

# Green and Circular Development Strategy for the Qinba Mountains

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**Abstract:** To promote the green and circular development of the Qinba Mountains, the Chinese Academy of Engineering launched a major advisory project in 2015 called the Study on the Green & Circular Development Strategy of the Qinba Mountains. Based on an analysis of the scope and value cognition of the Qinba Mountains, this study investigates innovative development associated with the mountains, with particular focus on the contradiction between protection and development. This study then proposes three development strategies—ecological civilization, regional coordination, and antipoverty—and offers suggestions, such as formulating special planning, setting up coordination mechanisms, and strengthening government support.

**Keywords:** Qinba Mountains; green and circular development; strategic focus; measures and suggestions

## 1 Introduction

President Xi Jinping pays high attention to the construction of key ecological functional areas, and he repeatedly stresses setting aside enough recovery space for the nature and holding the bottom line of ecological civilization. Green and circular development is an important strategy for future social and economic transformation in China, and the green and circular development of ecologically sensitive regions is a key aspect of this strategy. The Qinba Mountains are located in China's geological center, serving as the country's central reservoir as well as its ecological foundation and green lifeline. While the green and circular development of the Qinba Mountains is essential for poverty alleviation and transformational development, it also highlights important issues related to the national Belt and Road Initiative as well as the national ecological environmental system and strategic safety. Accordingly, the Chinese Academy of Engineering commissioned a major advisory project called Study on the Green & Circular Development Strategy of the Qinba Mountains. Following thor-

ough investigation and research by 24 academicians and over 300 experts, an advisory report on the green and circular development strategy for the Qinba Mountains was produced. It contains many important suggestions and countermeasures that can serve as preliminary ideas for the green development of the Qinba Mountains and other mountainous regions in China.

## 2 Overview and value cognition of the Qinba Mountains

### 2.1 Scope and definition

The Qinba Mountains region refers to the area where the Qinling and Bashan Mountains are located. It spreads across the middle of China, stretching over 1 000 km and covering about 308 634 km<sup>2</sup>, with a total population of 61.64 million (Table 1). This area includes 20 cities divided into districts from five provinces and one city such as Henan, Hubei, Sichuan, Shaanxi, Gansu, and Chongqing, and a Gannan Tibetan Autonomous

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**Table 1.** Regions and counties within the scope of the Qinba Mountains [1].

Province/ direct-controlled municipality	Prefecture-level city	District/county	Total population (million people)	Permanent resident population (million people)	Area (km <sup>2</sup> )
Shaanxi	Xi'an	4	2.94	2.78	7 828
	Baoji	3	0.47	0.46	6 722
	Weinan	3	0.79	0.75	2 232
	Shangluo	7	2.49	2.23	19 574
	Hanzhong	11	3.85	3.14	27 012
	Ankang	10	3.06	2.35	23 535
Henan	Luoyang	5	2.64	1.64	10 828
	Pingdingshan	2	1.82	0.82	3 793
	Nanyang	7	5.83	3.77	16 720
	Sanmenxia	3	1.47	0.86	8 778
Hubei	Shiyan	8	3.47	2.49	23 698
	Xiangyang	7	4.25	2.77	14 234
	Shennongjia Forestry District	—	0.08	0.06	3 253
Gansu	Longnan	9	2.81	1.34	27 838
	Tianshui	2	1.31	0.06	5 922
	Dingxi	3	1.04	0.06	7 729
	Gannan	4	0.47	0.01	15 135
Sichuan	Dazhou	5	4.32	2.04	12 515
	Bazhong	5	3.94	1.76	12 292
	Guangyuan	7	3.11	1.53	16 310
	Mianyang	4	1.70	1.15	13 198
	Nanchong	4	4.28	2.81	7 531
Chongqing	—	6	5.50	4.07	21 957
Total	—	119	61.64	40.21	308 634

Prefecture; a Shennongjia Forestry District; and 119 counties (district, county-level city).

## 2.2 Value cognition

### 2.2.1 Unique spatial location

The Qinba Mountains occupy the central part of China's landmass and serve as the natural dividing line between the southern and northern climate regions, the watershed of the Yellow and Yangtze Rivers, and the transitional belt of the eastern plain and western plateau areas. Among geologists and biologists, the Qinling Mountains, the Alps, and the Rocky Mountains are referred to as the "three sisters of the earth." The Qinba Mountains region borders the Silk Road Economic Belt in the north, the 21st Century Maritime Silk Road in the south, and the Yangtze River Economic Belt in the east. It is surrounded by major cities and towns in the Midwest China, including the Chengyu City Group, Central Shaanxi Plain City Group, City Cluster in the Middle Reaches of the Yangtze River, and Central Plains Urban Agglomeration. Thus, it boasts unique value in terms of spatial location for the mutual connection of national development strategies, such as the East-West Balanced Development, the Belt and Road Initiative, and the Yangtze River Economic Belt.

### 2.2.2 Outstanding ecological value

The Qinba Mountains region is the central reservoir, ecological green lung, and important ecological gene pool of China. Within the region, there are 235 rivers and 55 large reservoirs, with a total runoff volume of  $1.532 \times 10^{11} \text{ m}^3$ . Since the water is of good quality, it has become a water conservation area and acts as the source for the middle route of China's South-to-North Water Diversion project. The region has one world natural heritage site, one world geological park, 40 national nature reserve areas, 61 national forest parks, 12 national geological parks, 11 national wetland parks, seven national scenic areas, and five national water conservancy scenic areas. The forests here comprise 10% of all national forest area in China. Thus, it is a key carbon sink and oxygen bar. The region boasts over 6 000 species of plants and animals, including over 120 national protected animals and rare plants, such as giant pandas, crested ibis, golden monkeys, and takins. Therefore, the region has an important role in the protection of certain species.

### 2.2.3 Rich cultural resources

The Qinba Mountains contain early evidence of human life and represent the birthplace of the Chinese nation as well as the essence of Chinese civilization. The Chongqing Wushan fossil of

a non-hominin ape that inhabited the region 2.04 million years ago remains the oldest non-hominin ape relic discovered in China to date. About 17 hominid sites in Yunxian County, Longgang County, Lantian County, Luonan County, and Dali County show good continuity over time. In addition, over 20 sites and relics of Chinese ancestors are scattered throughout the region (e.g., in Huaxu, Fu-hsi, Nvwa, Shennong, Dadiwan, and Banpo), which represent many major historical cities and human settlements, and comprise the cradle of Chinese civilization. Moreover, Taoism and Buddhism developed in the region [2], which is home to the White Horse Temple, the Caotang Temple, the Louguantai Temple, the Zhongnan Mountains, the Wudang Mountains, the Mount Hua, and other holy sites. The area also saw the fusion of diverse cultures such as Han, Three Kingdoms, Chu, Qin, Bashu, Zang, and red culture. In short, the Qinba Mountains are a rich cultural resource and will be crucial for improving cultural soft power and rejuvenating Chinese civilization.

### 2.3 Existing problems

As a result of administrative jurisdiction barriers and other factors, development of the Qinba Mountains region has lagged over the years. There is a sharp contrast between the “ecological highland” and the “economic lowland.” Here, the conflict between socioeconomic development and ecological environmental protection becomes increasingly prominent.

On the one hand, a large part of the population lives in poverty, and alleviating poverty is difficult. Among China’s 11 centralized and continuous destitute areas, the Qinba Mountains region occupies the middle geological position, covering the most provinces and the largest territory, supporting the largest poverty-stricken population. At the end of 2015, there were 7.12 million poverty-stricken population in the region, accounting for 12.8% of the national population of poor people, and the poverty incidence was 11.6%, which was 2.04 times the national average. The region has 67 national-level poverty-stricken counties, comprising 11.3% of the national total poverty-stricken counties [3]. During the 13th Five-Year Plan, in the south of Shaanxi Province alone, 311 400 households will need to relocate, accounting for 1.08 million people, which is 10.8% of the total population that will move. With such large-scale, severe poverty in the region, alleviating it will be costly and difficult.

On the other hand, the ecological environment is relatively sensitive, and the risk of environmental pollution is intensifying. About two-thirds of the national territory of the Qinba Mountains region is part of a restricted development zone, or forbidden development zone, in the key ecological functional areas [4]. As China’s green lung and central reservoir, it has numerous water-resource protection areas, water conservation areas, biodiversity protection areas, nature protection areas, primitive forests, and water and soil conservation areas. As such, the cost

of ecological protection is very high. Water pollution, industrial pollution, urban waste pollution, and other risks are becoming increasingly severe. The water body is eutrophic, and there are serious problems with mine exploration, sand excavation, and water and soil loss. There are over 1 100 tailings ponds in the region, more than 700 of which are within water-resource areas. Water- and soil-loss areas cover 23% of the total territory of the region.

## 3 Rationale and objective of the green and circular development of the Qinba Mountains

### 3.1 Development thought

This research aims to do the following: focus on the five development concepts of “innovation, harmonization, green, openness, and sharing;” make ecological civilization construction the fundamental task; emphasize the research purpose of “ecological protection orientation;” tackle the problems of regional poverty alleviation and social economic development; explore the ecological development path of “blue water and green mountains are golden and silver mountains;” maintain “clean water and fresh wind;” promote ecological productivity; and support people’s livelihoods through green and circular development.

### 3.2 Development goals

#### 3.2.1 General goal

This work focuses on the general requirements for comprehensively constructing a well-to-do society, building a beautiful China, and achieving the development goals of ecological environmental protection and poverty alleviation in the Qinba Mountains region.

##### 3.2.1.1 Ecological environmental protection

From an environmental perspective, we must aim to achieve the following in the Qinba Mountains region: protect water, biological, agricultural, and forestry resources; solve the ecological problems of water and soil loss, sand excavation, and mine exploration; settle current asynchronous and uncoordinated problems of water-resource treatment in the same watershed; relocate all residents within the biological red line; guarantee that socioeconomic development falls within a biologically supportable scope; and repair the ecologically sensitive core zone by supporting the platform of national parks.

##### 3.2.1.2 Social poverty-alleviation development goals

To relieve endemic poverty, the following tasks should be accomplished: developing education in the mountainous areas; achieving regionally coordinated development inside and outside the region; achieving overall poverty-alleviation goals for the region’s seven million poor people; and promoting coordinated

and linked development inside and outside the region in the fields of transportation network construction, industrial coordinated development, and so on. Through the technical innovations of green agriculture, forestry, animal husbandry, and drug industries, as well as the exhibition of local cultural treasures, it will be possible to build a green industrial system in the Qinba Mountains region.

### 3.2.2 Goal stages

#### 3.2.2.1 Short-term goals (until 2020)

The Qinba Mountains region will achieve prosperity and build a regional ecological compensation mechanism with the support of industries such as cultural tourism, green agriculture, forestry, animal husbandry, and pharmaceuticals. The construction of the Xi'an–Wuan High-Speed Rail, Chongqing–Xi'an High-Speed Rail, Xi'an–Chengdu High-Speed Rail, and Lanzhou–Chengdu Expressway will create backbone roads and rail networks connecting the cities surrounding the Qinba Mountains, thus perfecting the urban-rural spatial system.

#### 3.2.2.2 Mid-term goals (until 2030)

The Qinba Mountains region will show obvious ecological-economic effects: all residents within the biological red line will have relocated, and the urbanization rate of the population will be maintained at around 55%. The outstanding ecological problems in the region will have been repaired and improved, the Qinba national central park system will have been built, and a pattern of safe eco-spaces will have been formed. National and provincial level I end roads will all be connected in the central region. A general aviation network will be formed around the Qinba Mountains region, and a local Internet system will be developed.

#### 3.2.2.3 Long-term goals (until 2050)

The green industrial system of the Qinba Mountains region will have been essentially constructed, and the ecological effects will be apparent everywhere. The development pattern of the core and peripheral areas of the Qinba Mountains region, featuring function dislocation, coordination, and harmonization, will have been formed. Formerly ecologically weak and sensitive areas of the core will have successfully completed comprehensive ecological restoration. The national ecological civilization demonstration area will have been achieved, becoming a prime example of green and circular development in China's mountainous areas.

### 3.3 Theoretical path

There are three aspects of the theoretical path for the green and circular development of the Qinba Mountains.

- (1) Constructing a circular network expanding across administrative regions. This will involve, first, building a development carrier for the circular economic demonstration

area; second, facilitating a feedback process for “resource–product–renewable resources;” and, third, constructing regional industrial-, agricultural-, and social-circulation systems.

- (2) Constructing a circular space operating across urban-rural regions. This will entail, first, seeking a coupling relationship between urban, town, and rural circular economic modes; second, constructing a circular economic point–axel mechanism with urban-rural integration; and, third, forming a circular economic network with urban-rural integration.
- (3) Constructing a circular economic development model crossing industrial fields. This will require, first, developing a longitudinal and closed circular economic industrial chain based on ecological effect, and, second, constructing a regionally integrated industrial chain system in the cluster area.

## 4 Focus of the green and circular development strategy for the Qinba Mountains

### 4.1 Ecological civilization strategy

#### 4.1.1 Thoughts on strategy

This strategy aims to fully employ the region's ecological resources to utilize the integrated development of modern industrial and network information technology (Internet Plus), set ecological civilization construction as the fundamental goal, use ecological economic development for support, and coordinate the construction of a key ecological functional area in the region.

#### 4.1.2 Strategy goals

Creating a central ecological functional area in the Qinba Mountains will further guarantee water quality and safety for several important waterways, including the middle route of the South-to-North Water Diversion Project, the Yangtze River, the Yellow River, and the Huaihe River. It will also protect the regional ecological safe pattern and biological diversity, which will facilitate regional ecological economic development and make it the new model for national ecological civilization construction.

#### 4.1.3 Strategy focus

##### 4.1.3.1 Construct a Qinba protected-area system and build a national central park

Given the region's outstanding ecological strategic position and its huge international tourism potential, ecological protection should be held to international standards. This will initiate high-level ecological protection and promote building the Qinba protected-area system. Based on the ecological red line, this system will be the strictest ecological protection system in China. Built jointly by five provinces and one city through coordina-

tion between the central government and the provinces, it will strengthen the protection of ecological resources and repair the ecological environment. Adopting the standard of the International Union for Conservation of Nature (IUCN), the Qinba protected-area system will have three levels. Level I is national level. Different national parks in the Qinba Mountains will be built through the integration of national lands such as scenic zones, nature protection areas, forest parks, and geological parks. Level II is regional level and includes provincial nature protection areas, forest parks, geological parks, and wetland parks. Level III covers municipal and county nature protection areas, forest parks, and wetland parks. This will expedite the process of formulating restrictions and protection measures for the different protection grades. Then, they will be jointly executed in the five provinces and one city, thereby practically and effectively protecting key ecological resources in the protection area.

The key component is the national central park system with the scenic zone as the support. It will lean on existing cultural tourism resources and form a national central park system consisting of various scenic zones. Existing scenic zones with sound resources and strong cultural caches will be preferentially selected, such as world heritage sites, world geopark, national nature reserves, and national scenic spots. These will form a national central park system with 15 scenic zones (Shennongjia, Mount Hua, Zhongnan Mountains, Mount Taibai, Wudang Mountains, Guangwu Mountains, Funiu Mountains, Little Three Gorges, Mount Maiji, Baima-Wanglang, Baishuijiang, Jianmen Shu Road, Foping, Baotianman, and Ancient Longzhong). With the construction ethos of “protection first, cultivation focus, district linkage, and category guidance,” this development is divided into three categories—nature, culture, and cultural landscape—all of which contribute to forming the brand of the Qinba national central park and improving the international image of the Qinba Mountains region.

To attract tourists, five themed routes to sites of interest will be constructed, covering prehistoric relics, religious culture, regional folk customs, natural landscapes, and biological resources. The initial focus will be on constructing the following important projects: the Qinling Mountains Museum, the Qinba International Forum, a Bicycle Race circling the Qinba, a Self-driving Travel Camper for the Qinba, and a Qinba Circular Tour.

#### 4.1.3.2 Promote basin linkage and build a water-resource monitoring system in the Qinba

To shift from administrative division management to overall basin management, it will be necessary to break the administrative jurisdiction boundaries of the five provinces and one city and construct a water-resource monitoring system across administrative divisions. This will allow for real-time monitoring of the water quality of key basins in the Danjiangkou Reservoir

and other main streams and their tributaries. This will guarantee water-quality safety in the water-resource protected zone of the middle route of the South-to-North Water Diversion Project.

The tasks to be achieved include the following: integrating the monitoring stations of the water conservancy environment; reasonably arranging the monitoring sections of the Hanjiang River upstream of the Danjiangkou Reservoir; comprehensively optimizing and screening the factors of section proximity and repeatability; and determining the monitoring section layout in space with representativeness, operability, and historical continuity. Autonomous monitoring stations for water quality can be built on the basis of the 49 current monitoring sections and two autonomous monitoring stations. To compensate for any defects in monitoring quality and frequency, stations can be established at strategic sections within the reservoir, the main tributary of the Hanjiang River, the reservoir entrances of tributaries with serious pollution, and other tributaries with large pollution risks. This requires establishing a cross-regional water-quality management agency to oversee the improvement of the timeliness and accuracy of water-quality monitoring.

#### 4.1.3.3 Guide industrial transformation and hasten support for ecological economy

The Qinba Mountains region possesses specific traditional resource-development enterprises. This study suggests the following: adopting policies guided by green production transformation, encouraging industrial and mining enterprises to adopt green energy-saving and environmental-protection technologies, formulating an elimination mechanism for pollution industries, and closing and transfer schemes for mines in ecologically sensitive areas.

Continuous environmental protection ensures the protection of productivity, and improving the ecological environment drives productivity development. Cultural tourism, health industry, scientific research and development industries, and ecological economic trades should be fostered to build a green industrial system. The central government and provinces should strengthen subsidies for green agriculture and forestry in the following ways: promote public entrepreneurship and innovation; encourage returnees to the countryside and people in the villages to innovate with a focus on leisure agriculture and forestry; and process agricultural and forestry products, rural tourism, and the rural service industry. The government should also combine agricultural reforms with Internet Plus, encourage peasant households to process green agricultural and forestry products, create the geological landmark of “Qinba green food,” and export green agricultural and forestry products. This will increase peasants’ income and thus alleviate poverty while also promoting green practices. Based on current circular industry development, green circular industry demonstration parks should be constructed following green principles, thereby achieving the innovative development of the circular economy.

#### 4.1.3.4 Reduce population density and construct green urban-rural spatial patterns

The Qinba Mountains region has the largest population among China's ecological diversity function areas. This can easily produce conflicts between the needs of the people and the land. Reducing population density and guaranteeing reasonable ecological bearing capacity through population emigration are fundamental to solving this issue and avoiding conflicts between ecological protection and construction development. It is suggested that the nonresident population of 20 million be resettled in the surrounding cities through household registration reform in 5–10 years. The outward movement of the resident population of 3 million–5 million can be led through movement policies, and the population scale should be controlled within the reasonable ecological bearing scope of 90 people per square kilometer. Meanwhile, this study recommends dividing population evacuation areas and population restriction areas; adopting ecological compensation, immigrant movement, urbanization, and other ways to control and adjust populations; and conducting reasonable spatial transfers and outward movement.

Following the planning and layout requirements of the key ecological functional areas in China, the planning and construction of cities, towns, and villages should be coordinated; development and control spaces, scales, and standards should be strictly controlled; and the emission of pollutants should be strictly controlled. The construction of low-carbon cities and “multiple planning integration” pilot work should be hastened and ecologically sensitive protection areas and agricultural production places should be protected. The following steps are also recommended: combining the topographic features of the Qinba Mountains region, increasing the pace of the green and characteristic development of urban villages, creating urban village landscapes and spatial patterns based on the characteristics of the region, accelerating green energy replacement in the region's urban villages, and stimulating the promotion of green energies in the region such as biomass and solar energy.

#### 4.1.3.5 Innovate guarantee systems and promote compensation mechanisms for ecological marketization

This study suggests the following: creating an ecological assessment and evaluation mechanism for the Qinba Mountains region; coordinating optimized, restricted, and forbidden development areas; executing differentiated performance assessment policies and index systems; coordinating policy environments for economic development and ecological optimization; and assessing the formulation and implementation of relevant policies such as green development, circular development, and low-carbon development.

The current simple ecological compensation mechanism of financial transfer and payment should be dismantled, and an ecological resource mechanism for paid usage should be promoted. Further, there should be a consolidation of diversified

compensation systems between ecological resource output areas and supply areas for point-to-point industrial support, technical support, and talent support. Moreover, this study recommends formulating policies, regulations, and standards for ecological compensation of the Danjiangkou Reservoir and the upstream region based on a national ecological compensation mechanism. There is a need for further clarification of the basic principles, major fields, compensation scope, compensation targets, capital resources, and compensation standards for ecological compensation. It is also necessary to perfect the allocation and usage assessment methods for ecological compensation capital and the reasonable distribution of payments for key national ecological function areas. Other recommendations include building a market platform for carbon emission permit trading in the Qinba Mountains region, hastening the reform of tax expenses for the resource environment, promoting a water-quality-based price system (good price for good water quality), and launching marketization strategies for a water-quality-based compensation system (poor price for poor water quality).

## 4.2 Regional coordination strategy

Against the background of the Belt and Road Initiative, the middle “#”-shaped area supported by the four city groups of Chengyu, the Central Shaanxi Plain, the Central Plains, and Wuhan will become crucial for realizing westward opening and land-sea coordination in China. This area surrounds the Qinba Mountains. Thus, regardless of macro-strategy guidance trends or the overflow needs of the central region, the coordinated development of the surrounding urban areas is unavoidable. The Qinba Mountains region is dependent on the surrounding cities to resolve the conflict between ecological protection and poverty alleviation. Based on the above analysis, this study focuses on the coordinated development of the area surrounding the Qinba Mountains and the cities in the central region.

### 4.2.1 Thoughts on strategy

Protecting and developing the Qinba Mountains region depends on developing the surrounding urban area to realize outward population movement and economic development. This study recommends the following: analyzing labor divisions and defining the core and peripheral areas of the Qinba Mountains region; prioritizing green-core ecological protection, promoting the regionally coordinated development of peripheral areas, making greater efforts to protect the ecology of the internal mountainous areas, and hastening poverty alleviation in the internal mountainous areas; changing the simple and unequal relationship for outputting ecological resources from the mountainous bottomlands to the peripheral highlands, improving transportation between mountainous and peripheral areas, and forming an effective regionally linked coordinated development pattern.

#### 4.2.2 Strategy goals

The strategy goals include the following: building coordinated development patterns for internal and external communication in the Qinba Mountains region, realizing the driving and supporting effect of peripheral urban areas on internal mountainous areas, connecting roads and infrastructure between peripheral urban areas and internal mountainous areas, bringing the environmentally friendly functions of the peripheral urban areas to the internal mountainous areas, and forming a green-core spatial characteristic mode.

Additional goals are as follows: developing the core area of the Qinba Mountains into a place of national importance for ecological safety and a central ecological main function demonstration area; making the peripheral area the transformation platform for the Belt and Road Initiative and the middle pillar for supporting eastward and westward opening; creating a pan-Qinba Mountains region (core and peripheral areas) as China's ecological civilization demonstration area with ecological productivity as the driving force; and realizing win-win development through regional coordination.

#### 4.2.3 Coordination path

##### 4.2.3.1 Step-based coordination

The first step is constructing the Chengyu–Central Shaanxi Plain core supporting area, which connects with Urumchi (Land Silk Road) and Kunming (Maritime Silk Road) to form The Belt and Road transformation platform and develop the leading hub region for westward development. The second step is strengthening the coordinated development of Wuhan–Zhengzhou and forming a “double longitudinal” pattern of Chengyu–Central Shaanxi Plain and Wuhan–Zhengzhou. The third step is intensifying the horizontal connection of the Chengyu–Central Shaanxi Plain city aggregation areas and the Wuhan–Zhengzhou city aggregation areas, realizing the coordinated development of the peripheral urban area and implementing national spatial development strategies.

##### 4.2.3.2 Layer-based coordination

On the one hand, the relationship between the internal ecologically sensitive area and external urban area should be coordinated with a focus on handling protection–development, front area–central region, and relieving–bearing relationships. The ecological pressure on the core area can be relieved through peripheral expansion and ecological protection in the core area. With the ecological conservation of the core area, an ecological guarantee should be provided along with a leisure backyard garden for the peripheral area. The expansion area will serve as the economic focus of the Midwest region and bear the key economic functions at the national level. The core area will serve as the important ecological screen and bear the important ecological functions at the national level. The peripheral area is the important bearing

place for population evacuation and industrial outward movement of the green core area. On the other hand, there should be internal relationship coordination. The area along the Hanjiang River can receive an appropriate amount of development, but other areas are mainly focused on restricted or forbidden development. In terms of ecological repair, basin treatment, and tourism development, cooperation should be pursued to create a Qinba ecological core with a blue sky, clean water, green mountains, and fresh air.

#### 4.2.4 Strategy focus

##### 4.2.4.1 Establish a coordination mechanism for ecological protection

The strategy focus includes the following: breaking administrative barrier restrictions and combining the five provinces and one city to develop ecological protection, integrating the water quality monitoring outlets of provinces and the city, building water-quality monitoring outlet systems with regional linkage, and providing support through a water-pollution joint warning scheme. Other strategies include strictly following ecological protection and restricted development requirements of the Qinba ecological protected area, achieving regional consensus on the important ecologically sensitive and protected areas of the region, and establishing a unified ecological protection management mechanism among the five provinces and one city. Further strategies include forming an ecological protection mechanism for the Jialing River basin, the Hanjiang River basin, and other river basins; guaranteeing upstream and downstream ecological protection; breaking administrative boundaries; jointly protecting natural forest regions, water sources, nature protection areas, and other ecologically sensitive areas; developing cross-regional ecological protection treatment areas; and building a Qinba national central park.

##### 4.2.4.2 Coordinate internal and external industrial functions

Based on the internal and external development of the urban circle surrounding the Qinba, this study recommends reasonably dividing internal and external industrial functions, consolidating communication between surrounding cities and the central Qinba Mountains region, changing the single-direction biological resource output into multidirectional functional coordination, encouraging resource-consuming urban enterprises in the central Qinba Mountains region and high-pollution enterprises to move to peripheral industrial parks, and achieving green circular transformation. This study also suggests intensifying military–civilian integration; strengthening the role of scientific R&D and the Internet in peripheral cities to optimize the industrial structure of internal and external regions; and coordinating the development, transfer, and diffusion of electronic information, biological industry, education, and training in peripheral Qinba cities. Other suggestions include establishing a unified brand for the agricultural and forestry industries of the region, promoting the development

of green agricultural and forestry industries, and facilitating the development of tourism and ecological city construction.

#### 4.2.4.3 Build a connected infrastructure

The strategy focus includes strengthening the connected infrastructure systems of the urban areas surrounding the Qinba, including modern transportation, communication, and tourism services. In terms of transportation, the focus should be on perfecting the rapid-transit trunk-line system (high-speed rail, expressway, and general aviation), establishing a cultural and tourism-related slow-traffic system, and forming an internal traffic network for the Qinba led by the national trunk-line system. The strategy should also accelerate the construction of the Qinba's external ring, construct a rapid-transit system between all central cities and main functional units, promote the construction of public services and big data centers, and accelerate the development of cultural tourism. The labor population should receive guidance at the appropriate age regarding the construction, operation, maintenance, and management of infrastructure to alleviate poverty through employment.

#### 4.2.4.4 Establish an urban-rural spatial system with internal and external coordination

The central region of the Qinba Mountains should focus on constructing a key ecological functional area. Based on the current situation, the necessary transportation trunk lines and network systems should be perfected, urban-rural development areas with scattered areas of large dispersion and small concentration should be controlled, and the current urban-rural spatial system should be handled. The strategy focus includes forming a bead-string and ring-type spatial belt with large and medium cities alternating with green ecological areas in the peripheral area of the Qinba Mountains region. The external ring and green core will jointly form a new urbanized urban-rural spatial structural system led by ecological civilization construction. The bearing capacities of the surrounding large cities should be strengthened for the evacuation and outward movement of people in the central Qinba Mountains region, and the driving force of the urban cities of the peripheral areas should be intensified for the central region. By establishing special spatial and industrial structure systems, a core area that drives the rise and development of the Midwest China can be formed, and three new lines with homeland security significance should be constructed.

With Mount Hua, the Wudang Mountains, Mount Taibai, the Zhongnan Mountains, Shennongjia, Guangwu Mountains, and other characteristic natural and cultural tourism resources forming the core, a national central park should be constructed, which will drive cultural tourism in the Qinba Mountains region and its peripheral urban areas. This study also recommends encouraging the cross-regional joint application of cultural heritage and natural heritage, and stimulating the cross-regional joint

protection and development of the cultural areas of the Three Kingdoms and Jialing River basin. Relying on the peripheral ring of the Qinba, this study recommends constructing a tourism circle surrounding the Qinba, building a Qinling Mountains Museum and Forum, and holding large Qinba events with the five provinces and one city. Also recommended is the construction of three Qinba internal tourism service centers at Hanzhong, Shiyan, and Dazhou, as well as the building of a middle Qinba ecological tourism module, a southern Chengyu tourism module, a western Shaanxi–Gansu–Sichuan tourism module, and an eastern Henan–Hubei tourism module. Other recommendations include forming five linked tourism belts, including a Hubei–Henan religious and ecological cultural tourism belt, a Shaanxi–Sichuan cultural tourism belt of the Three Kingdoms and Shu-Han, a Gansu–Sichuan historic cultural ecological tourism belt, a Henan–Shaanxi–Gansu Hanjiang River basin ecological tourism belt, and a Shaanxi–Hubei historic ecological cultural tourism belt.

### 4.3 Overall poverty alleviation strategy

#### 4.3.1 Thoughts on strategy

Regarding poverty alleviation, this study recommends the following: seeking poverty alleviation through green and circular development; alleviating poverty through industry, education, movement, and compensation; building an ecological poverty alleviation roadmap for people in the Qinba Mountains region; and providing experience and reference for poverty alleviation in other centralized and ecologically sensitive areas in China.

#### 4.3.2 Strategy goals

The goal is to alleviate poverty for all 7.12 million poor people in the Qinba Mountains region and improve their living conditions by 2020.

#### 4.3.3 Strategy focus

##### 4.3.3.1 Drive employment for poor people in the region by developing green industries

Due to restrictions on infrastructure and ecological protection, the Qinba Mountains region has lagged behind in industry development, leading to insufficient regional employment and significant poverty. Therefore, developing a green and circular industrial system integrated with the regional ecological environment is the most important path for resolving poverty. The green industrial system of the Qinba Mountains should focus on green agriculture, forestry, animal husbandry, and drug industries; cultivate cultural tourism; support education, scientific research, headquarters economy, e-businesses, and other tertiary industries; and conduct an overall green transformation for existing traditional industries and mining industries. Meanwhile, existing military-civilian industries in the mountainous region should be combined, and military-civilian integrated development should

be undertaken. Other strategies include relying on Internet Plus, expanding Taobao rurally, guiding agricultural products to obtain more marketing channels, and enriching the green industrial basis.

The population of the deep mountainous areas primarily depends on agriculture for income. This study identified the following focus areas: applying Internet Plus in the agricultural field, offering more sales space for agricultural products for peasants in areas with restricted transportation, and increasing their income since populations in town-development areas mainly have employment for their income. Other focus areas include cultivating tertiary industries in cities and small towns, reforming green production technologies in mining and other industries, sustainably increasing local economies, providing more employment space for regional populations, and guaranteeing stable employment. For areas with tourism potential, locals should be encouraged to focus on cultural tourism development.

#### 4.3.3.2 Solve poverty by optimizing education

Education is the fundamental method for alleviating regional poverty. The Qinba Mountains region has a large population. We should first educate them and then alleviate their poverty. Steps include learning from global experience to develop vocational education and equalize basic education resources, introducing higher education institutions, and achieving a cluster effect of education and scientific research. Referring to cases in Switzerland and South Korea, this study suggests promoting two primary strategies: a vocational education system in the mountainous areas and a job-rotation system for basic education resources.

Vocational education system in the mountainous areas: this involves combining large- and medium-sized enterprises in the central region, adopting an “apprentice-type” vocational education mode, encouraging large- and medium-sized enterprises in the central region and vocational institutions in the mountainous areas to jointly conduct vocational education, and conducting parallel pilot work for junior-senior high school education and vocational education. The system should also add relevant vocational courses to the junior-senior high school system, gradually increasing the proportion of courses to 40%. Given the special circumstances of mountainous areas, this study proposes providing vocational education in equipment manufacturing, pharmaceutical manufacturing, agricultural product processing, modern agriculture, and rural finance.

Job-rotation system for basic education resources: first, retired teachers should go to the mountainous areas to support education. Suggestions include encouraging retired teachers in large- and medium-sized cities surrounding the Qinba Mountains to support education in the mountainous area and hold posts there as well as creating a job-rotation plan for urban and rural teachers. Second, Medium- and small-sized cities in the central Qinba Mountains region should implement a three-year job-rotation

system for urban and rural teachers, include mountainous areas in the range of the school district in the central region, and implement a regular job-rotation system in one school district.

#### 4.3.3.3 Jointly settle poverty problems inside and outside the region through immigrant movement

This study recommends combining the ecological protected area system in the Qinba Mountains region and dividing the ecologically sensitive areas requiring movement in the mountains area, along with helping poor people in the region to move. Internal and external types should be categorized. Poor people should receive guidance for solving housing problems, and employment channels should be created. Based on the bearing capacities of the population-steady and population-concentration areas of the Hanjiang River Valley, Danjiang River Valley, Hui-cheng Basin, and Southern Foot of Bashan Mountains, as well as cases of urbanized development in other parts of the world, the resident population of the Qinba Mountains region should decrease to over 30 million, and 3 million–5 million people should move outside the region, thus gradually reducing population density and guaranteeing that the population density of the core area will be maintained at 90 people per square kilometer. Thus, a vigorous reconstruction of urban-rural housing in the Qinba Mountains region is recommended, along with the formation of a reasonable urban-rural layout system based on ecological bearing capacity.

#### 4.3.3.4 Alleviate poverty in some ecologically sensitive areas through an ecological compensation mechanism

This study recommends further improvements to water-resource compensation mechanisms in the ecologically sensitive areas of the upstream of Danjiang Reservoir, the water conservation area of the Hanjiang River, and the water conservation area of Jialing River, among others. A poverty alleviation mechanism should connect the water-resource supply area and water-conservation area. This study also recommends hastening the ecological resource compensation mechanism for ecologically sensitive areas of forests, grasslands, agricultural land protection areas, water and soil conservation areas, biodiversity protection areas, and so forth.

## 5 Guarantee measures for the green and circular development of the Qinba Mountains

### 5.1 Formulate and implement a relevant series of plans

This study suggests formulating an overall strategic plan for the green development of the Qinba Mountains region along with corresponding industrial, facility, transportation, urban-rural, and main function area plans centered on green and circular development. It also recommends researching development content within the scope of the Qinba Mountains. All special

plans should be approved by the relevant national departments and be jointly executed and implemented by the governments of the five provinces and one city.

## 5.2 Establish a sound regional coordination mechanism

This study recommends establishing a comprehensive coordination group for constructing the national ecological primary function area, alleviating poverty, and promoting development in the Qinba Mountains region, along with the relevant departments, provinces, and cities. This study also suggests promoting the coordinated development of the Qinba Mountains region; strengthening a top-level design and system layout; and formulating a unified green assessment system, an ecological warning scheme, a tourism service network, and other collaborative schemes for the five provinces and one city.

This study recommends establishing a management center of the Qinba national central park and big data center of the Qinba national central park, directly administered by national ministries and commissions. The members of the center would be relevant department personnel from the five provinces and one city.

It also recommends integrating resources within the region, encouraging joint application for World Natural and Cultural Heritage status, crossing administrative boundaries, and improving the overall popularity of the region throughout the world.

This study recommends creating a Qinba Forum, a regional collaborative development promotion platform. Using the method of “joint sponsorship and rotation undertaking,” the Forum should be held every two years, coordinated by the five provinces and one city. Domestic and international think tanks, experts, scholars, and enterprises should be invited to participate, thus strengthening research on the Qinba Mountains region as well as its green and circular development.

This study recommends the speedy formation of a “Qinba Convention” to obtain cross-regional consensus on ecological protection, infrastructure construction, industry linkage, and oth-

er problems faced by the five provinces and one city. It will also encourage the surrounding urban areas to enter the implementation stage of collaborative construction.

## 5.3 Intensify policy support at various levels

This study suggests that at the national level, the focus should be on intensifying the policy inclination of the ecological resource compensation mechanism and policy support for green agriculture, forestry, animal husbandry, and drug industries. Led by the National Development and Reform Commission (NDRC) of China with support from relevant departments, a preferential price system for good water quality and a water-quality-based compensation system should be developed jointly by the five provinces and one city.

It is suggested that at the level of the five provinces and one city, intensive support should be provided for the Qinba Mountains region in terms of finance, revenue, transfer payment, and poverty relief and development. In cooperation with Shaanxi, Sichuan, Chongqing, Gansu, Hubei, and Henan, a foundation should be established to support the development of green ecological industries in the Qinba Mountains region.

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