

Project Title

More Than a Buffer Zone: Planning of the Protection and Development Belt around Wuyishan National Park

Project Statement

Wuyishan National Park is situated on the border between Fujian and Jiangxi, China. In recent years, issues of ecological protection, value demonstration, eco-industrial development, community well-being, and regional management have begun to emerge between the national park and surrounding areas. The Protection and Development Belt around Wuyishan National Park is China's first protection and development belt around a national park. The project site is the Jiangxi section of the belt, covering the area of Yanshan County, which encompasses the northern part of the national park and surrounding areas.

The plan breaks with the traditional island approach of buffer zone and proposes the planning concept of "More than a buffer zone" from the social-ecological perspective to realize the joint sustainable development of the national park and surrounding areas. We propose three planning strategies: multi-objective integration in three-level zones to guide regional sustainable development; internal and external linkage for differentiated protection and utilization; internal and external co-management at multiple levels. These strategies will ultimately lead to the shared prosperity for the national park and surrounding areas, and the common achievement both of ecological protection and human well-being.

Project Narrative and Contents

Site Introduction

Wuyishan National Park is one of the first national parks (NP) in China and a World Cultural and Natural Heritage Site. It boasts the best-preserved subtropical forest ecosystems and a rich gene pool of species in the same latitude zone of the world. Additionally, it is the birthplace of the world's oolong and black teas, as well as

the birthplace of Zhu Zi's Neo-Confucianism.

The project is situated in the Jiangxi area of the Protection and Development Belt around Wuyishan National Park, covering an area of 2,178 square kilometers in Yanshan County, encompassing the northern part of the NP and surrounding areas.

Problems and Challenges

1 Regional Habitat Fragmentation

Wuyishan National Park is situated within a region characterized by a high population density and a high level of human activity, with a trend of landscape fragmentation. The conservation of biodiversity and natural heritage integrity in the NP has faced significant challenges.

2 Insufficient Demonstration of National Park Values

The NP offers a limited capacity of recreation and interpretive education opportunities, while the similar resources of surrounding areas are not effectively demonstrated.

3 Low Diversification of Regional Eco-Industrial Development

The site is dominated by the upstream production of the tea, bamboo, and agricultural industries. The resource advantages of the NP have not yet been transformed into the brand advantages of surrounding areas, and the regional green economy is not sufficiently developed.

4 Low Level of Community Well-being

The NP's protection requirements have resulted in strict limitations on community production and living activities within the project site. There are deficiencies in public services and support facilities.

5 Vacancies in Regional Coordination Management Mechanisms

Multi-level relationships of management coordination are involved between the NP and surrounding areas, where the efficient mechanisms are not yet established: the relationships between NP and provincial management agency, between NP and surrounding municipal and county governments, and between NP and local villages and towns.

Techniques and Methods

1 Planning framework of regional symbiosis of national park and surrounding areas

Traditionally, protected areas were thought of as islands, with the surrounding areas acting as pressure sources. The creation of buffer zones is seen as a means of regulating surrounding resource-use activities and mitigating the impact of development. In recent years, there has been a gradual increase in the recognition of protected areas and their surrounding area as a whole, but there has been less comprehensive practice.

The plan changes the past perception of park-surrounding area relationship as a "one-way restriction". From the social-ecological perspective, a new type of park-surrounding area relationship is created, with the concept of "more than a buffer zone", i.e., the protection and restoration of the surrounding areas will promote the conservation of ecosystem integrity in NP; at the same time, quality resources and brand value of NP will promote the green transformation of industries in surrounding areas. The ultimate goal is to achieve regional symbiosis of the NP and surrounding areas.

2 Approach to analyzing internal and external linkage of protection and development needs

Applying multidisciplinary theories and methods, the plan innovatively constructs a multilevel analysis framework for protection and development needs that connects the NP and surrounding areas. This includes regional supplementation of the habitats and ecological corridors for NP, regional expansion of the carrying capacity of NP value demonstration, as well as lengthening of the industrial chain throughout NP and surrounding areas.

3 Approach to zoning and land use layout based on multi-objective coordination

Applying multi-objective spatial optimization tool, the plan constructs the zoning and land use layout of the belt. First, the four objectives of ecological protection, recreational interpretation, industrial development, and service support are determined. Then, the land type and cost to realize each objective are determined according to the objective compatibility relationship. Finally, a solution that

maximizes the comprehensive benefits is outputted in the context of biodiversity conservation through model calculations, which are based on the results of the analysis of protection and development needs.

4 Multifaceted collection of stakeholders' demands

We have engaged in ongoing communication with the stakeholders involved in the sites. This has involved a detailed examination of their participation, difficulties, and demands. This process has helped us to identify the current management problems and stakeholder relations, and to develop an improved management mode.

Key Points of Planning (Strategies)

1 Comprehensive planning: Multi-objective integration in three-level zones to guide regional sustainable development

The results of the multi-objective coordination analysis informed the overall layout of the belt. The core protection zone, joint protection zone, and integrative development zone of the NP are delineated based on the principle that the intensity of protection is gradually weakened from the interior of the park to surrounding areas, while the intensity of development and utilization is gradually strengthened. The proportion is 13%, 38% and 49% respectively. The three-levels zones guide the overall protection and development direction of the region.

Four compatible land use types are further planned: conservation, eco-tourism, eco-agriculture and multi utilization, which correspond to the conservation sub-target itself, the integration of conservation and tourism, the integration of conservation and agriculture, and the integration of both utilization sub-targets. The proportion is 41%, 16%, 11% and 32% respectively. The plan significantly contributes to conservation, with the area for conservation sub-target increasing by 22%; and the area of enhanced conservation with compatible utilization targets increasing by 27%.

2 Specialized planning: Internal and external linkages for differentiated protection and utilization

In the ecological protection section: the NP serves as the ecological source for ecosystem authenticity protection. In the joint protection zone, OECMs, stepping stones and biological corridors are planned. In the integrative development zone, a green space system in towns and cities is established.

In the recreation and interpretation section: opportunities for nature education

and recreation are strictly limited within the NP. In the joint protection zone, similar recreational opportunities are provided to expand the NP visitor capacity. In the integrative development zone, multiple recreation and vacation products are provided.

In the industrial layout section: different segments of the tea and other industries are situated according to natural endowments and carrying capacity. In the ecological planting origin of NP, the quality of the tea harvesting area is upgraded. In the joint protection zone, deep processing parks are constructed. In the integrative development zone, technology service centers are set up, and the integration industry of tea, culture and tourism is planned.

In the facilities support section: a facility system serving both NP and local communities is established, and the construction intensity gradually increases from inside NP to outside. The gateway communities are built around the boundary of NP to provide entrance service. In the joint protection zone, the agricultural, cultural, and tourism integration centers provide special services. In the integrative development zone, the development bases provide comprehensive services.

3 Mechanism guarantee: Internal and external co-management at multiple levels

Establish joint working mechanisms with multiple internal and external parties at multiple levels. At provincial level, Jiangxi and Fujian provinces establish a joint meeting mechanism for NP cooperation. At county level, the NP and relevant departments of cities and counties jointly establish a mechanism for park-local coordination. At town and village level, the NP and relevant towns and villages jointly establish a mechanism for community co-management. The four major aspects of joint coordination are ecological protection, recreation organization, green industry, and community governance to ensure the implementation of the planning of the belt.

More Than a Buffer Zone: Planning of the Protection and Development Belt around Wuyishan National Park

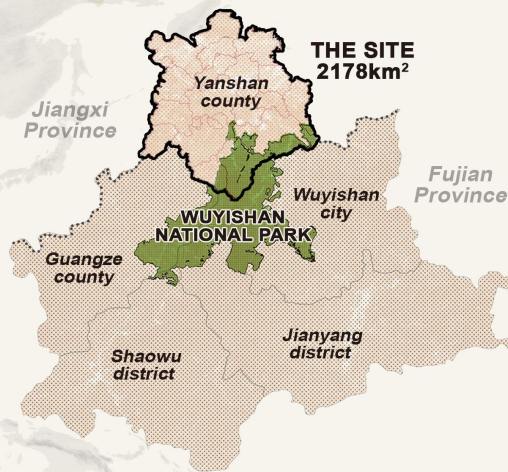
Background

PROFILE OF THE SITE

The Protection and Development Belt around Wuyishan National Park is China's first protection and development belt around a national park, including five cities and counties in two provinces. The project is situated in the Jiangxi area of the belt, covering an area of 2178 km² in Yanshan County, encompassing the northern part of the NP and its contiguous areas.



THE SITE

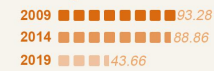


PROBLEMS AND CHALLENGES OF THE SITE



Regional Habitat Fragmentation

Average Patch Area of Forest



Maximum Patch Area of Forest



Insufficient Demonstration of National Park Values

Visitors (thousand) 2019

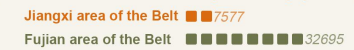


Tourism Revenue(billion) 2019



Low Diversification of Regional Industrial Development

Value Added of Tertiary Industry (billion) 2019



Low Level of Community Well-being

Per Capita Disposable Income 2019



Vacancies in Regional Coordination Management Mechanisms

Number of Stakeholders



VALUES OF WUYISHAN NATIONAL PARK

ECOSYSTEM - the best-preserved and most representative original subtropical forest ecosystem in the same latitude zone of the world

FLORA & FAUNA - 3404 species of higher plants, 769 species of vertebrates, among which 211 species under state key protection

AESTHETICS - unique Danxia landform landscape, Chinese landscape painting scroll, the harmonious unity of nature and culture

CULTURE - the birthplace of the world's oolong and black teas, Zhu Zi's Neo-Confucianism, as well as important Buddhist and Taoist mountain



Oil tea planting and processing



1979-1982



Nature Reserve

1987



Man and the Biosphere World

1999-2017



World Cultural and Natural Heritage Site

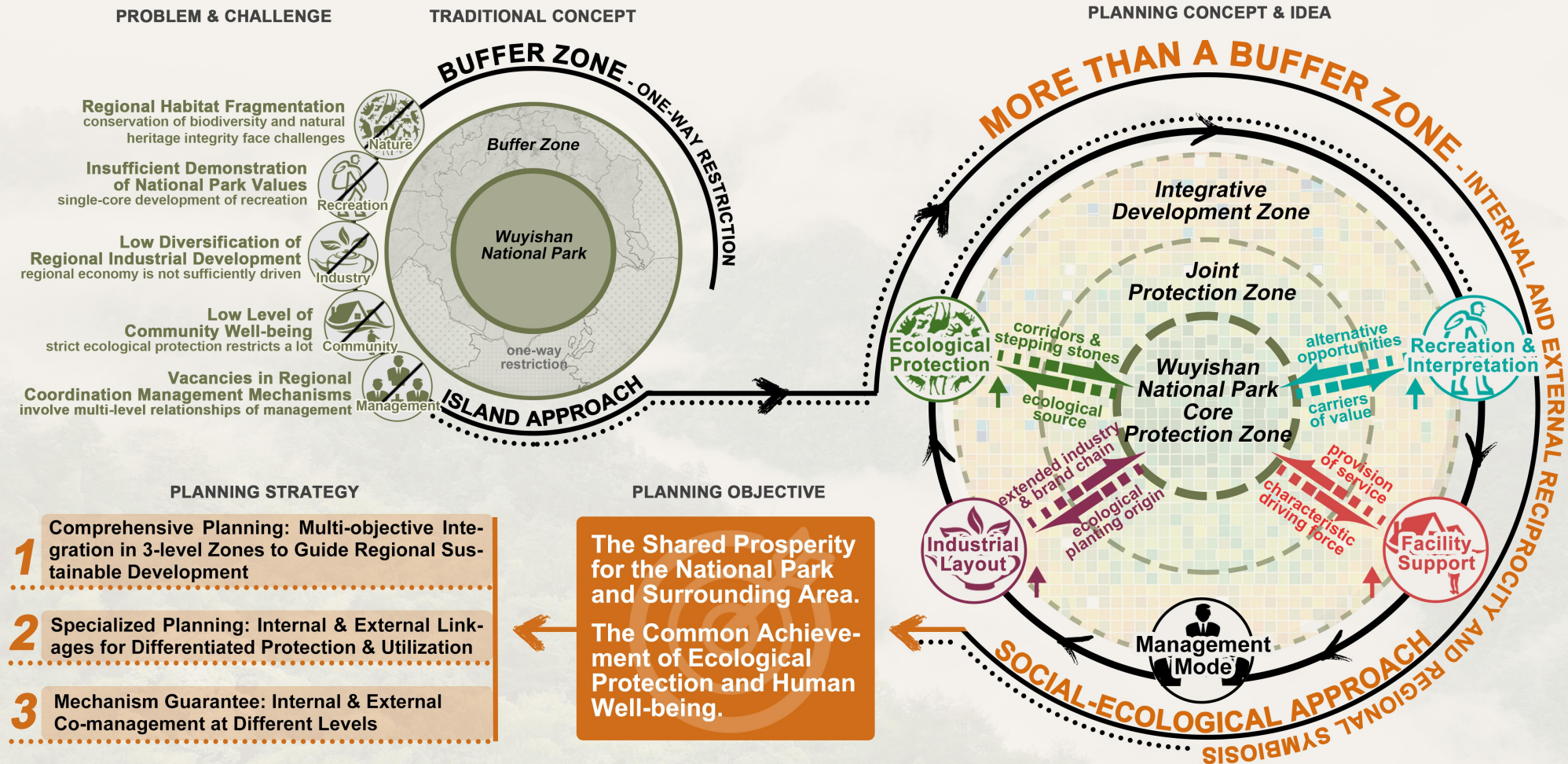
2021



Wuyishan National Park

MILESTONES OF WUYISHAN NATIONAL PARK

Concept, Objective and Strategy



HIGHLIGHT OF TECHNIQUES & METHODS

PLANNING FRAMEWORK OF REGIONAL SYMBIOSIS OF NATIONAL PARK AND SURROUNDING AREAS

APPROACH TO ANALYZING INTERNAL AND EXTERNAL LINKAGE OF PROTECTION AND DEVELOPMENT NEEDS

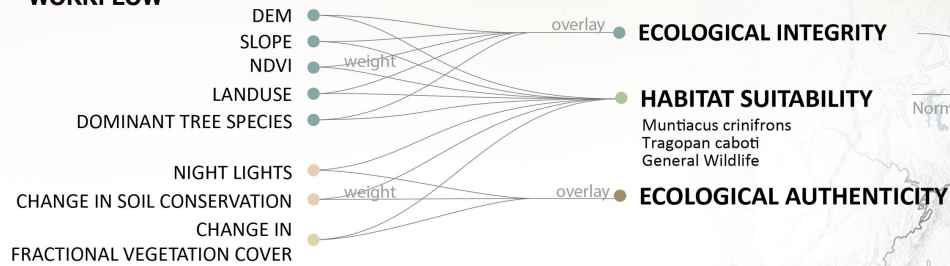
APPROACH TO ZONING AND LAND USE LAYOUT BASED ON MULTI-OBJECTIVE COORDINATION

MULTIFACETED COLLECTION OF STAKEHOLDERS' DEMANDS

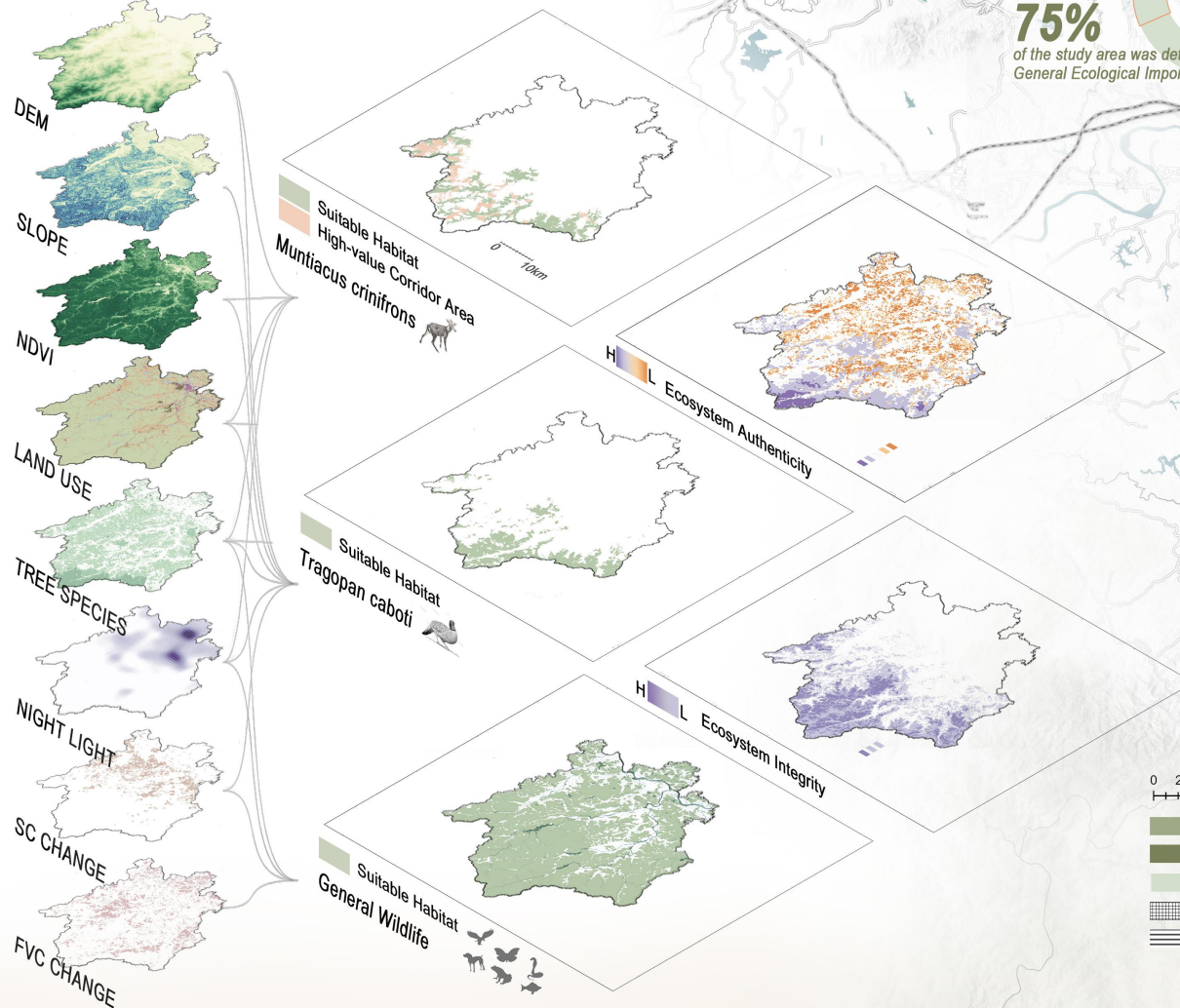
More Than a Buffer Zone: Planning of the Protection and Development Belt around Wuyishan National Park

Analysis: Ecosystem and Habitat Significance

WORKFLOW



ANALYSIS RESULT



ECOLOGICAL SIGNIFICANCE EVALUATION

We calculated the ecological significance in terms of ecological integrity, ecological authenticity and habitat suitability. Black muntjac and yellow-bellied pheasant were selected as representative species for analysis. We finally identified high-value ecological areas and corridors as inputs to the conservation layer of the planning model. At the same time, the gaps in the existing conservation system were analyzed.

56%

General Ecological Importance Area is unprotected

75%

of the study area was determined to be General Ecological Importance Area

22%

High Ecological Value Area is unprotected

32%

of the study area was determined to be High value Corridor Area

34%

High value Corridor Area is unprotected

4%

of the study area was determined to be High Ecological Value Area

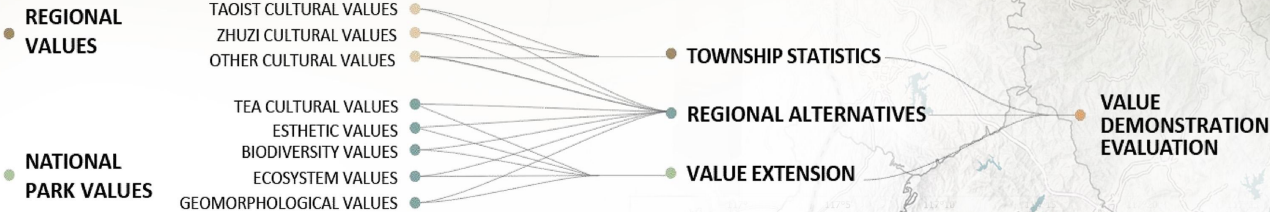
0 2.5 5 10 km

High Ecological Value Area
High-value Corridor Area
General Ecological Importance Area
Protected Area
Ecological Protection Red Line

More Than a Buffer Zone: Planning of the Protection and Development Belt around Wuyishan National Park

Analysis: Value Demonstration Priority

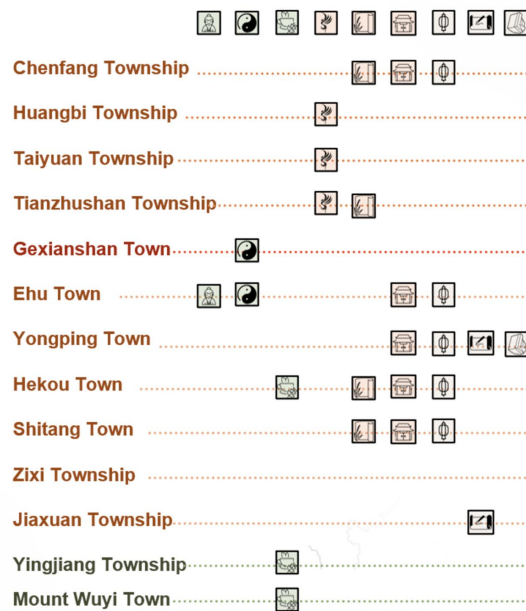
WORKFLOW



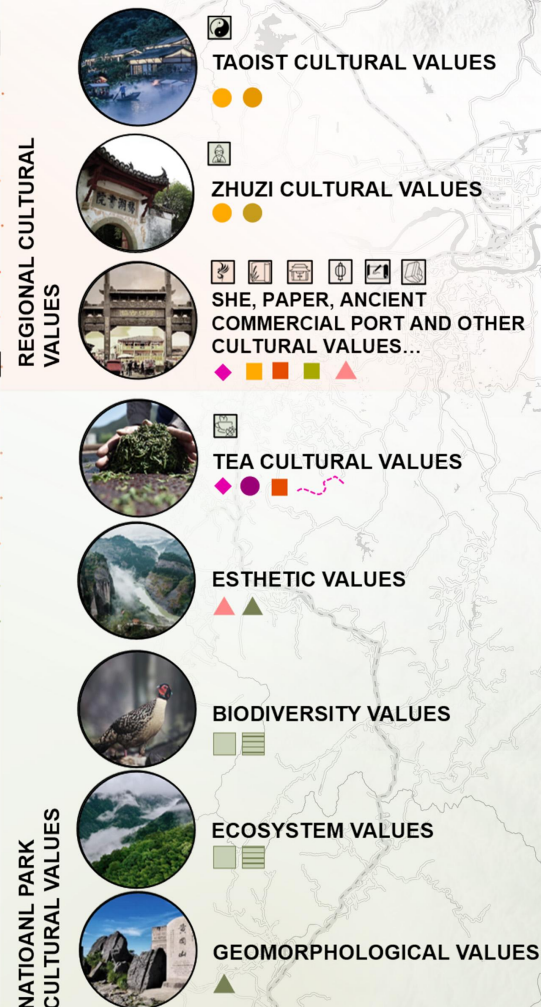
Begin by assessing both national park values and regional values. Identify the nine main types of values in the region and analyze their distribution in the townships. Then, identify the main carriers of these values and analyze the distribution of the carriers and the tourism income and tourist volume of value demonstration. Find links to the distribution of regional value carriers and identify priority alternative areas for national park tourist capacity in order to promote the joint enhancement of national park value demonstration and regional tourism development.

ANALYSIS RESULT

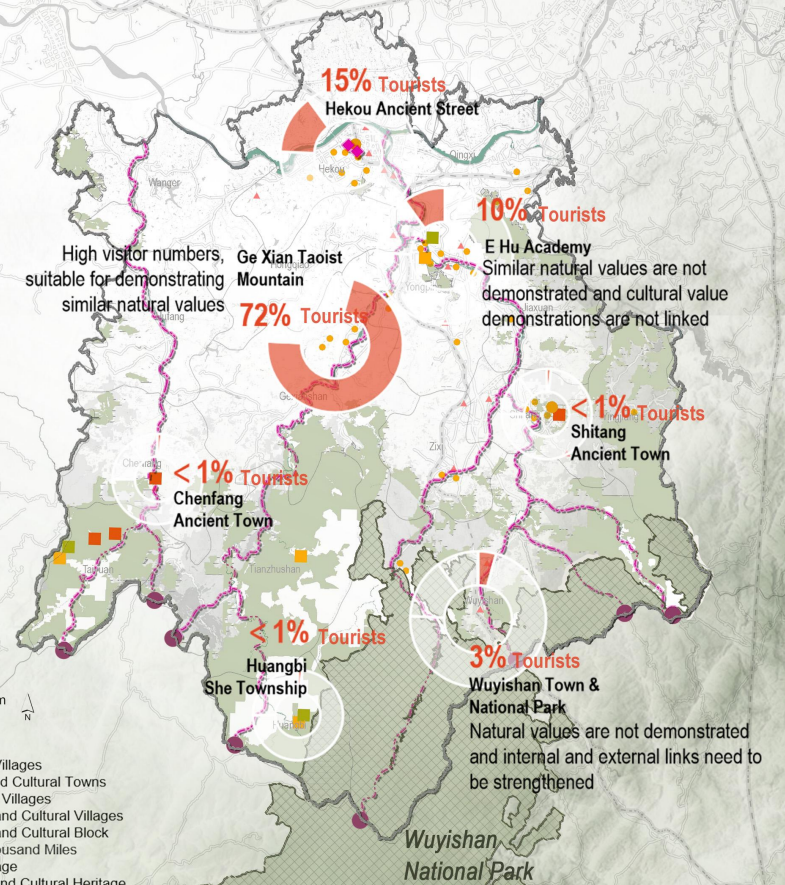
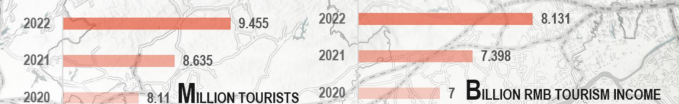
Regional Value Statistics



Major Value Types



Carrier Distribution and Value Demonstration



STATISTICS ON CULTURAL MONUMENTS BY TOWNSHIP

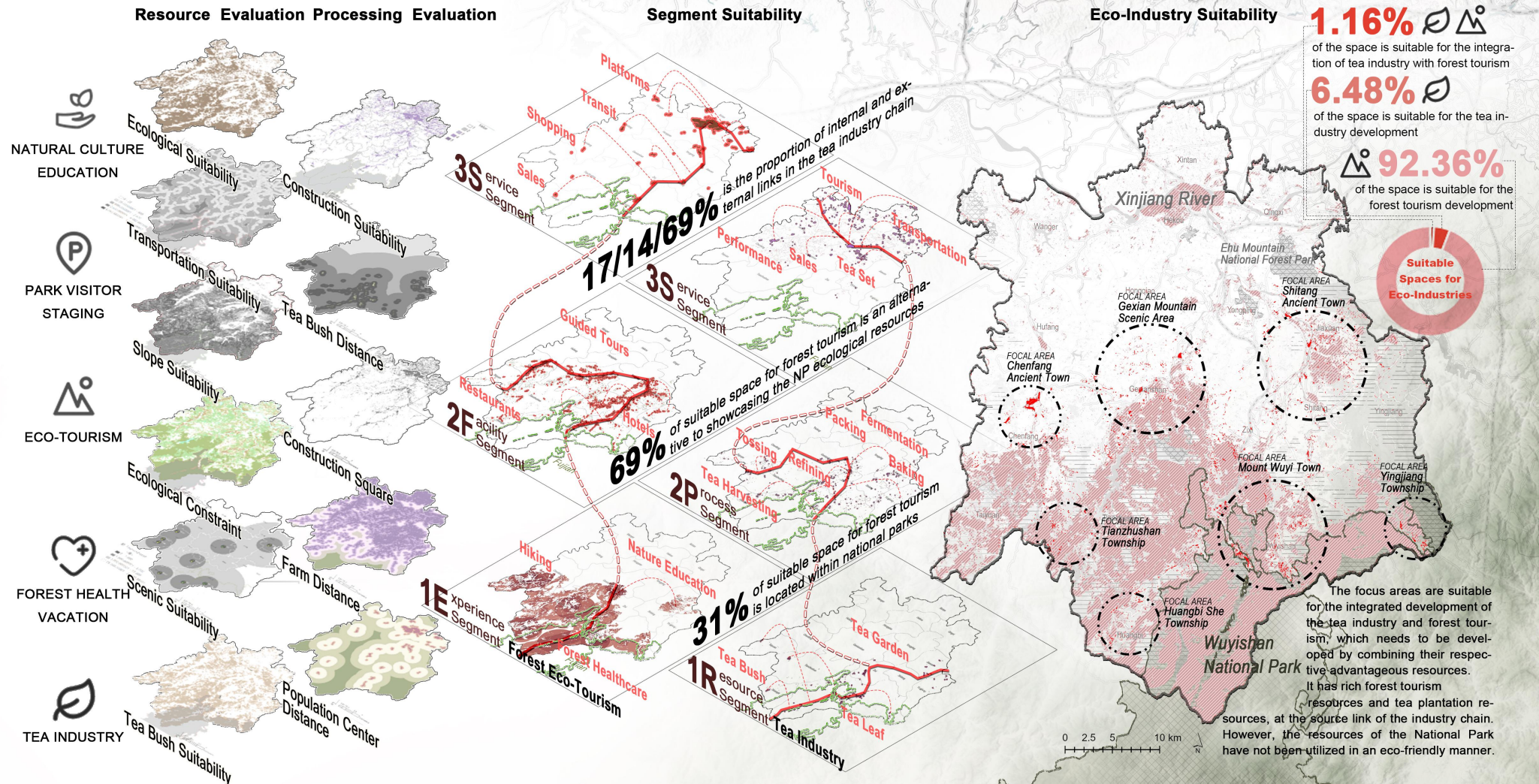


Analysis: Eco-Industry Chain Spatial Suitability

WORKFLOW

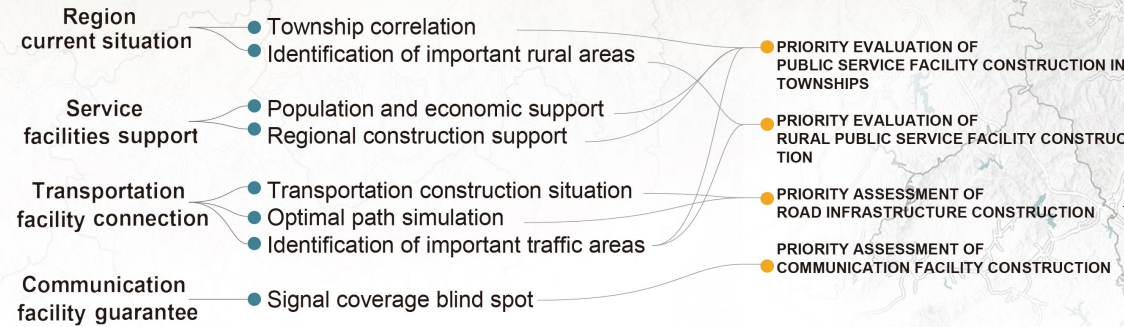


ANALYSIS RESULT

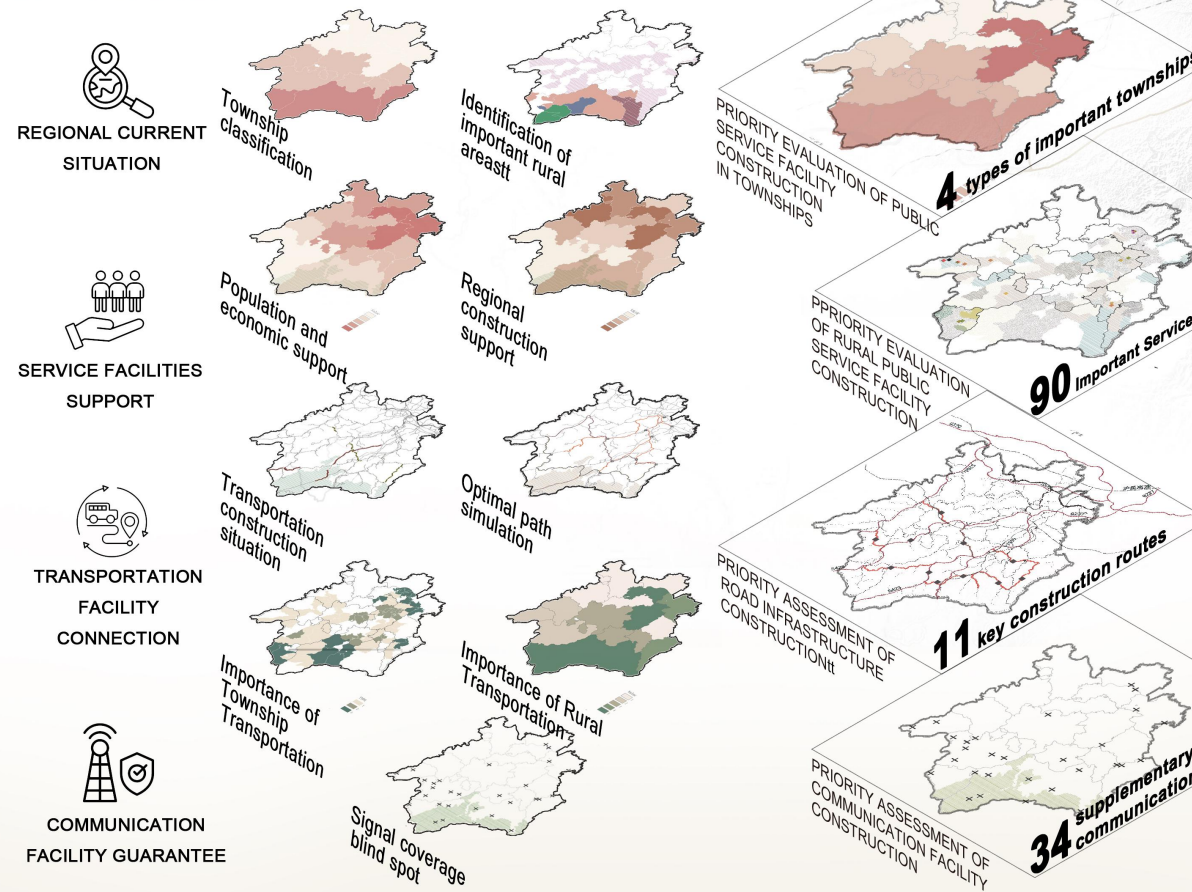


Analysis: Facility Development Priority

WORKFLOW



ANALYSIS RESULT

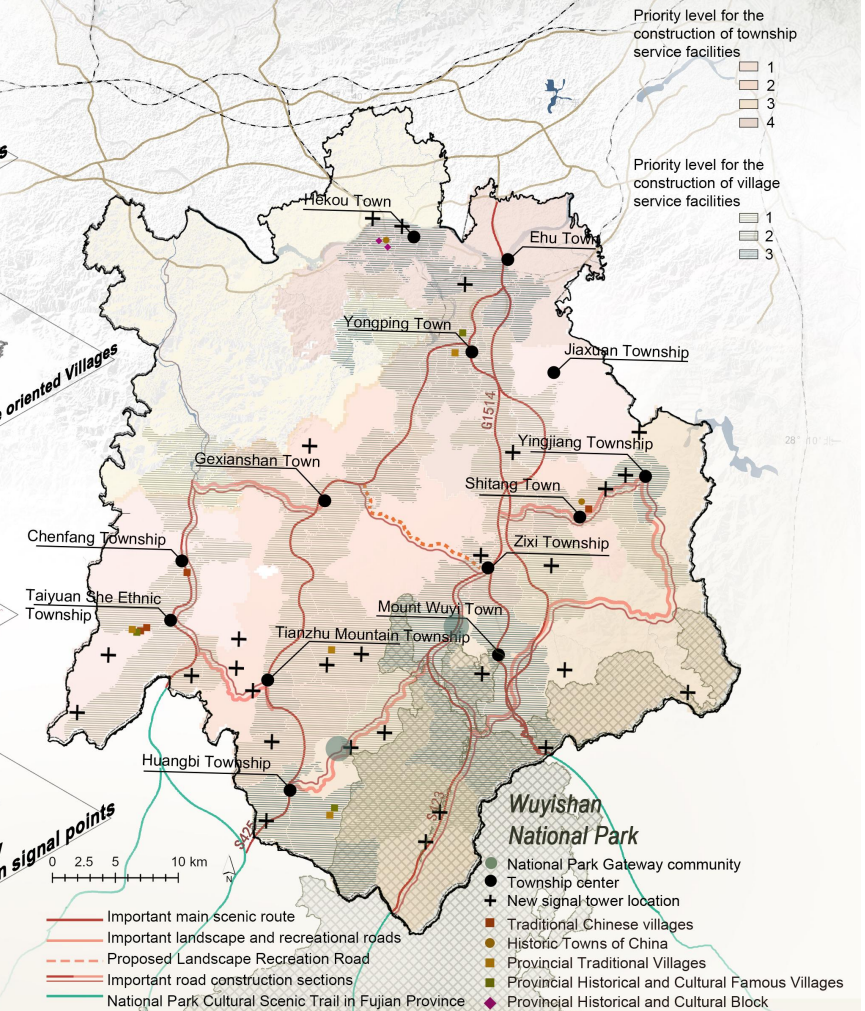


PRIORITY ASSESSMENT OF INFRASTRUCTURE CONSTRUCTION

The priority analysis of identifying regional service facility construction is based on the importance of townships and villages in the development of national parks and their socio-economic data.

The priority evaluation of transportation facilities is based on the identification of important roads that need to be improved and the simulation of the optimal path.

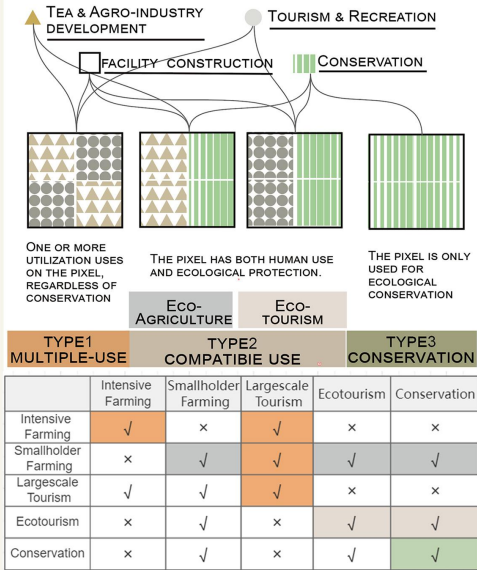
The priority analysis of signal facility construction aims to comprehensively improve signal coverage level by identifying existing blind spots in signal coverage.



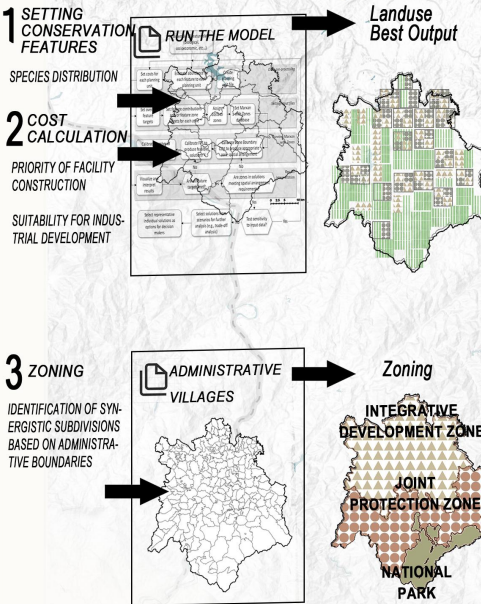
Master Plan

MULTI-OBJECTIVE SYNERGY ANALYSIS

LAND USE OBJECTIVE

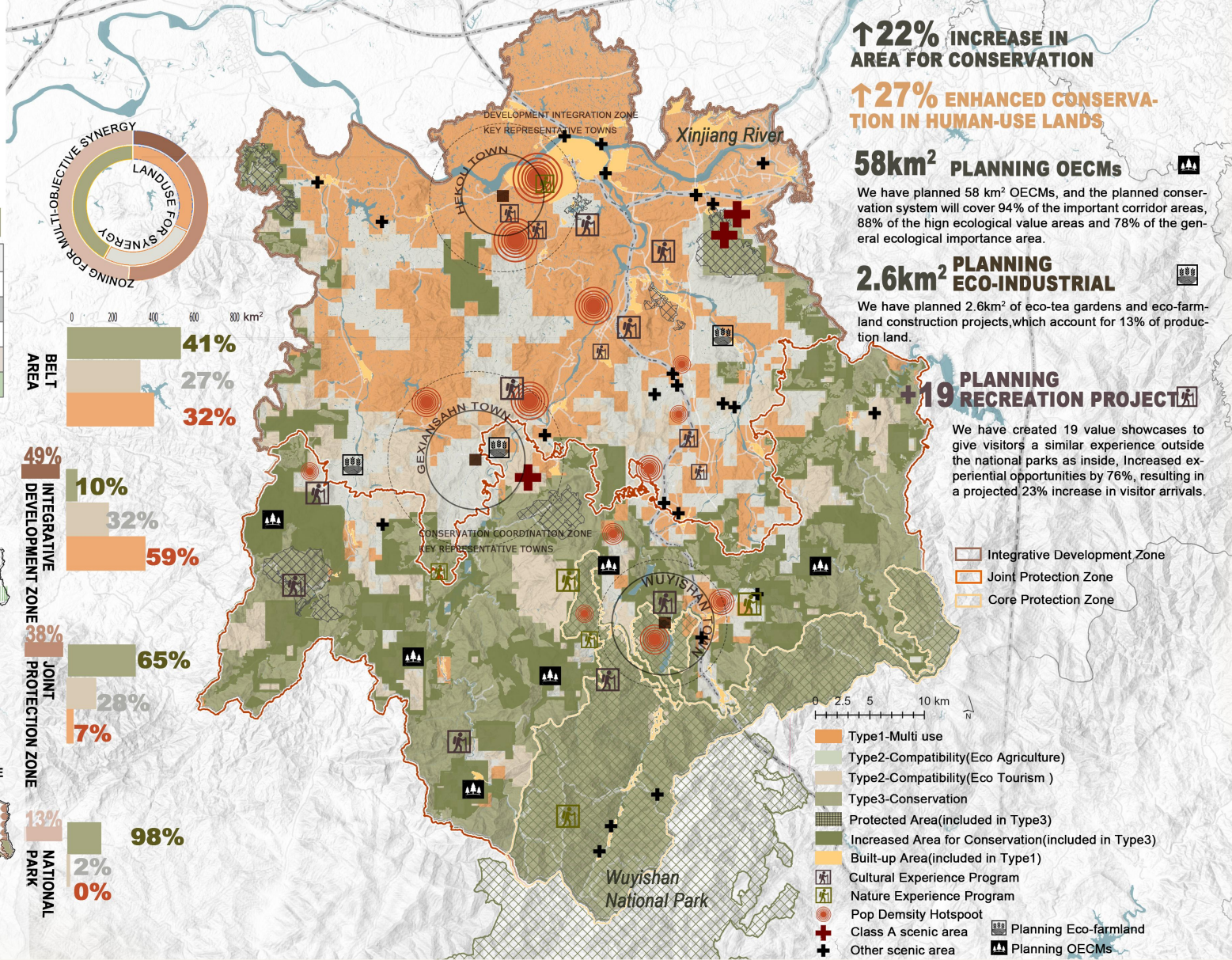


ZONING OBJECTIVE



MASTER PLAN

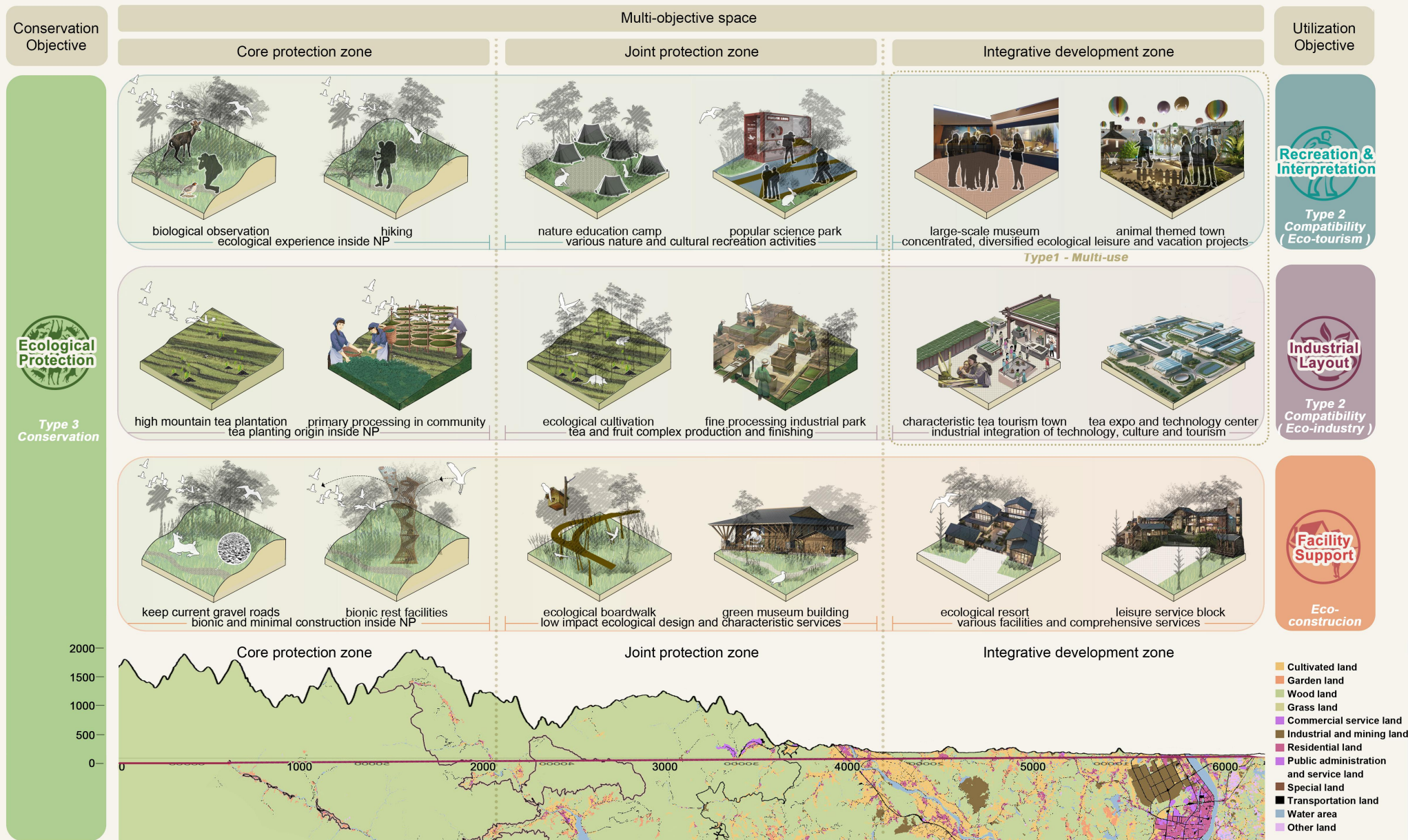
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Strategy 1: Comprehensive Planning

Multi-objective Integration in 3-level Zones to Guide Regional Sustainable Development

The integration-type zoning of the three gradients guides the overall protection and development direction of the space, based on the principle that the intensity of strict protection is gradually weakened while the development and utilization is gradually strengthened. The target composite land use classification of four categories guides the optimization of specific parcels' functionality.



Strategy 2: Specialized Planning

Internal & External Linkages for Differentiated Protection & Utilization

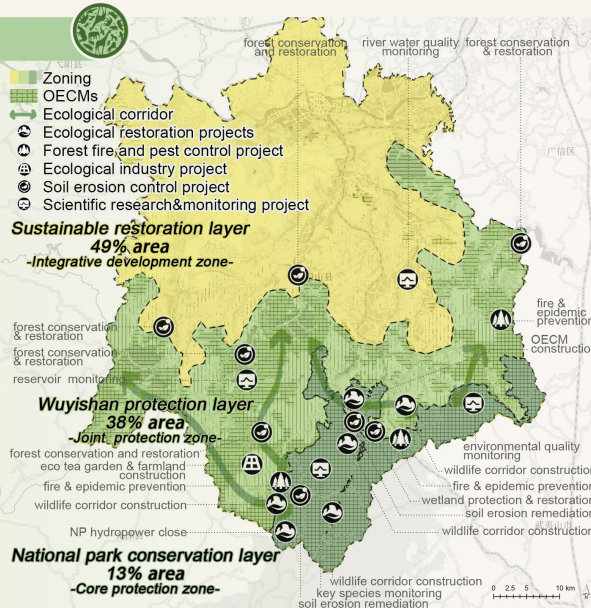
Based on the analysis of multi-level protection and development needs, we propose a specialized planning connecting national park and surrounding area.

This includes regional supplementation of habitats and ecological corridors, expansion of value demonstration space carrying capacity, lengthening of the industrial chain, and supplementation of facility construction.

1. Ecological Protection Section

Eco-target and Regulation

Target	Regulation	Content
Reducing human disturbance and enhancing biodiversity	comprehensive ecological restoration, ecological industry and tourism activities	Bio-friendly improvement of tea plantations and cultivated land Ecological restoration of mining areas Eco-friendly construction of tourism facilities
Support ecological networks in surrounding areas	protection and restoration, the establish of OECMs with communities, sustainable use of natural resources	OECMs construction wildlife corridor construction species monitoring,
promote the integrity and authenticity of the ecosystem in NP	strict ecological conservation, prohibition of human activities except of scientific activities	In situ conservation of species and setting of research and monitoring facilities



2. Recreation & Interpretation Section

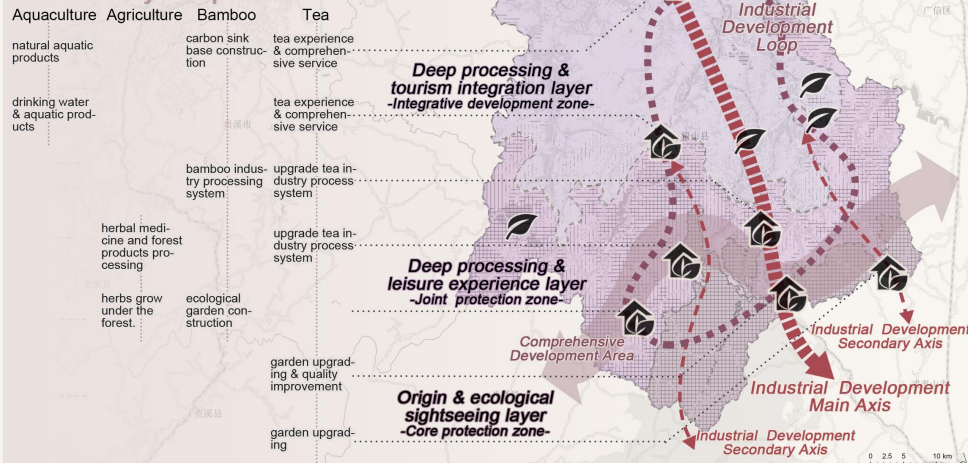
Value Display Format



3. Industrial Layout Section

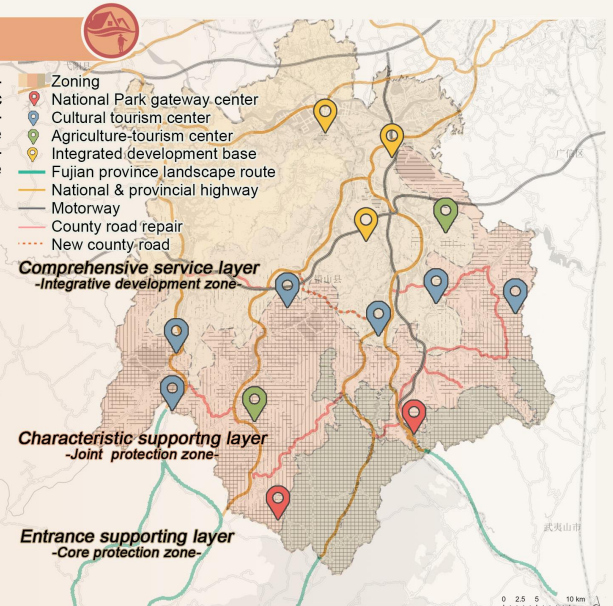
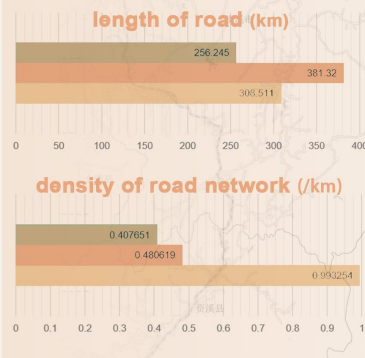
Build ecological industry chains and brand value chains that extends outward.

Industry Composition



4. Facility Support Section

Establishing a system of facilities with supporting functions for national parks and public services for the community. Gradually increase construction intensity from the inside to the outside. Build a "host-guest sharing" facility system to enhance community welfare and tourism services

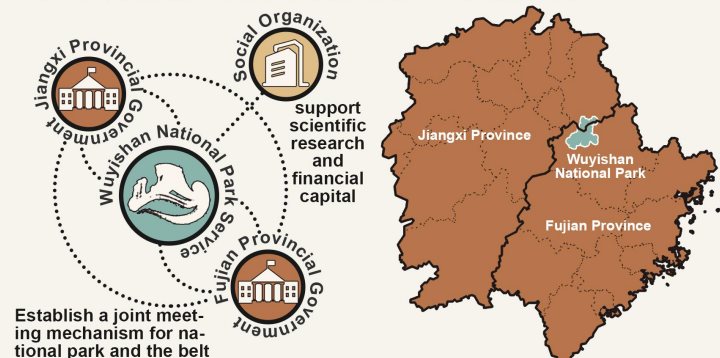


Strategy 3: Mechanism Guarantee

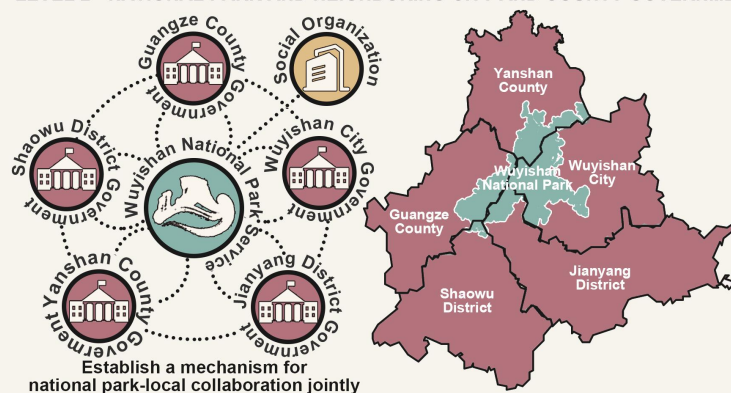
Internal & External Co-management at Different Levels

Establish a joint working mechanism with internal and external parties at multiple levels.

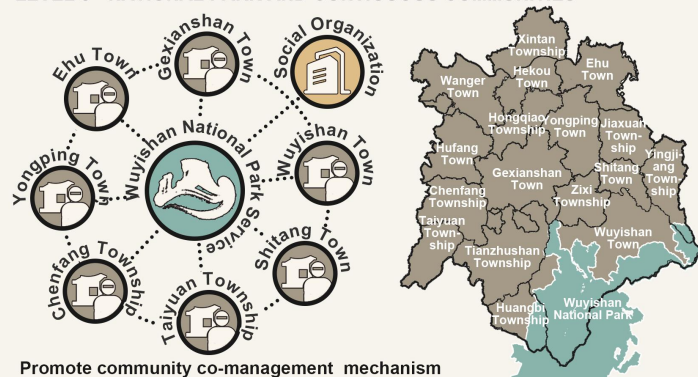
LEVEL 1 - NATIONAL PARK AND PROVINCIAL GOVERNMENTS



LEVEL 2 - NATIONAL PARK AND NEIGHBORING CITY AND COUNTY GOVERNMENTS



LEVEL 3 - NATIONAL PARK AND CONTIGUOUS COMMUNITIES



Four major aspects of joint coordination ensure the implementation of the planning of the belt.



Location		The whole region supporter							
		Wuyishan National park				Surrounding areas			
Cooperative fields and examples									
	Pine wood nematode control	leader	supporter	supporter	supporter	cooperator	leader	leader	supporter
	Oecms construction	/	/	/	/	cooperator	leader	leader	supporter
	Visitor center and museum	leader	supporter	supporter	supporter	cooperator	leader	leader	supporter
	Scientific research and education base construction	leader	supporter	supporter	supporter	cooperator	leader	leader	supporter
	National park brand certification and promotion	leader	cooperator	cooperator	supporter	leader	cooperator	cooperator	supporter
	Production promotion	supporter	leader	leader	supporter	supporter	leader	leader	supporter
	Communication facilities construction	cooperator	cooperator	cooperator	supporter	supporter	leader	leader	supporter
	Entrance community construction	cooperator	cooperator	cooperator	supporter	supporter	leader	leader	supporter