production

With leading enterprises and professional cooperatives as the main body, accelerate the integration of primary processing machinery construction, promote the processing capacity to adapt to the demand for medicinal materials processing, form a "leading enterprise + cooperative + farmer" production mode, improve the primary processing capacity of Chinese medicinal materials such as net preparation, cutting, drying, grading, packaging, preservation, warehousing, promote the comprehensive use of Chinese medicinal resources, and ensure the quality of Chinese medicinal products.

3.6 Strengthen Forest Land Supervision and Ecological Monitoring

3.6.1 Forest Land Supervision

In accordance with the requirements of the "Yunnan Province Underforest Planting Forest Land Use Standards", the county (city, district) forestry and grassland authorities are the responsible units for forest land supervision, make full use of integrated "sky-ground" monitoring methods, monitor and manage the compliance, scope of use and intensity of use of underforest medicinal material planting land in a timely manner, and ensure the safety of forest land use. Operating entities carry out underforest medicinal planting activities according to the business scale and land use scope set in the record form or implementation plan, and the "restricted use of forest land" and "preferred use of forest land" different operating intensity requirements stipulated in the "Yunnan Province Underforest Planting Forest Land Use Standards".[6]

3.6.2 Ecological Monitoring

Formulate technical procedures for ecological monitoring of the cultivation of medicinal plants under forest, establish a third-party ecological monitoring mechanism, carry out annual ecological monitoring assessments, guide the improvement of production technical specifications, and ensure the continuous performance of ecological services in production areas. Include indicators such as land use, ecological environment, and forest growth into the monitoring and evaluation system, establish and improve the ecological monitoring indicator system. Focus primarily on key planting areas for monitoring.

Yunnan's diverse ecological environment, formed by its unique geographical location, complex and diverse landforms, and diverse climatic conditions, nurtures Yunnan's biodiversity. The various ethnic ancestors who have lived in Yunnan since ancient times, in the long-term practice of interdependence with nature, have developed ethnic cultural diversity that is highly adapted and integrated with ecological and biological diversity. It is this ethnic cultural diversity, which has a benign interaction and high integration with nature, that ensures that Yunnan, despite thousands of years of vicissitudes, remains a rare "plant kingdom", "animal kingdom", "world garden" and "ethnic cultural kingdom", making it the most beautiful province in the beautiful China. Our country has included ecological civilization construction into the "five-in-one" overall layout, integrated into economic construction, cultural construction, and social construction in all aspects and the whole process. The national ecological environment protection has undergone historical changes and achieved historical achievements, becoming a global leader in ecological civilization and sustainable development. As the most biodiverse and most beautiful province in China, Yunnan fully exploits the highly integrated advantages of "three diversities in one", becoming the vanguard of national scarce medicinal plant conservation engineering technology.

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