

# The Green & Circular Development Strategy of the Qinba Mountain Area (Phase II)

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**Abstract:** The Qinba Mountain Area is a concentrated poverty-stricken area, and it is significant in terms of ecological protection. Thus, the green and circular development of this region is critical in achieving China's goals of constructing an ecological civilization and alleviating overall poverty. This study explores a green and circular development path for the Qinba Mountain Area and provides engineering support for green and innovative development and poverty alleviation in this region. By using inductive and deductive methods, this study introduces the ecological and strategic values of the Qinba Mountain Area and analyzes the challenges of ecological protection and regional coordination in this region. It further clarifies the general strategy and positioning of the green and circular development in this region and proposes four specific paths: an ecological protection path based on national parks, an industrial development path based on transformation and optimization, a space construction path based on ecological bearing capacity, and a regional coordination path based on a win-win principle. We hope that this practice can play a demonstrative role in solving regional contradictions between ecology and poverty and in safeguarding social and ecological securities.

**Keywords:** Qinba Mountain Area; green & circular development; ecological protection; green industry; regional coordination

## 1 Introduction

In 2015, the state promulgated the *Master Plan for Ecological Civilization System Reform*, which states that the construction of an ecological civilization is a national strategy and that the path to such construction is green and circular development. The Qinba Mountain Area is an important ecological protection area and is poverty-stricken [1]. Therefore, its green and circular development is significant for the construction of an ecological civilization and for poverty alleviation in China. In 2015, the Chinese Academy of Engineering launched a consulting project called "The Green & Circular Development Strategy of the Qinba Mountains." The project focused on the prominent contradiction between the Qinba Mountains being an ecological highland and an economically depressed area. To address this contradiction, the project put forward an engineering and technical path of green and circular development [2]. The project's research results had strong repercussions and prompted national attention to the regional strategic value of the Qinba Mountains.

To further promote the "green rise" of the Qinba Mountain Area, in 2017, the Chinese Academy of Engineering launched another consulting project titled "The Green & Circular Development Strategy of the Qinba Mountains (Phase II)." This project aimed to carry out in-depth research in two dimensions, through research field and content

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extension. The project addressed many subjects such as ecology, transportation, the National Park, urban and rural areas, and industry development. The project report put forward countermeasures and suggestions in the fields of ecological protection, regional coordination, etc. The relevant research provides sufficient theoretical support for the green rise of the Qinba Mountain Area in China and lays out a basic concept for regional coordination around the Qinba Mountain Area.

Based on this project's research results, this paper analyzes the value and problems of the Qinba Mountain Area, puts forward the idea and orientation of regional green and circular development, and expounds the path of regional green and circular development from the four aspects of ecological protection, industrial development, spatial construction, and regional coordination, to provide guidance for the green and innovative development of other ecologically sensitive areas in China.

## 2 The value and problems of the Qinba Mountain Area

### 2.1 Regional value

#### 2.1.1 Ecological value

According to relevant research and calculations, in 2015, the Gross Ecosystem Product (GEP) of the Qinba Mountain Area was 594.1 billion yuan (5.38% of the national total), and the high value areas of the GEP were mainly distributed around the Qinling Mountains, the Daba Mountains, and the Funiu Mountains. The share of various ecological services provided by the Qinba Mountain Area's ecological assets is calculated based on the share of ecosystem services provided by the global ecological assets (Fig. 1). According to these calculations, the biological environment quality is the most important ecological function of the region, with a value of 357.973 billion yuan, accounting for 60.25% of the total ecological assets. Its next key function is water conservation, with a value of 85.181 billion yuan, accounting for 14.33% of the total ecological assets. Soil and water conservation functions comprise the lowest share at only 4.63%.

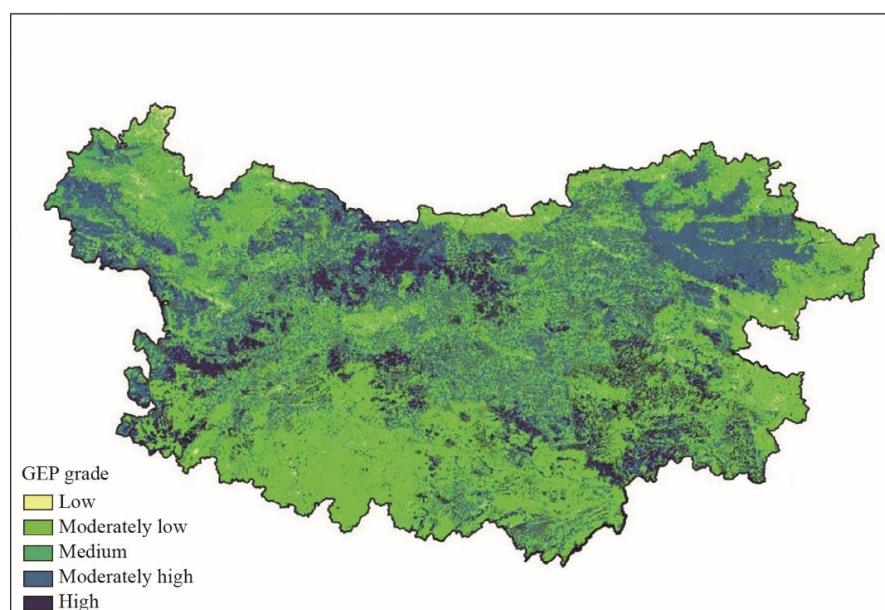


Fig. 1. Distribution of the value of ecological assets in the Qinba Mountain Area.

In the Qinba Mountain Area, the GEP output is 1 963 500 yuan/km<sup>2</sup>, 1.71 times that of the national average. The Qinba Mountain Area accounts for 3.19% of the national territory while its GDP only accounts for 2.26% of the national total. However, its GEP accounts for 5.38% of the national total. The richness of the region's ecological resources does not match its level of economic development. This is a typical trend of ecological highlands accompanied by economic depression.

#### 2.1.2 Strategic value

The Qinba City Area has the geographical advantage of “connecting the east and the west, and connecting the north and the south.” This area is key for China in demonstrating its commitment to “attach equal importance to the east and the west, open up in multiple directions, coordinate land and sea, and connect the north and the south.” The

high-tech industry cluster in the region has undertaken the important missions of forming the Belt and Road western city clusters and opening windows to the west.

(1) The Qinba City Area is important in achieving a balanced development of China's territory. There are three urban agglomerations in the east of China's densely populated areas: the Yangtze River Delta, the Pearl River Delta, and Beijing–Tianjin–Hebei. In the west of China's densely populated areas, near the Hu Huanyong Line, there should be city clusters that undertake the function of not only opening to the west but also balancing the land and space between the east and the west. Therefore, the Qinba City Area (especially the Xi'an–Chengdu–Chongqing area) has become key to constructing the balanced development of China's land and space.

(2) The Qinba City Area is the center of the #-shaped “two horizontal and three vertical” strategic patterns for regional development in China. The state requires the western region to have a city cluster that can undertake the core function of opening up to the west to exhibit the commitment to “attaching equal importance to the east and the west, opening up in many directions, coordinating land and sea, and connecting the north and the south.” The Qinba City Area is located in the central ring of the #-shaped pattern and plays an important role in the east–west transmission and the north–south coordination. The area is key for the rise and development of the central and western regions, poverty alleviation, and national security and stability.

(3) The Qinba Mountain Area is an important hub for China to realize the Belt and Road initiative's multi-directional opening. The Qinba City Area connects the Silk Road Economic Belt to the north (Xi'an and Lanzhou) and connects the Silk Road Economic Belt Gateway to Xinjiang in the west. Furthermore, it connects the central support area of the Yangtze River Economic Belt to the south (Chongqing and Wuhan); the Silk Road Bridgehead on the two seas of Kunming and Nanning through Guiyang to the south; and belongs to the Belt and Road conversion hub platform, thereby supporting the east–west opening of China.

## 2.2 Existing problems in the region

### 2.2.1 Great pressure on ecological protection

The ecological red line comprises close to 70% of the Qinba Mountain Area. The residential areas within the ecological red line require ecological migration, and all sloping lands above 25° must be converted into forests. Industrial categories such as low-output and high pollution quarrying, sand digging, primary smelting, and metal rolling in the area must be closed or moved. Due to the ecological protection requirements, the types of industrial development in the surrounding cities and towns are limited. The population has been low for a long time; the economic growth is slow; and development vitality is lacking. Achieving a reasonable balance between regional ecological protection and economic growth has become the main problem faced by the core hinterland of the Qinba Mountains. To solve this problem, there is a need to start with cooperation and mutual assistance of the surrounding areas, for the rise of a green industry in the area, and for effective ecological compensation mechanisms [3].

### 2.2.2 Difficulties in cross-administrative coordination

The Qinba City Area includes many city clusters. Restricted by the traditional administrative jurisdiction of our country, its coordinated development must be carried out in many different fields such as ecological protection, industrial transformation, and guidance for urban and rural residents. Breaking administrative barriers, formulating effective coordinated development policies around Qinba, and realizing regional co-governance and a win-win situation are the main problems hindering development. In addition, considering the region's economic volume and contact conditions, it has become important for the region's development to increase the share of the urban area around Qinba in the national functional subdivision, strengthen the core functions of the urban clusters, and enhance the strength of regional internal connection.

## 3 Guiding ideology of green and circular development in the Qinba Mountains

### 3.1 Guiding ideology

Continuing the core development orientation of “green water and green mountains are golden mountains and silver mountains” and starting with the internal and external interaction of and cooperation support for the Qinba Mountain Area, a new paradigm of green development in leading ecological areas has been explored. Through the support of green and circular development in many fields such as ecological protection, industrial transformation, and regional coordination, the Qinba Mountain Area is promoted to become a demonstration zone for national ecological protection and green and circular development, which will guide the green development of many ecologically sensitive areas in China and enable the region to undertake the strategic mission of national spatial

balance.

### 3.2 Overall positioning

Based on the natural and human resources endowment and the Qinba Mountain Area's ecological protection value and prominent position in national security and regional strategy that is guided by the national "two centenary" and "three-step" strategic development blueprint, the overall positioning of the Qinba Mountain Area could be described as a demonstration zone for the following: national ecological protection guarantee; a balanced land and space development; and green and circular development, as the hub of the Belt and Road initiative.

### 3.3 Supporting path

Given the prominent contradiction between the regional ecological protection and economic development of the Qinba Mountains, as well as its geographical characteristics, combined with a wide range of regions involving the special administrative jurisdictions in Hubei, Shaanxi, Sichuan, Henan, Gansu, Chongqing (five provinces and one city), the proposed green and circular development path for the Qinba Mountains considers four aspects: ecological protection, industrial development, spatial construction, and regional coordination. The four aspects seek a win-win situation through the construction of an ecological protection system for protected areas, based on national parks; the development of green recycling industry based on transformation and optimization; the construction of a national land space system based on ecological carrying capacity; and a regional cooperation mechanism based on a win-win cooperation.

## 4 Ecological protection system based on national parks

### 4.1 Restoration of the region's overall ecological protection pattern

Ecological protection pattern is a planning strategy based on the status quo of ecosystem services, which is of great significance for protection and development. Regional ecological nodes and ecological corridors should be established in the Qinba Mountains; the ecological chain should be effectively connected; and the overall connectivity of the region and the convergence of ecological sources should be improved. The regional ecological protection pattern of the Qinba Mountains consists of six important ecological patches, 42 key ecological nodes, 10 river corridors, and two biological corridors based on the key ecological nodes.

The scope of the ecological protection pattern is concentrated in the main mountains (Qinling, Funiu, Daba, Minshan, Micang) and river valley areas in the research area. This scope must be maintained for the future regional development of the Qinba Mountains. The construction of an ecological protection pattern based on the importance of ecosystem service functions will become the scientific basis for the planning and layout of the Qinba Mountain Regional National Park, regional ecological protection planning, and ecological civilization construction.

More than 70% of the nature reserves have been included in the scope of ecological resource areas. The distribution of ecological protection pattern constructed in this paper (Fig. 2) is highly consistent with the targets of preserving species diversity, recognizing the importance of water conservation, and ecological sensitivity adopted in the identification of ecological source areas, which reflects the reliability of the construction results.

### 4.2 Nature reserve system, and the national park as the main body

#### 4.2.1 Set up four national parks

According to the corridor analysis and construction results (indicating the appropriate ecological environment of species), the Qinling National Park and the Funiu Mountain National Park and should be added to the existing Shennongjia National Park and the Giant Panda National Park system. New natural reserves, scenic spots, and natural parks should also be added. The spatial connectivity of the corridor area should be improved. Overlapping protected areas should be integrated, and the types of protected areas should be defined. Through the integration and improvement of the nature reserve system, a new spatial distribution relationship of nature reserves in the Qinba Mountain Area can be formed. The proportion of nature reserves will be adjusted to 39.6%.

#### 4.2.2 Add five new nature reserves

(1) The management system of the Qinba Mountain Nature Reserve should be improved. The state-level nature reserve should be managed by the State Forestry and Grassland Administration (Department of Nature Reserve Management). The provincial nature reserve should be directly managed by the Provincial Forestry Department, and

the municipal and county-level nature reserves should be cancelled. (2) In areas where there are gaps in habitat and ecosystem protection, five new national or provincial nature reserves should be built: the Shaanxi Antelope Nature Reserve, the Fengxian Golden Monkey Nature Reserve, the Liumian Golden Monkey Nature Reserve, the Lueyang Forest Musk Deer Nature Reserve, and the Eyi Forest Musk Deer Nature Reserve. (3) For the natural reserves with unreasonable boundaries, such as the Niuweihe Nature Reserve and the Sangyuan Nature Reserve, boundary adjustments should be carried out to achieve more effective protection (Fig. 3). The total area of new natural reserves in the Qinba Mountain Area is estimated at about 14 400 km<sup>2</sup> and the share of the regional area at about 4.5%.

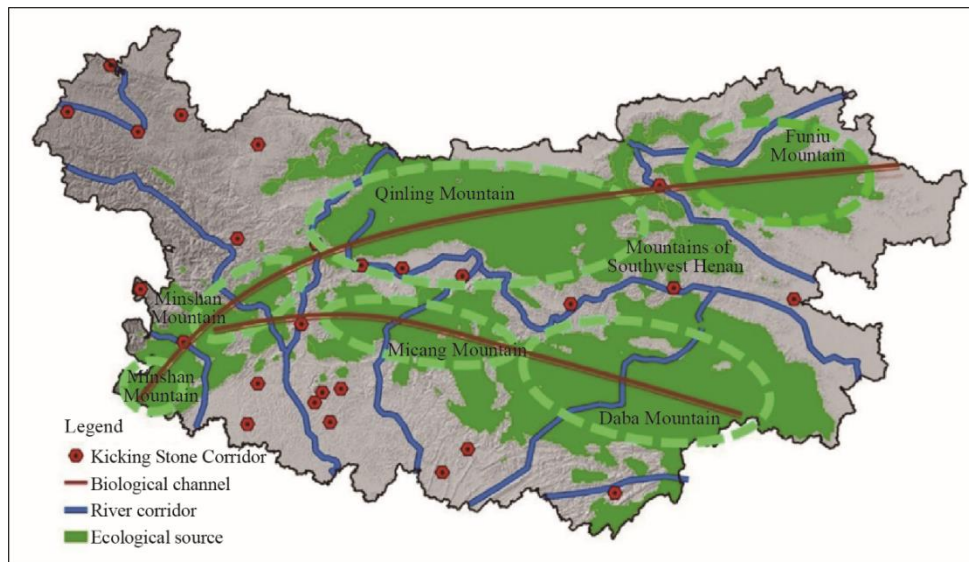


Fig. 2. Ecological protection pattern for the Qinba Mountain Area.

#### 4.2.3 Add seven new scenic spots

(1) To improve the management system of scenic spots, management should be separated. A franchise system should be established. The relationship between the protection management of scenic spots and land use and coordinated development of surrounding towns should be coordinated. The scenic spots with unreasonable protection boundaries and function divisions should be accordingly adjusted, and the scenic spots with unreasonable protection management regulations should be improved. (2) In areas where cultural and natural values are not protected, seven new scenic spots should be added: the Chongqing Ningchang Salt Industry Site, the Gansu Province Xinxu Baishuiluji Moya, the Shaanxi Ningqiang Qiang People Cemetery, the Zhangliang Temple, Chang'an Shengshou Temple, the Shangluoya Tomb, and the Donglong Mountain Site. The total area of new scenic spots in the Qinba Mountain Area would thus constitute an area of about 34 500 km<sup>2</sup>, and the share of regional area would constitute about 10.8%.

#### 4.2.4 Add seven new natural parks

(1) A management system should be established for the Qinba Mountain Natural Park. The original forest park, the Geopark, the Water Conservancy Scenic Spot, and other non-natural reserves and scenic spots should be integrated into the natural park management system. (2) In areas where there are gaps in the protection of natural resources, seven national or provincial natural parks should be added: The Shuhe Natural Park, the Xiaokouhe Natural Park, the Mumahe Natural Park, the Yudaihe Natural Park, the Yanzihe Natural Park, the Jiahe Natural Park, and the Mohe Natural Park. (3) The management system of the natural parks should be improved according to local conditions and policies; reasonably guarantee the support of personnel, funds, and projects; and provide scientific management ability to the management organization of the natural parks. The total area of new natural parks in the Qinba Mountain Area is estimated at about 48 500 km<sup>2</sup>, and the area accounts for about 15.2%.

## 5 Green and circular industry system based on transformation and optimization

### 5.1 Focus on boosting green agriculture and forestry industry

A number of demonstration zones for agricultural products with distinct characteristics, diverse types, and strong competitiveness should be established. By focusing on the eight industries that constitute the backbone of poverty

alleviation (edible fungus and medicinal fungus, vegetable, Chinese herbal medicines, forest and fruit, silkworm, animal husbandry, poor hemp, and tea), we could actively cultivate new industries such as rural leisure tourism. We can focus on the following three industries to optimize economic development.

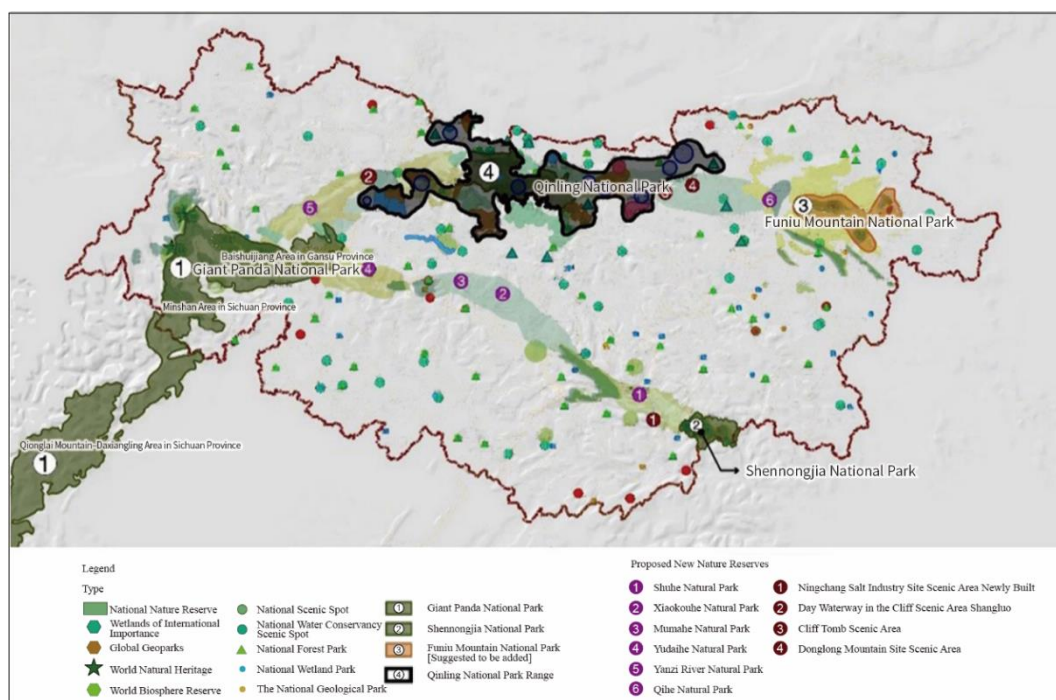


Fig. 3. Nature reserve system in the Qinba Mountain Area.

(1) Develop the characteristic forest and fruit planting and processing industry: The Qinba Mountain Area is rich in species. It has a suitable climate for the long-term cultivation of a variety of forest and fruits such as kiwifruit, chestnut, and walnut. Citrus, as an important fruit in southern Shaanxi, has become a characteristic industry of economic development and an important source of income for fruit farmers.

(2) Develop the undergrowth economy and form the modern compound agroforestry (three-dimensional planting and breeding): By relying on the rich forestry resources in the Qinba Mountain Area, we could develop special economic forests such as prickly ash, walnut, chestnut, lacquer, eucommia, Taxus, and olive [4] and reasonably arrange the special Chinese herbal medicines, edible fungi, special vegetables, rare birds, and so on in the forests. We should choose an under-forest product model suitable for regional economic development and ecological environment protection; carry out an organic combination of forest cultivation, forest use, and forest protection; help forest farmers to embark on the road to prosperity; and promote the development of regional green and circular economy and the sustainable development of the forestry industry.

(3) Develop ecotourism and leisure agriculture and forestry: The Qinba Mountain Area is rich in ecological resources. It has a unique natural environment and a strong and diverse forestry production, and therefore has unique advantages of developing an ecological agriculture. We can pay attention to the model developments such as those of ecological tea gardens, under-forest chicken, and pig–biogas–fruits model. To improve the quality and benefits of products, we should actively develop the ecological forestry and recycling mode, popularize the use of organic fertilizers, and develop organic planting and ecological breeding in the plains and suburban agricultural areas.

## 5.2 Transformation and upgrading of the traditional manufacturing and processing industries

### 5.2.1 Greatly reduce heavy chemical industry

By reducing the number of heavy chemical enterprises, the proportion of high-energy-consumption, high-pollution, and resource-dependent industries should be reduced by limiting the number of heavy chemical enterprises. (1) In view of the current situation of the small coal reserves, poor coal quality, low concentration of the coal industry, and low production efficiency in the Qinba Mountain Area, in 5–10 years, all coal mines in the area should be gradually closed, and coal production should be withdrawn completely from the area. (2) We should strictly control the development of small- and medium-sized hydropower projects in small- and medium-sized basins and protect

and maintain the basin's ecological environment and health. In addition to hydropower projects that address poverty alleviation, no new small- and medium-sized hydropower stations should be built in the region. (3) Establishment of new metal smelting and processing enterprises should be prohibited in the core hinterland of the Qinba Mountains, and existing enterprises should not be allowed to expand their production scales.

#### 5.2.2 Develop and strengthen the equipment manufacturing industry

The transformation and upgrading of the equipment manufacturing industry in the Qinba Mountain Area should focus on improving quality and efficiency by using digital, intelligent, green, and other high-tech innovative technologies to promote high-end development. (1) We should build a national aviation industry cluster and a new demonstration zone for national industrialization with leading domestic and distinct aviation themes. (2) We should cultivate and improve the automobile manufacturing industry, focus on the core and key technology research and development, and actively develop the high-end special-purpose vehicle, electric vehicle, high-end auto parts, and other related industries, with independent brands. (3) We should adjust and improve the equipment manufacturing industry and focus on the development of intelligent precision CNC machine tools, functional components, and control systems to meet the market requirements of small batch, customization, and high performance.

#### 5.2.3 Cultivate and promote the green processing industry of special products of agriculture, forestry, and animal husbandry

The Qinba Mountain Area is rich in agriculture, forestry, animal husbandry, and mineral water resources. Therefore, we should vigorously develop the special local product processing industry for agriculture, forestry, and animal husbandry, and position it as a characteristic, advantageous, and pillar industry of regional economic development. (1) To develop the woody oil industry, we should build a national woody oil seed-breeding park, a science and technology exhibition park, an oil-intensive industrial processing park, a national research center for woody oil engineering technology, and a germplasm center for woody oil in the Qinba Mountain Area. (2) We should develop the modern industry of traditional Chinese medicine; set up a research center for modern traditional Chinese medicine in the Qinba Mountains; build a national planting base for traditional Chinese medicine, a distribution center for traditional Chinese medicine, and a processing base for traditional Chinese medicines. (3) To develop the silk and linen textile and clothing industry, we should promote the "moving of Mulberry from the east to the west" and consolidate and improve the existing silk and linen production bases. (4) We should develop the drinking water industry and build a natural, healthy, and high-end production base for regional high-quality drinking water.

### 5.3 Cultivate strategic emerging and high-growth green industries

We should develop strategic emerging and high-growth industries such as new materials, new energy, biomedicine, information technology, ecological, and cultural tourism to create a new pattern of regional socioeconomic development in the Qinba Mountain Area. (1) Relying on the Guanzhong Plain urban agglomeration, we could focus on the development of new generation information technologies, high-end equipment manufacturing, new materials, and biomedical industries. By relying on the Central Plains urban agglomeration, we could focus on the development of new generation information technology, high-end equipment manufacturing, new materials, biomedicine, new energy vehicles, and digital creative industries. By relying on the Chengdu Chongqing urban agglomeration, we could focus on the development of new generation information technology, high-end equipment manufacturing, new materials, biomedicine, new energy, new energy vehicles, energy conservation and environmental protection, and digital creative industries. By relying on the Wuhan urban agglomeration, we could focus on the development of new generation information technology, equipment manufacturing, biomedicine, new energy vehicles, energy conservation and environmental protection, and digital creative industries. (2) We should build a modern service industry network in the hinterland of the Qinba Mountain Area, with Hanzhong and Ankang as the main centers; Nanyang, Mianyang, and Tianshui as the poles; and Longnan, Guangyuan, and Shangluo as the nodes. Furthermore, we should focus on the development of e-commerce, modern logistics, modern finance, science and technology services, pension health, and other industries.

## 6 Land space system based on ecological bearing capacity

### 6.1 Main function zoning

According to the strategic positioning and location characteristics of each district and county, the Qinba Mountain Area can be categorized into the following areas: strictly controlled area, development promoting area, development

optimizing area, and development relieving area (Fig. 4).

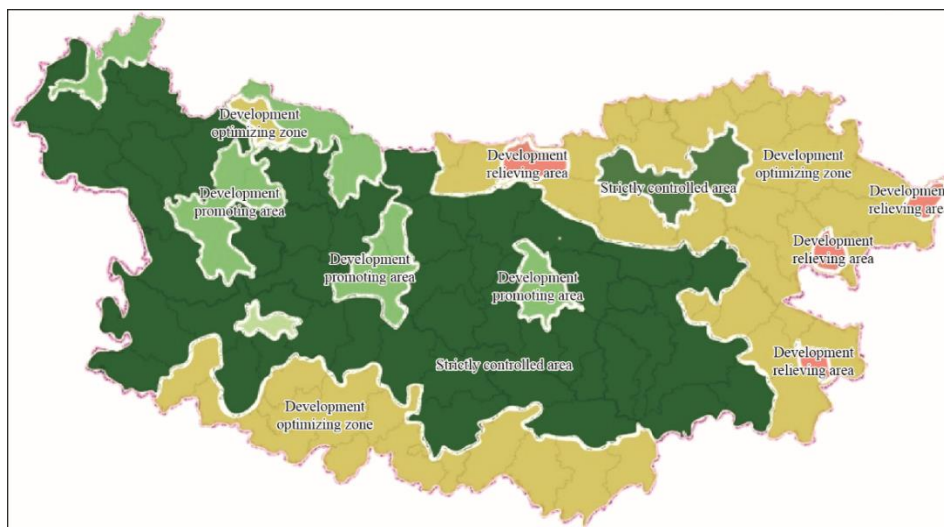


Fig. 4. Functional development zone in the Qinba Mountain Area.

(1) Strictly controlled areas have great ecological value, high ecological sensitivity, less suitable land for urban development and construction, poor transportation infrastructure, scattered population, and fragmented land use. The regional status quo should be maintained in these areas. The ecological red line should be strictly controlled, and ecological migration should be gradually implemented. (2) The ecological value and sensitivity of development promoting areas are reduced compared with those of the strictly controlled areas. Under the premise of ecological protection, we should encourage economic development, increase the proportion of secondary and tertiary industries, absorb some ecological immigrants, and increase urban construction land. (3) Development optimizing areas have well-developed economy, good traffic facilities, and higher ecological bearing capabilities. To avoid excessive expansion of urban construction land, we should reduce the emission of pollutants from industrial production and residential life and gradually establish the pillar industry by transformation from the secondary to the tertiary industry. (4) The development of development relieving areas is subordinate to the influence of the urban core area. They have large population bases, high levels of economic development, and their urban construction levels exceed the local ecological bearing capacity. Therefore, the population must be properly dispersed; urban construction and development must be reduced; green industries must be developed; and the ecological environment must be repaired.

## 6.2 Overall basin planning in urban and rural space

Taking the protection of water resources as the starting point, administrative divisions on ecological process should be amended. The green circulation unit of the river basin should be constructed; the regional landscape features should be highlighted; and the four types of spatial management and control units should be established. (1) For “full green” units, the most strict protection guidelines should be conducted. The ecological restoration should focus on improving forest coverage; carrying out soil erosion control; prohibiting the further development of urban and rural areas; and gradually moving existing villages and residential areas. (2) The “deep green” units should be strictly protected, and all kinds of development and construction that do not conform to the region’s functional orientation should be strictly prohibited. The population dispersion should be carried out in full measure, and the scales and grades of urban and rural areas should be controlled. The industries with low negative ecological impact should be considered as the main focus. The development of ecological and green industries shall be carried out within the scope of environmental carrying capacity. (3) The “medium green” units should host green and low-impact industries; carry out the development of ecological economy and related industries such as landscape agriculture and tourism within the scope of environmental carrying capacity; and intensively optimize the space. (4) The “light green” units should be treated with moderate development to ensure the strategic ecological space and the overall continuity of ecological protection as the development premise; enhance the ability of industrial and population agglomerations; and improve the level of urbanization.



### **6.3 Green living and rural revitalization**

Combined with the suitability orientation of rural space construction in mountainous areas [5], we could construct a new model of rural revitalization of “green human settlements + balance of production and residence” in the Qinba Mountain Area. (1) The original site of revitalization would mostly be the surrounding villages in the ecologically sensitive areas. In accordance with the resource conditions of the villages, the ecological background and traditional industries could be transformed, iterated, and continuously utilized to form characteristic tourism villages, supply bases for green agricultural products, and characteristic commodity origin and direct selling places. The ecological resources and human settlements could be combined to improve the necessary facilities for human settlements. (2) Villages in ecologically sensitive areas need to be relocated. The location of immigrant communities should be close to the city and industrial parks so that adequate employment options can be provided for villagers. Ideal living service facilities and beautiful living environments should be created for villagers to live and work in peace and contentment.

## **7 Regional coordination mechanism based on a win-win cooperation**

### **7.1 Formulate the guidance catalogue for the adjustment of industrial structure**

We should establish and improve the policy system of investment, finance and taxation, price, credit, land, environmental protection, and employment to support the adjustment and upgrading of regional advantageous traditional industries in the Qinba Mountain Area. We should implement the national industrial policies and regularly issue guidance on industrial orientation layout. A guiding catalogue should be formulated for the adjustment of regional industrial structure to introduce policies and measures to promote technological transformation, mergers, and reorganizations of enterprises and to guide enterprises to invest in encouraged projects while other projects are strictly controlled and eliminated. We should make good use of the national policies to eliminate overcapacity and use the supporting policies for the transformation and upgrading of resource-exhausted cities. We should create a policy synergy to support the adjustment and upgrading of advantageous traditional industries.

### **7.2 Improve the connection of internal and external infrastructure**

The modern transportation, communication, and tourism service infrastructure system of the Qinba Mountain Area and its surrounding areas should be strengthened. We should also pay attention to the improvement of the fast traffic trunk system and the construction of the slow traffic system for cultural tourism; form the internal traffic network of the Qinba Mountain Area under the guidance of the national trunk system; accelerate the construction of the external large ring road of the Qinba Mountain Area; build a fast-traffic system among the central cities and main functional units; build public service facilities and big data centers; and promote the development of cultural tourism. We should guide the working-age population in the area to participate in the construction, operation, maintenance, and management of infrastructure construction to help alleviate poverty and promote prosperity through employment.

### **7.3 Promote the construction of a financial system and mechanism to serve the green agriculture and forestry economy**

For the transformation to a green agriculture and forestry economy, the Qinba Mountain Area should deepen the construction of the financial system and mechanisms and form diversified financial products that are conducive to the development of ecological agriculture and forestry products. Financial resources such as securities, insurance, guarantees, funds, and futures should be encouraged to participate in the development planning of projects and in projects of rural and agricultural industries in the Qinba Mountain Area. Furthermore, agricultural financial institutions should be encouraged to deeply participate in the agricultural industry chain and help in the financing of agricultural production, circulation, processing, sales, and other activities; actively develop forest mortgage loans; and play the role of policy-based agricultural credit guarantee institutions. Focusing on the regional industry, tourism, ecological, and infrastructure construction projects, we can achieve a pragmatic goal between financial poverty alleviation and targeted poverty alleviation.

### **7.4 Build an intelligent, basin-based development management platform**

A regional spatial data model of the Qinba Mountain Area should be constructed according to the requirements of monitoring, assessment, and early warning system construction of the basin land spatial planning. It relies on the land and planning platform of five provinces and one city and applies modern information technologies. We shall

simulate complex urban systems, perceive urban signs, monitor urban activities, preview the construction effects, and form a planning information system for information collection, assessment, early warning, simulation, and intelligent decision-making. Thus, a unified and intelligent platform for coordinated development and management of river basins could be constructed in the Qinba Mountain Area.

## 8 Conclusion

The Qinba Mountain Area is the ecological foundation and a valuable cultural source of China. The area has outstanding ecological value. However, it faces many problems such as the pressure of ecological protection and the difficulty of poverty alleviation. Implementing a green and circular development strategy for the Qinba Mountain Area is important in that it could serve as a demonstration zone for the “new green development paradigm for ecological, leading areas” in China. Furthermore, fundamentally solving the contradiction between the need to protect the regional ecology and the demands for poverty alleviation in the Qinba Mountains will be helpful. Besides, it is an important measure to promote the region to actively adapt to the changes in the international competitive environment and the national development stage in the new era, which will play a key role in maintaining the multi-dimensional social and ecological security of the region.

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