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RESEARCH ON THE APPLICATION OF MCDA METHOD IN COMPREHENSIVE EVALUATION OF RURAL RENEWAL

MCDA 在村镇更新综合评价中的应用研究

Name/研究生姓名

Liuyi Wu/吴柳漪

Supervisor(s)/导师姓名

Prof. Xiangfeng Li/李向锋 教授

Prof.Marco Trisciuoglio

Arc.Zhijun Liu/刘志军 高级工程师

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BY

WU LIUYI

Supervised by

Prof. Xiangfeng Li

and

Prof. Marco Trisciuoglio

and

Arc.Zhijun Liu

College of Architecture

Politecnico di Torino

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Abstract

Under the background of the "rural revitalization" strategy, the protection and renewal of villages and towns have attracted increasing attention, which has effectively promoted the process of new-type urbanization in China. Tourism development with capital intervention, as a means of village protection and renewal, not only injects vitality into villages and towns, but also brings certain influence, making the original system of villages and towns more complicated. Taking yancheng XinFeng Town village as the research object, with all my heart, with the introduction of integrated community development, tourism development, the goal of traditional features comprehensive evaluation system, in order to put forward more reasonable protection and update the project strategy, by synthesizing various subject demands, and similar to the sustainable development of traditional villages and towns to provide a reference and reference.

In this study, the multi-criteria evaluation method (MCDA) was introduced into the design of village renewal and reconstruction. According to the idea of multi-objective comprehensive development and multi-agent co-existence, the evaluation method was applied in multi-stage. First of all, AHP is introduced in this paper, referring to international conventions, current national norms and index elements in previous studies, and combining with the particularity of Xinfeng Town of Yancheng, the preset index system of village and town renewal evaluation system is preliminarily constructed. Secondly, through the analysis of specific cases to deepen the understanding of multi-objective conflict and multi-subject appeals, in order to modify the preliminary evaluation system indicators. Thirdly, this evaluation system is used as the basis for elastic adjustment. PROMETHEE method is used to evaluate the decision-making problems faced by Xinfeng Town in each stage of renovation process, and according to the evaluation results, protection and renewal strategies are proposed for each index in the subsystem of community development, tourism development and traditional style.

Finally, the evaluation index system model of village and town renewal is used to make an empirical study in combination with xinfeng 920 Block, Quanxin Village, Xinfeng Town, Yancheng City. On the basis of the comprehensive evaluation results, the analysis is carried out from different subject perspectives and different index elements, providing reference for the comprehensive evaluation of village and town protection and renewal projects. It is found that through the evaluation of the pre-event, in-process and post-event stages in the process of renewal of villages and towns, the current value and problems can be relatively systematically analyzed in the evaluation of the current situation, so as to continue or improve the value characteristics of villages and towns themselves. In scheme design, the advantages and disadvantages of different schemes can be compared according to the evaluation results and combined with each other to promote scheme optimization; In the post-implementation evaluation stage, the built effect can be evaluated to feedback the design and formulate relevant guidelines to achieve the protection and renewal of similar villages and towns. In this process, the introduction of assistive technology will make

the quantitative measurement of indicators more accurate, so as to increase the reliability of evaluation results.

Keywords: MCDA, rural renewal, comprehensive evaluation

Catalogue

Chapterter I：Introduction

1.1 Research background

1.1.1 Rural development requirements under policy background

In recent years, the central government has proposed in the National New Urbanization Plan (2014-2020) a new urbanization path with Chinese characteristics that puts people first, synchronizes the four modernizations, optimizes the layout, promotes ecological civilization, and inherits cultural heritage. China's rural areas are reconstructing the rural spatial pattern with the characteristics of "internal differentiation of villages and towns, integrated land use, diversified development paths and moderate spatial agglomeration".

In September 2018, the central committee of the communist party of the State Council issued by the strategy of rejuvenating the country planning (2018-2022) "is put forward to comply with the law of village development and evolution trend, according to different villages development present situation, geographic conditions and resources endowment, according to the cluster upgrading, and removal characteristics of protection, move into town, classification advance rural revitalization [1].On the one hand, the rural revitalization strategy and other national policies have vigorously promoted the government's top-down policy benefits and financial support for rural renewal. On the other hand, the development of new technology also promotes the value orientation and demand evolution in the renewal and development of rural areas.

1.1.2 The boom of rural tourism

With the development of national economy and the improvement of people's living standards, rural tourism as the representative of the village tourism form more and more attention. Traditional villages and towns have high tourist attraction due to their special natural environment and rich heritage resources. At the same time, due to the restructuring of rural economy, rural tourism, as a combination of the tertiary industry and the primary industry, has gradually attracted attention.

In 2016, The State Council issued several Opinions on Further Promoting The Construction of New Urbanization, pointing out that "to develop charming towns with distinctive advantages in leisure tourism, trade and logistics, information industry and advanced manufacturing". In this context, how to make use of the positive significance of characteristic towns to optimize resource allocation and promote urban-rural integration to achieve sustainable development of traditional towns and villages is a topic worth thinking

[1] The CPC Central Committee and The State Council issued the Strategic Plan for Rural Revitalization (2018-2022). People's Daily,2018-09-27(001).

about.

1.1.3 There are problems in the protection and renewal of traditional villages and towns

The problems existing in the protection and renewal of traditional villages and towns are mainly reflected in the imbalance of protection and renewal. There are three main problems: first, excessive development with capital intervention and unilateral pursuit of economic development have destroyed traditional villages and towns, changed the role of villagers and disintegrated rural society; Second, for the conservative development of the authenticity of the traditional style, the lack of endogenous power of resource endowment and gradually fading; The third is the neglect of differential development under the construction of rural modernization, which is mainly manifested in the layout of new rural housing in urban residential areas. Therefore, this paper mainly focuses on how to balance the needs of traditional villages and towns in landscape protection, community development and tourism development, and improve the endogenous power to achieve sustainable development.

1.2 Research purpose and significance

1.2.1 Research purpose

In this paper, in the country revitalization, new urbanization, characteristic town construction and a series of national policy background, the imbalance between focusing on conservation and renewal of villages and towns facing three major problems, to yancheng XinFeng Town village, with all my heart, for example, by building based on multi-objective multi-agent update evaluation system of villages and towns, and used in the different stages of construction, In order to put forward a more suitable renewal and development strategy for Quanxin Village in Xinfeng Town according to the evaluation results, weigh the relationship between the protection, renewal and development of the village, and provide reference for the renewal and development evaluation of the same type of villages and towns.

1.2.2 Research significance

（1）Practical significance

For the problems of multi-objective and multi-subject mixed in the process of village renewal, effective evaluation method research is based on practical problems and research needs. In 2012, the Guiding Opinions on Strengthening the Protection and Development of Traditional Villages proposed that "promoting the protection, inheritance and utilization of traditional villages". In 2014, the National New Urbanization Plan (2014-2020) clearly stated that efforts should be made to walk out of the path of new urbanization with Chinese characteristics. In 2018, the Strategic Plan for Rural Revitalization (2018-2022) pointed out the great significance of the rural revitalization strategy in the new era. Under the background of policy orientation and renewal demand, it is urgent to study the evaluation system of rural renewal

aiming at practical problems.

（2）Theoretical significance

Due to the multiple attribute of the village and complexity to the regeneration of villages and towns, through multidisciplinary cross method, set up in the face of towns and villages to update the multi-dimensional observation Angle of view, derived from various aspects factors affect real change the elements of the development of rural related aspects, to construct the stage of multiple subjects, multiple target and evaluation system, and combined with the empirical case, This paper demonstrates the effectiveness of MCDA comprehensive evaluation method in solving village and town renewal from method system to practical application.

（3）Application significance

By establishing an evaluation system from the perspective of multi-objectives and multi-subjects, this paper provides a more appropriate reference for the renewal construction strategy of multi-stage schemes and decisions in village and town renewal, and balances the demands of various parties with the participation of various parties to achieve coordinated development of multi-objectives. The research of this paper can be used as a reference for the existing conservation and renewal projects of villages and towns

1.3 Research contents and methods

1.3.1 Research contents

(1) Selection of comprehensive evaluation methods for village and town renewal

First, by combing update for villages and towns both at home and abroad, to study the assessment of excavated predecessors in the villages and towns update process is focused on the object, and then by comparing the commonly used evaluation methods, found the MCDA methods have certain suitability evaluation in villages and towns, and optimize on the existing evaluation methods, to increase targeted for complex evaluation objects.

(2) Interpretation of village attributes and construction of evaluation system under the background of capital intervention

First, through the summary of relevant literature research and field research, deconstruct the attributes of villages and towns; Secondly, the relationship between tourism development, community development and traditional style is analyzed. Finally, taking Xinfeng Town of Yancheng city as an example, this paper analyzes the specific contradictions and conflicts from the perspective of multi-objective and multi-subject. On the basis of the above analysis, the index of the evaluation system is constructed and the distribution of weight among multiple subjects is determined through the analysis of stakeholder theory.

(3) The demonstration of evaluation process in different stages of renewal process

MCDA method is applied in different stages of village renewal construction, in order to evaluate the status quo, design and construction effect systematically and reasonably, so as to realize the sustainable development of similar villages and towns.。

1.3.2 Research methods

(1) Literature review Method: Collect and sort out relevant domestic and foreign literature and materials, sort out relevant theoretical basis and practical cases at home and abroad, and consolidate the theoretical basis of this study.

(2) Questionnaire survey according to the required information and data, the local original inhabitants, tourists, development companies issued questionnaires. At the same time, interviews with local residents, street offices, development companies, design teams and construction units were conducted to obtain first-hand information.

(3) AHP method As a comprehensive evaluation method, analytic hierarchy Process can decompose complex problems into simple problems, so that the problems can be analyzed and solved. In this paper, the analytic hierarchy process (AHP) is adopted to decompose the multi-objective and multi-subject appeals of villages and towns at different levels, and the index system at different levels is established to provide a more scientific evaluation dimension for decision-making and judgment in the renewal process of Xinfeng Town.

(4) PROMETHEE method preference ranking method, as a comprehensive evaluation method, helps decision-makers judge the optimal solution by sorting the pros and cons of the analysis objects. This method allows both quantitative and qualitative indicators to exist in the same evaluation system. In addition, because PROMETHEE method avoids dimensionless and standardized processing of indicators, it reduces the possibility of information loss or error caused by data preprocessing and makes the results more real and scientific.

(5) the empirical approach based on the relevant theory and the case was summarized systematically analysis at home and abroad, with XinFeng Town as instance, combined with field research and practice are to obtain first-hand information, to update the construction to evaluate the early, middle and late stage in the process of put forward the corresponding development strategy, in order to provide references for similar towns.

The research ideas and methods of this paper can be summarized into an organic whole as shown in Figure 1-1.:

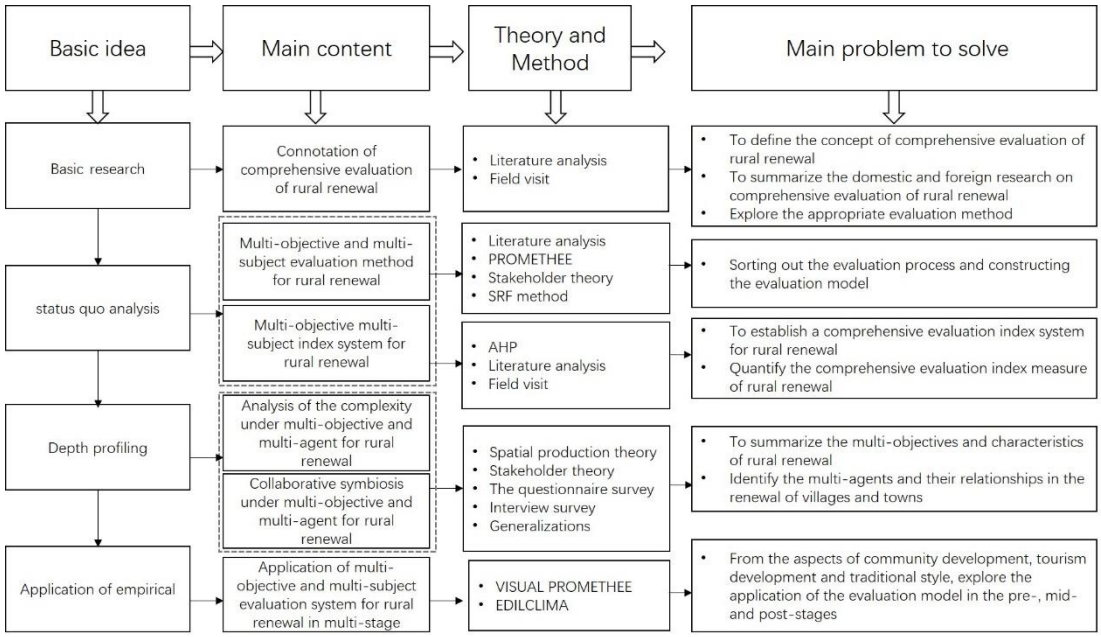


Figure 1-1 Technical route (Source: drawn by the author)

1.4 Concept Definition

1.4.1 Update of villages and towns

Village refers to a settlement where villagers live and produce in a certain geographical area. In China, the formation factors of villages are mainly physical geography and consanguinity, which can be divided into natural settlement type and clan settlement type.

A town is an administrative unit subordinate to a county or autonomous county. It usually refers to the transitional residential area between the country and the town as well as the urban area of an organized town.

Villages and towns can also be called rural settlements, including villages and market towns, etc., which is a basic settlement type between villages and market towns, as well as a general concept of social region. Villages and towns are the most basic settlement units in China. They are usually characterized by the concentration of residential buildings and the distribution of blocks, and the density of residential population is higher than that of rural areas, and they have formed a certain commercial basis.

Table1-1 Scale division of villages and towns

Name	Form	Number of residents（households）	Area（㎡）
Village	Natural villages (scattered settlements)	5~20	1000~2000
	A larger, more concentrated settlement	30~60	2500~6000
Town	Basically have the prototype of town	70~150	8000~15000
		4000~30000	10000~300000

In order to adapt to the natural environment and the survival and development requirements of villages and towns, the village space has been constantly renewing and developing itself. The "renewal" studied in this paper refers to the village space formed based on the influence of social and environmental changes, including physical space and non-physical space. In the renewal of villages and towns, the most direct change is the artificial environment in the material space of villages and towns. It is the basis of people's production and life.

Village renewal is a way of village construction. According to its main form, it includes reconstruction of original site or reconstruction in different places. According to its renewal content, it can include village style, infrastructure, public service facilities, living environment and conditions, etc. In essence, the renewal of villages and towns is to adopt various ways to improve the original backward conditions of villages and towns, update the original out-of-order appearance of villages and towns, expand and perfect the original relatively single functions of villages and towns, and finally build a new socialist countryside in line with the requirements of modern production and life.

Renewal is carried out on the basis of the original villages and towns, which is the continuation and development of the regional history of villages and towns, with a certain diachronic nature, rather than a complete negation. In the reconstruction and renewal of villages and towns, there are many means of renewal, which generally refers to the renovation, facade maintenance, repair and demolition of buildings, structures and the built environment. The renewal of the building can also be understood as the introduction of new technologies and materials, which not only revitalize the old building, but also meet the requirements of energy consumption and building technology.

1.4.2 Comprehensive evaluation

Comprehensive evaluation refers to the simultaneous evaluation of multiple indicators and units in a systematic and standardized way, which is a means to have a deep understanding and objective understanding of the evaluation objects, as well as the basis for sorting and selecting the best [3]. According to different stages of the evaluation system, comprehensive evaluation can be divided into pre-evaluation, in-process evaluation and post-evaluation [5]. Pre-evaluation generally refers to the evaluation of whether the system needs to be developed for planning studies, such as risk assessment, feasibility studies, etc. In-process evaluation is carried out during the implementation of the system plan. Ex post evaluation refers to the evaluation of whether the system achieves the expected goal after completion.

From the dimension of comprehensive evaluation, this paper evaluates the reconstruction and renewal work of villages and towns in advance, in the process and after the intervention of multiple subjects, so as to provide more systematic and scientific decision-making reference for the complex reconstruction work of villages and towns.。

1.4.3 MCDA

MCDA is called multi-criteria Decision Analysis (MCDA), which is widely used in the decision-

making field. MCDA provides a rich set of programs and algorithms for building decision problems, as well as designing, evaluating, and prioritizing alternative decisions. MCDA mimics the way humans make decisions. Although a variety of different MCDA approaches, techniques and methods have been investigated, the basic ingredients of MCDA are the same: a limited or unlimited set of actions, at least two standards and a decision maker (DM). Through these elements, MCDA assists in decision making primarily through selection, ranking, or sorting operations. Therefore, MCDA is not only a collection of theories, methods and technologies, but also a specific perspective to deal with decision-making problems [6].

It has the following elements: (1) Alternative plan: In the multi-criteria evaluation, alternative plan is a finite set, and all plans are comparable. (2) Program indicators: The indexes can be quantitative or qualitative, but the program needs to be comprehensively described. (3) Program goals: Different decision-makers can have different goals. Program goals are generated when all indicators reach the desired state of decision makers. (4) Index weight: Each index can be determined by decision makers in advance according to project experience and program objectives, or can be calculated by model, but the sum of index weight must be 100%.

In this study, MCDA method is adopted to carry out comprehensive evaluation for multi-subject and multi-objective conflicts in village renewal construction, which makes the evaluation method and decision-making process more refined and more reasonable.

1.5 Research status at home and abroad

1.5.1 Evaluation on village renewal

The evaluation research focuses on the protection and development of historic villages and towns, the survival and sustainable development of villages and towns' living environment, and rural tourism. Mazzanti[8][9] (2002,2003) introduced methods to evaluate the degree of protection of traditional heritage sites from different dimensions such as residents' cognitive cultural values and attitudes. Nasarhe and Purcell[10] (1992) developed a model for assessing the external appearance, aesthetic experience and cognition of towns based on environmental perception. Doratli[11] (2004) studied historical blocks based on the reconstruction work of a certain actual historical block, established an evaluation system with SWOT analysis method, and proposed countermeasures and measures to restore the characteristics of historical blocks. Kuśnierz-Krupa and Dominika[12] (2018) re-evaluate the historical heritage of the historic town Provins, southwest of Paris. They believe that the preservation of historic towns is conducive to revitalizing cultural heritage and educating the public. Rodrigues and Matot et al. [13] proposed and optimized an evaluation method using mathematical model and operations research. Based on fieldwork, the method evaluates the condition of a building and guides its renovation activities by plugging the findings into preset patterns of problems and defects and analyzing their impact. Egbelakin and Ingham[14] (2019) established a performance-based evaluation framework for multidimensional decision-making and evaluation methods, and sorted historical buildings in order to select the best case study, with the purpose

of selecting the best case to study their architectural structure. Kusnierz-krupa [15] (2018) believes that it is of practical significance to protect the cultural heritage of small towns with historical and cultural value and formulate different protection methods according to the evaluation results. He compares the protection planning and implementation effect of historical towns in Poland and Western European countries. This paper expounds the understanding and cognition of local government and local residents to historical towns and historical heritages, which has a far-reaching influence on the long-term protection and development of historical towns and heritages.

The research on evaluation system of village renewal in China mainly includes traditional village evaluation system, evaluation of village human settlement environment, evaluation of implementation effect and other research topics. The research is mainly carried out from the dimensions of regional culture, living environment and value assessment. Since the 1980s, the research on the protection of traditional villages began in China. In the aspect of village protection evaluation, the research content expands from the local research to the whole research, from the evaluation of a single factor to the comprehensive evaluation of traditional village protection and the evaluation of the implementation effect of existing protection planning schemes. In these evaluations, there are few studies on the targeted evaluation of the living environment of traditional villages. Most studies focus on the overall evaluation of traditional villages, and the living environment is generally a part of the evaluation system.

(1) Evaluation of village protection

Lin Zhiqiang and Shen Dawei [17] (2016) established an evaluation system for the features and features of traditional villages and put forward corresponding optimization strategies to guide the preparation of village protection planning in multi-ethnic and multi-cultural blending areas. By establishing an infrastructure assessment system, Lin Zului et al. [18] (2015) revealed the relationship between infrastructure construction in traditional villages and social and economic development, and provided strategies for the coordinated development of infrastructure in similar traditional villages in China and local social and economic development.

(2) Comprehensive evaluation of village protection

Li Yinyin [19] (2017) selected the protection and survival value of the region where traditional villages are located as the theme of her evaluation research, and combined with the characteristics of each region, established an evaluation system using AHP method to explore a new approach to the protection and development of villages. Tong Chenglin [20] (2014) took the evaluation of the comprehensive value of traditional villages as the research topic, and studied how to improve the protection level of traditional villages after obtaining the evaluation results. Liu Lulu, Xiao Dawei, Fu Juan et al. [21] (2014) constructed an evaluation system from the dimensions of sustainability, social value, economic benefits and environmental outcomes.

(3) Evaluation of rural human settlement environment

For traditional villages in mountainous and hilly areas, Wang Xiu et al. [22] determined the evaluation index and index weight from the dimensions of regionalism, degree of material heritage protection, degree

of intangible heritage inheritance, system and measures. On this basis, the application directions of conservation evaluation research, such as dynamic monitoring, tourism development and conservation management, are proposed. Tan Lingchong et al. [23] took the evaluation system of hunan traditional villages as their research object and constructed the evaluation system from three dimensions, namely, ancient architecture, pattern texture and cultural heritage. Zeng Liqun et al. [24] took Dalu Village, a traditional village, as the research object to carry out ecological environment evaluation research, emphasizing the protection of high-value core resources of villages and the survival of fragile ecological environment of villages. In the research of Chen Xin [25], he takes the evaluation of traditional village features as the research theme and builds an evaluation system from five dimensions, including architecture, industry, topography, pattern and culture. In the basic evaluation of ancient villages, xiao-ming zhu [26] to objective standards, with residential, natural, environmental improvement and so on three big dimensions established evaluation system, traditional villages the three dimension focuses on practical, environment and economy, and the scene investigation survey data generated in the process of correction method and the calculation method is put forward its own views.

4) Evaluation of the implementation effect of protection planning

Zhao Yong et al. [27] focused on the first batch of historical and cultural villages and towns in China, put forward their own opinions in terms of theoretical methods for their protection evaluation, classified villages and towns according to their protection status, and established a protection evaluation index system. Zhu Xiaofang [28] selected traditional villages in Jiangsu Province as a case, summarized the factors affecting the protection of traditional villages, established an evaluation system to evaluate the implementation effect of various measures to protect traditional villages, and put forward suggestions for improvement and the direction of future improvement and optimization. Yang Liguo et al. [29] analyzed four dimensions, including the authenticity of village culture, the activation degree of village historical buildings, the survival and integrity degree of village style and the result of intangible cultural inheritance

To establish an evaluation system to evaluate the protection and survival effect of traditional villages. Zhang Yanling et al. [30] took the construction of evaluation system of historical cultural towns and villages as the research theme, and based on AHP method, constructed evaluation system from three dimensions of material heritage, intangible heritage and protection measures taken.

1.5.2 Comparison of common evaluation methods

At present, In the field of decision-making, TOPSIS-Technique of Order Preference Similarity to the Ideal is a common research method to construct decision model Vikor-vlsekriterijumska Optimizacija I Kompromisno Resenje, and promethee-the Preference Ranking Organization METHod for Enrichment of Evaluations), SIR-The superiority and suggestion Ranking Method, AHP-the Analytic Hierarchy Process, Goal Programming, etc. [31] It is usually divided into multi-attribute decision analysis (MCDA-multicriteria Decision Analysis), Mathematical programming (MP-Mathematical Programming) and Artificial intelligence (AI-artificial) Intelligence), common methods in the construction of specific evaluation models

and their classification are shown in Table 1-2.

Table 1-2 Commonly used multi-criteria decision making methods (source: drawn from references)

Model building method	abbreviations
※MCDA-Multicriteria decision analysis	
1. Analytic Hierarchy Process	AHP
2. Network analytic hierarchy Process	ANP
3. Eliminate and choose to express reality	ELECTRE
4. Preference ranking organization method	PROMETHEE
5. Approximate ideal solution sorting method	TOPSIS
6. Multi-criteria optimization and compromise solution method	VIKOR
7. Decision experiment and evaluation experiment method	DEMATEL
8. Simple multi-attribute rating techniques	SMART
9. Swing weighting method	SW
※MP-Mathematical programming	
1. Data envelopment analysis	DEA
2. Linear programming	LP
3. Nonlinear programming	NLP
4. Multi-objective planning	MOP
5. Goal planning	GP
6. Random programming	SP
※AI-Artificial intelligence	
1. Genetic algorithm	GA
2. Grey system theory	GST
3.Neural networks	NN
4. Rough set theory	RST
5.BN Bayesian network	BN
6. DT tree of decision	DT
7. Case-based reasoning	CBR
8.Particle swarm optimization	PSO
9. Support vector machines	SVM
10. Association planning	AR
11.Ant colony algorithm	ACA
12. Evidence theory	DST

MCDA is a methodological framework designed to provide decision-makers with knowledgeable advice on a limited set of alternatives (also known as actions, goals, solutions, or candidates) while evaluating against multiple criteria (also known as attributes, characteristics, or goals). The choice of multiple solutions is usually considered as an MCDA problem, so many classical MCDA methods are applied to the problem solving process. Based on the principles of these MCDA methods, they can be divided into four categories :(1) multi-attribute utility methods, such as AHP and ANP; (2) Survival of the fittest methods such as ELECTRE and PROMETHEE; (3) Compromise methods, such as TOPSIS and VIKOR; (4) Other MCDM technologies, such as SMART and DEMATEL. There are also conformance technologies that combine other MCDA technologies, such as GIS-MCDA technology.

MP is also a kind of method commonly used in the decision-making field, which usually includes data

envelopment analysis method and various planning analysis methods. Such methods are usually evaluated with the goal of obtaining the best output. For example, data envelopment analysis (DEA) adopts the method of linear programming to evaluate the relative effectiveness according to the input and output indicators of multiple schemes, which has been applied in ecological environmental governance, enterprise operation efficiency and sustainable development evaluation [32][33][34].

In recent years, with the development of computer technology, AI method has been gradually promoted and applied to solve complex optimization problems

Common AI algorithms include GA, GST, NN, RST, BN, DT, CBR, PSO, SVM, AR, ACA and DST. For example, genetic algorithms are used to evaluate new industries [35].

In addition, some scholars combine MCDA, MP and AI with two or three types of methods to construct evaluation models, and achieve good results. For example, Yang Zongzhou [36] et al. (2008) evaluated suppliers based on principal component analysis and ELECTRE method, and the research results verified the feasibility of the evaluation model. Wei Gang et al. (2009) combined AHP and PROMETHEE method to build a distribution network planning scheme selection model and proved the effectiveness of the method [37]. Zeng Chao et al. (2018) constructed an evaluation model of rainwater utilization based on AHP and PROMETHEE, and evaluated 4 different regions in Yunnan Province and put forward corresponding improvement suggestions [38]. Shi Baofeng et al. (2017) constructed a credit rating model of merchant micro-loans based on the coefficient of variance-Promethee II method [39].

Through the review of common evaluation methods, it can be found that the methods of model building vary according to the types of specific research problems. In this study, the evaluation of village and town renewal focuses on the evaluation with different objectives and needs under the situation of multi-party intervention, which is a multi-attribute decision-making problem. Therefore, MCDA related methods can be considered to build the model, for example, AHP combined with PROMETHEE can be used to build the model.

1.5.3 Application of MCDA in town evaluation

In 1951, Harold William Kuhn and Albert William Tucker proposed the vector Max Problem, the first explicit consideration of the basic concept of MCDA. In 1972, a conference on "Multi-criteria Decision making" (MCDM) was held at Columbia University, South Carolina. Since then, MCDA/ MCDM has experienced rapid growth and continues to grow today [6]. There are some foreign studies on multi-criteria analysis cases in rural areas, as shown in Table 1-3.

In the foreign studies, AHP, ANP and MAVT occupy the majority. The problems to be solved include macro-scale rural tourism or sustainable development, facility location and other aspects, as well as micro-scale building renewal and transformation. However, in China, there are few studies on MCDA in villages and towns, and the research methods are mostly limited to the analytic Hierarchy Process (AHP). Luo Zhihua [49] (2012) sorted and selected the optimal reuse scheme by using utility analysis method according to the characteristics of the reuse of architectural heritage, and proposed a design and planning operation

mode based on the evolution of the project reuse construction prototype. Guo Haihui [50] (2013) calculated the economic, environmental and social utility of the whole life cycle of the historic block protection and reconstruction project, analyzed the internal connection among the three, and evaluated the comprehensive utility of the project. Li Yunyan [52] (2018), based on the particularity of architectural protection in historical and cultural features area and the comprehensive development of features area, improvement of residents' living environment and drive to surrounding areas, constructed an architectural evaluation system in historical and cultural features area with AHP.

Table 1-3 Research on the application of MDCA in villages and towns abroad

(source: self-drawn according to references)

Author	Time	Problem	MCDA method
Zafri, Niaz Mahmud et al	2021	Quantitative analysis of accessibility of public facilities in rural areas	TOPSIS
Ahamed, Tofael et al	2021	Sustainable Agricultural development [42]	GIS-MCDA
Peters, Chelsea N. et al	2019	Selection of drinking water sources in rural areas [45]	ELECTRE
Karimi, H. et al	2019	Landfill options	AHP、GIS-MCDA
Zenonas Turskis,	2017	Rank the value of heritage buildings [40]	AHP、EDAS
Valentina Ferretti et al	2015	Management and planning for sustainable development of cultural and natural heritage [43]	MAVT
Eglioinyt	2014	Existing vernacular buildings are transformed into modern buildings [44]	AHP
Huey-Jiun Wang	2010	Selection of Reuse schemes for historic buildings [48]	ANP
Jose M. Anton et al	2006	Location of health service facilities in rural areas [47]	AHP、ELECTRE、PROMETHEE

In view of the above research, the categories of MCDA methods used and the problems solved will be counted, as shown in Table 1-4. The two methods of AHP and ANP in the multi-criteria evaluation method are mainly used to select solutions and establish evaluation system. At present, there is no research to show which method can be applied to what, only according to the research objectives to determine which method is suitable, it is necessary to analyze other conditions combined with other conditions. Therefore, the selection of multi-criteria evaluation method in the field of village renewal is still in the exploratory stage.

Table 1-4 Statistical table of MDCA problem solving (drawn by author according to references)

MCDA Method	Scheme selection/evaluation system
AHP	Rank the value of heritage buildings
	The existing vernacular buildings are transformed into modern buildings
	Grading restoration standards for heritage buildings
	Building evaluation system of historical culture area
SW	Choose energy - saving brick and stone old building renovation scheme
	Management decisions for architectural heritage
EDAS	Rank them by heritage building value
ANP	Historic building reuse scheme selection
	Selection of new uses for historic buildings
TOPSIS	Evaluate, sort out and sort out different renovation schemes of old buildings
PROMETHEE	Suitability analysis of ecotourism activities
	Evaluation of competitiveness of tourism industry

1.5.4 Review and summary

This section summarizes the development of comprehensive evaluation related to villages and towns at home and abroad, the comparison of common evaluation methods, and the application of multi-criteria evaluation methods in the field of village construction. The main points of multi - criterion analysis theory are summarized in theory.

Throughout the research on evaluation of village renewal at home and abroad, scholars mainly focus on evaluation of traditional village protection, evaluation of human settlement environment and evaluation of sustainable development of villages, forming a diversified research structure and perspective. In the application of village evaluation methods, AHP, ANP and MAVT occupy the majority. The problems to be solved include macro-scale rural tourism or sustainable development, facility location and other aspects, as well as micro-scale building renewal and transformation. However, there are fewer studies on MCDA in villages and towns in China, and the methods are more limited to AHP. It can be found that AHP can structure and systematize complex problems, while PROMETHEE method can sort schemes according to the differences in indicators of each scheme, and PROMETHEE is widely used in the field of multi-attribute decision-making. As the village and town renewal studied in this paper is faced with complex

problems of multi-subjects and multi-objectives, AHP can be adopted to disintegrate the objectives. Meanwhile, the advantages and disadvantages of alternative schemes need to be sorted, so PROMETHEE is adopted. Therefore, the combination of AHP and PROMETHEE can be considered.

1.6 Organizational structure of the paper

This paper is divided into six chapters, the main content of each chapter is as follows:

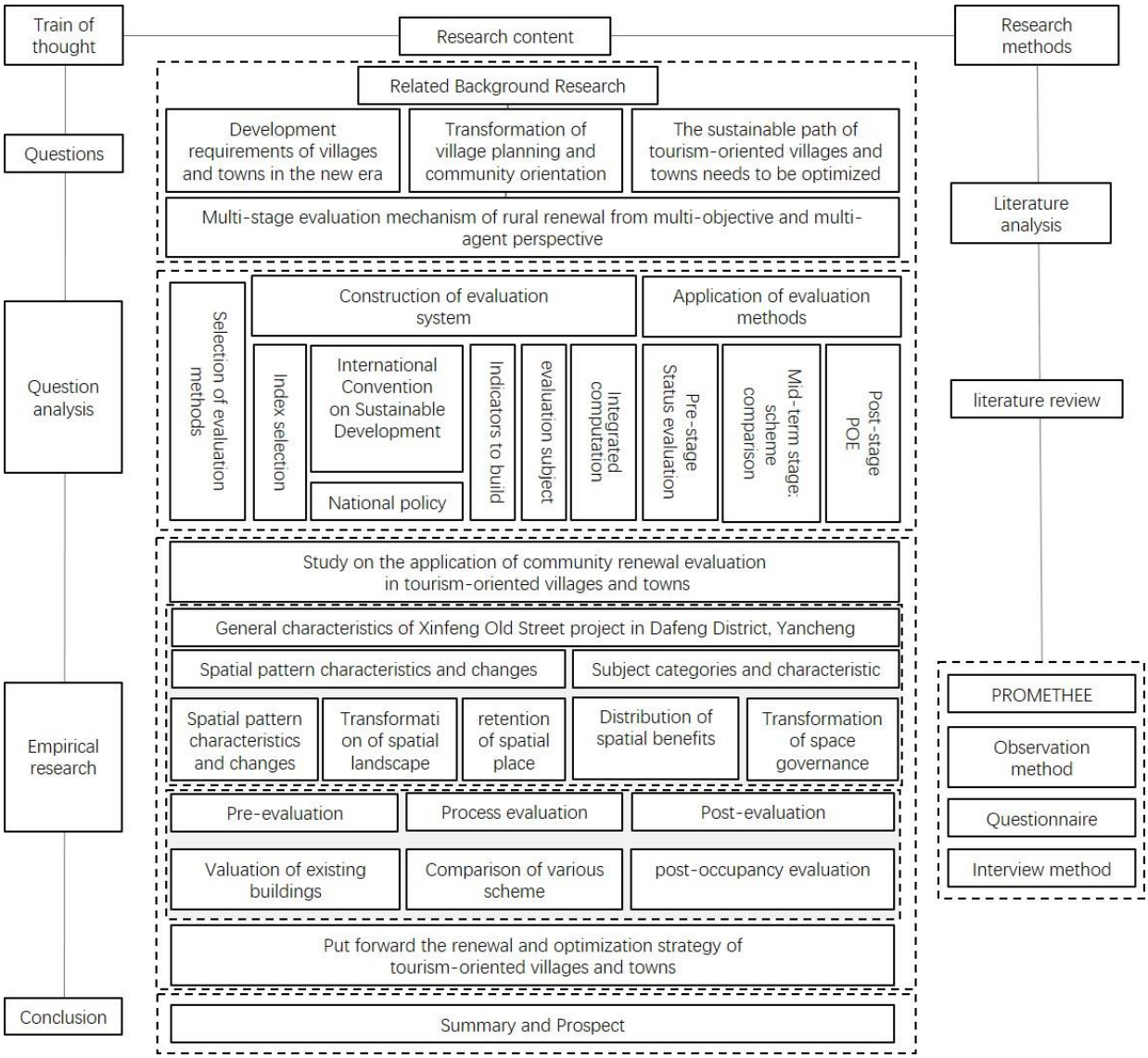


Figure 1-2 Framework of the paper (Source: drawn by the author)

The first chapter is the introduction, which mainly summarizes and reviews the research background, concept definition and previous studies to guide the formation of the research ideas of this paper.

The second chapter updates for villages and towns in the face of multiple criteria evaluation methods of selection and introduction, PROMETHEE method, sorting solution, using the AHP analytic hierarchy process (AHP) to build index, and the introduction of stakeholder theory on multi-agent under different main body perspective analysis to determine the index weight, and on the multistage evaluation to application.

The third chapter is about the construction of the index system in the evaluation process of the second chapter. This paper analyzes the different attributes of villages and towns, uses AHP to construct the evaluation system under multi-objective and multi-subject, and discusses the application of auxiliary technology of indicators.

The fourth chapter takes the renovation and renewal of Xinfeng 920 Old Street in Xinfeng Town of Yancheng City as an example to illustrate the complexity and contradiction of multi-objective and multi-subject in village and town renewal, as well as how to coordinate and symbiosis. In this way, the evaluation system established in chapter 3 is reversed and the multi-weight is assigned.

The fifth chapter is the multi-stage specific application of PROMETHEE method in case villages and towns, and puts forward strategies and suggestions for village renewal with a more systematic and reasonable evaluation system and method.

The sixth chapter summarizes and prospects, summarizes the previous research results, and puts forward shortcomings and prospects.

Chapterter II: Evaluation from multi-objective, multi-subject and multi-stage

In the first chapter, on the basis of comparative analysis of MCDA common methods, it can be found that AHP simplifies, structures and systematizes complex problems, and considers the interdependence between upper and lower levels and levels. PROMETHEE method can sort the schemes according to the differences in indicators of each scheme, and PROMETHEE is widely used in the field of multi-attribute decision-making. Therefore, this study chooses AHP and PROMETHEE combined method to build an evaluation model.

This paper mainly uses PROMETHEE method to build the model, in which the evaluation system construction link combined with AHP level analysis of indicators; In the link of weight assignment, SRF method is used to calculate in decspace tool. In the process of data collection, questionnaire interview, literature research, spatio-temporal data, performance simulation, field measurement and other methods can be used, as shown in Figure 2-1. For detailed data sources and methods, see Table 2-1 in Chapter 3.

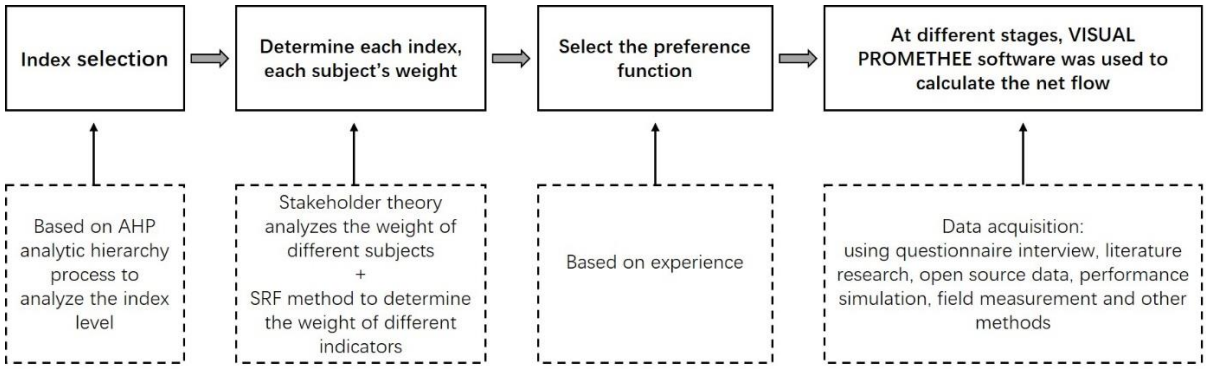


Figure 2-1 Framework of the paper (Source: drawn by the author)

2.1 Multi-objective：PROMETHEE

PROMETHE method is a multi-criteria evaluation (MCDA) method, which allows both quantitative and qualitative indicators to exist in the same evaluation system. In addition, PROMETHEE method does not require dimensionless and standardized processing of indicators, which can avoid information loss or error caused by data preprocessing and increase the reliability of results.

2.1.1 Method principle

PROMETHEE method has simple thinking and clear concept. The main calculation steps are as follows. Firstly, the preference function corresponding to different indexes is determined. Secondly, determine the thresholds of different indicators: no difference threshold, advantage threshold, determine the weight of evaluation indicators; Thirdly, the full ranking of each scheme sample is determined according to the net flow, that is, the inflow, outflow and net flow of each scheme sample are calculated by the preference function, and the full ranking of the samples is carried out according to the net flow.

The basic principle of this method is as follows:

Suppose A multi-standard decision problem with m alternatives, the solution set A={α_1, α_2,⋯, α_m}, They are based on a set of k indicators. F={ f_1, f_2,⋯, f_m }. PROMETHEE ptwo comparison based on the scheme, for two of them (a,b), the evaluation index fj,j∈{1,2,3,⋯,k},

$$d_j(a,b) = f_j(a) - f_j(b) \qquad (1)$$

d_j (a,b) represents the degree to which plan A is superior to Plan B for the evaluation index f_j, And then compute it according to the preference function, Change the difference d_j (a,b) into a single preference degree, expressed as P_j (a,b):

$$P_j(a,b) = Hj[dj\ (a,b)], \forall a,b \in A \qquad (2)$$

Where, $P"j"\ (a,b) \in [0,1]$,when $d"j"\ (a,b) < 0$, $P"j"\ (a,b) = 0$。The preference function has two thresholds, P is the preference threshold, Q is the indifference threshold,, when $d"j"\ (a,b) < Q$, then plan A and B are not the first choice; when$d"j"\ (a,b) < P$, plan A is superior to plan B..

In the calculation of overall preference degree, SRF is used to set weights for each indicator to obtain the overall preference degree of plan A to B:

$$\prod(a,b) = \sum_{j=1}^{k} w_j P_J(a,b) \qquad (3)$$

2.1.2 Preference functions

Due to the different indicators of multi-criteria evaluation and the different degree of risk preference of decision makers, it is a very complicated process to determine the priority relationship of the plan, so the preference function selected is also different. The priority function refers to the degree of superiority of one sample over another on a certain indicator.

The PROMETHEE method includes six typical preference functions, proposed by Brans & Mareschal, which are the general criterion (Usual), the quasi criterion (U-shape), the linear preference criterion (Linear), the Gaussian criterion (Gaussian), the indifference interval Linear priority relationship criterion (V-shape), classification criterion (Level). The function diagram of each criterion is shown in Figure 2-1. These criteria cover most multi-criteria decision-making problems.

In the general criterion function, for a specific index, only when the index values of scheme A and scheme B are equal, there will be no difference between A and B. As long as the values of A and B are different, the scheme sample with the maximum value has Strict advantage, at this point, no specific thresholds need to be defined.

In the quasi-criteria function, the indifference threshold P needs to be defined. In this function, for a specific indicator, when the difference between scheme A and scheme B is greater than P, the decision maker considers that the sample with the largest value has an absolute advantage.

In the linear priority relation function, the advantage threshold Q needs to be defined. When the difference between scheme A and scheme B is greater than the threshold Q, the decision maker considers that the scheme with the largest value has an absolute advantage. When the difference between scheme A and scheme B does not exceed Q, the preference function behaves as a linear preference function, and the

advantage of A to B increases linearly.

In the classification criterion function, the dominance threshold q and the indifference threshold P need to be defined. Scheme samples A and B are indifferent when the difference between scheme A and scheme B does not exceed the P-value. When the difference between the two lies between the P and Q values, a has a weak dominance relationship with B. When the difference between A and B is greater than the Q value, the decision maker will think that the sample with the greatest value has an absolute advantage.

In the quasi-criteria function, the Q value and P value need to be set. When the difference between A and B does not exceed the multi-threshold Q, there is no difference between the two. When the difference between the two is between Q and P, the preference function is calculated by the formula, and a has a weak dominant relationship to B. When the difference between the two is greater than the Q value, the decision maker believes that the plan with the greatest value has an absolute advantage.

In a Gaussian function, the dominance of a sample grows as the deviation X grows. In the setting of indicators, this kind of function is used relatively rarely.

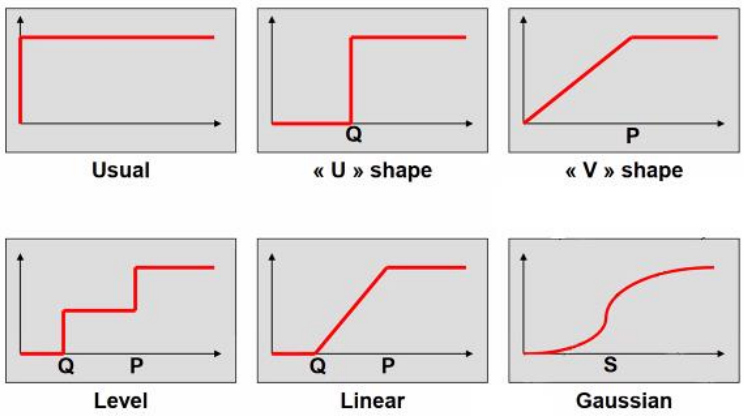


Figure 1-2 Six preference functions (Image source: redrawn by author)

2.1.3 PROMETHEE-GAIA

Visualization and graphical representation of the relative positions of alternatives can be achieved based on the contribution of individual metrics. The purpose of the GAIA approach is to represent the preferences of decisions and their implications in as two-dimensional view as possible. By using principal component analysis, an optimal plane is obtained where actions represented by points can be projected with minimal loss of information. Criteria can be represented on this plane by axes whose lengths indicate their discriminative power (importance) in the problem. The position of the individual indicators indicates the similarity or conflict between them: the smaller the angle, the more similar the two indicators are. Weights can also be represented on this plane; information about the weights is represented by the vector decision axis (π), which shows the direction of the compromise solution resulting from the weights assigned to the criteria. If the weights are concentrated on a standard, it is clear that the pi axis coincides with the axis of that standard in the GAIA plane. When weights are distributed over all criteria, the pi axis is displayed as the weighted result of all criteria axes. If π is long, it means that the PROMETHEE decision axis has strong

decision power, and decision makers are invited to choose alternatives in their direction as much as possible. On the other hand, if π is short and there is no strong decision-making power, it means that according to the weights, the evaluation metrics are strongly conflicting and choosing a good compromise solution is a difficult problem. In this plane, the evaluation indexes with similar preferences to the evaluation objects point in the same direction, and the evaluation indexes with conflicting preferences for the evaluation objects point in the opposite direction.

2.2 Multi-agent: Stakeholder analysis

2.2.1 Stakeholder theory

In the decision-making process of village renewal, it is affected by the following factors: interaction between different subjects, different goals and different roles. Participants act in a network, exchange resources, and use different interaction patterns in order to achieve goals within a predefined decision context.

According to Edward R. Feiman, stakeholders are identifiable individuals (or entities) who can influence or be affected by activities in terms of products, policies and processes.

Stakeholder analysis involves the following resources: political resources, that is, the consensus that actors can mobilize; Economic resources, i.e. the ability to mobilize money and other factors to change the behaviour of other relevant actors; Legal resources, i.e. strength, strength/weakness from legal rules; Cognitive resources are the information that helps make the final decision. Stakeholders can be roughly divided into political subjects, bureaucratic subjects, holders of special interests, holders of general interests and experts.

The main stakeholder analysis methods include power/interest matrix, stakeholder circle and social network analysis.

The main analysis method used in this paper is power/benefit matrix method. The main questions to consider in this approach are: (1) Who are the stakeholders? (2) What stakeholders want, that is, the interest base. (3) How stakeholders will try to achieve what they want, namely the power base. Divided into four quadrants according to the matrix. For the powerful and high-stakes "players," the strategy is to give them the most attention. For people with small rights and low interests, the strategy is to treat them as potential stakeholders and avoid them gaining rights or interests. For high-power, low-interest "makers", or low-power, high-interest "subjects", the strategy is to make them players or invalidate them.

2.2.2 SRF method and weight determination

Understanding the preferences of decision makers and determining the weight of criteria is a challenge in assisting decision making. There are several ways to assign a standard weight. Among them, Simos proposed a relatively simple process, using a set of cards, allowing indirect determination of the value of the weight. This process was perfected by Bernard Roy and Jose Figueira and is known as the Simos-Roy-Figueira method (SRF)[82].

In this paper, the SRF method is used to assign weights to each index, and the numerical values are calculated on Decspace software. By organizing different stakeholders to rank the importance of indicators, and inserting blank cards in the interval between indicators, then setting the ratio of Z-axis, reserving decimal places and the type of weight, finally calculating the weight of indicators.

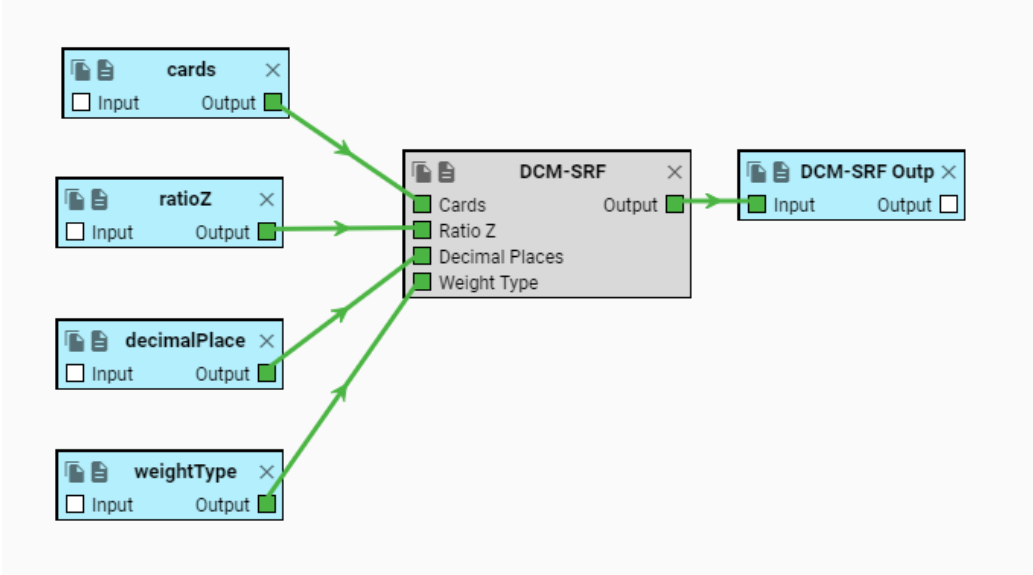


Figure 2-3 Weight assignment operation process (Source: Decspace)

2.3 Multi-stage: evaluation process before, during and after the event

According to the comprehensive evaluation defined above, the evaluation system can be divided into pre-evaluation, in-process evaluation, post-evaluation and follow-up evaluation for different stages [5]. It emphasizes the integrity and continuity of the evaluation content, and the evaluation covers the complete life cycle of the project, which is conducive to the mutual support of project evaluation information at different stages to form a whole of mutual verification, so as to ensure the scientific nature of the evaluation. In addition, the whole process dynamic evaluation of the project is emphasized, the whole process from the beginning to the end of the project is tracked, evaluated and supervised, the summary and improvement before, during and after the decision-making stage and the construction process are strengthened, and real-time feedback and timely adjustment are made according to the results [64].

This paper used the AHP analytic hierarchy process (AHP) properties of deconstruction and reconstruction of villages and towns that form the basis of index system, and according to the characteristics of different indicators preference function, as a base, can be in advance to evaluate present situation pattern, the condition of existing buildings and so on, make the transformation in the process of

update more scheme comparison and selection of the subcontractor to make decisions, After the completion of the evaluation of the update effect.

2.4 Case analysis

2.4.1 Village renewal under multiple objectives and subjects: Zhangyan Village, Qingpu District, Shanghai

The renewal of Villages and towns in Zhangyan Village adopts public-private partnership (PPP) mode, that is, the cooperation mode between the government and social capital. Located in Chonggu Town, Qingpu District, Shanghai, the village is a traditional village of Shanghai city level and has been famous for its prosperity since the Song Dynasty. However, with the acceleration of urbanization, population migration, serious hollowing of villages, infrastructure and buildings in disrepair, village rejuvenation and sustainable development urgently need to be solved.

Figure 2-4 Composition of planning team (Source:reference [6])

Management level	Planning and consulting level	User level
Qingpu District Government, Chonggu Town Government, Zhangyan Village Committee, PPP cooperative unit (China Construction East Hu Development Investment Co., LTD.)	Category of Personnel:Architects, experts in ancient architecture research, planners, planning consultants, etc Company Affiliation:Shanghai Zhongjian Dongfu Development & Investment Co., LTD., Tongji University Architectural Design & Research Institute (Group) Co., LTD., Shanghai Tongji Planning & Design Institute	Public buildings such as Cheng Limited Temple:Monks, believers, and passers-by The village committee:Village administrators and residents Residence:Local villagers, returning entrepreneurs, renters

Figure 2-5 Planning process (Source: Redrawn from reference [6])

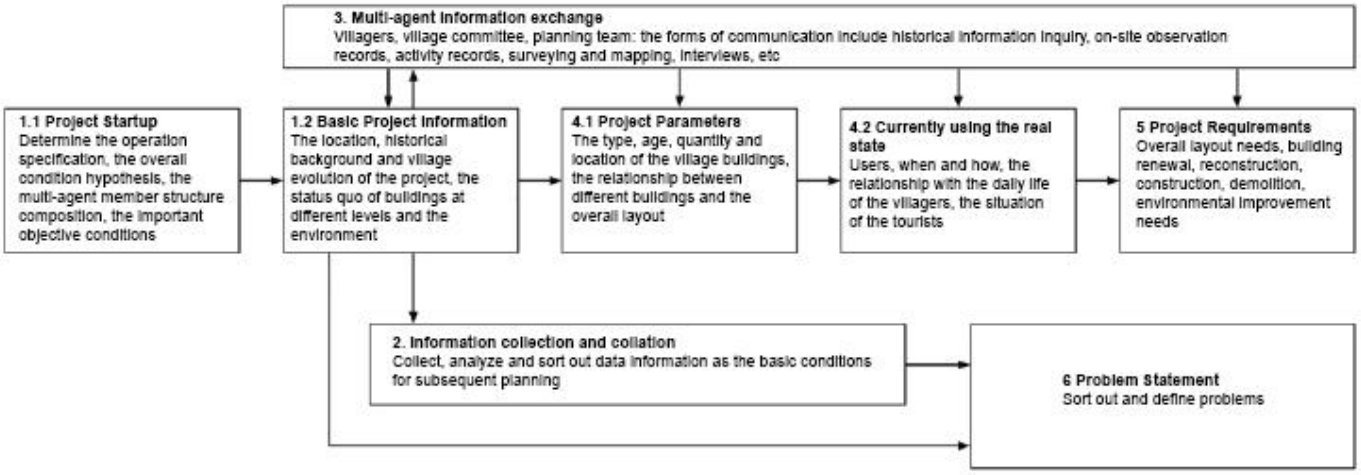


Figure 2-6 Information matrix of Yan Village Renaissance Planning (Source: redrawn from reference [6])

Information types	Target	Facts	Concept	demand	Problem statement
Function	Village regeneration and revival; Meet the needs of multi-subject groups; Sustainable development of villages	Traffic analysis: lack of parking space, traffic disorder; Behavioral patterns: the diversity of behavioral patterns of different groups; Spatial status: multiple types of points, lines and planes, seriously damaged buildings, weak infrastructure can not meet modern needs	Priority relationship: to coordinate the interests of different groups (government, PPP cooperative company, villagers, and migrants); Functional relationship: to coordinate the relationship between different types of users; Future development: Sustainable	Parking and traffic needs: sufficient parking space is needed and the road system needs to be reorganized; Outdoor space needs: daily public activity space for residents, village culture exhibition space; Functional replacement: renewal replacement, demolition and reconstruction, extension and section layer addition	Functional organization: adapt to modern needs; Outdoor space: diverse and applicable; Functional replacement: modern replacement of traditional functions; Traffic organization and improvement: traffic flow and convenience
Form	Environmental improvement, functional integration, diversified sharing and style coordination	The water system and streets are not clear enough, the building types are diverse, and the architectural style is messy	Reorientation and arrangement of water system and streets; Building repair, addition, reconstruction carbon into the new building	Increase the public activity space, increase the building sharing and multi-meaning, architectural style coordination	Continuation of village features, retention and expansion of courtyard functions, and confirmation of architectural features after the implantation of new functions
Economics	Return on investment, operating cost, sustainability of operation and maintenance	High maintenance cost of 32 protected buildings; The outflow of indigenous people and lack of popularity; Consumption demand based on tourism development is limited	Precise positioning, cost control; Expand the diversity, versatility, sharing of functions	Cost assessment and analysis, pay attention to the whole life cost, determine reasonable construction standards, control operation and maintenance costs	Assess the impact of the initial budget on project development; The balance between the preservation of traditional construction mode and cost control
Time	Make a reasonable time node; Identifying different stages of conservation and development; Determine the key points and difficulties in different stages; Determine the content of construction in stages and batches	Importance: time limit impact; Duration: time allocation and impact of transformation activities; Economic budget and impact coefficient over time	Concept of suitability, the concept of locality, the concept of flexibility and adaptation	Improvement: With the passage of time, the traditional atmosphere of the village gradually accumulates and strengthens; Time arrangement: formulate the construction periodic table in detail, urge the consortium to strictly implement; Time - based cost control: coordinate the relationship between time cost and economic cost	Sorting out the development context of the past; Assessment of current rehabilitation measures and instruments; A sustainable vision for future development; Post-use assessment of the built environment

Figure 2-7 Site layout of "Ten Views of Zhangyan" (Source: redrawn from reference [6])

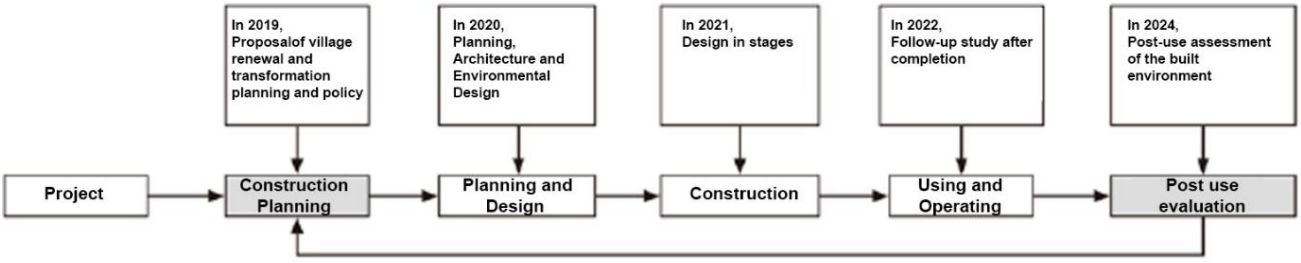


Figure 2-8 Closed-loop of the whole process from architectural planning to post-use evaluation

(Source: redrawn from reference [6])

As THE PPP model is a mode of cooperation between social capital and government, the stakeholders involved are complicated. Its purpose is to reasonably distribute project risks between the government side and the social capital side, clarify the relationship between rights and obligations of both sides, ensure that both sides can reasonably claim rights and fulfill obligations according to the contract, and ensure the smooth implementation of the project in the whole life cycle. Compared with the traditional model, THE PPP model has the characteristics of benchmarking social demand, capital guarantee advantage, reasonable policy orientation, multi-stakeholder interests balance, operation and management integration, etc.

In this mode, during the project of Zhangyan Village, a planning team was organized to establish an information matrix table based on the needs of village rejuvenation, integrate information and explore problems, and then establish a planning scheme of information matrix.

The plan for the revitalization of Zhangyan village takes into account multi-layered issues: not only engineering projects, but also sociological, engineering and economic issues involving systems theory and methodology. At present, the renovation of some buildings has been completed and put into use; During the construction process, many activities have been held according to the content of activity planning. After the completion of the project, the project team plans to intervene in post-use evaluation to study the experience and deficiency of such projects' renovation, so as to complete the closed loop from architectural planning to post-use evaluation.

2.4.2 Quantitative index evaluation technology: Fangxi Village reconstruction based on the analysis of spatio-temporal behavior characteristics based on WiFi probe technology

In the above multi-objective, multi-subject and multi-stage evaluation system of villages and towns, the direct measurement and operability of indicators are highlighted. For example, behavioral trajectory data is taken as one of the quantitative indicators for the evaluation of communicative space vitality, which can be measured by WIFI probe technology. And microclimate data as one of the quantitative indicators of environmental quality evaluation of public space, which can be measured by meteorological stations and hand-held meteorological instruments. Below, taking the multi-criteria evaluation process of WiFi probe technology before the implantation of modern facilities in traditional villages as an example, the guiding

role of quantitative index evaluation on the implantation of facilities is explored.

1. Case background

With the rise of big data research, data collection based on WiFi probe equipment provides a new way to study human behavior rules in environmental behavior science. This case analyzes the results of the course "Spatial Optimization design of Villages and Towns Community" of Southeast University. Taking Fangxi Village, Dingshu Town, Yixing City, Jiangsu Province as the site, WiFi positioning equipment is set inside the village to obtain the location data of mobile phones, and then the spatial-spatial track data of residents and tourists is formed after cleaning. Furthermore, comparative analysis, frequent itemset mining and trajectory clustering are used to study the law of passenger flow on weekdays, weekends, holidays and before and after, in order to provide objective and quantitative design basis for village Renaissance planning.

2. Design logic

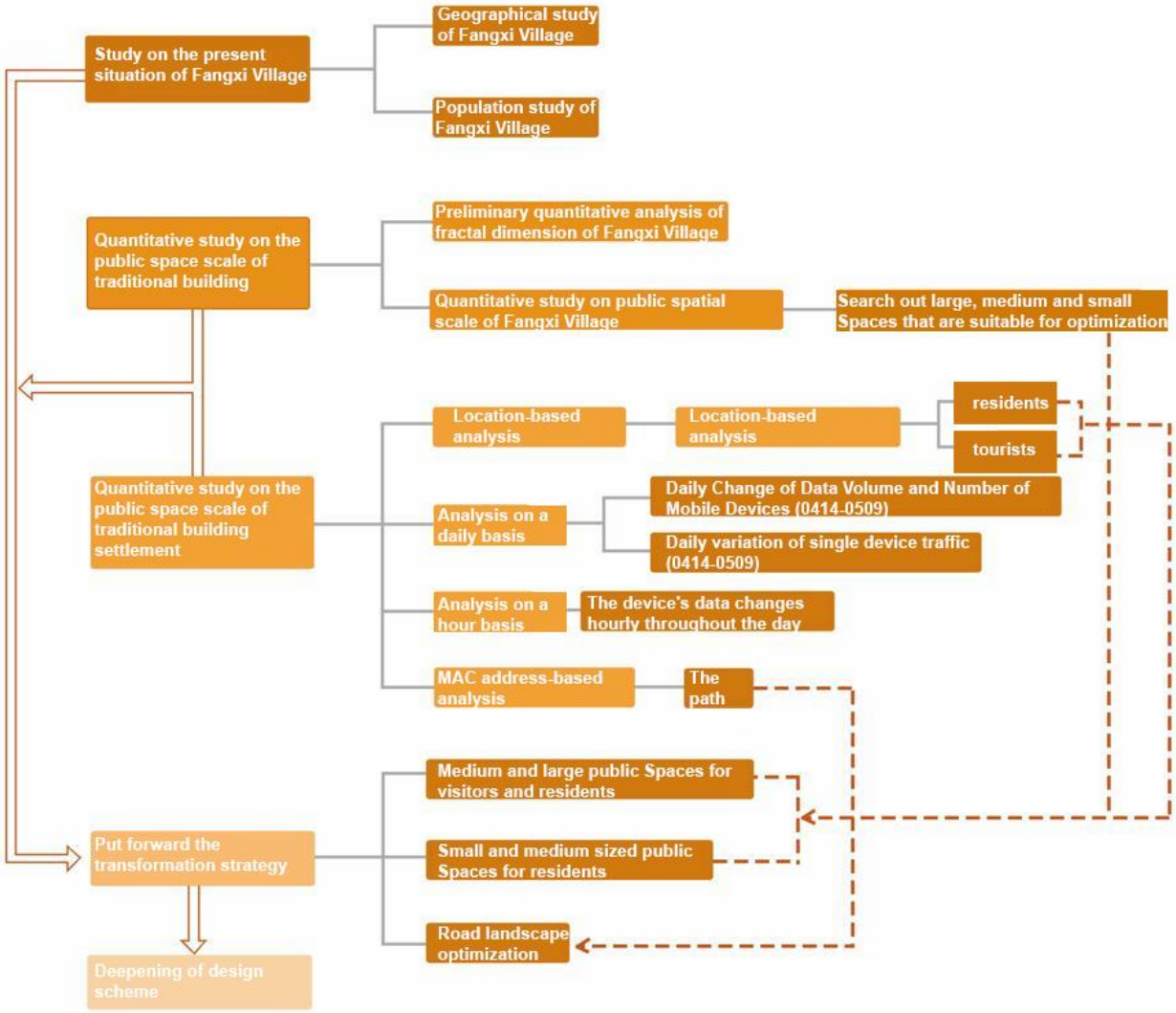


Figure 2-9 Design logic

(Source: design Unit of Spatial Optimization Design of Villages and Towns Community)

Based on the study of the current situation of Fangxi, the design puts forward strategies to improve the current situation through quantitative research on the scale level of traditional village public space and

analysis of spatio-temporal behavior characteristics based on WiFi probe technology. Among them, based on spatial and temporal behavior of WiFi probe technique analysis on concrete, this paper mainly includes: based on the analysis of the geographical location at a crowd of different probe traffic, daily and hourly analysis based on time dimension at a different time of flow change, based on the analysis of the MAC address in order to obtain action.

3. Working principle of WiFi data collection

The phone emits a signal around it that contains a unique ID -- a MAC address. The main principle of WiFi data collection is to detect the MAC addresses of all nearby devices through the probe device. When the device passes near the probe, the data will be collected and sent to the relevant location server through the 4G module in the device. By calling the data of cloud server, cleaning analysis is carried out to study the law of human behavior [9].

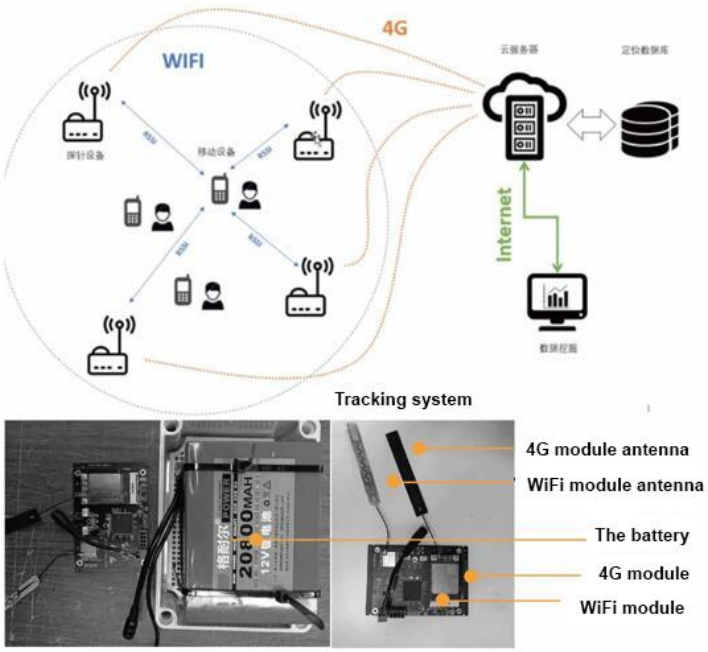


Figure 2-10 Working principle and equipment composition (Source: Design class of Spatial Optimization Design of Villages and Towns Community)

4. Equipment arrangement and data processing

Under the consideration of the equalization of layout and crowd density, the layout of equipment involves different space types such as main road, secondary road and public service facilities.

Preliminary cleaning was performed on the data obtained by the equipment, and fixed WiFi devices such as routers were screened out, which was characterized by continuous stay time of more than 18 hours near a certain equipment point. The data of nearby residents, represented by the continuous stay time of more than 6 hours at a certain point, can be classified as tourists and residents. The frequency range of MAC addresses ranges from 2 to 2000. Then, further data classification processing.

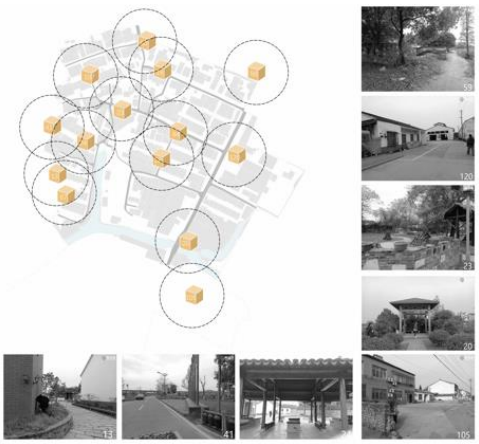


Figure 2-11 Device layout.

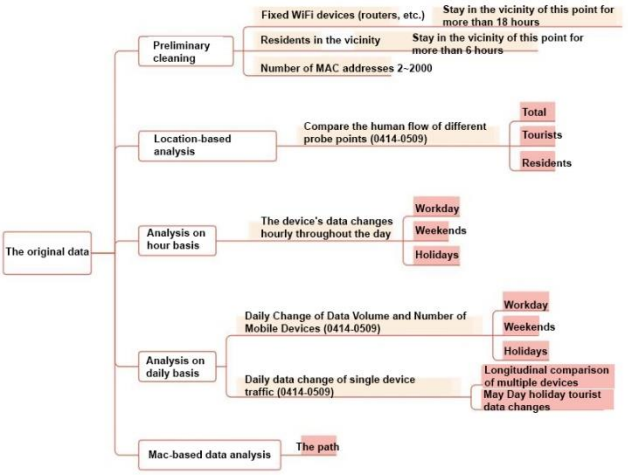


Figure 2-12 Data processing

(Source: Design Unite of Spatial Optimization Design of Village and Town Communities)

5. Data analysis and integration

(1) The amount of positioning data and the number of mobile devices change day by day

In the period from April 14 to May 9, the number of equipment increased significantly before and after the May Day holiday. There is little difference between weekdays and weekends.

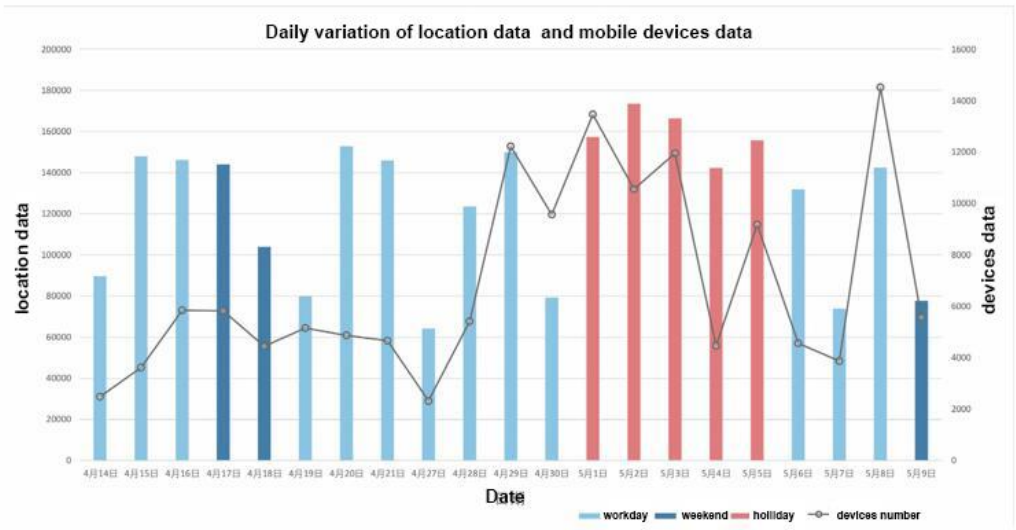


Figure 2-13: Daily changes in the amount of positioning data and the number of mobile devices

(Source: Design class of Spatial Optimization Design of Rural communities)

(2) Thermal map analysis of typical positions

The village entrance space (41), main public open space (24), residential land (67) and remote workshop (105) were selected as typical locations for thermal map analysis. The maximum human flow was at the 24th point, and remained at a high level around the May Day holiday. In other locations, the flow of people is relatively sparse.

Figure 2-14: Thermal map analysis of typical locations

(Source: Design class of Spatial Optimization Design of Rural communities)

(3) Path visualization

On the basis of the amount of positioning data in the early stage, the human flow behavior is fitted to try to restore the human flow track graph, and the data attempt to analyze the human flow route from the mapping relationship between two probes. On the left, the wider and darker the line, the more dense the traffic. The results show that there are three main roads with relatively dense flow of people in Fangxi Village, and the later design can be targeted to optimize the landscape.

Figure 2-15: Path visualization

(Source: Design class of Spatial Optimization Design of Rural communities)

(4) Statistical visualization of each probe at weekends, working days and holidays

The flow of people every day (0414-0509) was counted, and the date was divided into three categories: weekend, working day and holiday, and the daily mean value of each time period was calculated respectively. Through hourly comparison, combined with on-site field research, we can explore the behavior characteristics of people flow, and carry out targeted building transformation or public space

optimization.

Further analysis shows that each equipment point has a special flow characteristic. The variation of the flow of people among equipment points is also different. For example, the flow of no. 24 equipment is the largest, but its data changes slowly from time to time. In addition, the accuracy of data processing can be verified by on-site actual investigation and combined with architectural functions.

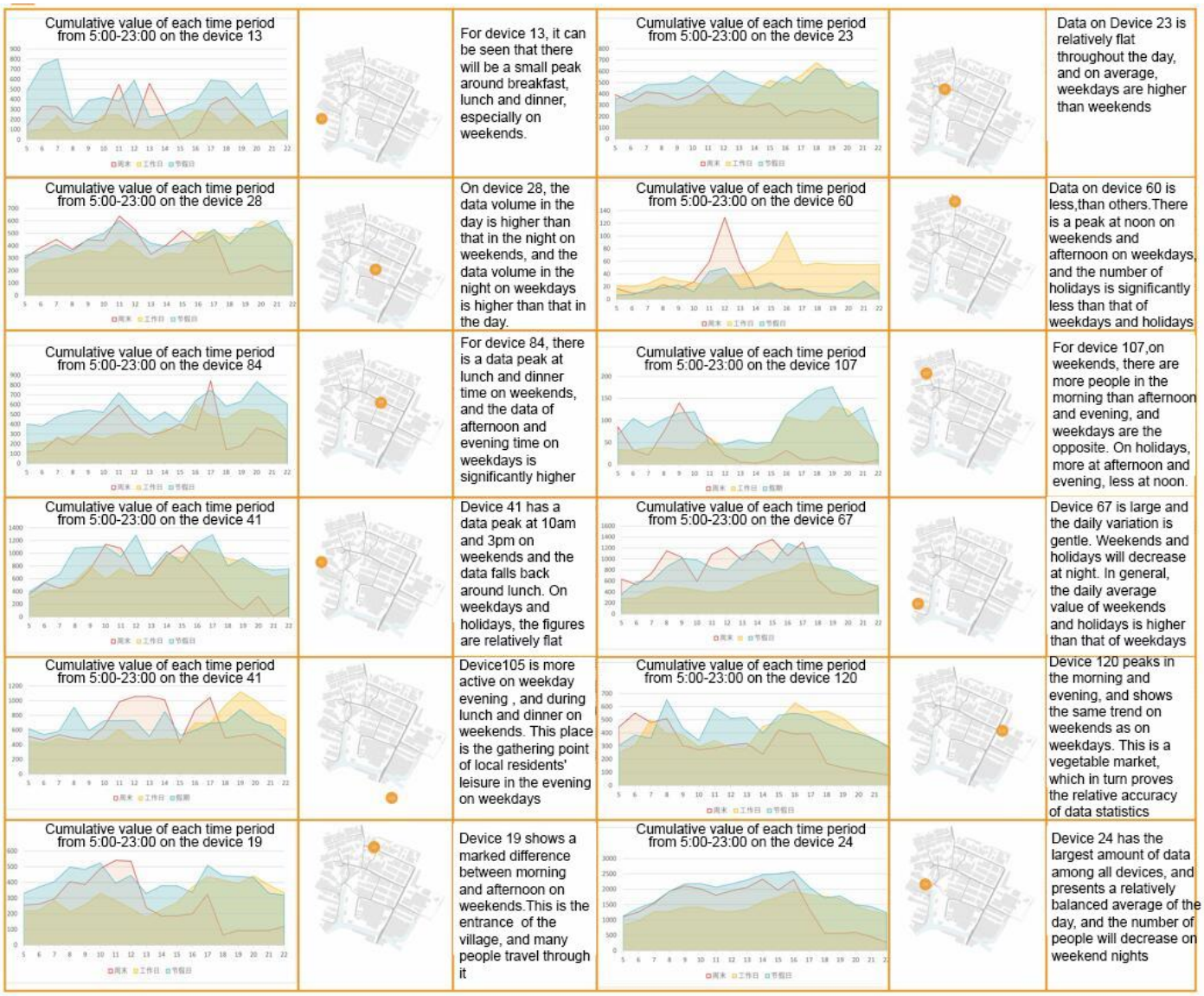


Figure 2-16: Statistical visualization of each probe at weekends, working days and holidays

(Source: Design class of Spatial Optimization Design of Rural communities)

The time segment of each day is divided into non-meal time during the day, meal time and 3 o 'clock in the evening, and the data type of each point is analyzed. For example, the data type represented by point 67 in the residential space will increase before and after meal time, be balanced at 3 o 'clock during holidays, and be dense on weekdays and weekends. Most of these points are located in front of residents' houses or alleys. Another example is the main public open space represented by spot no. 24 in the scenic spot. There is no obvious data bias at three points, and the data quantity is balanced.

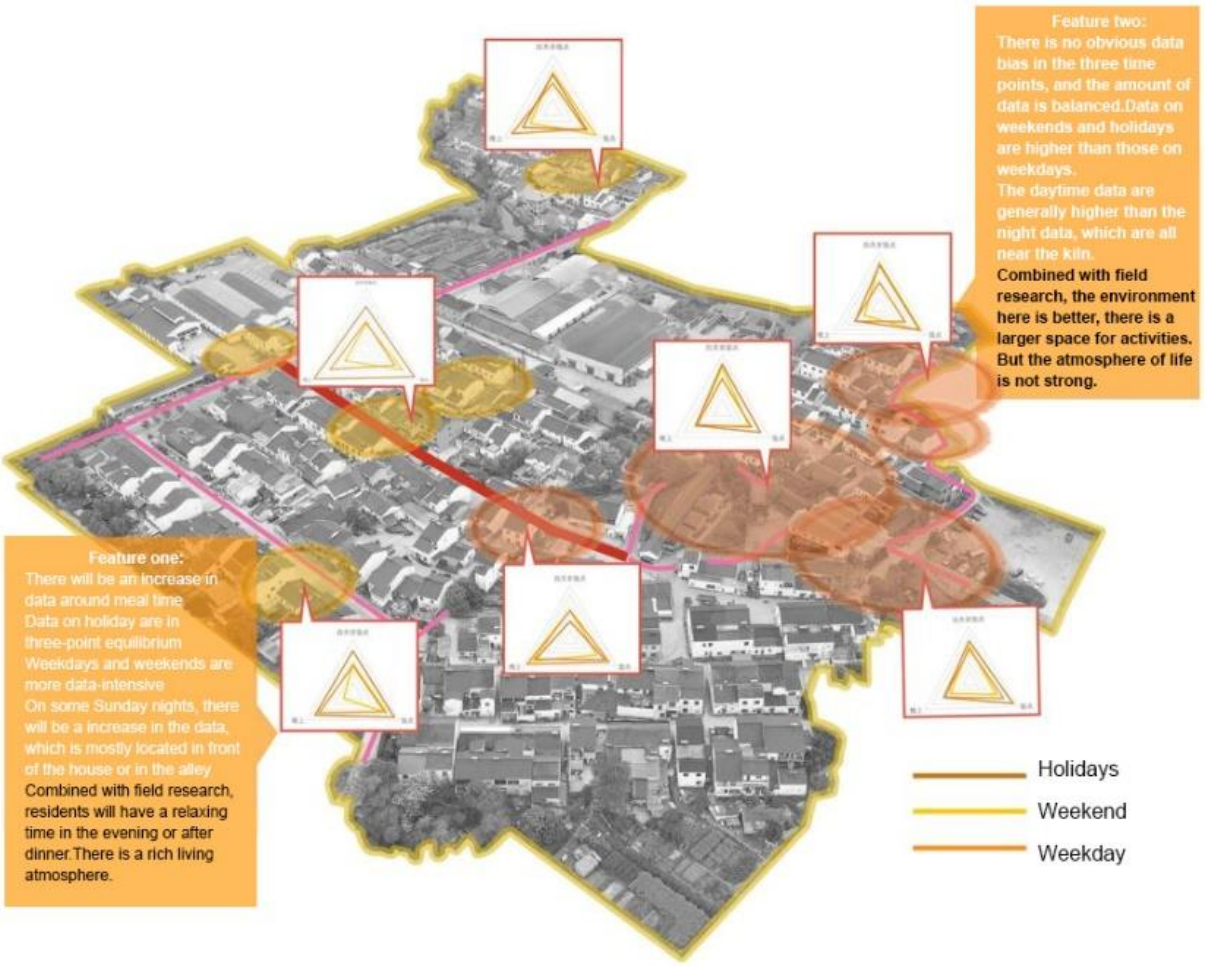


Figure 2-17: Data integration

(Source: Design class of Spatial Optimization Design of Rural communities)

(5) Update the strategy

Based on the analysis of spatio-temporal behavior characteristics of WIFI positioning technology above, we conducted a detailed sorting of the overall public space of Fangxi Village, discussed from different categories and scales, used data to guide the design operation, and also used traditional architectural design methods to think and improve. To improve the quality of life of fangxi village villagers, upgrade the quality of fangxi village public space, add and improve the functional facilities of Fangxi Village; At the same time, we should pay attention to the promotion of the cultural influence of qianshu Dragon in Fangxi Village.

(6) Summary

This case is deduced into the evaluation system of village renewal, as one of the quantitative indicators of the vitality evaluation of communication space, and provides technical support for layout strategy in the early stage of implantation.

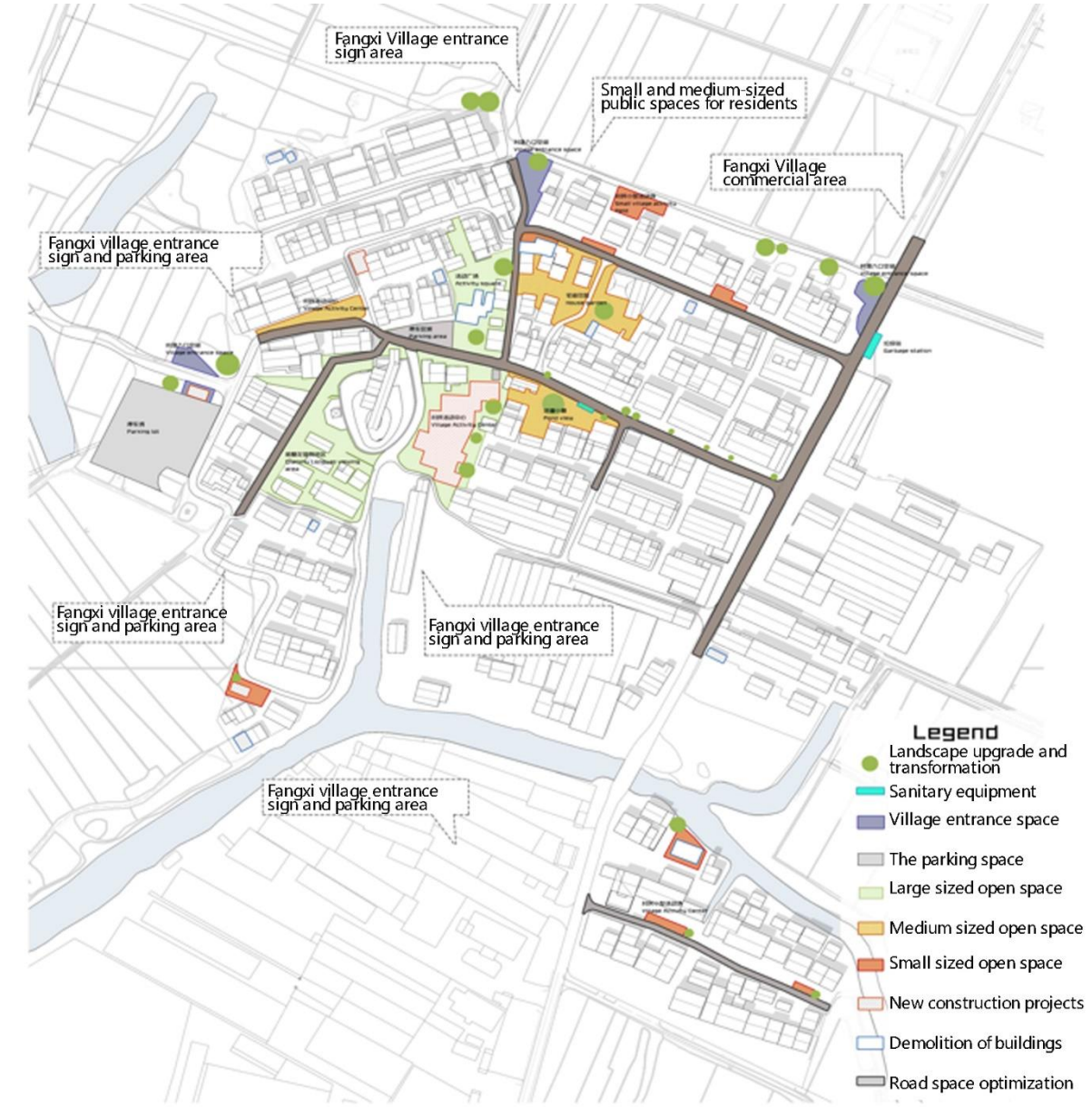


Figure 2-18: Renewal strategy

(Source: Design class of Spatial Optimization Design of Rural communities)

Chapterter III: Evaluation from multi-objective, multi-subject and multi-stage

From January 2021 to January 2022, the research group has completed the preliminary investigation and selection of typical villages, selected nearly 170 villages (towns), and designed the "Traditional Villages and Modern Facilities Implantation Survey General form" (see appendix for the list of villages and towns, survey general form and examples of filling in the general form). So far, nearly 40 villages have been investigated, covering jiangsu, Zhejiang, Anhui, Hebei, Henan, Shandong, Guizhou, Hubei, Jiangxi, Fujian and other provinces, and the "basic situation of traditional villages and modern facilities implantation survey database" has been preliminarily established.

Figure 3-1 Distribution of villages investigated by the research group (photo source: drawn by the author)

On the basis of "basic situation of traditional villages and Implantation investigation database of modern facilities" supported by the research group, combined with national and provincial documents related to rural construction and United Nations sustainable Development Goals, the comprehensive evaluation system of cultural and tourism village renewal was preliminarily constructed. Abstract the three basic attributes of village tourism, namely community, heritage and tourism: (1) Community attribute, community is not only the most basic structural unit in the history of human society, but also the most basic management unit in the contemporary administrative system and the most important living and production homes of residents. (2) The attribute of heritage is a given attribute recognized by The Times and national discourse in the modern context and beyond the scope of community. A few villages that retain time-honored historical information, cultural landscape and national memory have become carriers and recorders of traditional civilization in the post-industrial era through some authoritative certification [68]. (3) Tourism attribute is a derivative attribute developed from community or heritage attribute along with the development of tourism industry and the new urbanization guided by tourism [69], and its core is the dual attribute of tourism resources and tourism industry. Therefore, the subsystem of its three attributes is constructed, coupled, quantitative measurement is highlighted, and systematic evaluation of cultural villages and towns is carried out from different levels, different stages and different evaluation subjects.

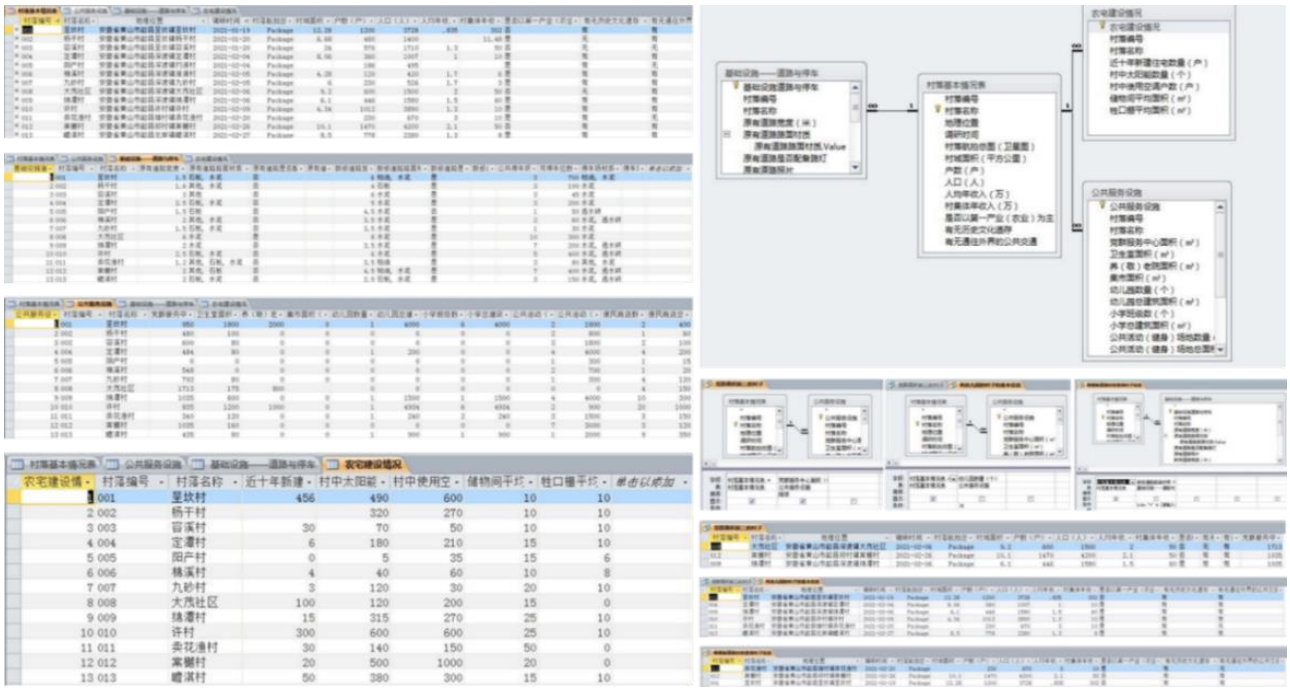


Figure 3-2 Basic situation of traditional villages and interception of modern facilities implantation survey database (picture source: Collated by the research group)

AHP is used to decompose the overall evaluation target layer by layer, and the evaluation target of each layer is obtained. The qualitative and quantitative evaluation is carried out for multi-objective hierarchical comprehensive evaluation. In addition, based on the cognition of the three attributes of tourism-type towns and villages mentioned above, the evaluation system should not only measure the development of the three subsystems of traditional style protection, community development and tourism development independently, but also evaluate the synergistic development among them.

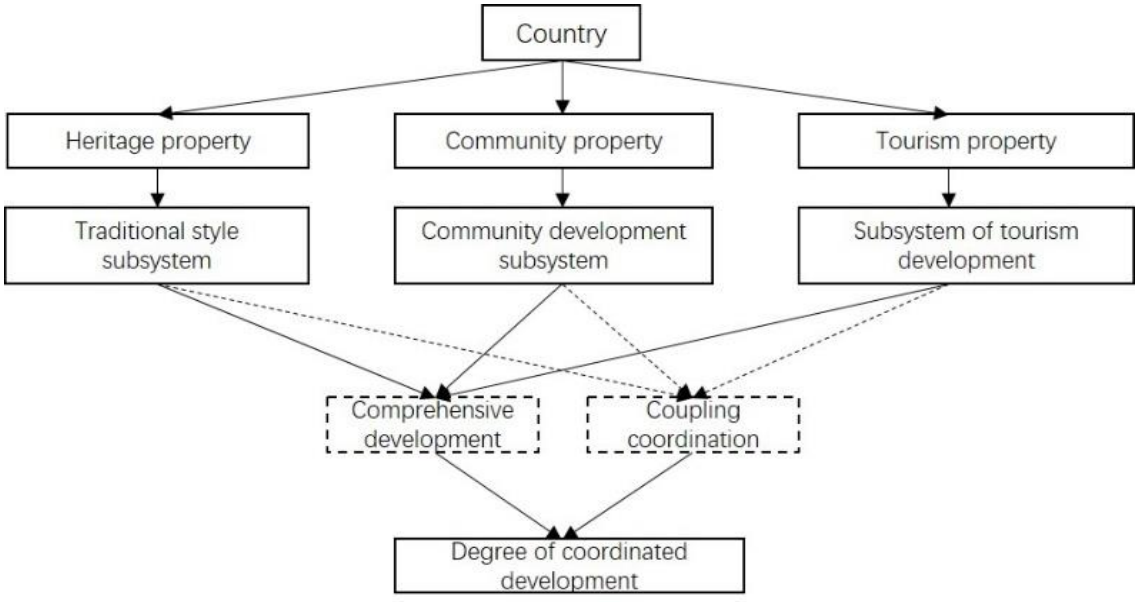


Figure 3-3 Basic logic of village and town renewal evaluation (picture source: self-drawn by the author)

3.1 Index Selection

Based on the theoretical framework of sustainable development of tourism-oriented rural communities, this paper selects the subsystem index system of traditional style, community development and tourism development by means of document induction, literature analysis, field observation and in-depth interview. (1) Sort out and summarize relevant research and government documents on tourism development such as the protection of traditional villages, sustainable development of rural communities and construction of new countryside, and characteristic towns in China, and establish a primary index database. (2) Evaluate the effectiveness, scientificity, identification, availability and operability of each index through field investigation of villages and towns in different regions, types and development status. (3) In-depth interviews were conducted with scholars related to traditional villages, grass-roots township staff, tourism developers, community residents and tourists to examine the sustainable development elements of traditional villages from the perspective of different stakeholders. (4) After the primary election of the indicator system, focus groups were held consisting of professors, associate professors, postgraduates and postgraduates, and rural construction practitioners. (5) Based on the index database constructed by the tourism, community and style sub-systems, the 1±X evaluation system is used for elastic operation.

3.1.1 Index selection of community development subsystem

In the selection of indicators of community development subsystem, the following documents are referred to: ① Internationally mature Label EcoQuartier released in 2012 involves four dimensions and 20 principles, including methods and processes, residential environment and use, land use, environment and climate protection, and the following indicators are excluded: (1) Only global, regional, national or urban macro-level indicators, such as urban planning systems that adapt to climate change and risk, active modes of transport, biodiversity conservation, etc. (2) China's National Plan for the Implementation of the 2030 Agenda for Sustainable Development released in 2016 and China's National Voluntary Report on the Implementation of the 2030 Agenda released in 2021 overlap with the former. In addition, the following indicators are excluded: Indicators that are managed by higher administrative departments or are counted at or above the county level, such as indicators of public service facilities such as highway mileage for 10,000 people and number of hospital beds for 10,000 people; Policy indicators formulated and implemented uniformly by the state without significant differences among villages; Targets already achieved in 2022, such as the poverty rate and universal health coverage; Indicators that contradict the sustainable development of villages and towns, such as the number of houses per household. (3) At the same time, the first level indicators were constructed according to the five goals in the Strategic Plan for Rural Revitalization (2018-2022), and the overall perception indicators were added based on the literature. Based on the above, a community development subsystem of village and village renewal covering 6 first-level indicators and 24 second-level indicators was integrated.

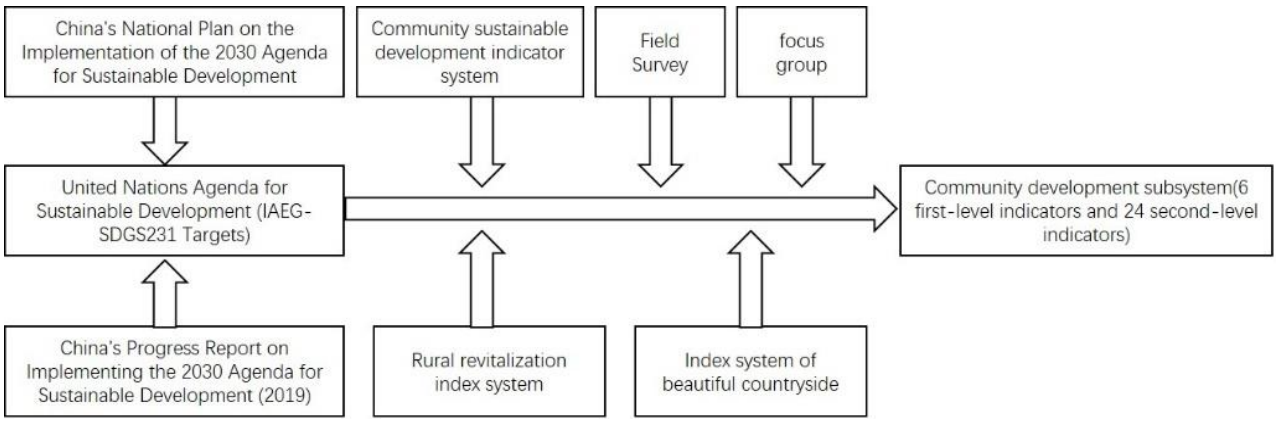


Figure 3-4 Index selection process of community development subsystem

(Source: drawn by the author)

3.1.2 Subsystem index selection of traditional style

In the selection of indicators for the sub-system of local features, the index System for Evaluation and Identification of Traditional Villages (Trial) ([2012] No. 125) is mainly referred to, including traditional architecture, site selection and pattern, and intangible cultural heritage. In addition, on the basis of the three major parts, combined with relevant literature, field research and focus group discussion, two new first-level indicators of heritage identity, heritage activation and inheritance were added, and finally a traditional style sub-system with five first-level indicators and 20 second-level indicators was formed.

3.1.3 Index selection of tourism development subsystem

In the selection of indicators of tourism development subsystem, we mainly refer to the Classification and Evaluation of Quality Grades of Tourist Attractions (GB/T17775-2003), combined with field research and relevant literature, and pay special attention to the definition and data sources of indicators related to rural tourism in previous studies. And "whether it is a necessary indicator for the development of rural tourism destination" "whether it can reflect the characteristics of rural tourism" and "whether it has the operability of rural scale" as the basic standards. The subsystem of tourism development including destination, tourist source market, tourism channel and tourism support system is determined comprehensively, which includes 4 first-level indexes and 15 second-level indexes. As shown in Table 3-2, an evaluation system was formed based on the three subsystems of traditional style, community development and tourism development, and adjusted flexibly according to the differences of the research objects at different time stages.

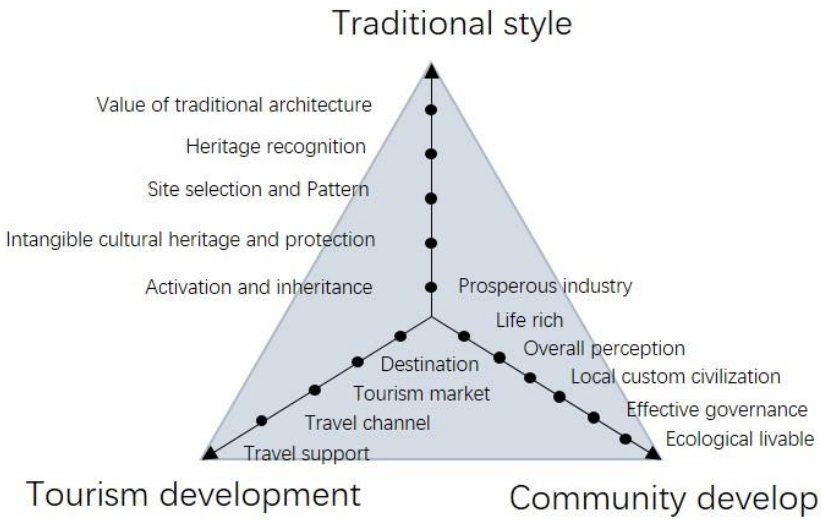


Figure 3-5 Evaluation dimensions of village and town renewal (Source: drawn by the author)

3.2 Data acquisition and processing

After constructing the evaluation system, some indexes are removed and replaced according to the operability of the case. The indexes are classified into objective quantification category and subjective feeling category to obtain evaluation data sources. The sources of evaluation data are divided into field measurement, report literature and subjective evaluation. Among them, the data of the field measurement section is basically perfect, and the latter two need to be further screened, measured and designed based on instruments and cases. Contact the evaluation team, including but not limited to the project developer, architects, professional designers except buildings, construction companies, owners' representatives, and other local residents.

Table 3-1 Methods of obtaining and assigning indicators

Data acquisition	Method	Secondary index	Assignment method
PRA	Resindnt of PRA	CA3,CB2,CB3,CC1,CC2,CC3,CD3,CE1,CE2, CE3,HB1,HB2,TD1,TD2	Richter 5 subscale assignment
	Visit of PRA	TA2,TB2,TC2,	
Sampling	Residents of sampling	CB1,CD1,CD2	1-5 points were assigned according to the specific evaluation criteria of each index
	Visit of sampling	TB3	
Comprehensive	Government + Literature	CA1,CA2,CF1,HA1,HA2,HC1,HD1,HD3,HE2,HE3, HE5,TA6,TC3,TD3	value or ratio
Measurement	Field visit	HA4,HA5,HC2,HC3,HC4,HC5.HD2,HD4,HE1, HE4,HE6,TA1,TC1	1-5 points were assigned according to the specific evaluation criteria of each index
	Model or map measurement	CF2,CF3,CF4,CF5,CF6,CF7,CF8,CF9,HA3,TA3,TA4, TA5,TB1,	value or ratio

Table 3-2 Index system of sustainable development of village and town renewal

Community development subsystem					Traditional style subsystem					Tourism development subsystem				
Level indicators	Serial number	secondary indicators	description	Index reference	Level indicators	Serial number	secondary indicators	description	Index reference	Level indicators	Serial number	secondary indicators	description	Index reference
Prosperous industry CA	CA1	Development of characteristic industries	The development degree of local advantage industry	I/II/ IV	Value of traditional building HA	HA1	longevity	Construction age in the building cluster	VI	Destination TA	TA1	Rural nature	Degree of preservation and display of typical rural landscapes, cultures and industries	IV
	CA2	Industrial diversification	Industry type Type quantity	IV		HA2	Scarcity	Cultural relic protection unit level	VI		TA2	Popularity of tourism resources	Popularity, public awareness and media exposure of tourism resources	IV
	CA3	Local employment opportunities	The extent of employment opportunities available in the region	IV		HA3	Scale	Gross floor area	VI		TA3	Scale of tourism resources	Number and area of tourism resources covered by the village	VII
Rich life CB	CB1	Per capita annual household income	Annual per capita household income	I/II/ IV		HA4	Integrity	Conservation of the building	VI		TA4	Tourism infrastructure	The number and perfection of public toilets, smashed marking systems, tourist reception facilities, trash cans and other facilities	VII
	CB2	Community wealth gap	The degree of inequality in the community	I/II		HA5	Richness	Types of building functions	VI		TA5	Entertainment facilities	Quantity and quality of tourism and leisure facilities and projects provided to tourists	VII
	CB3	Housing satisfaction	Degree of satisfaction with housing	IV	Heritage recognition HB	HB1	Resident Identity	Degree of recognition of historical heritage	**IV**		TA6	Reception capacity	The largest tourist reception capacity in the village	VII
Overall perception CC	CC1	Life satisfaction	How satisfied you are with your life	IV		HB2	Emotional attachment	Degree of attachment to historical heritage	IV	Source market TB	TB1	Customer source market distance	Distance from core source market	VII

Ecological	Local custom civilization CD	CC2	Residents' happiness	Degree of happiness	I/II	Site selection and pattern HC	HC1	Longevity	Formation age of the existing site	**VI**	Travel channel TC	TB2	Satisfaction	Tourist satisfaction with the travel experience	VII
		CC3	Sense of relative deprivation	The emotional level of deprivation	III		HC2	Richness	Types of existing historical environmental elements	VI		TB3	Stay time	Average stay time of tourists	IV
		CD1	Formal education level	The educational level of the adult workforce	I/II/IV		HC3	Pattern integrity	Degree of preservation of the traditional pattern of the village	VI		TC1	Transportation service	Accessibility and ease of transportation systems to central cities	VII
		CD2	Green education	Green ecological publicity and education	I/II		HC4	Scientific and cultural value	Village site selection, planning and construction reflect scientific, cultural, historical and archaeological values	VI		TC2	Information service	Difficulty of obtaining tourist information	VII
		CD3	Neighborhood	Degree of neighborhood harmony	I/II		HC5	Coordination	Village and surrounding natural scenery maintain a harmonious and symbiotic relationship	VI		TC3	Tourism marketing	Tourism marketing plan, tourism promotion channels and effects	VII
	Effective governance CE	CE1	Policy transparency	Openness of policy	I/II	Intangible cultural heritage value HD	HD1	Scarcity	Intangible cultural heritage level	**VI**	Travel support TD	TD1	Resident friendliness	How friendly the residents are to tourists	IV
		CE2	Villager participation	The degree to which villagers participate in governance	IV		HD2	Richness	Types of Intangible Cultural Heritage	VI		TD2	Community participation rate	Proportion of community residents among tourism practitioners	IV
		CE3	Service satisfaction	Satisfaction with community service	II		HD3	Continuity	Continuous inheritance time	VI		TD3	Sources of funds	Degree of diversification and stability of tourism investment	IV
		CF1	Industry friendliness	Environmental friendliness of the industry	II/III		HD4	Dependency	Scale of inheritance activities	VI					

	CF2	village green	Village greening rate	IV	Heritage activation and inheritance HE	HE1	Inheritance of traditional craftsmanship	Degree of inheritance of traditional construction techniques and other activities	**VI**
	CF3	Sewage waste treatment	Scale of sewage and waste treatment facilities	I/II/ III/ IV		HE2	Intangible cultural heritage	Inheritance situation	VI
	CF4	transportation facilities	Accessibility of transportation facilities	II/ III		HE3	Scale of intangible cultural heritage activities	Scale of inheritance activities	VI
	CF5	Village road hardening	The proportion of hard roads	IV		HE4	Inheritor of intangible cultural heritage	Whether there is a clear representative inheritor	VI
	CF6	Village lighting coverage	Number of street lamps/line kilometres	V		HE5	Building revitalization	Degree of building renovation	IV
	CF7	Sanitary toilet penetration rate	Toilet coverage	I/II/ III		HE6	Building registration restoration	Restoration of buildings on record with the government	IV
	CF8	Public facilities perfection	Degree of perfection of public facilities	I/II/ III					
	CF9	Accessibility of financial services	Degree of financial service facilities	I/II/ III					

Note: Ⅰ: IAED-SDGS; Ⅱ: National plan; Ⅲ: Progress report; Ⅳ: Literature; Ⅴ: Focus group; Quality Classification and Evaluation of Tourist Scenic Spots (GB/T17775-2003)

3.3 Auxiliary technology for quantitative evaluation of indicators

As shown in Figure 2-1 in Chapter 2, in the data collection process in the evaluation process, methods such as questionnaire interviews, literature research, spatiotemporal data, performance simulation, and field measurements can be used. Traditional data collection methods include archival data method, document data method, questionnaire survey method, interview method, direct observation method, site survey and measurement, systematic observation method, measurement method, recording method, photographing method, video recording method, recording method, etc. Cognitive maps and records of usage patterns, records of changes to design and changes to space usage functions, etc. Although traditional data collection

methods are highly operable, they are time-consuming and labor-intensive. Therefore, we can consider introducing new technologies and combining traditional methods to obtain more objective data results for certain indicators. For example, the use of big data enables users and managers to quantitatively evaluate and improve the performance of buildings. Disney has begun to use location tracking and other usage experience metrics to optimize its parks; another example is the use of space syntax to analyze the characteristics of spaces in a quantitative way.

(1) Open source big data platform

In the process of quantitative evaluation of indicators, some macro data can be obtained on the data platform, such as climate data and population data in the "China Statistical Yearbook". In Western countries, there are also some visualization platforms, which can obtain data graphs of the number of social housing units, the number of jobs, and the number of births, as well as public questionnaire platforms, which can obtain quantitative scores for some perceptual indicators.

On the APUR platform, for example, this data visualization tool provides nearly 400 maps, 70 indicators, 6 themes and 22 statistical sources. Data visualization enables one to observe developments and bring the Paris region and municipal commune into view. The indicators are grouped into six themes: population society, family, housing living conditions, unemployment integration, economic employment and living environment. For example, it includes the number of social housing units, the number of jobs, the number of births, families with cars, the number of doctors, and even an index of the use of public transport and green spaces. The tool's cartographic interface is based on three data representation models that allow the available information to be clearly defined: (1) Number of people, giving an idea of the number of people considered (for example, the number of youth under the age of 20 in a district, municipal commune, or district). (2)Provide the ratio of structure and "weight" information for each category (for example, the ratio of young people under 20 to the total population of a district, municipal commune, or district). (3) The evolution trend in the past 5 years. Twenty-two statistical sources were developed, including the INSEE census, as well as economics and trade, housing, demographics and social affairs, health, environment and transport.

Figure 3-6 Data visualization based on indicators such as population and society, housing and living conditions, economic employment, and living environment

(Source: APUR)

(2) Space-time trajectory data

This technology can capture the IP address of the mobile phone Wi-Fi without affecting the user's mobile phone signal, and realize the monitoring of daily traffic and arrival and departure time. This technology was developed by Professor Huang Weixin from the School of Architecture of Tsinghua University and his team development. Detect the behavior patterns of users and the usage of each main space, and extract the information and geographic location related to subjective feelings more effectively.

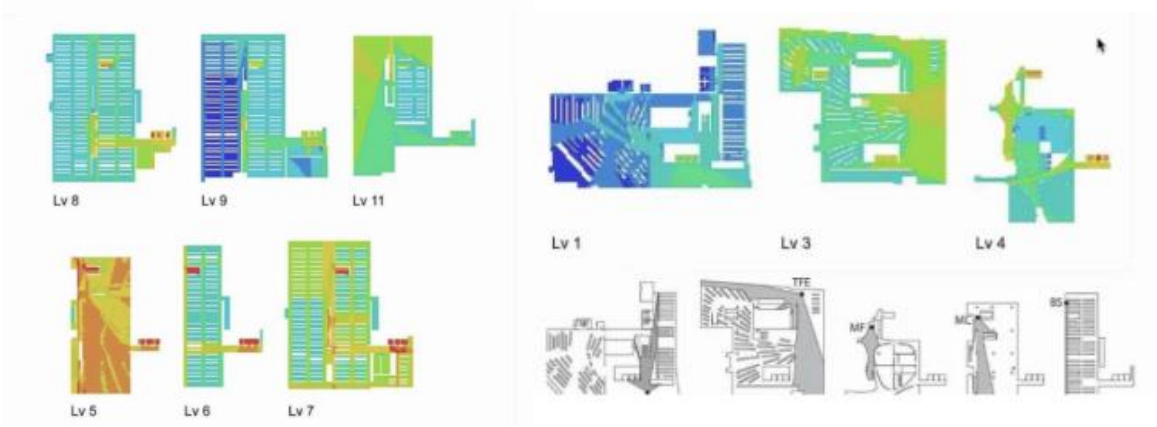


Figure 3-7 Visualization of space-time trajectory based on WiFi probe

(Image source: Huang Weixin's team at Tsinghua University)

(3) Simulation and actual measurement of building indoor and outdoor environment

In addition, it is also possible to measure the physical environment of the buildings in the streets, alleys, squares and other spaces inside the building or outside the building group to evaluate the building envelope, equipment and facilities, and the layout planning of the building group, so that the individual buildings in villages and towns can be evaluated. And the planning layout is more scientific and livable.

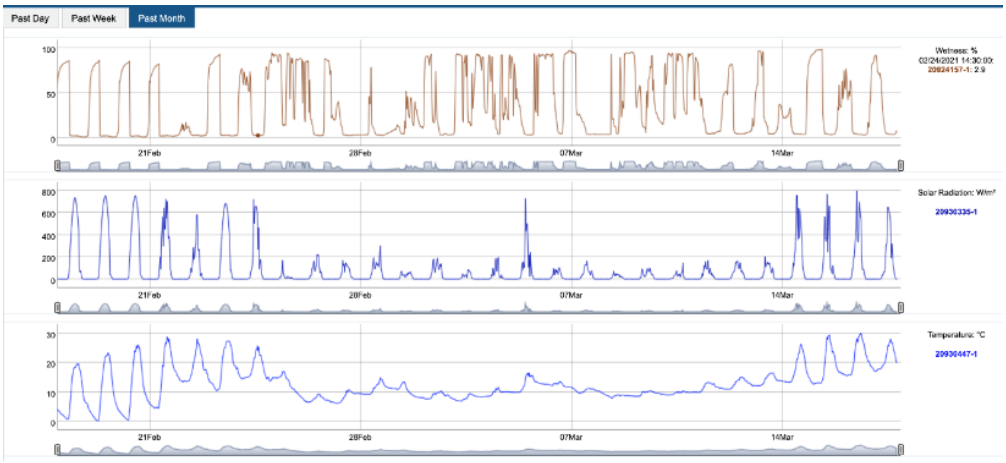


Figure 3-8 Outdoor microclimate data of Zhangjiawan Village

(Source: Measured by the research group of "Dynamic Simulation Technology for Green and Livable Unit Planning in Villages and Towns")

Chapterter IV: The Complexity and contradiction of villages and towns renewal under multi-objective and multi-subjects——taking Xinfeng Old Street as an Example

4.1 General characteristics of the old street project in Xinfeng town, Yancheng city

The project is located in Xinfeng Town, north of Dafeng District, east of Jiangsu and north of Shanghai. It is one of the important cities in Shanghai's "two-hour economic circle" and Yangtze River Delta Economic Zone, and has the location advantage to build an international open area. Xinfeng Town belongs to Dafeng District of Yancheng City, located in the north of Dafeng city, the base is located in the core town area of Xinfeng Town, located in the key position to connect the scenic spot and the town, and adjacent to the National 4A level scenic spot Holland Flower Sea, which has a good industrial development foundation and tourist base.

Figure 4-1 Location of the project (photo source: Applicable Studio of China Rural Construction Institute)

According to the yancheng country revitalization strategy implementation plan (2019-2022 "file, around the" industry strong city, ecological city, rich xing city "development strategy and" two sea green development path, "aimed at" one of the leading enterprises in the middle north jiangsu rural revitalization "target, implement the strategy of rejuvenating the country into a new era of yancheng" three rural "work always gripper.

The abundant plant resources, animal resources and water resources in the region lay a good foundation for the construction of a sound ecological network. The century-old rivers, quantico, strips,

fields and blocks are planned to become characteristic landscape, with blue and green interwoven, coherent water network and more waterfront space. With water culture, educated youth culture, farm culture, folk culture and other cultural resources.

In addition, in the sixth year of the Republic of China (1917), national industrialist Zhang Qian came to Dafeng and founded Dafeng Yanken Joint-stock Company. In the eighth year of the Republic of China (1919), Zhang Qian hired Dutch water expert Telek to plan farmland water conservancy projects in Xinfeng, and established four drainage and irrigation systems: district, kuang, drainage and Tiao. In 1919, the first market town -- Xinfeng Town (also known as "Xinfeng Set" in the early stage) rose up in Dafeng Reclamation Area. Its core area covers an area of 140000 ㎡, which is located at the junction of Yufeng, Tongfeng and Yifeng. The following year, the reclamation department of Dafeng Company also moved to The Yufeng area of Xinfeng Town. Chinese historian Meng Chunsun called Xinfeng Town "the first town in the village planning of the Republic of China" in his diary.

Figure 4-2 Current situation of water system ecology

(Photo source: F.I.T Studio)

The planning and positioning will integrate Xinfeng Old Street into the Doulonggang Ecological Group, highlight the cultural and historical accumulation of the old street and the characteristic pattern of Tiaotian, and create a new business card for innovative cultural tourism in Yancheng City. With the theme of "living humanistic old street, all-round cultural tourism experience", the reclamation management bureau site renewal, Qihai immigrant cultural center, soy sauce workshop, Xinfeng Theater Square, houseboats, waterfront forest, riverside theater, Guided by key cultural experience projects such as water

cruises, it is a comprehensive cultural tourism experience project integrating catering, accommodation, retail, bars, cultural creativity, entertainment and other formats. The total area is about 40 hectares, with a planned investment of 700 million yuan. After completion, it will become a new landmark of the old commercial street project in northern Jiangsu.

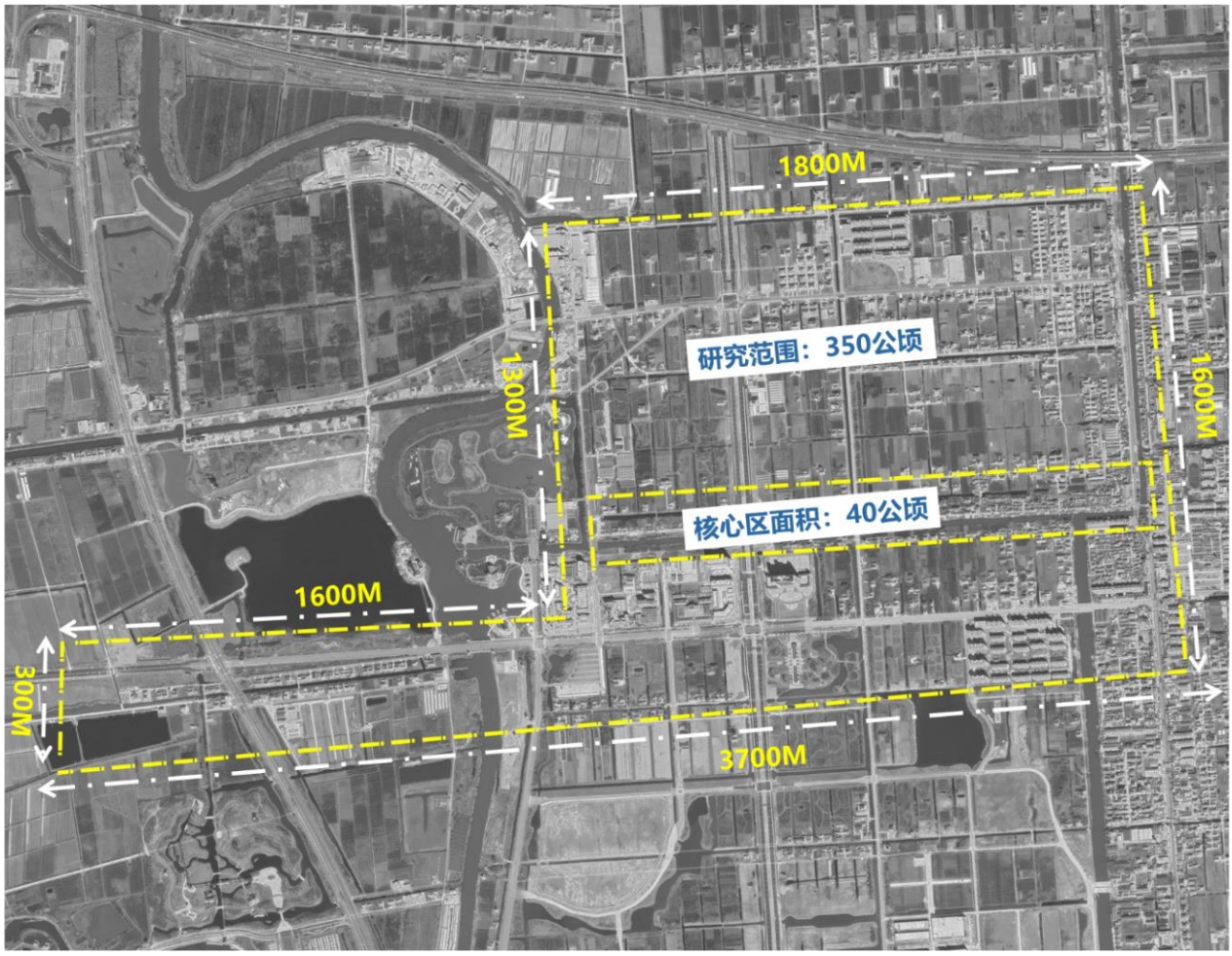


Figure 4-3 General planning scope of the base

(Photo source: F.I.T Studio)

It mainly includes landscape lighting, greening enhancement, house repair, and new facade. While improving the infrastructure, we pay more attention to the improvement of the "quality" of the old streets, fully tap the cultural atmosphere of the old streets, update the relics of the Bureau of Reclamation, and display projects such as the Qihai Immigrant Cultural Center, the Soy Sauce Workshop, and the Xinfeng Old Theater. Create a comprehensive cultural tourism experience format such as water cruises, catering, entertainment, bars, and cultural creativity. Fully develop the tourism economy, realize the integration of historicity, functionality and entertainment of the old streets, and fully meet the needs of tourists for food, housing, transportation, travel, shopping and entertainment.

This study focuses on the core area of the project. Based on the conceptual planning scheme completed by the Applicable Studio of China Rural Construction Institute since May 2020, and the first-phase and soon-to-be-launched second-phase on-site design projects since June 2021 as primary data, this

paper carries out research and discussion.

Figure 4-4 3D tilt photography before the first phase of the project transformation

Figure 4-5 Overall status

4.2 Transition and conflict from the multi-objective perspective

In the conceptual phase of the overall planning of the project, there were corresponding thoughts about the positioning of the project, which was a cultural and tourism project based on commercial development or a people's livelihood project based on stimulating community vitality and improving living environment. At the same time, in the local environment where the project itself is located, how to retain folk customs and local style on the basis of the development of the former two. If there are both, which is the priority of the three. This involves how to mobilize public participation, play the role of residents and balance the interests of various parties.

From the perspective of improving the living environment, in terms of physical space, there are a large number of houses with poor features in the section that need to be renovated and transformed, and it is very difficult to clean up the river and purify the water quality. In terms of community construction, in the mutual feed-forward relationship between capital and land, there are many obstacles to coordinate the game relationship between capital subject and individual farmers to better promote the transformation of rural space.

From the perspective of cultural and tourism business operations, if the 2km long blocks are built according to commercial streets, a large number of business forms need to be implanted to maintain sufficient vitality. Development intensity is related to the problem of input-output ratio. If the cost of relocation is too high, it may be necessary to improve the floor area ratio to balance the benefits. For example, appropriately increasing the number of building floors and expanding the building volume locally is not only conducive to the placement of new functions, but also can relieve the sense of monotony to a certain extent.

From the perspective of the protection of local features, the conservation of the natural endowment of the water system on the north and south sides of the site and the excavation and development of local conditions and customs are also related to the mutual influence of top-down spatial planning and design and bottom-up self-organization.

4.2.1 Changes and contradictions of spatial functions

From the overall regional planning, base unicom the Dutch flowers village village of scenic spot, XinFeng Town area, the whole heart domain, the original production space, living space and social space on the platform of the government and the state-owned assets occurred under the capital involved in restructuring, agricultural production function, the cultural inheritance function, economic development, leisure tourism have significant transformation.

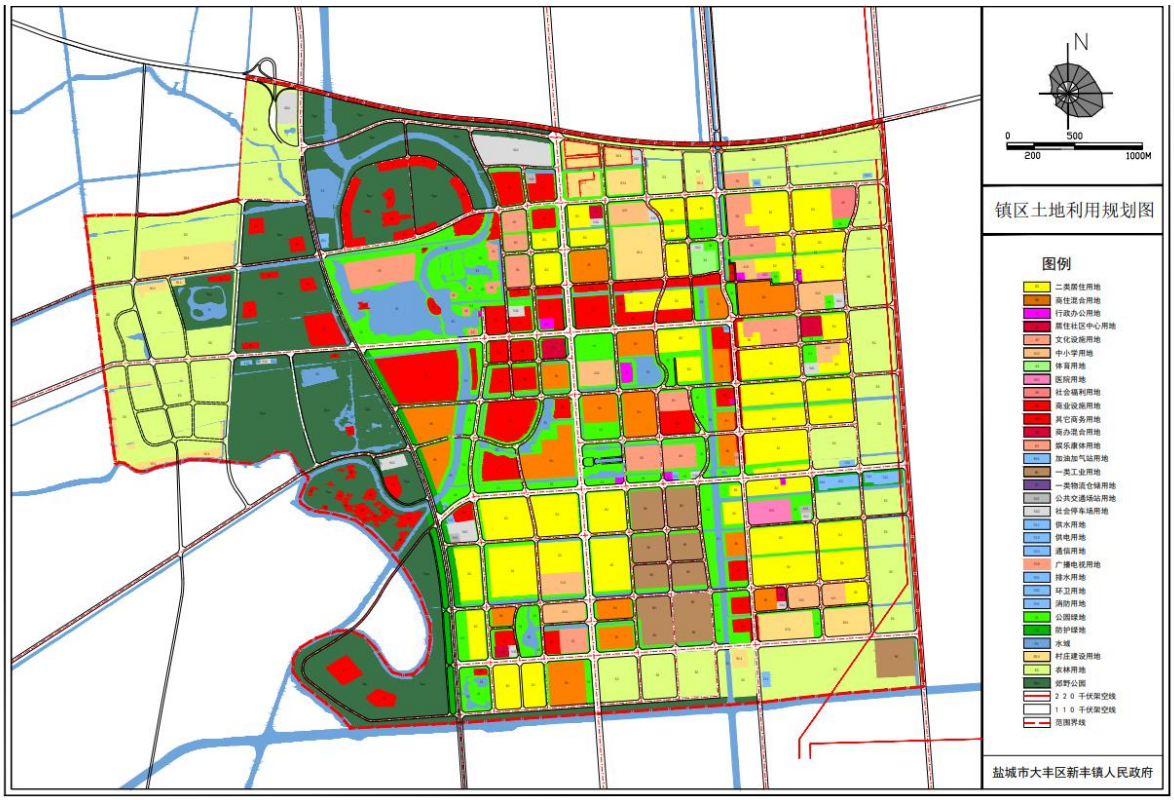


Figure 4-6 Land use plan of Xinfeng Town

(Source: Xinfeng Town People's Government of Dafeng District, Yancheng City)

Since its launch in 2012, the Netherlands Flower Sea Scenic Area has invested nearly 3 billion yuan, including 320 million yuan to build a government-led core scenic area. The construction of the Dutch Sea of Flowers began in 2013, the business form was improved in 2014, and the supporting facilities were supplemented in 2015 and 2016. In 2017, the Dutch Sea of Flowers received a total of 2.56 million tourists, achieving a comprehensive tourism income of 298 million yuan. A large number of Dutch Huahai Quanxin Village farmers are engaged in green planting, flower maintenance, property cleaning and other work here, and the per capita income has been greatly increased [95].

In the revised Master Plan of Xinfeng Town, Dafeng District, Yancheng City (2020-2035), the land attributes within the project land scope are mainly commercial land, second-class residential land, and mixed commercial and residential land.

The area to which the base belongs has been preliminarily developed. Among the currently developed land, there are multifunctional business forms such as commerce, residence, electronic technology, supporting services and scientific research, as well as undeveloped primitive farmland and natural dwellings.

Project name	Site Area (m^2)	Land property	Development status
Creative Park	500000	Residential, commercial, Technology	Not built
Wells Chocolate Factory	50000	Commercial	Under construction
Van Gogh Impression Park	50000	Commercial	Completed
Golden Field Blue Bay Residential	130000	Residential	Completed
Research Institute of Flowers	70000	Scientific research	Completed
Holland Flower Sea Hotel	140000	Commercial	Completed

Figure 4-7 Current functional formats (Source: F.I.T studio)

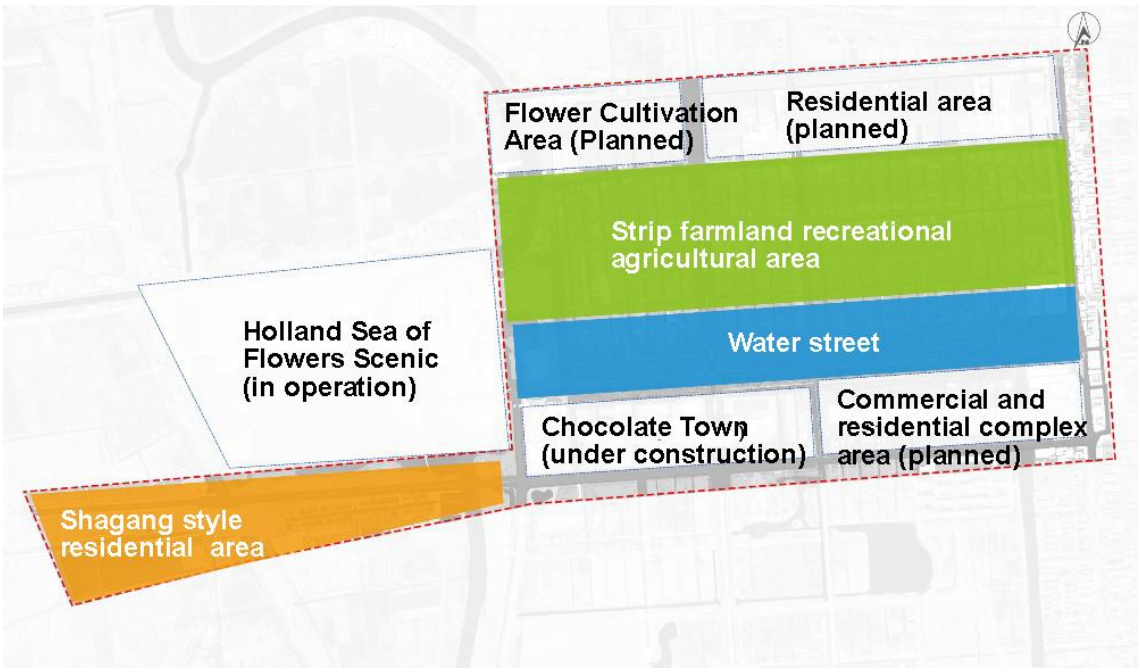


Figure 4-8 Functional zoning after space reorganization (Source: F.I.T studio)

In terms of agricultural production function, the single agricultural production is transformed into the combination of agriculture, leisure tourism, science and technology education, forming a mixed functional agricultural area of stripe landscape agriculture and flower research and cultivation. In this process, there is a contradiction between ecological conservation in absolute sense and rural industrial development.

In the leisure tourism function, the land transfer is further expanded and refined. Under the intervention of capital, some natural dwellings transform into multi-form mixed commerce through land transfer, and introduce individual businesses through investment attraction, such as catering, home stay, exhibition and so on. Some dwellings were preserved and improved. In this process, in addition to the land expropriation problem, there are also many problems such as the location and form of public space and commercial space on the surrounding residents.

In terms of living and living functions, the improvement of the quality of residential houses and the improvement of supporting facilities, on the one hand, the implantation of modern facilities and the improvement of supporting facilities bring villagers a more convenient and green life style, but at the same time, villagers' inherent concepts and life style can not be changed for a while. On the other hand, the style protection of traditional dwellings will be hampered by modern facilities, and at the same time, it is against the aesthetic orientation of some villagers.

In terms of the function of cultural inheritance, on the one hand, with the intervention of consumer culture and foreign culture, some local cultures have been reshaped to cater to people's pursuit of cultural style, thus leading to mass consumption. On the other hand, the local traditional culture has been more fully explored, and manifested and inherited in the form of exhibition architecture and landscape elements such as Qihai Cultural Center and Reclamation management Bureau, which can enhance the identification of local history, customs and human feelings. Therefore, there are differences and reconciliations in the

positive guidance and different dominance of cultural inheritance.

On the function of economic development, the development of capital adjusted the employment structure. After investigation, it was found that before the intervention, most local residents were retired workers and agricultural personnel of local enterprises. After the project development, some villagers and residents of nearby towns were recruited into the scenic area to engage in security and cleaning work, and some residents were employed freely between rural and urban areas through land transfer. At the same time, there are also urban merchants stationed in the city, strengthening the two-way flow of urban and rural population.

4.2.2 Expansion and transformation of spatial landscape

The countryside has rich landscape resources. As an important element of tourism development, the landscape ecological value of the countryside has been fully explored, the landscape space has expanded, the landscape form has changed, and the diversified rural landscape has been formed. After capital transformation, rural spatial landscape has become the main content of rural spatial consumption, the identification of rural landscape is improved, and the symbolic significance is obvious. Moreover, the selective transformation of rural spatial landscape by capital also aggravates the differentiation and unbalanced development of rural spatial landscape.

In the following, the spatial landscape of Xinfeng Laojie area is analyzed at macroscopic and microscopic scales by morphological methods from two clues: temporal resolution and spatial resolution.

In the medium resolution scale, along the time clue, the project area is radiated by the Dutch sea of flowers, and a series of spatial landscape expansion and intensification are carried out. In Google Earth, we selected the area from Xifeng Theater in the east to Holland Flower Sea View Area in the west, and selected four periods: 2009, 2013 (the construction of Holland Flower Sea began), 2016 (supporting facilities gradually improved), and 2021 to analyze the spatial landscape evolution of the area in the past ten years. Overall performance for water system as the foundation, the adjustment on the expansion of scale and form, led to the original for farmland and water as the main body of ecological space, into the enterprise market management of rural leisure space of scenic spots, and within the scenic area, space from the industrial structure to the function form has been replace. In addition, with the gradual improvement of supporting facilities and the gradual expansion of space landscape, the scenic area is transformed and upgraded from sightseeing to vacation, which promotes the development of whole-region tourism in Dafeng.

Along the spatial clues, the spatial landscape of the project area has formed a morphological transformation from single to multiple. The area is rich in landscape resources, such as water resources, strip resources and green space resources, as well as with the development of the Dutch Sea of Flowers and other flower industries. The area of flowers has become one of the biggest areas of tulip planting in Holland, and it has developed multi-functional landscape places such as flower cultivation area and flower research institute. Through the adjustment of the water system pattern, the original linear space is changed into the form of interwoven lines and surfaces, and part of the original farmland and green land are cut into island

space, which further enhances the enjoyment and playability.

Figure 4-9 Spatial landscape pattern evolution at resolution (Source: Google Earth)

At the high resolution scale, the region is adjusted and reorganized in local space along the temporal cues. The first phase of the project is selected as the research scope, and the aerial photography and the general map of the expected effect in 2020 (before construction) and August 2021 (under construction) are selected as the time points for analysis. First, in the protection and utilization of existing resources, based on Xinfeng River and Beihaogou, river channel dredging and riverbank regulation are carried out to strengthen waterfront space. In this project, it is difficult to coexist the absolute ecological protection and the shaping of waterfront activity space. For example, the decision between natural revetments and hard landscape walkways. Second, in the adjustment and reorganization of public space, public buildings or landscape pieces are reshaped, or local landscape elements are condensed to strengthen local style. However, in this process, the layout of public space has an impact on the surrounding residents; The construction difficulty increased by retaining the original trees; There is also a contradiction between the labor and time resources needed to highlight the authenticity of materials and the tight construction period and cost performance to uphold local elements. Some subtle observations were made in participating in the project: for example, the contradiction between the layout of landscape public toilets and feng shui, the contradiction between the destruction of trees in the process of site cleaning and the "ecological civilization", the difference between the local texture of blue brick and stone and the authenticity of the materials of pasted brick and lacquer. Thirdly, in the landscape transformation of the roads inside the village, the accessibility and the navigability of the roads are reorganized from a top-down perspective, so as to connect the interior landscape space of the site and build a complete road system. But in this process, there are changes in traffic flow and privacy caused by the change of road level, which lead to micro-individual complaints.

Figure 4-10 Spatial landscape pattern evolution at high resolution

(Source: F.I.T studio)

Along the spatial clues, the uneven landscape development is formed. The transformation of rural spatial landscape by capital takes the core area of rural consumption as the main body, that is, the linear space along the Xinfeng River system is expanded and focused on shaping. The rural spatial landscape has been strengthened to a certain extent on the whole, but shows unbalanced development in regional and local space. Compared with the obvious landscape features in the tourism service area, the residents' living space landscape is slightly plain and even chaotic.

4.2.3 Retention and replacement of special place

From the clue of bottom-up human perception, daily life and place spirit can survive in the space scene where tourists and villagers roam and live.

(1) The survival of the site activities

In the preliminary investigation, the extracted fragments of local people's activities, such as chatting under trees, fishing by the river, and craft activities, were extracted as the activity intention of public space and translated into the boardwalk, landscape sketch, and open space of waterfront space.

Figure 4-11 Extraction of scene elements (Source: self-taken)

(2) Extraction of scene elements

Blue brick and red brick are the most used building materials in the site, and they are also one of the background elements of the street style. In this renovation and renewal, a large number of water brick elements are used in the construction of buildings and pavement parapet, so as to achieve the simple visual feeling of relatives.

In the residential buildings in the site, concrete has been widely used as wall, window and floor paving material. It is also one of the important elements of the architectural style of the last century. Concrete is economical and applicable, durable, and simple color, as long as the texture and shape of the processing is a good construction material, this design, the concrete design again, used in the construction of the plank road, landscape pavilion. Wood is one of the main materials in Chinese traditional construction, and bamboo is a natural material with characteristics in southern areas. In this design, natural materials such as bamboo and wood are combined with masonry and concrete to make the construction materials more warm. In the last century, when things were scarce, thin, simple metal materials were used to make doors, Windows, railings and other building components. In order to save materials as the original intention, there is a reasonable structure, simple and light design aesthetic. In this design, thin round steel is used as a railing and part of the enclosure structure. The lightness of round steel reduces the barrier between people and the environment. The common materials in the site, such as blue brick, gray tile, red brick, bamboo and wood components, constitute the basic color intention of the site. The corresponding color application in the design will continue this impression in the color vision.

Figure 4-12 Extraction of scene elements

(Source: drawn by the author)

(3) The improvement of place space

In terms of waterfront space, the original waterfront residences were cleaned and replaced to form waterfront activity venues with open Spaces, increasing hydrophilicity and openness.

Figure 4-13 Natural revetment transformed into hard walkway

(Source: self-taken)

In terms of the enhancement of landmark architecture, Xinfeng Theatre, as the starting point of the old street, has a dual significance in terms of material space and intention representation.

Figure 4-14 Upgrading and renovation of Xinfeng Theatre (Source: self-taken)

4.3 Complexity and contradiction in multi-agent wrestling

The subject of a project is called stakeholder. The concept can be traced back to 1984. Freeman defined stakeholders as individuals or groups who can influence or be affected by the realization of goals [85].

Multiple stakeholders involved in the project include: local government, Jiangsu Yufeng Tourism Development Co.,LTD., China Rural Construction Institute, Jiangsu Yangjian Group Co.,LTD., local villagers, operators, tourists, etc.

From the investors, the project is a multi-capital cooperation model of the government and the state-owned investment platform. On the one hand, it is similar to the construction of rural characteristics led by government funds to a certain extent, and is related to the policies of "Yanfeng economic integration", "improving the public cultural service system and establishing the national all-region tourism demonstration zone, and steadily implementing the integrated development strategy of cultural and tourism industry". Holdings platform, on the other hand, because of its market operation mechanism, jiangsu yu feng tourism development Co., Ltd in Dafeng Holand flowers, plum blossom bay scenic spots have operating experience, such as regulation in the capital, capital strength, project investment, management talent and technology has more advantages, also can move more social capital investment.

From the perspective of the project owner, the project is the EPC project total package system, need to understand the content of engineering products, to more accurate expression of the owner asked, in the specific work process, give full play to the leading role of, and able to construction subcontractor, equipment suppliers and owners to properly handle the relationship between the three. At the same time, in the process of EPC project general contracting, the construction schedule, procurement and design work can be deeply integrated, and the procurement and construction work can be effectively carried out in the design work, so as to effectively shorten the project cycle.

From the perspective of local villagers, they are not only the object of decision-making, but also the subject of decision-making, and they are closely related to the investment subject through the transfer of land ownership. Local villagers have a strong dependence on land, and once they lose ownership, they need high economic compensation. The balance point between cost and benefit becomes the core of mutual restriction between investment subject and villagers.

The design team contacts residents, investors, construction parties and government functional departments. The work of the design team is more like a technical coordinator at the intersection of top-down and bottom-up, synthesizing the demands, aspirations and representative interests of different subjects and transforming them into professional expressions and instructions for material production.

In the situation of multi-party involvement, the "rights" and "responsibilities" of all parties become very complicated and the boundary is blurred. The following is to clarify from the distribution of interests and the transformation of governance.

4.3.1 Allocation of spatial benefits

With the participation of multiple subjects, the project has a certain degree of contradiction and complexity. Under different power levels and interest levels, the intervention of multiple parties will affect the final decision of the project. The following will describe and analyze each stakeholder to judge the weight and coping strategies of each stakeholder. The power level and interest level are scored by analyzing various stakeholders and their ways of obtaining interests, so as to get some coping strategies.

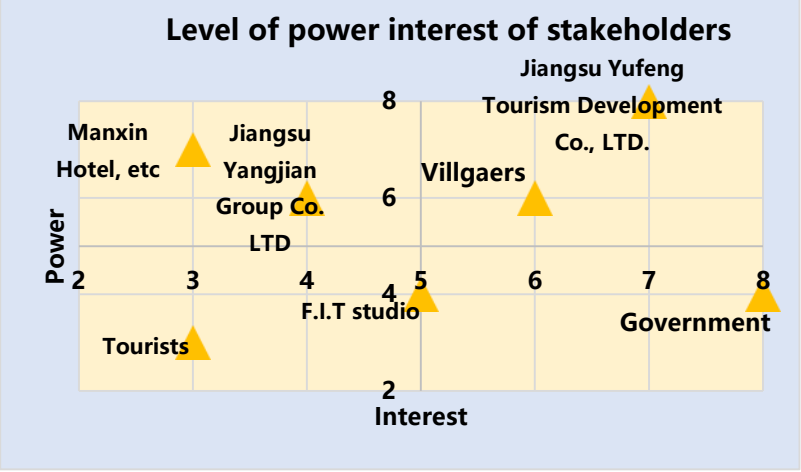
Jiangsu Yufeng Tourism Development Co., Ltd. was registered and established in 2014. The company's business scope includes the design of tourist attractions; Planning and design of tourist attractions and gardens; Tourism scenic spot management, etc. The company has developed and operated many tourist attractions such as the Dutch Sea of Flowers and the Bay of Plum Blossoms, and has certain experience.

The design company, China Township Construction Institute, was established in 2011. As a design team specializing in rural construction, we provide comprehensive, all-round and large-scale solutions for rural financial system, industrial system, built environment system and ecosystem, and provide long-term design intervention services for service objects. With the evolution of The Times, such design enterprises will also provide a platform for rural talent training, system construction and model output in the process of exploring repeatable and market-oriented rural construction methods. They may integrate with farmers and

village collectives to build a new type of rural development community, innovate social enterprises, and assume certain functions of exploring and enlightening rural construction methods [94].

Table 4-1 Table of stakeholders (Table source: drawn by the author)

Category of Interested Parties	Name of Relevant Party	Role	Power	Interest	Power level	Interest level
Internal	Jiangsu Yufeng Tourism Development Co., LTD.	First party	Investment subject, development right	Obtaining development rights and capital profits; Enhance the attraction of the scenic area, maintain a stable tourist market, and maintain a prosperous commercial economy.	7	8
Internal	F.I.T studio	Designer	Technical subject, providing professional knowledge resources	To integrate the demands of all parties and provide professional related services	5	4
Internal	Jiangsu Yangjian Group Co. LTD	Construction	Technical subject, providing professional knowledge resources	Realize the effective promotion of the project cycle	4	6
Internal	Manxin Hotel, etc	Operators	Business entity, right of management	The acquisition of management rights and capital benefits; Convenient public facilities and infrastructure conditions	3	7
External	Villagers	Villagers	Former use subject	Improve living conditions, raise incomes and create more jobs	6	6
External	Tourists	Tourists	Use subject, use right	Enjoy the landscape, experience the characteristic culture, and get physical and mental pleasure	3	3
External	Xinfeng Town Government	Government	Regulation subject, the decision-making power	Raise people's income and create more jobs; Increase the construction of urban public facilities and infrastructure, strengthen public management, improve the living environment; To achieve political achievements, enhance the reputation of the city, increase fiscal revenue	8	4



The power/interest matrix can be used to determine how to channel political power in developing new strategies. The groups in panel D, as shown in Figure 4-20, are in positions of power, and their attitudes are

hard to predict. The attitudes of stakeholders in box C can be predicted and their expectations are often met, but they cannot be ignored. If the groups in boxes A and B unite on an issue, their influence increases, but they are fairly easy to deal with.

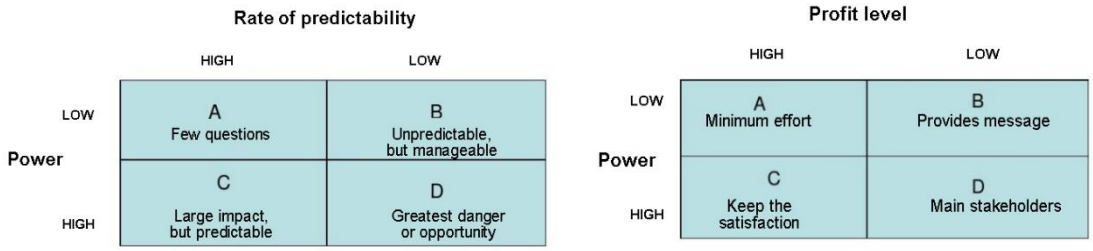


Figure 4-20 Stakeholder matrix (Source: drawing by the author)

The power/interest matrix classifies stakeholders according to how much power they have in their hands, and how much they focus on their goals. When evaluating a goal or decision, an important factor to be considered for the main stakeholders in grid D is the acceptability of the decision. The group in grid C is also very important, although they are relatively less critical, but if a particular event occurs, they may move to grid D and become the key influence group. However, the demands of the stakeholders in block B will affect the more critical stakeholders, so they also need to be paid attention to. Providing information can achieve this purpose.

4.3.2 Rights and responsibilities of space management

1. Power and responsibility in operational governance

This project is closely related to the operation mode of capital in rural areas. Capital plays an important role and has a relatively decisive right to speak. Capital intervention in rural areas not only assumes the role of operators, but also enriches the system of rural space governance. However, capital's governance of rural areas is more out of profit acquisition rather than public obligation, resulting in the lack of publicity due to the large extent of the new rural space governance is subject to the logic of capital, and the will of villagers may be implicitly controlled or squeezed in the decision-making process.

On the other hand, China Rural Construction Academy once proposed another bottom-up operation mode with villagers as the main body, that is, the "one social organization and four Ministries" joint social organization system, as the operating mechanism with built-in finance, establishes a village community with power, governance, property rights and financial rights. Take credit cooperation as the entry point to serve the elderly and the villagers' industry, quickly strengthen the cohesion of grassroots organizations, and gather the village talents around the two committees. With the credit Cooperation Department as the financial support, the village assets and resources should be acquired and stored purposefully through the Land Cooperation Department and the Housing and Housing Cooperation Department. Through the consumption cooperation to expand the service scope, increase the membership coverage and engagement, and expand the income channels.

2. Rights and responsibilities in construction management

At the beginning of the project, a phased construction plan was proposed: in the first stage, starting from the public site, the project brand was established through river landscape renovation, pedestrian path construction, water park node, flyover landscape node, and street park node to gather popularity. In the second stage, project nodes of comprehensive service center, homestay group, soy sauce workshop, Qihai Immigration Cultural Center, former site renewal of Reclamation Management Bureau, and Xinfeng Theater renewal will be built into a new gathering place of culture, tourism and consumption in Dafeng in 2022. In the third stage, industries are gradually gathered and projects are developed in depth to form a benchmark for cultural and tourism development that drives regional development. In the actual project, taking the first phase project as an example, the design is carried out by stages and parts. The lot is divided into 15 blocks for staging design, drawing and construction. The design team works with the general contractor to carry out the on-site design.

Xifeng Town Old Street renovation and protection, environmental improvement project, by the China Rural Construction Institute in May 2020 to complete the overall project planning, in May 2021 entered the site to carry out the project design deepening and construction cooperation work, at the same time, Yang Construction planning Research Institute to cooperate with the construction drawings to deepen the work. During the Spring Festival in 2022, the engineering department of Phase I will be separated from the street. It is expected that the phase I project will be basically completed by March 2022 and the design work of Phase II project will be carried out. Because the Laojie project involves the renovation and reinforcement of old houses, the use of special building materials, and the need to coordinate the concerns of indigenous people within the project scope, the design and construction are difficult, and the project has been slow to promote. Therefore, on June 29, 2021, the owner led the design company, construction company, supervisor and other consulting companies to have a discussion to exchange the experience of project design and construction promotion. At the symposium, the technical points in the process of project promotion were fully exchanged and the ideas of project promotion were reorganized. Considering the urgency and complexity of the project, the owner, after soliciting opinions from all parties, decides to change the subsequent construction drawing deepening work to China Rural Construction Institute for cooperation, and the owner will hire a consultant to coordinate the deepening design and construction drawing design of the project.

Since July 2021, due to the tight project cycle, fast-track project management mode has been adopted, that is, before the design is completed, when the construction drawing design of some parts of the project has been completed, the construction of this part will be carried out first, so that the project construction and project design phases will overlap. In this case, the design process of the project is decomposed into several parts, through the full lap of the design and construction, the conditional "side design, side construction" is realized in the organizational way.

Therefore, the demonstration section of the phase I project was further divided into 15 sections as follows.

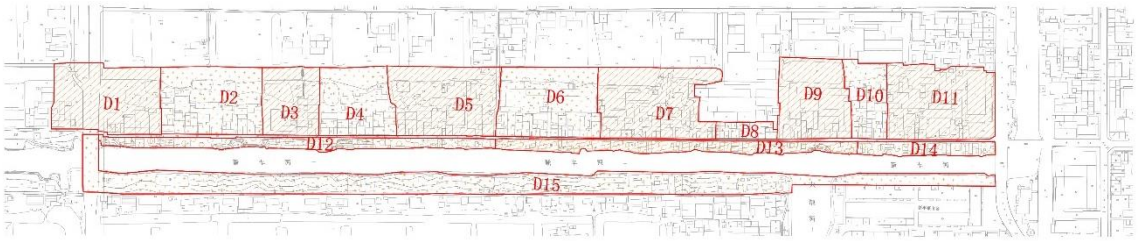


Figure. 4-21 Plot division (Source: drawn by author)

They are D1 (businesses on both sides of Tongfengqiao), D2 (east side of Tongfengqiao), D3 (Tofu workshop area), D4(home stay area), D5 (west side of Tofu Workshop), D6 (soy sauce Workshop area), D8 (residential houses along the street on the south side of Qihai Immigration Museum), D9 (former Reclamation Management Bureau area), D10 (New Reclamation Management Bureau area), D11 (Xifeng Theater area), D12 (Soy Sauce Workshop to Tongfengqiao section), D13(Soy Sauce workshop on the north bank of the River to Dassi River section), D14 (North bank of the river to the east of Dassi River), D15 (Site landscape on the south bank of the river).

In the following, the author participated in the internship from July to September as a cycle to record the progress of the project. In terms of project management, I wrote work summaries and plans on a weekly basis, which were divided into three sections: site situation, work arrangement and problems to be confirmed.

It can be seen from the project promotion table that, in terms of the overall arrangement of each section, the complexity and contradiction of the project are analyzed from the three aspects of cycle, implementation and bearer.

In terms of time cycle: generally, the project results should be promoted weekly. Longer time lines in some sections; The time schedule arrangement of each section has a certain succession rule. The reasons are as follows. From the perspective of design, according to the typology, the combination of typed "houses" and prominent "buildings" makes the whole block more sense of place. From the perspective of products, in accordance with the law of regionalism and times, it connects the village environment and buildings in an economic and piecewise way to maximize the interests of an operation; In terms of time arrangement, due to the urgency of time, it is unrealistic to evenly distribute the design period of each section. In this context, focusing on shaping the priorities of the area involves selection and decision-making, as detailed in Chapter 4.

In terms of implementation, most of the lots can be delivered as planned, while some of the lots are slightly delayed or even seriously overdue. Some of them are always followed up, and some of them are delayed because of the delay caused by the follow-up after being put aside for a period of time for some reasons. Locked in the overdue section, it can be found that it is often a complex section that needs multi-party negotiation, or a node section that is key to shape, which is indeed restricted by complex realistic factors and difficult. For example, D3 Tofu Workshop, D9 Old Reclamation Management Bureau, and D8 Qihai Immigration Museum south residential buildings are affected by land acquisition and storage

problems, which involve multiple stakeholders, so the progress is intermittent. D4 Home stay area and D10 New Reclamation Management Bureau involve multiple rounds of comparison selection and decision-making of scheme design, and the actual implementation cycle becomes longer after many changes of the undertakers.

On the stakeholder side, the more complex the partner, the higher the communication cost and the longer the implementation cycle. In ascension involving residential renovation, for example, in houses accounted for larger block, because of the need to by party a and the opinions of the villagers can advance, put forward the villagers election of the villagers advice on behalf of the reaction, and dealing with house repair problems without grades, points, these can be further refined management. In the past engineering management field, multi-attribute decision making is also widely used in the selection of contractors.

In general, both the multiple subjects involved in the balance of interests and the multiple teams involved in the project implementation have increased the complexity of the project. Therefore, the use of scientific and effective decision-making methods may make the project progress more smoothly.

Table 4-3 Xinfeng Town Old Street Renovation and protection, environmental improvement project promotion schedule (drawn by the author)

Number	Project	Place	Undertaker	Implementation	Time table											
					2021/07				2021/08				2021/09			
					1w	2w	3w	4w	1w	2w	3w	4w	1w	2w	3w	4w
Overall planning stage																
1	Overall planning	Headquarter base	F.I.T	Plan												
				Actual												
Stationary design phase																
1	**D12** (Soy Sauce Workshop to Tongfengqiao section)	Construction site	F.I.T studio & Jiangsu Yangjian Group Co. LTD	Plan												
				Actual												
2	**D15** (Site landscape on the south bank of the river)	Construction site	F.I.T studio & Jiangsu Yangjian Group Co. LTD	Plan												
				Actual												
3	**D1** (Commercial area on both sides of Tongfeng Bridge)	Construction site	F.I.T studio &Nanjign Yangtze River Urban Architecture Design CO., LTD	Plan												
				Actual												
4	D6 (Soy Sauce Workshop area)	Construction site	F.I.T studio &Nanjign Yangtze River Urban Architecture Design CO., LTD	Plan												
				Actual												
5	D14 （The north bank of the east side of the Da Si River）	Construction site	F.I.T studio &Nanjign Yangtze River Urban Architecture Design CO., LTD	Plan												
				Actual												
6	D7 （Wrought iron workshop）	Construction site	F.I.T studio &Nanjign Yangtze River Urban Architecture Design CO.,	Plan												
				Actual												

			LTD													
7	D8（Qihai Immigration Museum south side of the street residential）	Construction site	F.I.T studio &Nanjign Yangtze River Urban Architecture Design CO., LTD	Plan												
				Actual												
8	D13 (River north bank sauce oil workshop to the Da Si River)	Construction site	F.I.T studio &Nanjign Yangtze River Urban Architecture Design CO., LTD	Plan												
				Actual												
9	D2（Tongfeng bridge commercial east side）	Construction site	F.I.T studio &Nanjign Yangtze River Urban Architecture Design CO., LTD	Plan												
				Actual												
10	D3（Tofu workshop area）	Construction site	F.I.T studio &Nanjign Yangtze River Urban Architecture Design CO., LTD	Plan												
				Actual												
11	D5（Tofu workshop west side）	Construction site	F.I.T studio &Nanjign Yangtze River Urban Architecture Design CO., LTD	Plan												
				Actual												
12	D4 (Area of a home stay facility)	Construction site	F.I.T studio &Nanjign Yangtze River Urban Architecture Design CO., LTD,Manxin Hotel	Plan												
				Actual												
13	D10（New Reclamation Management Bureau Area）	Construction site	F.I.T studio &Nanjign Yangtze River Urban Architecture Design CO., LTD	Plan												
				Actual												
14	D9（The original reclamation Management Bureau area）	Construction site	F.I.T studio &Nanjign Yangtze River Urban Architecture Design CO., LTD	Plan												
				Actual												
14	D11（Xinfeng Theatre Area）	Construction site	F.I.T studio & Jiangsu Yangjian Design Institute	Plan												
				Actual												
15	Municipal drawings	Construction site	F.I.T studio & Jiangsu Yangjian Design Institute	Plan												
				Actual												

4.4 Coordination and tradeoff under multi-objective system

Xinfeng Old Street is a type of tourism development under the intervention of capital, but it has a more complex background, goal and main body. Xinfeng Old Street is located at the junction of scenic spot, town and village, which determines its multiple transitional characteristics. Compared with the typical rural

construction, Xinfeng Old Street has more obvious capitalization characteristics. Compared with the urban block reconstruction, Xinfeng Old Street has more intensive communities and aborigines, and retains the ecological characteristics. In such a transitional space mixed with multiple subjects, how to balance the multi-objective construction is the key to transform Xinfeng Old Street into a comprehensive cultural and tourism landmark.

4.4.1 Coupling coordination of conflicting objectives

The main contradictions mentioned in the above chapters are abstractly attributed to the protection of local landscape, the needs of community development, and the intervention of tourism development. The changes of spatial function, spatial landscape and spatial place brought about by the three goals involve different stakeholders. Therefore, the protection of rural landscape and the development of rural industry cannot coexist in an absolute sense, while the conflicts in the use of other leisure tourism objectives vary with the specific contents. For example, the conflicts between the aesthetic appreciation of rural landscape, ecological protection and the protection of rural landscape are relatively weak. However, the implantation of modern facilities required by community development and the transformation of foreign culture under the intervention of capital are difficult to coexist with the preservation of local features.

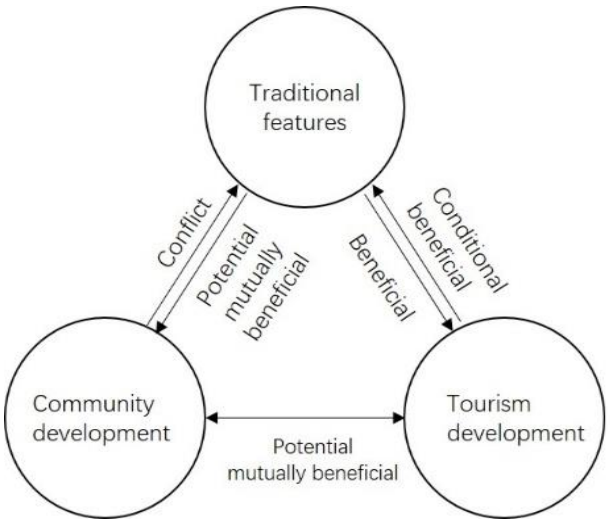


Figure 4-17 Internal relationship diagram of multi-objective system of tourism-oriented villages and towns (Source: drawn by the author)

From a top-down perspective, the current Dafeng District aims to practice the development path of "two seas and two greens" from the perspective of planning, deepen the top-level design of global tourism, highlight natural features, enrich culture and folk customs, improve product quality, and build a "Yangtze River Delta cultural and tourism benchmark" brand. Xinfeng Old Street is one of the layout of the whole tourism map of Dafeng. Cultural and tourism development can take local landscape as endowment and drive community development as the tertiary industry. Although the implantation of modern facilities will inevitably have a certain impact on the rural traditional style, the retention of absolute traditional style is not conducive to the development of rural modernization; With the intervention of tourism development,

traditional features are also the condition of tourism resources. Therefore, under the balance, it is necessary to cover modern facilities with the skin of traditional features. For example, in the renewal of residential buildings, wooden grated Windows are placed on the outside of double-glazed aluminum steel Windows, and public toilets are landscaped

From the perspective of bottom-up, the improvement of the quality of human settlement environment involved in community development is related to the development interests of community residents, while the protection of local landscape and tourism development are related to the regional, ethnic group and national identity and economic and cultural interests. The conflict between the three is not diametrically opposed and irreconcilable. In many cases, in the bottom-up cognitive system, there is a narrow view of macro cognition. For example, villagers tend to focus on the immediate situation, the situation of the housing site and surrounding areas, and are indifferent to the improvement and long-term development of public space. This is understandable and makes sense. Therefore, soft ideological work such as the villagers' assembly and other measures can adjust the cognitive system and the goal contradiction of different target parties.

Figure 4-18 Relationship between new buildings and people

Figure 4-19 Relationship between modern facilities and traditional buildings

Figure 4-21 Relationship between the new public space and the old wall

Figure 4-20 Relationship between the new building and the tree

(Source: collected by the author)

The four pictures in the construction stage above are taken as examples to show the phenomenon of contradictory coexistence: the defense of self-built houses from the perspective of villagers and the overall renewal from the perspective of the government and development group; the influence of modern facilities such as air conditioning machines on traditional features; and the relationship between new buildings and trees under the concept of ecological conservation. This microscopic phenomenon shows the contradiction and coordination between local style protection, community development and tourism development.

4.4.2 Comprehensive development of mutually beneficial objectives

As previously mentioned, in the local landscape protection target, tourism development cannot be separated for local features, under the capital intervention, on the one hand, due to the transplantation of foreign culture and lead to the reshaping of the native culture, but also because of the capital operation of mining integration makes the inheritance of local culture carry forward, such as the bench border style with entertainment, the combination of scientific research and education, So as to meet the needs of tourists in all directions. Community development will inevitably lead to the loss of traditional features in an absolute sense due to some modernization and renewal, thus forming new features. However, the retention and protection of some traditional features will also form auxiliary forces for the development of industries such as service industry in the development goal of the community to a certain extent.

There is also a potential mutually beneficial relationship between community development and tourism development in the goal of community development. At present, the positioning of the old street is not clear. It is located around the Flower Sea scenic area of the Netherlands, and its commercialization is inevitable. Is it a commercial or residential area? Is it an attraction or a place of daily life? These ambiguities and intermediate states indicate the transformation of the urban-rural dual structure under the new urbanization. Complexity and systematism are no longer exclusive to cities, and rural areas need more complex responses due to more diversified interventions. Although the development of rural tourism will deconstruct and reshape the daily routine of the community, it can also be regarded as one part of the industry in the development of the community and provide a better endogenous driving force for the development of the community.

In the goal of tourism development, the protection of rural features is an endowment of tourism development, but tourism development also needs some modern facilities implanted to meet the needs of tourist capacity and service supporting. It will also help the community grow.

These three kinds of objectives have been applied from design methods or concrete implementation, but not fully combined. The homogeneity of function orientation, superficial culture and history, and some nominal goals are the main problems that can be improved and deepened in the next phase of the project.

4.5 Balance and symbiosis under multi-subject demand

Stakeholders in village construction refers to "any person, group or organization affected by the cause

or result of an event". At present, the design participants of the Xinfeng Old Street project include the government, the state-owned platform company responsible for the development and operation, the EPC general contractor and the design team. However, the management operation needs the synergistic action of multiple stakeholders, and the rights, responsibilities and obligations are not fair and equal, which is a hidden danger of long-term management.

4.5.1 Government-development-construction: actual participants with converging interests

At present, the top-down planning model is still the main model for village construction in China. Although accompanying rural construction has been active in the field of rural construction in recent years, however, most of them are point-based intervention, and tourism village projects are funded by the government and state capital platform, so the government-development-builder has the absolute right to speak. This method has the advantages of easy to implement capital, transfer land and accelerate construction. Local governments, as the exclusive developer divide assets platform, and as the project owner and the EPC project general contractor is top-down model of power, the power of the most fundamental principals or the government, as investors of rural construction, including land investment, direct financial capital investment and through exclusive assets investment platform, although can get some profit and tax, However, the main goal is to implement the relevant policies and requirements of the state, achieve the demands of the government, promote the comprehensive development of rural areas, direct investment in the built environment and industry, as well as investment in maintaining social order and social form.

The power-capital alliance formed by the government, development and construction plays an important role in the protection of rural features, the development of rural communities and the development of tourism industry, but it is also easy to produce a crisis of rural social development, making ordinary villagers become marginalized in rural construction. The strong monopoly of the rights-capital alliance in the use of space leads to the lack of fairness and justice in the sharing of interests of villagers.

4.5.2 Villagers: core interest parties that are difficult to gather

With the transformation of rural space, villagers, as the main body of the space before the transformation, may pander to, comply with, or oppose and resist under the discourse system of power and capital alliance. Some villagers realize that implied in the village itself under the capital involved in ecological, home and culture value can bring considerable benefits for them, or profit by controlling the land circulation, homes, cater to or obey the arrangement of the right to information and union, will own the fixed assets, labor and other inputs to the capital to build system of rural production, consumption cycle, part of the revenues, The development demands of villagers and village collective are also realized in the process of capital circulation. In addition, some villagers choose to reject and resist the conversion of power and capital by measuring the profit and loss of their own interests or out of nostalgia of local feelings, which becomes the daily life in the commercial street and resists alienation.

Through interviews and surveys, the views of local villagers on the project also need to be classified. For local residents in the community, to some extent, they are also tourists. The reason why they give a high evaluation is that it provides leisure places and more employment opportunities. For villagers with property rights, the evaluation involved is more complex. It is found in the interview that first, villagers have less awareness of the improvement of public environment and focus more on the protection of their homestead and private property. Second, for some villagers, once they have gained a certain right to speak, the goal is to seize the opportunity to get more benefits for themselves. Thirdly, the value judgment of individual villagers is different from that of designers. For example, they believe that the layout and location of public toilets affect the feng shui layout of their own houses, but on the other hand, it brings convenience to their lives. Fourthly, not to suffer from a lack of wealth and inequality, which involves a more complex human problem. Some villagers will misunderstand the judgment of some decisions. Even though the living environment of their own homes has been recognized, they will be dissatisfied by comparing with others. As a group, even if villagers are included in the consideration and given the right to speak, there are still differences and disagreements within the group. However, under the pressure of top-down acceptance, the negotiation time is compressed, so is the discourse right of the villagers. According to the stakeholder theory, the coping strategy is reduced from "making them satisfied and winning their support" to "not letting them interfere with the project".

4.5.3 Design team: stakeholders in reconciliation

Generally speaking, the work of the design team can be divided into two parts: communication and coordination and professional technology. Concept planning of planning, from the first phase of the survey, to since June 2021 on site design continues to this day, in addition to the record in the design fee settlement form work, a lot of work is not visible, is linked to the villagers, development project owner and government functional departments, to coordinate with municipal, lighting, ZhanChen etc for project quality control, It is a technical coordinator at the intersection of top-down and bottom-up, synthesizing the demands, aspirations and representative interests of different subjects and transforming them into professional expressions and instructions for material production.

In this process, the design team is indispensable on the one hand, but full of frustration on the other hand. In the constant communication and compromise, the professional ego of the designer is challenged and restricted. Faced with top-down political decisions, bottom-up individual interests and the double squeeze of time cycle tension, designers continue to expand the scope of professional work, while facing the situation of gradually losing their voice. Comprehensive overall landscape and tourism development demands in top-down and bottom-up under the control of the community development demands of each different, the designer is not so much the space of "self-expression", in spite of this, the design team chose not passively adapt to, but with the ideal positive practice, the concept of township construction plan with the company type, mixed with various main appeal, to participate in the whole process.

Figure 4-22 Design team surveying the site.

Figure 4-23 Communication between multiple representatives

Figure 4-24. Design team investigates villagers' demands

Figure 4-25 Communication between the design team and the builder about the construction effect

(Photo source: taken by the author)

Figure 4-26 Excerpt of typology research in the process of investigation

(Source: drawn by the author)

Despite the amount of time and effort that the design team put into the project, the design billing standard is still based on the drawing area, however, the services provided go far beyond even the pre-planning and post-operation consulting. However, today's industry market is still in accordance with the implementation of the "Engineering investigation and design Charging standards" issued in 2002, but the 2002 version of the standard lacks relevant content, these new designs can not find the charging basis, resulting in a large number of design work to improve the quality of construction but not the corresponding charging. However, such positive practices with ideals that do not conform to the logic of the market cannot

maintain the virtuous circle of the construction industry. These problems are not just individual cases, but the work and roles of the architectural professionals represented by them encourage us to rethink the connotation and boundaries of architectural professional practice, as well as the corresponding rights and responsibilities.

In rural environment, rural construction projects solve more human problems and need to understand the characteristics of the countryside and the needs of villagers. The rural environment seems calm and serene, but in fact, everyone has his own interests in mind: how to defend his own acre of land, how to maximize his own interests. Therefore, how to persuade the villagers to support projects in the country, and sell them to move out from the old house, moved into a new house, and even some of the villagers had to bear part of the money, how to make them willing to accept and deliver to give them a satisfactory results, these problems, is very difficult, difficult things. In past rural construction projects, there have been some problems caused by the mismatch between architects and local living culture. There are some successful practices. For example, Wang Qiuan, the founder of Anzhe Architecture, as a rural construction practitioner who was not trained in construction, is active in the front line of rural revitalization with the performance of 1,500 projects a year. He has spent a lot of time and work to study the problem of "people", focusing on the disputes between people, among which doing villagers' work is a very important link, including holding villagers' meetings, leading the government team to do villagers' work together. His architectural design concept is simple and pragmatic, starting from functions and use needs, and how to improve the quality of life of villagers. And from the architectural modeling, it is not always catering to the villagers' aesthetic and orientation.

Picture 4-27 The architect holds the villagers' meeting

(Source: Anzhe Architecture)

In addition, in addition to the government, villagers and architect teams, there will also be capital intervention and weighing the interests of the general contractor and various subcontractors, which will involve more complicated conflicts and entanglements. Architecture itself is not enough to solve the complex interpersonal relationships, such a place in the site the ambivalence of all sorts of stakeholders in secretly wrestling, relocated, head of the household, and between the party a, party a and supervisor, project department internal, and when the building is presented in the media, is widely spread, but a bit cagey about exactly these battles. Some stories do, some stories don't; And the former is highlighted, become our favorite picture and text, and further widened the gap between the design ideal and the industry reality.

The boundaries of architecture are infinitely expanding, which is difficult for the current practitioners

to control. On the one hand, it leads to unclear rights and responsibilities and additional cumbersome workload, but on the other hand, it can lead to more segmentation of the industry. The architect's sense of social responsibility cannot rely on the heroic feelings outside the market logic. Architects are good at using broader dimensions to better control projects and improve design quality. However, sacrificing their own rights and interests to provide more "free" services cannot promote the virtuous circle of the industry, but lead to more industry practitioners lose confidence and turn to leave.

In the process of construction, there is also the phenomenon of buck-passing, which causes the confusion of management due to the unclear rights and responsibilities, leading to the delay of the project. Especially in the process of introducing architectural planning, developers, builders and design teams may tend to avoid responsibility for their own interests. At present, the feasible path in the international scope mainly includes: in the industry of Western countries, UIA and AIA will bring architectural planning into the service scope of architectural companies or consulting companies, and carry out service billing. In China, some scholars are proposing to build a third-party platform composed of representatives from various stakeholders to evaluate projects by promoting government policies.

Chapterter V: The application of PROMETHEE Evaluation method

5.1 Elasticity modification of the evaluation system

Based on the evaluation system of coupled community, village and cultural tourism subsystems described in Chapter 3, elastic adjustment is made according to the actual situation, and the application is tested in different stages. In the specific application process, the selection of indicators is screened according to the following principles: (1) Different evaluation objects need to have differences in this indicator, for example, some infrastructure and public service facilities indicators are the same, which can be omitted in the calculation of the model. (2) It is comparable in the same index. (3) Availability of data.

5.2 Pre-stage of the scheme: measurement study of the value of old public buildings

In the process of site investigation, there is a great controversy about the preservation of the existing buildings. Due to the interior of the first phase of the project, traditional buildings account for more, gray tile roof, blue brick and red brick wall, style is better, some buildings are old, poor quality, comprehensive analysis of the current situation of the building, put forward the following renewal plan: (1)there are 6 buildings along the street in the whole section of Heping block due to serious quality problems need to be rebuilt; (2) Five buildings along the street are located in an important position in the street, so demolition and reconstruction should be considered to meet the functional needs; (3) The new building is given priority to by the second floor, increase the area to facilitate the commercial operation, and increase the change of the ups and downs between the buildings, break the monotony of the original buildings along the street. In the public buildings, there are several historical buildings with heritage value, and in the villagers' own houses, there are some dwellings with good architectural quality and certain heritage value. Taking public buildings as an example, THIS paper ranks several public buildings and evaluates their value from the perspectives of community development, heritage protection and tourism development, so as to serve as a reference for decision-making of operation strategy.

5.2.1 Research Objects

The research object mainly selects the phase I project of the core area in the master plan, that is, from Tongfeng Bridge in the west, to Xinfeng Theater in the east, to the south side of Xinfeng River in the south, and to the north ditch range in the north.

There are three main historical building sites, which are the former site of the reclamation management Bureau, painting shop and Pu Jia alley. There are 4 retained industries, respectively, bean curd workshop, soy sauce factory, textile factory, Xinfeng theatre. The former site of soy sauce factory (D6) as

shown in Figure 5-1, the former site of Xinfeng Theatre (D11) as shown in Figure 5-2, the former site of textile factory (D8) as shown in Figure 5-3, and the site of Reclamation Management Bureau (D10) as shown in Figure 5-4 are selected for evaluation.

Figure 5-1 Soy Sauce Workshop (photo source: taken by the author)

Figure 5-2 Former site of Sun Fung Theatre (photo source: author)

Figure 5-3 Former site of textile mill (photo source: author)

Figure 5-4 Former site of Reclamation Management Bureau (Photo source: author)

5.2.2 Evaluation process

Taking the above four old buildings as the evaluation object, taking the evaluation system established in Chapter 2 as the foundation system, screening indicators according to the actual situation, and using PROMETHEE method to sort.

The main data sources fall into three categories: The survey data, historical data and subjective data are respectively from the basic data of the project site investigation, Xinfeng local Chronicles and the research results of the project planning and exhibition team. And the interview data of PRA group (a consultative group composed of Party A's representative, EPC general contractor's representative, design team's representative and villagers' representative) as well as the collected minutes of the weekly meeting of all parties.

The above data is applied to VISUAL PROMETHEE software. Firstly, three scenarios are set, namely, villagers, design team and development team. After calculating the weight of each perspective by DCM-SRF method, the weight of each index is assigned, and then the software generates the comprehensive scene. Then, according to the evaluation system set in Chapter 4, 61 indicators are set, and 21 indicators are activated, and the unit, legend, orientation, weight and preference model of these indicators are set. Then, the data of four selected objects are input into it, and the visualization results are obtained by software operation.

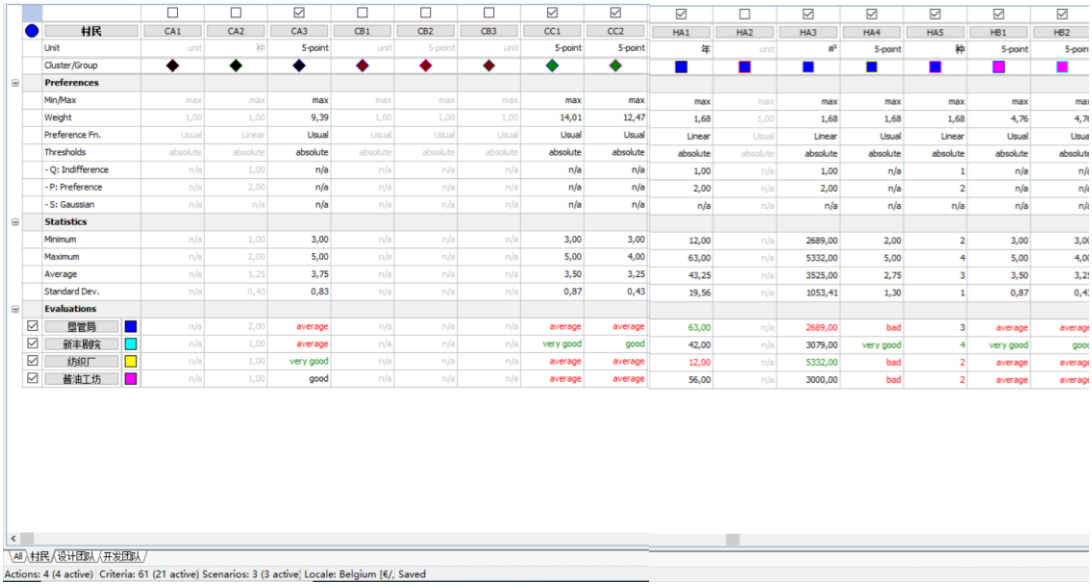


Figure 5-5 Visual PROmeTHEE Excerpt (Visual PROMETHEE)

5.2.3 PROMETHEE analysis based on the value assessment of existing buildings

1. Comprehensive analysis of old buildings

As shown in Figure 5-6. After scoring from the perspective of the three parties, Xinfeng Theater ranked first, followed by Reclamation Management Bureau, soy sauce workshop, and textile factory. The former two show more significant advantages, the latter two are not different. From the perspective of different stakeholders, as shown in the right figure in Figure 5-6, the ranking order of the design team and

the development team is consistent and consistent with the comprehensive ranking, which is different from the perspective of villagers. From the perspective of villagers, Xinfeng Theater ranks first, and is quite different from the soy sauce workshop, textile factory and reclamation management bureau of the last three, whose flow values are very close. From the perspective of the design team, the distribution of the advantages and disadvantages of the four objects is relatively average, and the latter two are relatively similar. From the perspective of the development team, the first two are more similar. In addition, the flow values of the design team for Xinfeng Theater, reclamation management Bureau and textile factory are similar to those of the other villagers and the development team, and there is little difference in the flow values of the three to the soy sauce workshop.

Combined with the interview and evaluation results, it is found that all parties have great recognition of Xinfeng Theater, which is located at the intersection of village and town, so they will focus on it in the subsequent design and make it the starting point of Old street. The development team and the design team have the same orientation, thus laying the foundation for the final decision.

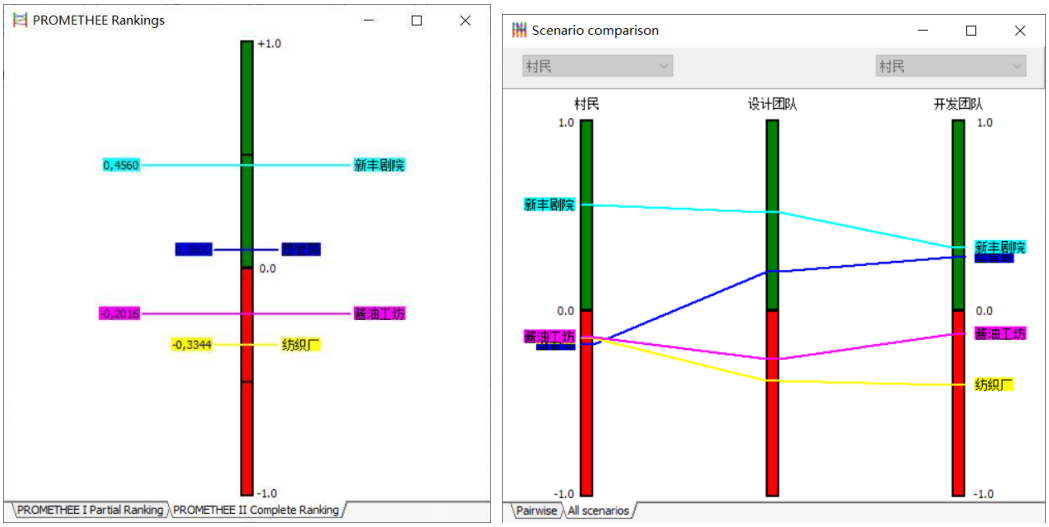


Figure 5-6 Total Ranking of PROMETHEE Ⅱ (Visual PROMETHEE)

2. Multi-level analysis of old buildings

The value evaluation system of old buildings is divided into three systems: community development, local style and tourism development, and 21 indicators are screened out. PROMETHEE rainbow map is the boundary view of the complete ranking map of PROMETHEE ii. The four selected objects are sorted from left to right according to the complete ranking of PROMETHEE ii, which can intuitively distinguish the advantages and disadvantages of the existing value of each object. Different colors represent different index factors, and the larger the color block represents the greater the influence. Indicators above the 0 axis represent a positive impact on the existing value assessment, while indicators below the 0 axis represent a negative impact.

In conclusion, as shown in Figure 5-7, Xinfeng Theatre, located on the far left, is superior to other regions in 16 index factors, while only 5 index factors are inferior, which are longevity (HA1), rurality (TA1), industrial diversification (CA3), inheritance of traditional construction techniques (HE1), and

village greenness (CF2). However, most of the index factors of textile factories are at a disadvantage, with only three indicators above the 0 axis. In addition, PROMETHEE RAINBOW map can also help to identify whether the existing architectural value of each object is in a state of balanced development. For example, Xinfeng Theatre is outstanding in enhancing the overall perception of the community and promoting the construction of rural culture and civilization. However, the development of reclamation management Bureau and soy sauce workshop is relatively balanced in all aspects. The negative influence of textile mill is more prominent in traditional building value.

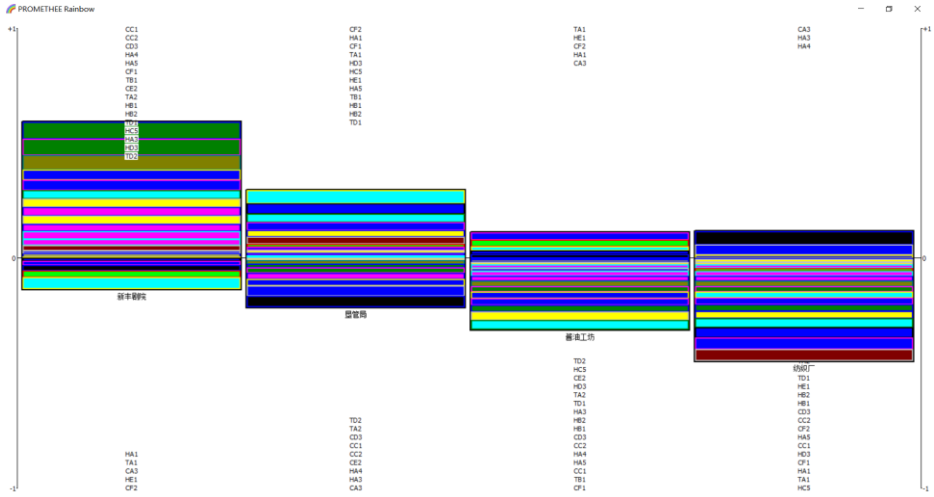


Figure 5-7 Rainbow Image of PROMETHEE (Visual Promethee)

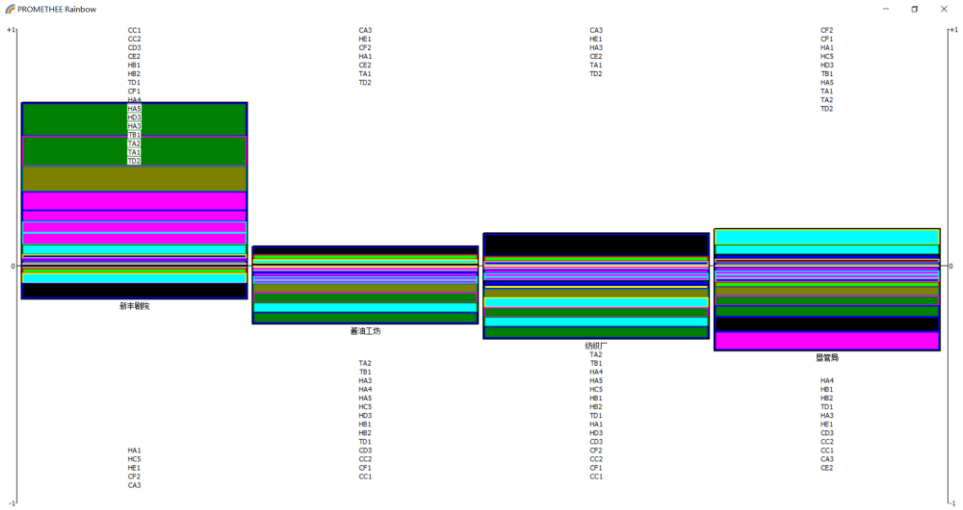


Figure 5-8 Rainbow image of Promethee based on the perspective of villagers

(Visual Promethee)

From the perspective of the design team, as shown in Figure 5-9, the indicators that have the greatest impact on the four selected objects are all from the traditional architectural value level, namely the dark blue part in the figure. In addition to the traditional architectural value, Xinfeng Theatre, which is located on the far left, has a great impact on the overall perception and village customs and civilization, which are consistent with the will of villagers, while other indicators have little difference.

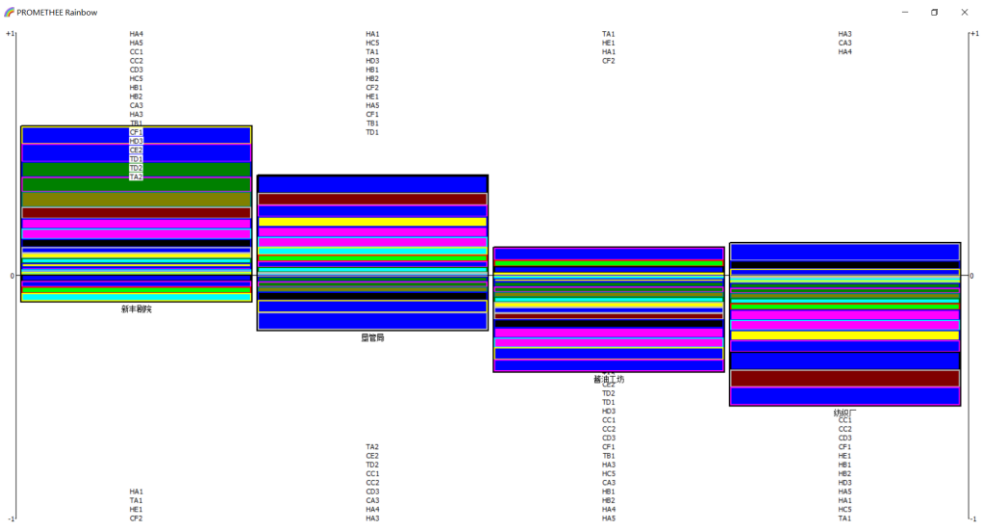


Figure 5-9 PROMETHEE is a rainbow image based on the design team (Visual PromeTHEE)

From the perspective of the development team, as shown in Figure 5-10, the most influential factors of Xinfeng Theater and soy sauce Workshop are the destination level in the tourism development subsystem, namely, rurality and tourism resource visibility. Among the disadvantages of Xinfeng Theatre, the most influential factor is the greening degree in the ecological livable area, which is also the focus of Party A in the later renovation.

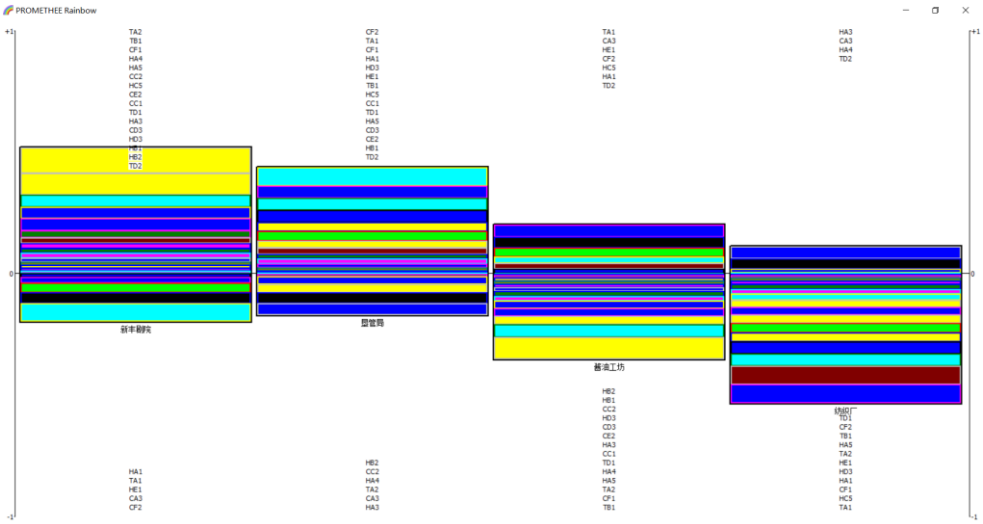


Figure 5-10 PROMETHEE is a rainbow image based on the development team (Visual PROMETHEE)

3. GAIA analysis of old architectural value

The quality of GAIA analysis is judged by the Delta parameter. According to the experience, a Delta value greater than 70% is considered as little information is lost in the GAIA analysis. In this paper, it is 95.4%, and the GAIA analysis is valid. As shown, the comparison object in GAIA figure the value of the closer distance represents with similar characteristics, from the center to around for each index of each shaft axis, the closer the location of the representative indicators shaft is higher, the meaning of each index represents the length of axis represents in calculating the discriminant of Phi, the coarser red shaft axis for decision-making, The longer the decision axis, the more reliable the GAIA analysis. From the perspective

of index factors, as shown in Figure 5-11 (b), traditional architectural value (HA1, HA3, HA4), ecological livable (CF2), tourism destination (TA1) and other factors play an important role in the evaluation and calculation of the existing architectural value. However, the characteristics of tourism support (TD1 and TD2) of the selected objects are similar, so the discrimination is weak. The GAIA plan can also judge the similarity between the selected objects. For example, the Reclamation Management Bureau and the soy sauce workshop have similar value characteristics, indicating that the two existing buildings have similar basic conditions, and they can be used in the renovation of similar strategies and cross-reference. Xinfeng Theatre and textile factory have opposite properties in each index, so different strategies should be adopted in the process of renewal to complement each other. The GAIA plan can also show the differences between different subjects. Figure 5-11 (c) shows that the evaluation of the design team and the development team is similar. The evaluation of soy sauce workshop and textile factory by different subjects was similar.

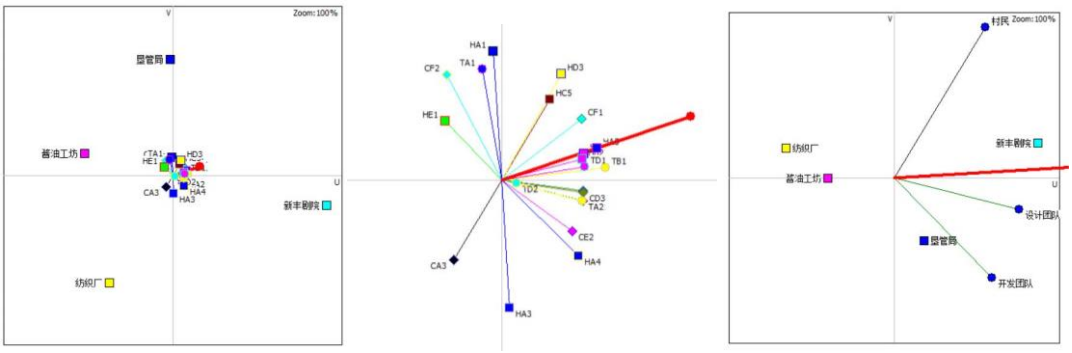


Figure 5-11. (a) Global graph of GAIA graph based on multi-objective

(b) Local enlargement (c) Multi-agent based GAIA graph

（Source：Visual PROMETHEE）

As shown in Figure 5-12, the information of the four existing buildings can be analyzed in detail. Xinfeng Theatre has advantages in most indicators, but from the analysis of all indicators, Xinfeng Theatre is at a disadvantage in terms of local employment opportunities (CA3), greening rate (CF2), longevity (HA1), heritage of traditional crafts (HE1) and rurality (TA1). Therefore, in the process of renovation and renewal, the greening and rurality can be enhanced in the physical space. In the soft factor, employment opportunities can be opened to the community and local culture can be inherited, with a small degree of renovation. Textile factories have great advantages in terms of local employment opportunities (CA3), scale (CA2) and process inheritance (HE1), but other indicators are at a disadvantage. Therefore, demolition and construction can be considered in the later transformation process. However, the advantages and disadvantages of the reclamation management bureau and soy sauce workshop are equal, so the advantages can be selectively protected, and the upgrading or replacement parts can be updated. For example, the reclamation Management Bureau has great advantages in environmental friendliness (CF1), greening rate (CF2), longevity (HA1), coordination (HC3) and rurality (HA1). Therefore, the original pattern and traditional style of the Reclamation management Bureau can be preserved and adjusted and optimized in terms of local employment opportunities (CA3), villagers' participation (CE2), scale (HA2) and integrity

(HA3). The soy sauce factory can adopt a similar strategy to the reclamation management Bureau, but under some obviously contradictory indicators such as environmental friendliness (CF1), it can improve its environmental friendliness through green treatment or industry replacement.

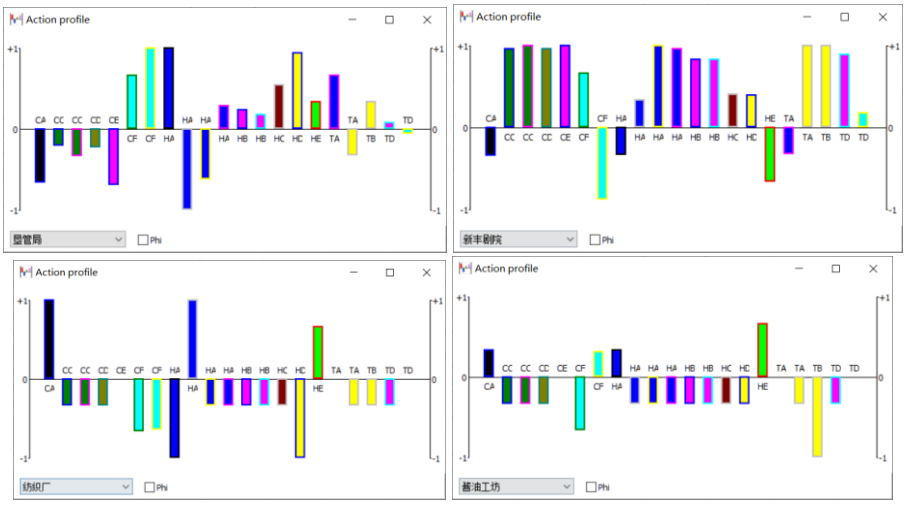


Figure 5-12 Bar chart of existing building valuation indicators (Source: Visual Promethee)

5.2.4 Transformation strategies and schemes

According to the above analysis results, the following transformation strategies are proposed:

(1) Carry out transformation operations in different levels and types. According to the advantages and disadvantages, the operation strategies are divided into: upgrading, partial transformation and complete construction. For example, the strategy of upgrading Ximeng Theater with good performance in each index should be adopted; the inferior textile factory should be dismantled and constructed; and the soy sauce workshop and reclamation management Bureau with relatively homogeneous and similar index distribution should be partially reconstructed.

Figure 5-13 Renovation plan of four public buildings: Xinfeng Theatre, Textile factory renovated into Qianhai Cultural Center, Reclamation Management Bureau, Soy Sauce Workshop

(Source: F.I.T Studio)

(2) When upgrading existing buildings, we should purposefully improve them based on their advantages and disadvantages. For example, Xinfeng Theater can improve its greening and rurality in physical space, open job opportunities to the community and inherit local culture in soft factors. In the scheme, it focuses on the combination of the south waterfront space and the entrance square to create an ecological green space, and the facade style is ordered based on the original good building quality. For the reclamation management bureau, the original pattern and traditional style can be retained, and the local employment opportunities, villagers' participation, scale and integrity can be adjusted and optimized, that is, the construction quality of the retained part can be improved and appropriate expansion can be carried out. In terms of the scheme, the operation of the building is small, mainly to shape the square space, and the use of the original damaged and exposed wooden frame so-called exhibition device, to show the salt reclamation culture. For the soy sauce workshop, the original pattern and style should be preserved while the functions with environmental pollution should be replaced to strengthen and make use of its rural landscape. In terms of the scheme, it also extracts the sauce jar elements in the original factory and converts them into landscape elements, while retaining its original pattern.As for the textile factory, it is easy to dismantle because of its poor appearance and color steel house, and its relatively abundant land is used to replace it into Qihai Cultural Center for new construction.

Figure 5-14 Demolition of the old textile factory site to build Kai Hai Immigrant Cultural Center

Figure 5-15

Conversion of original wood components of Reclamation Management Bureau into exhibition devices

Figure 5-16 Soy sauce jar in the soy sauce workshop becomes a landscape element

Figure 5-17 Facade renewal and surrounding landscape design of Xinfeng Theatre

(3) Although different stakeholders have different emphases, the evaluation similarity between the design team and the development team is relatively high, and there is a certain difference with the villagers before. Moreover, the evaluation net flow value of the design team is between the development team and the villagers, so we can focus on the communication between the villagers.

5.3 Mid-stage of the scheme: Compare and select multiple schemes for the core area planning

5.3.1 Research objects

Three schemes of core area planning are selected as the research objects, ranging from Xinfeng Theatre in the east to Holland Flower Sea in the west, and extending north and south along Xinfeng River. Before the transformation, the advantages lie in that, first of all, the dense river network lays a solid foundation for creating rich spatial types, provides a platform for various kinds of hydrophilic activities in the region, and provides a stage for creating a scene hydrophilic commercial street. Secondly, there are many aborigines in the village, which preserves the original production and living conditions of the villagers. There are many vegetable fields and rape flower fields, which have a strong rural atmosphere and obvious site characteristics, so as to avoid homogeneous competition with surrounding projects. On the other hand, there are also the following problems: First, in terms of traffic, internal traffic is not smooth, there are many dead-ends, parking lots and cycling stations are missing, and space tolerance for external vehicles and pedestrians is insufficient. Secondly, culturally, there is no carrier to present several major cultural systems, such as cultivation culture, water culture, educated youth culture and folk culture. There is no cultural activities to enrich the lives of villagers and tourists, and no festival planning. Thirdly, in terms of architecture, the street interface lacks characteristics, some dwellings lack of repair, and the building lacks the connection with the space. Fourth, in terms of public space, the village has less public space, low space utilization, water but no hydrophilic space, lack of hydrophilic path, poor spatial vitality and experience, and insufficient municipal facilities and public service facilities construction. Fifth, in terms of industrial disadvantages, the planning area has a single type of business, streets lack vitality, no commercial atmosphere, and streets have few historical industry remains.

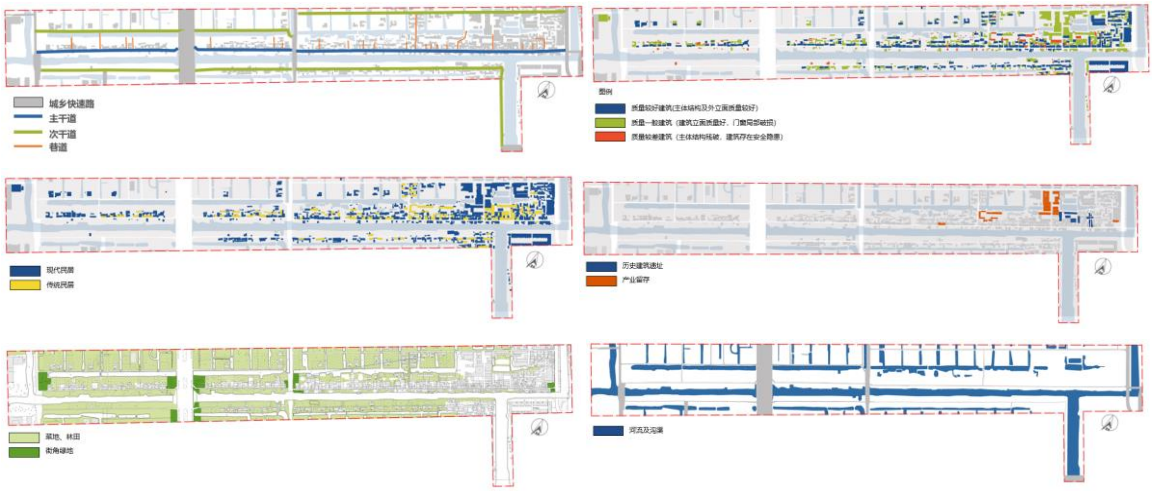


Figure 5-18 Analysis diagram of current traffic, building quality, age, heritage, green space and water system in the core area

(Photo credit: F.I.T Studio)

Therefore, based on the summary of the current situation and problems, the vision of "living humanistic street" and "all-round cultural and tourism experience" is put forward by taking advantages as the starting point and solving problems as the orientation. Based on this vision, three paths in different directions are proposed.

The three schemes were compared pairwise to get the good and bad rankings, and the performance of the three schemes under different subjects and different objectives. This paper introduces the characteristics of the three schemes.

1. SCHEME 1: Roaming the streets

The linear space is used to shape multi-level street space, which can be summarized as the following characteristics:

(1) It is not one street, but "five" streets: the construction of interesting slow traffic makes the diversified slow traffic lines connect with each other and switch easily. Mainly: a main street line, on the basis of the existing main road to open up a number of lanes, to increase the depth of walking experience; Two water routes, dredge the Xinfeng River boat line, set up a number of dock stations, flexible up and down; The two lines between the fields and the farmland on the north side of the building add a continuous walking path to enrich the ecological leisure experience.

(2) It is not a thin facade along the street, but a vibrant space: the deep expansion enriches the spatial activity experience in the roadway. The main areas are: transforming the original residential areas into homestay groups; The old soy sauce factory will be transformed into a compound space integrating brewing experience, catering, cultural and creative sales and other functions; Revitalize and update the old site of the Reclamation Management Bureau as a place for cultural interaction; The original textile factory was transformed into a cultural exchange and cultural creation space with Qihai immigrant culture as the theme.

(3) Not just walk along the street, but stop and stay for a while: create open space, the space layout is compact and organic, public open space scattered in the old street, mainly for: shape important public buildings, street open space, important alley entrance layout garden square and other public space, river, farmland to join the green leisure site; The diversified scale of open space is formed. There are both small open Spaces and gardens for relaxation and large open Spaces and parks for activities.

(4) The river is not only a landscape to be seen, but a paradise to be entered: it is happy because of the water and closely connected with the river. The main manifestations are as follows: create space near the water, build a footpath near the water, build a platform on the water surface, and make commercial buildings and residences close to the water to strengthen the connection between people and water; Place in a hydrophilic space. Join the water cruise, water market, water accommodation, water performance, etc., to enrich the water experience.

(5) The old house is not an abstract symbol, but a moving impression of life: to show the culture, to dig deeply, to create a special cultural space and scene. The main manifestations are as follows: Aiming at the cultural relics of the old street, the design strategy of static protection, cultural deduction and activated

experience is adopted to carry out activation and renewal; Through sculptures, signs, performances and other forms to show the vicissitude of the old street and cultivation of history and culture.

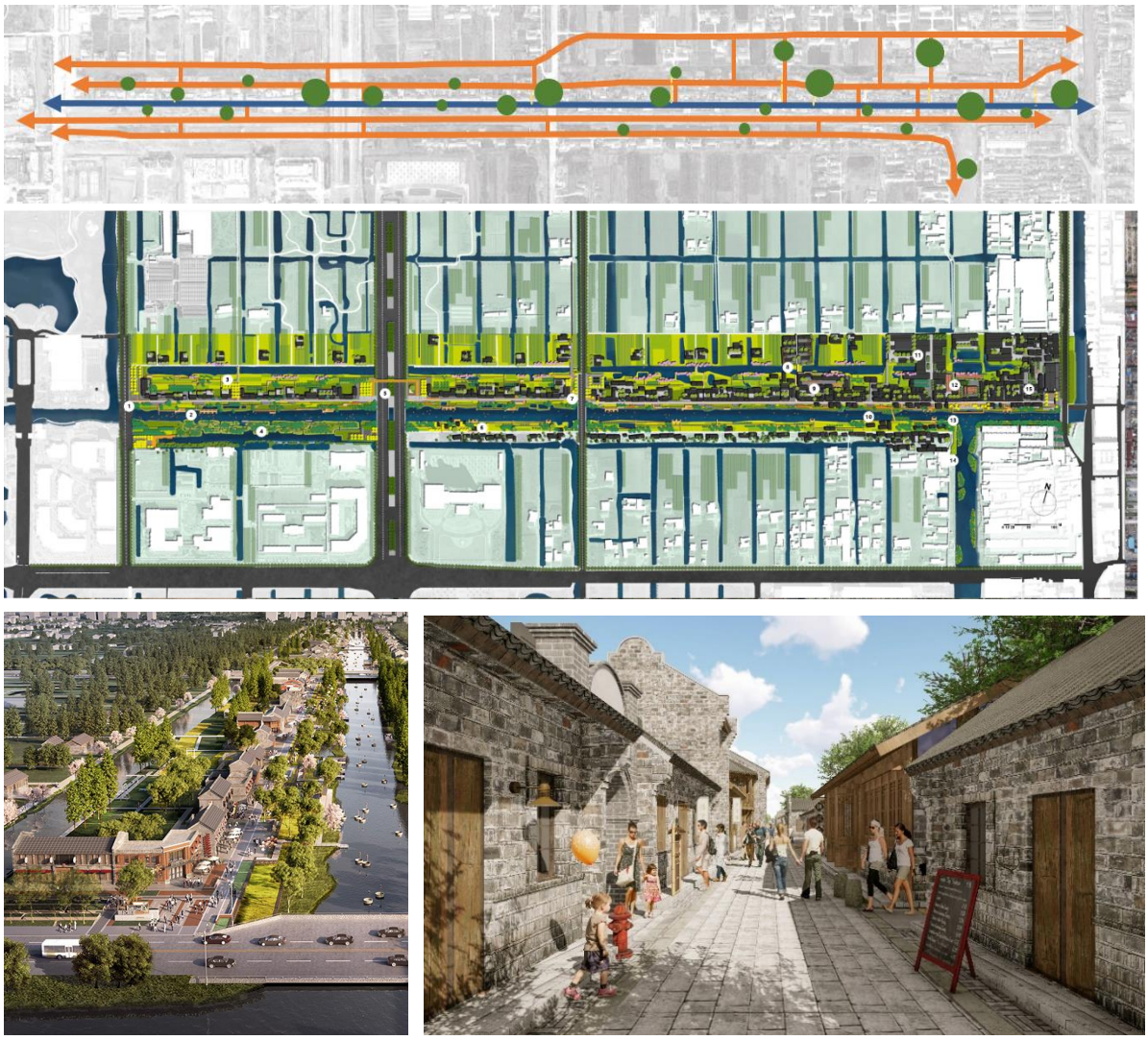


Figure 5-19 Scheme 1 "Roaming the Streets" (Source: Redrawn according to the data)

2. SCHEME II: Ecological islands

Connecting the North and South water systems, forming patchy islands, summarized as follows:

(1) Ecological transformation: combined with the existing water system, open the main river and the secondary river to convert the green space between the two rivers into islands, increase the waterfront boundary, and emphasize the ecological benefits and landscape effects of the boundary.

(2) As an important ecological infrastructure in the region, it plays the role of pollution prevention, purification and beautification, including improving domestic sewage treatment facilities and controlling surface runoff; Reconstructing wetland ecosystem and enhancing river self-purification ability; Enhance river landscape and achieve high-quality ecological base.

(3) The combination of culture and ecology carries cultural life. It plays the role of cultural publicity and ecological demonstration, including placing Xinfeng traditional culture in the node space, strengthening the publicity and education of ecological civilization and nature education.

(4) Balance life and tourism, and preserve the original production functions of river and green land,

such as planting and breeding, on the premise of providing living services for residents; At the same time, taking into account the needs of recreation and leisure tourism development.

(5) The building is in harmony with the ecological environment. It adopts the way of overhead and point-like contact to reduce the impact on the land and reduce large area hardening.

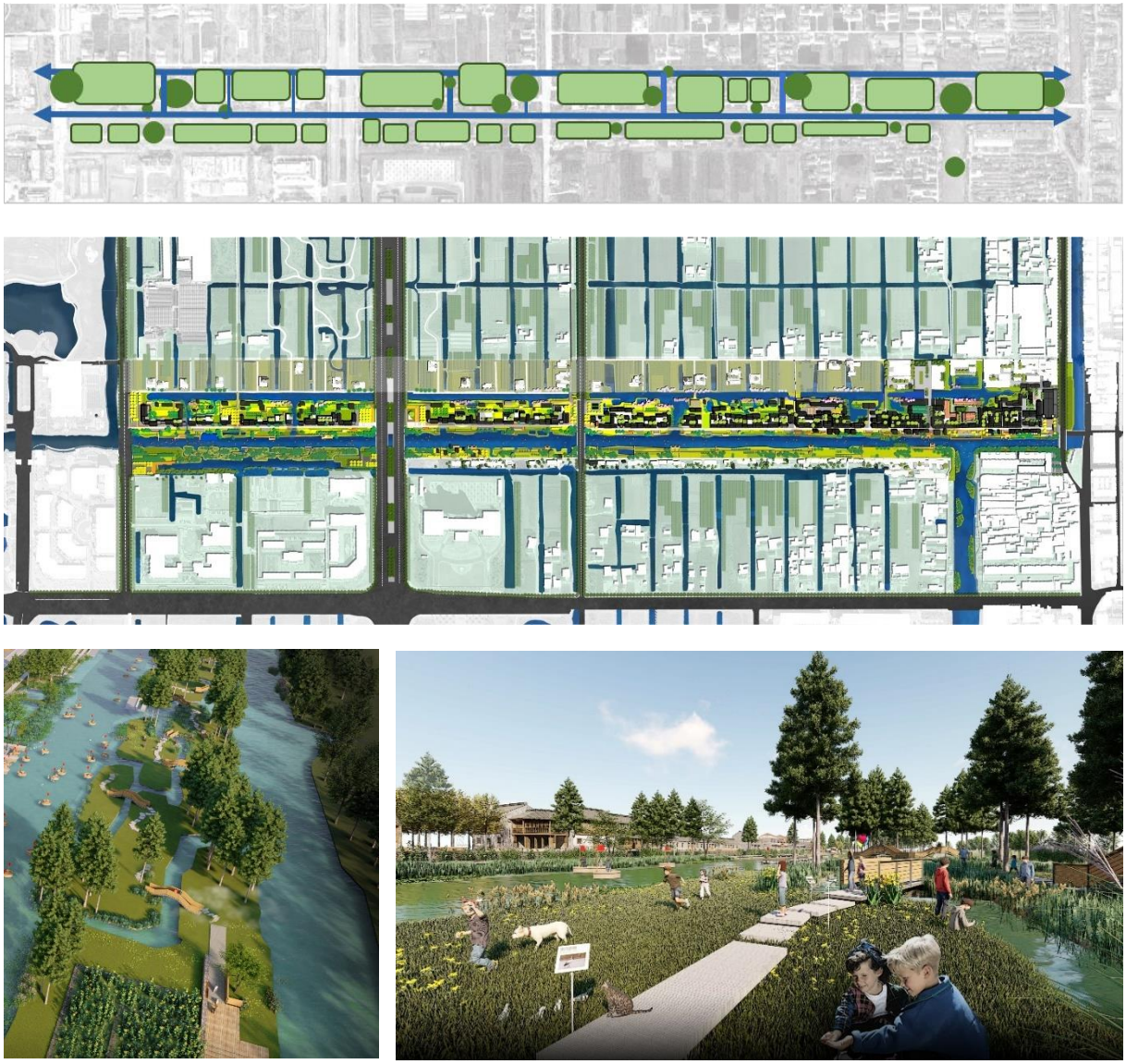


Figure 5-20 Scheme 2 "Ecological Islands"

(Source: Redacted according to data)

3. SCHEME 3: Multi-dimensional Living Museum

With old buildings as catalysts, vertical spatial layers are added to create a three-dimensional roaming path network. The features are summarized as follows:

(1) To create a three-dimensional cultural corridor streamline planning, with the former site of the reclamation management Bureau, painting shop, Pujia alley, bean curd workshop, soy sauce factory, textile factory, Xinfeng theater as the activation point, connected with the original trees, yards, ponds, to create a three-dimensional walking corridor for block visits.

(2) Shape the profile public space, combine the original two-story buildings of the block and some

new large public Spaces as aggregation places, and form the profile spatial relationship.

(3) Create a three-dimensional river landscape and enrich the spatial level of the river. Pay attention to the viewing effect and activity space.

(4) To create a mixed community, the mix of functional business forms, residents and tourists, and enhance the integrity, authenticity, participation and vitality of the community.

(5) Cultural tourism format implantation, from the perspective of cultural experience, tourism services, leisure landscape and convenient life, cultural tourism activities planning combined with the stage, water stage and various workshops, such as parent-child activities, practical education, outdoor music festival, etc., to stimulate endogenous motivation.

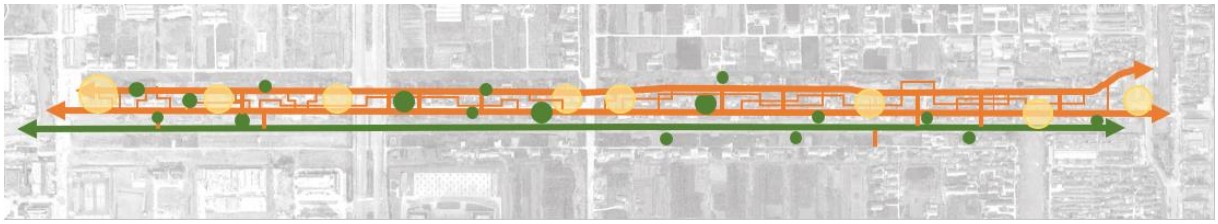


Figure 5-21 Scheme 3 "Multi-dimensional Living Museum"

(Source: Redacted according to data)

5.3.2 Evaluation process

Taking the above three schemes as the evaluation object, taking the evaluation system established in

the third chapter as the foundation system, screening indicators according to the actual situation, and using PROMETHEE method to sort.

The main data sources are: Drawing measurement data, historical data and subjective data are respectively from scheme drawings and text data, Xinfeng local Chronicles and research results of the project planning and exhibition team. And the interview data of PRA group (a consultative group composed of Party A's representative, EPC general contractor's representative, design team's representative and villagers' representative) as well as the collected minutes of the weekly meeting of all parties.

The above data is applied to VISUAL PROMETHEE software. Firstly, three scenarios are set, namely villagers, design team and development team. Then, according to the different weights of the three scenarios, the software generates a comprehensive scene. Secondly, according to the evaluation system set in Chapter 3, 61 indicators are set as the basis, and 51 indicators are activated according to the research object, and the unit, legend, orientation, weight and preference model of these indicators are set. Then, the data of the three schemes are input into it, and the visualization results are obtained by software operation.

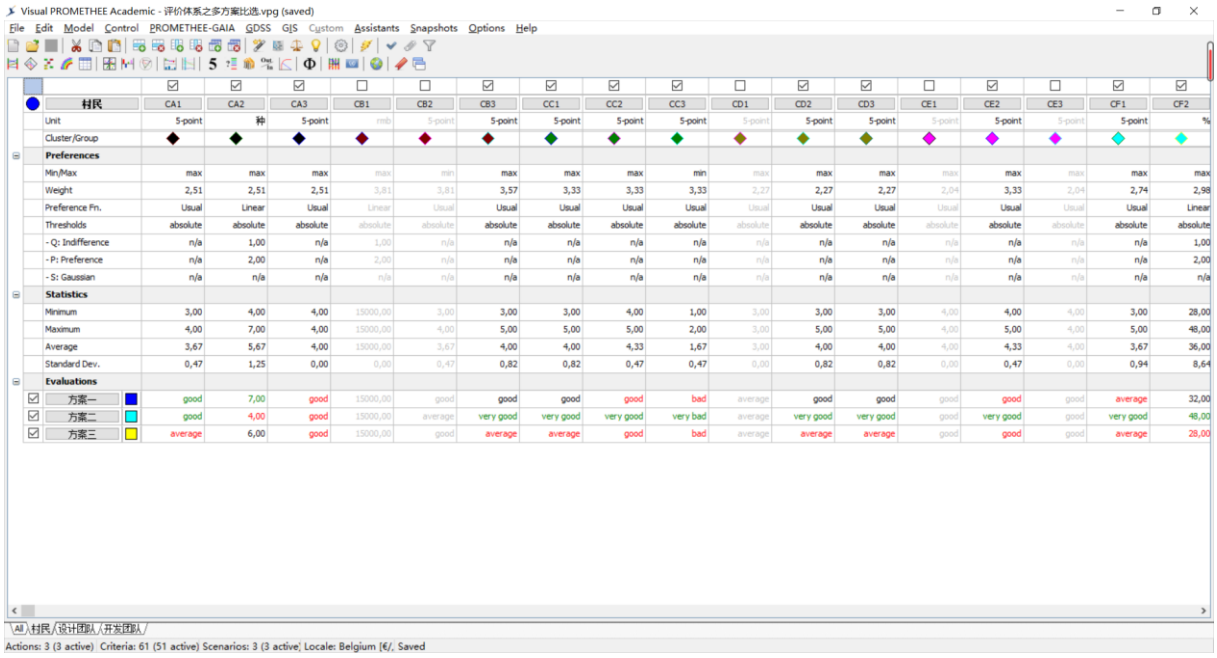


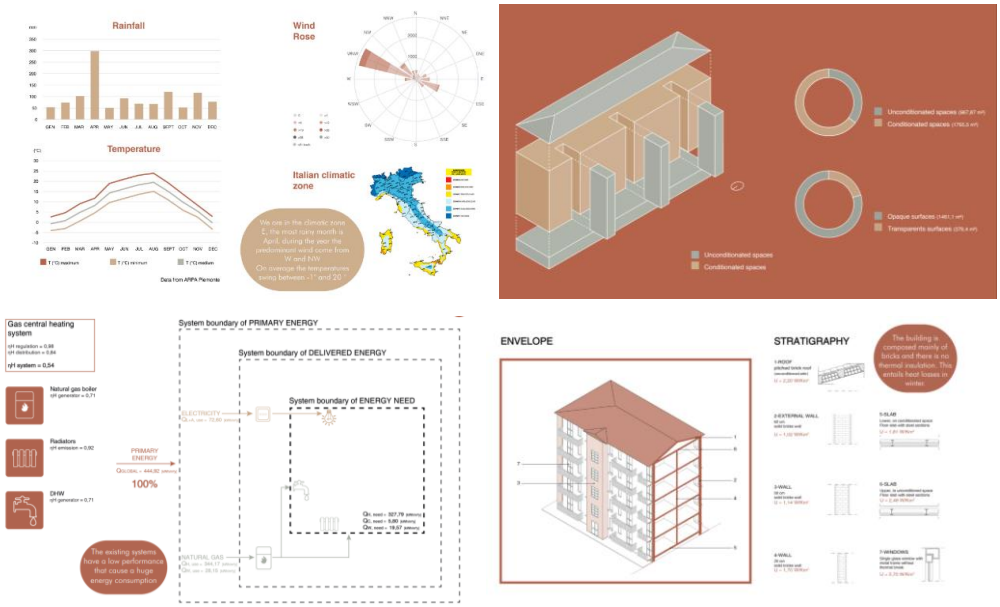
Figure 5-22 Visual PROmeTHEE Excerpt (Visual PROMETHEE)

5.3.3 Auxiliary technology of quantitative index evaluation: Comparison and selection of residential buildings based on performance simulation

In the quantification of the index data, the performance simulation software is used to quantify the housing situation. Taking 190-196 model houses in the first phase of the project as an example, the building performance of the model houses is simulated and evaluated in Edilclima software.

Figure 5-23 Technical drawings of residential buildings for demonstration households

(photo source: F.I.T studio)



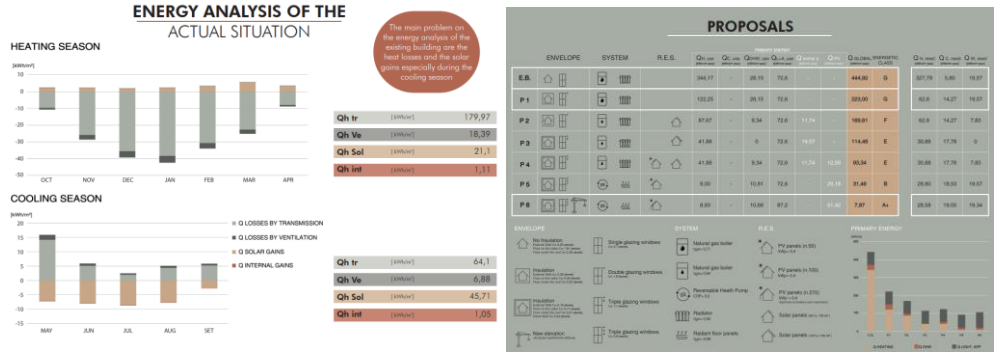


Figure 5-24 Energy consumption analysis process (Ssource: drawn by the author)

As shown in figure 5-24 process, (1) to set the first area, coordinate access to climate data, (2) and then to simulate the building is divided into conditioned part and unfettered part, (3) and then the building maintenance structure type and dimension of input into the edilclima software modeling calculation, (4) set up the dynamic system, (5) the winter heating and summer cooling energy consumption data can be obtained, It can be used as a reference for the score data of overall perception and ecological livable level.

5.3.4 PROMETHEE analysis based on multi-scheme comparison

1. Comprehensive analysis of the comparison scheme

After scoring from the perspective of the three parties, as shown in the left picture of Figure 5-25, Scheme 1 "roaming the streets" ranks first, followed by Scheme 2 and Scheme 3. The distribution of scheme 1 is above 0, and the distribution of scheme 2 and 3 is below 0, and the difference between the latter two is weak. From the perspective of different stakeholders, as shown in the right figure in Figure 5-25, the ranking order of design team and development team is the same. The ranking is that Plan 1 is superior to Plan 3 and Plan 2. From the perspective of villagers, Plan 2, "ecological island", ranked first, followed by Plan 1 and Plan 3. For both design teams, there was little difference in net flow values between the three solutions. From the perspective of the development team, plans one and three are similar.

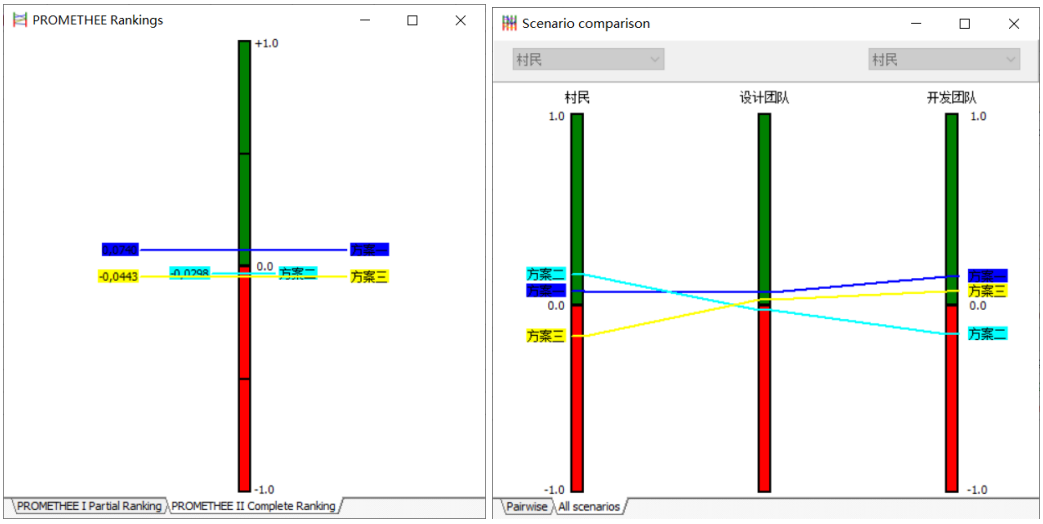


Figure 5-25 Total Ranking of PROMETHEE II (Visual PROMETHEE)

2.Multilevel analysis of comparison options

According to the rainbow diagram of PROMETHEE, as shown in FIG. 5-26 (a), in general, the distribution of colored blocks is relatively average, indicating that the distribution of index influence among the three schemes is relatively balanced without significant difference. Plan 1 has a slight advantage in terms of industrial prosperity (CA1, CA2), Plan 2 has advantages in terms of rurality (TA1) and coordination (HC1), and plan 3 has a better performance in terms of traditional architectural value (HA3, HA4). From the perspective of villagers, as shown in Figure 5-26 (b), Plan 2 has excellent performance in terms of affluent life (CB3) and overall perception (CC1, CC2, CC3); Plan 1 has no obvious advantages and disadvantages and ranks in the middle; and Plan 3 ranks the lowest because of its more obvious disadvantages in terms of overall perception (CC1, CC2, CC3). From the perspective of the design team, as shown in Figure 5-26 (c), there is not much difference between the advantages and disadvantages of the three schemes. Scheme 2 is ranked lower due to its poor performance in traditional style. From the perspective of the development team, as shown in Figure 5-26 (d), Scheme 1 has more advantages in terms of industry prosperity (CA1, CA2) and tourism channel (TC1).

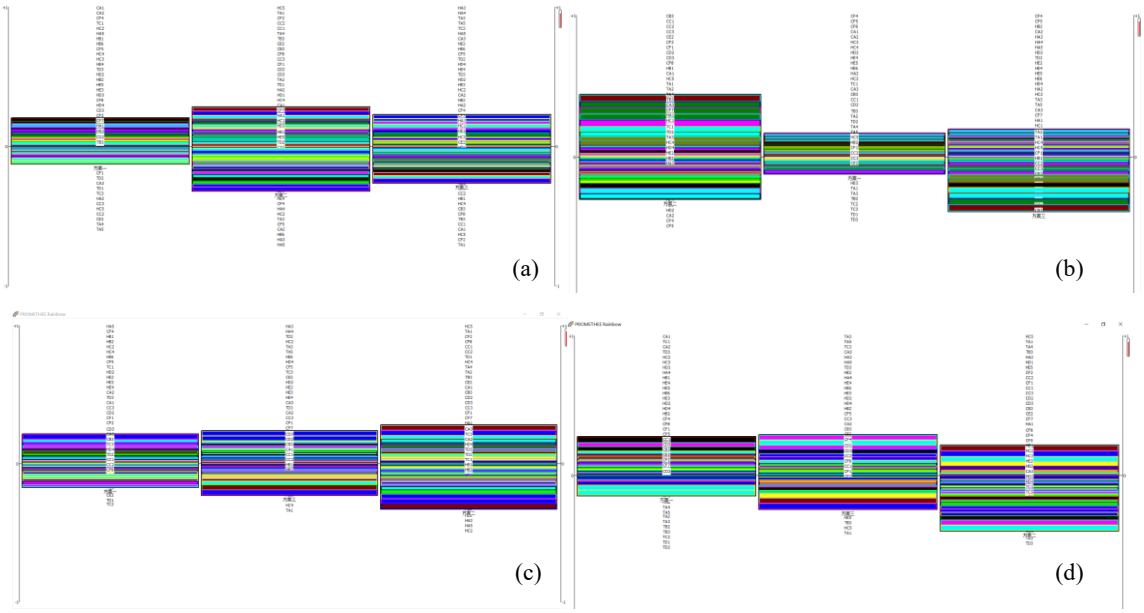


Figure. 5-26 Overall rainbow diagram of PROMETHEE (a), Rainbow diagram of Villager perspective (b), Rainbow diagram of design perspective (c), Rainbow diagram of development perspective (d)

(Source: Visual PROMETHEE)

3. GAIA analysis of multiple scheme comparison

GAIA analysis can be used as a supplement to PROMETHEE method. The closer each plan is in the GAIA plane, the more similar it is, and the axes sent from the center to the periphery are the indicator axes. The closer the indicator axes are, the meaning represented by each indicator is in the same direction. The longer the decision axis, the more reliable the GAIA analysis. Therefore, from the perspective of indicator factors, as shown in Figure 5-27 (middle), Factors such as tourism destination (TA4, TA3), tourism channel (TC1, TC3), industry prosperity (CA1, CA2) of community development subsystem, and site selection pattern (HC4, HC5) of local landscape subsystem play an important role in the calculation of the advantages and disadvantages of multi-scheme comparison. Scheme 1 and Scheme 2 are different and

relatively distributed, indicating that the two schemes can be contrasted with each other and combined with each other for improvement and promotion. As shown in FIG. 5-27 (right), from the perspective of different subjects, the opinions of the development team and the design team are more consistent, but different from those of the villagers.

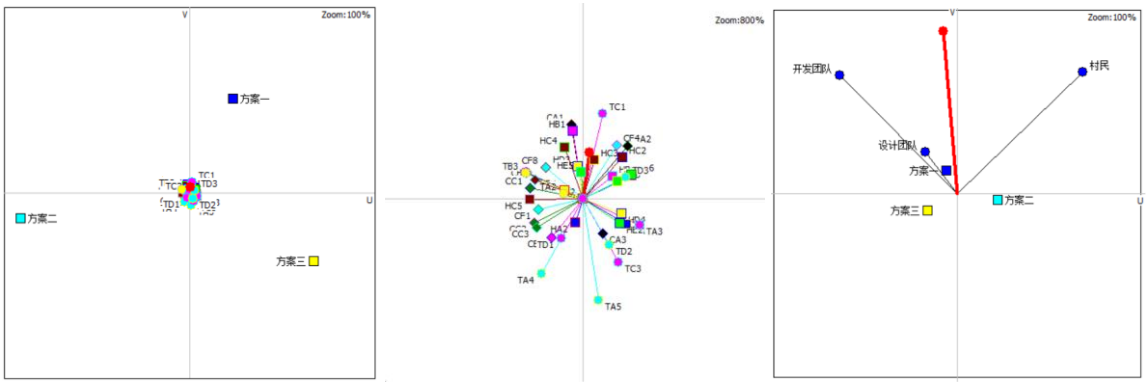


Figure 5-27 Global view of GAIA Planar graph based on multi-objective (a)

Enlarged view of the inner part of the circle (b)

Multi-agent Based GAIA diagram (c)

(Source: Visual PROMETHEE)

In GAIA Web, each evaluation index is distributed isometrically around the display center, and the direction of the decision axis is the same as that of the GAIA plane, so indicators expressing similar preferences are close to each other. For each dimension (single indicator or grouped indicator), the radial distance corresponds to the net flow Phi (Phi in the center is -1, and Phi in the outer circle is 1). For dashed circles, if phi is positive, it is shown in green; If it is negative, it is shown in red. As can be seen from Figure 5-28 below, schemes 1, 2 and 3 have different advantages in different indicators. Phi of scheme 1 is positive, while PHI of schemes 2 and 3 is negative.

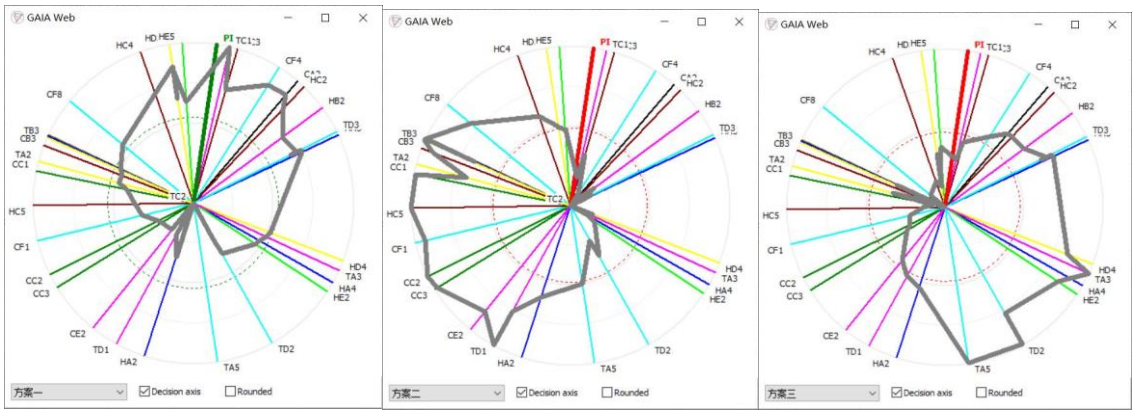


Figure 5-28 GAIA Web of Scheme 1 (a) Solution 2 (b) Solution 3 (c)

(Source: Visual PROMETHEE)

5.3.5 Improving Policies

Through the above analysis, it can be concluded that scheme 1 has more advantages and can be modified locally by comparing schemes 2 and 3. For example, combining the ecological strategy of Plan 2,

improve the utilization of water system and farmland resources; Combined with the activation strategy of Plan 3, the operation and maintenance of the living museum will be carried out to enhance the recognition and participation of the community on humanistic elements. Therefore, the following strategies are put forward: ① Regional integration and differentiated development. Integrate the development of the project into the Doulonggang ecological group for unified operation; Differentiated layout of commercial forms, the formation of spatial forms conducive to the development of industries and functions, and strengthen their own characteristics, establish the image of leisure street. (2) External capital and local villagers. According to the actual situation, the problem of Laojie Aborigines should be properly handled, industries and employment should be linked, and villagers should be guided to participate in cooperative development. Regional development should also promote the development of villagers. ③ Protect Tiaotian heritage and develop leisure agriculture. Based on the characteristic pattern of zao Tian, the industrial structure is optimized by means of leisure agriculture, the flower cultivation park is arranged, the land landscape is created, the agricultural park is shared, and the activities such as Zao Tian cycling are joined. (4) Highlight the humanistic characteristics of the old street and create a three-dimensional dynamic water street. The old street of the town, which condenses history and culture, and the Xinfeng River, which carries various activities and rich cultural experience, will be interwoven and extended, and the traditional waterfront site will be built into a high-quality interactive space to stimulate the vitality of the site, making it a new business card of innovative cultural tourism in the characteristic town.

5.4 Post-stage of the scheme: POE

Performance evaluation with assistive technology can also be added at the later stage of the program as a supplement and revision of the indicators of the community development subsystem. The evaluation results can be used as a reference for the formulation of guidelines or the improvement of norms to make the process of architectural design more scientific. In the European Union, for example, Tabula (manual on the physical performance of buildings by building type) has been established. Thus, an open platform is built and classified according to country, region, age and type, as shown in Figure 5-29, to obtain the energy consumption of heating and cooling required by residential houses, which can be used as a reference manual.

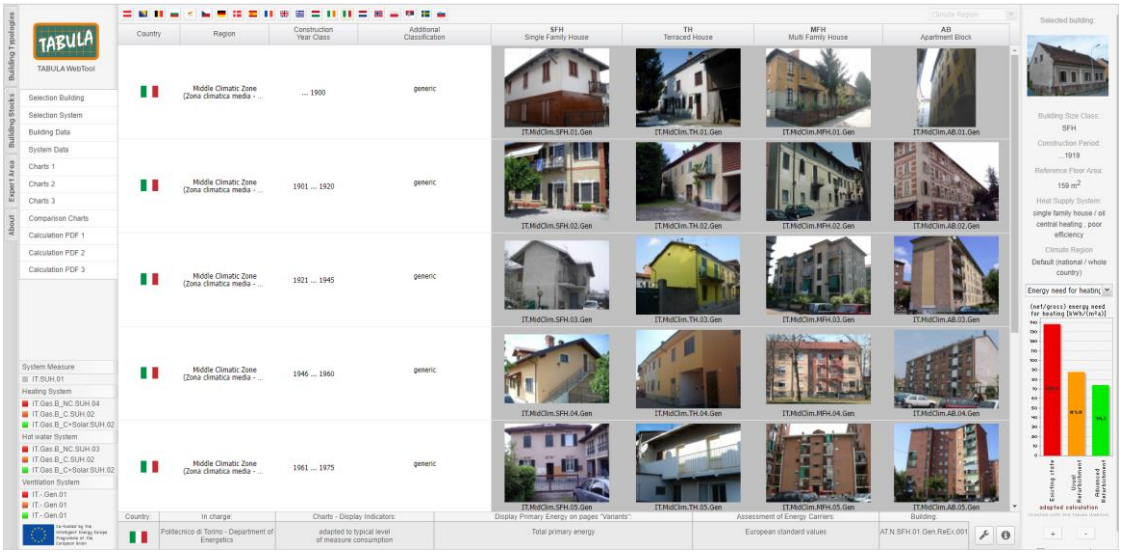


Figure 5-29 Building Performance manual example (TABULA Webtool)

In China, there are also relevant scholars to feedback the pre-design planning link through the post-evaluation report. For example, Weimin Zhuang's team conducted a diagnostic post-evaluation of the Tsinghua Science Building to study the actual use of the building. Accurate measurement of various indicators; Propose design strategies for at least the next 10-20 years; To improve the design quality of similar buildings in the future. As well as the Weinan culture and art center after the investigation of the evaluation, in order to study the real use of the building; Detailed evaluation of building performance; Conduct further investigations on certain aspects of building performance or user feedback.

5.4.1 Research objects

At present, the project is not completely completed, and only part of the blocks are open. However, during the Spring Festival, the activity operation has also attracted a large number of tourists. In ordinary times, nearby community residents also have leisure and recreation, and local residents have been recruited as cleaning and security personnel in the operation of the blocks. Due to the need for follow-up evaluation to improve the accuracy and scientificness of the evaluation results, but due to the project process, a more in-depth post-evaluation survey has not been carried out, so in this paper, only the application of this evaluation method is given as an example.

Three public Spaces are selected as the research objects, namely the entrance square space of Xinfeng Theatre, the water stage space and the stage space for post-use evaluation. The research objects are interviewed during the Spring Festival opening and during weekdays.

The entrance square, as shown in Figure 5-30, is located at the intersection of the old street and the town, which is an important node space. Through the transformation, the original space is integrated, and the dilapidated houses at the end of the road are properly demolished to form a large space and square, which gathers the flow of people and promotes the rest and consumption of tourists. The current road and integrated nodes are combined to form a ring line in series, so that pedestrians and tourists can travel freely

in the old street. And show the features of the old street, the formation of a certain role of identification. During the Spring Festival, various soft elements are decorated, such as lantern display board temporary vignettes, creating a strong festive atmosphere. On weekdays, the supporting landscape sketch facilities and rest facilities have been preliminarily improved, and the geographical location is close to the town, so it can also attract nearby residents to play and rest here. In the waterfront space connected by the square, there are also residents fishing here.

Figure 5-30 Rendering of the entrance square of Xinfeng Theatre; Real scenes of festivals and weekdays after completion (Source: author collation)

The main street space, as shown in Figure 5-31, selects the area near the entrance in the main street, which is bounded by the architectural interface on both sides. Through the atmosphere shaping of the interface along the street and the bottom interface, a traditional and simple space atmosphere is created. In terms of materials, the buildings along the street are relatively uniform. Most of them are traditional blue brick walls with wooden doors and Windows and traditional blue tile roofs. At the same time, metal signs and light belts are embellished to create a dynamic atmosphere. In terms of space, the linear space and open space are scattered, and the dotted rest space composed of red brick masonry chairs and green space forms a certain rhythm. In the form of business, there have been restaurants, cultural stores have been settled, the operators of different styles of soft clothing has enriched the spatial level of the main street. During the Spring Festival, through various soft elements decoration and activity operation, a large number of tourists are attracted, creating a strong festive atmosphere. On weekdays, because the whole area is still unfinished and construction teams still need to get in and out, there are fewer tourists, but a few surrounding residents take walks.

Figure 5-31 Spatial rendering of main street; Scenes of festivals and weekdays after completion (Source: author collation)

The water stage, as shown in Figure 5-32, is located at the confluence of Xinfeng River, which is the widest area of water in the river. It is an important public space node adjacent to the town. The design strategy strengthens the lack of deep interaction between land space and water space, and links the space between the river and the bank through a circular walkway, forming a visually independent performance stage. And does not affect access. And the hollow steel grating lining and under the water surface, to achieve the effect of people dancing on the water. According to the current operation and use effect, the activation of exhibition activities during the Spring Festival can attract a large number of people to stop. During weekdays, due to the incomplete physical space such as landscape planting, the expected space atmosphere has not been shaped yet, and people have not gathered yet.

Figure 5-32 Renderings of the water stage, actual scenes of festivals and weekdays after completion

(Source: author collation)

5.4.2 Evaluation process

Taking the above three public Spaces as the evaluation object, taking the evaluation system established in the third chapter as the foundation system, screening indicators according to the actual situation, and using PROMETHEE method to sort.

The main data sources are: drawing measurement data, historical data and subjective data, which are respectively from scheme drawings and text data, Xinfeng local records and research results of project planning and exhibition team, interview data of PRA group and collected minutes of weekly meeting of all parties.

The above data is applied to VISUAL PROMETHEE software. Firstly, three scenarios are set, namely villagers, design team and development team. Then, according to the different weights of the three scenarios, the software generates a comprehensive scene. Secondly, based on 61 indicators set in the evaluation system set in Chapter 3, 24 indicators are activated by adjusting them according to the research object, and the unit, legend, orientation, weight and preference model of these indicators are set. Then, the data of the three schemes are input into it, and the visualization results are obtained by software operation.

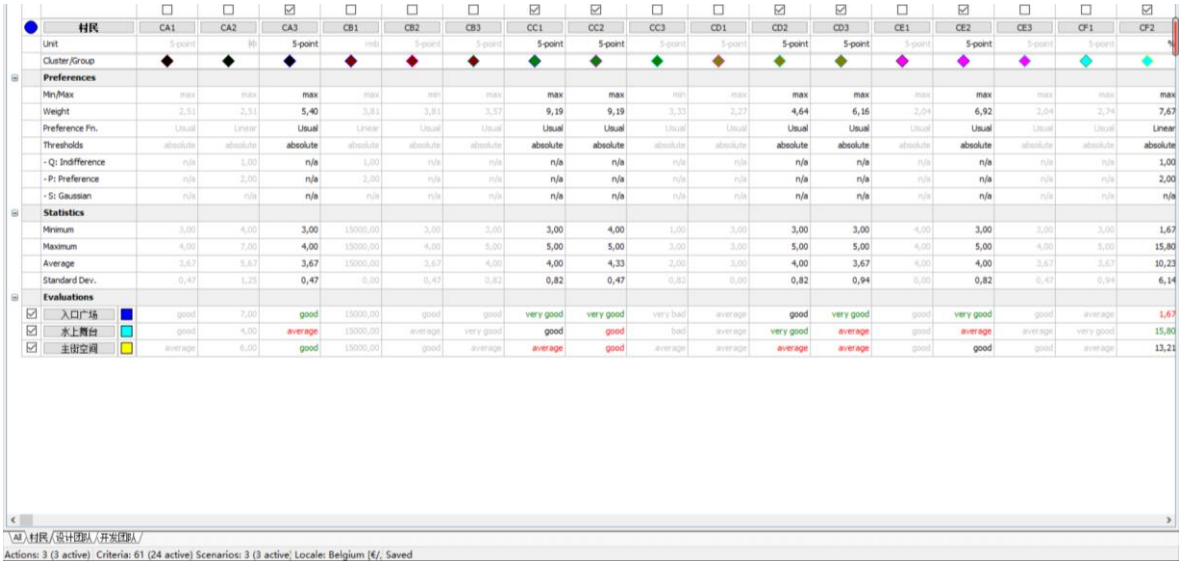


Figure 5-33 Visual PROMETHEE Excerpt (Visual PROMETHEE)

5.4.3 PROMETHEE analysis based on post-use assessment

1. Comprehensive analysis of the comparison scheme

The entrance square ranked first, followed by the main street square and the water stage. The entrance square is distributed above 0, and the main street space and water stage are below 0. From the perspective of different stakeholders, as shown in Figure 5-34 on the right, the design team, development team and villagers have the same ranking order, but differ in terms of net flow. From the perspective of villagers, the difference of net flow among the three is relatively average. From the perspective of the design team, the entrance space has obvious advantages for the main street space and the water stage, and there is little difference between the latter two. From the perspective of the development team, the gap between the

entrance space and the main street space is small, and compared with the water stage, the advantages are larger.

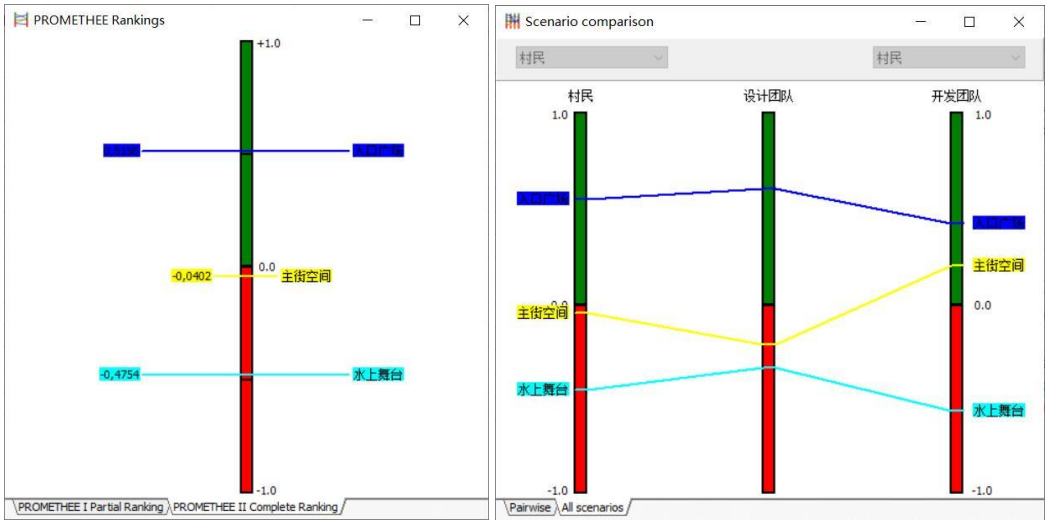


Figure 5-34 Total Ranking of PROMETHEE II (Visual PROMETHEE)

2.Multilevel analysis of comparison options

According to the rainbow map of PROMETHEE, in a comprehensive way, the area of ecological livable (CF5, CF4, CF2, CF8) color block is relatively large, indicating that the convenience of transportation facilities (CF4), the perfection of public facilities (CF8) and other aspects receive high attention. The entrance square has great advantages in hardening rate (CF5), residents' happiness (CC2), pattern integrity (HC3), and transportation facilities convenience (CF4), and is superior to the other two evaluation objects in general indicators. The main street space has advantages in terms of richness (HC2), perfection of public facilities (CF8), and convenience of transportation facilities (CF4), and the number of advantages indexes is similar to that of disadvantages indexes. However, most indicators of the water stage are at a disadvantage, especially in the accessibility of public facilities (CF8), transportation facilities (CF4) and other indicators, the flow value is low. From the perspective of villagers, the entrance square has the greatest advantages in life satisfaction (CC1) and resident happiness (CC2). The performance of the water stage is weak in the degree of perfection of public facilities (CF8) and the convenience of transportation facilities (CF4). From the perspective of the design team, richness (HC2), pattern integrity (HC3) and harmony (HC5) in the landscape protection subsystem occupy large color blocks and have a high degree of influence. From the perspective of the development team, the color block distribution of capital source in tourism support (TD3) and tourist satisfaction in tourist source market (TB2) is relatively large, and the influence degree is relatively high.

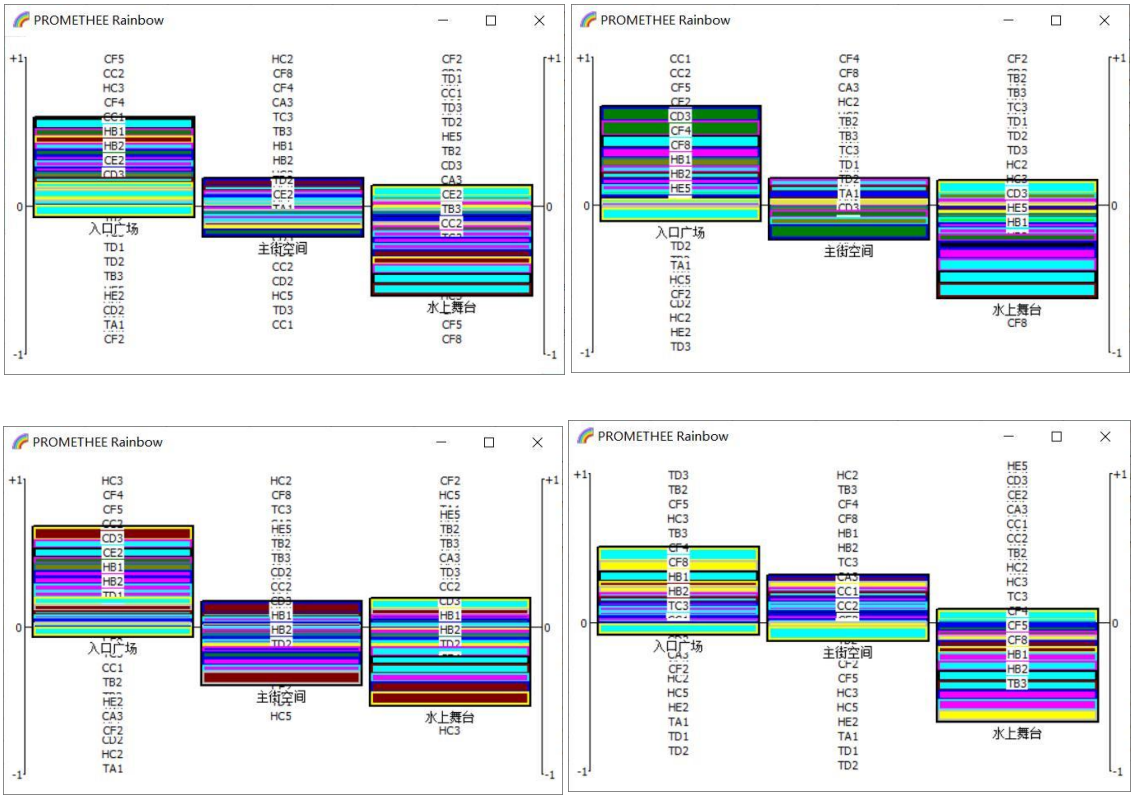


Figure 5-35 PROMETHEE Overall Rainbow map, Rainbow map from Villager perspective, rainbow map from design perspective, and rainbow map from development perspective

(Source: Visual PROMETHEE)

3. GAIA analysis of multiple scheme comparison

GAIA analysis can be used as a supplement to PROMETHEE method. The closer each plan is in the GAIA plane, the more similar it is, and the axes sent from the center to the periphery are the indicator axes. The closer the indicator axes are, the meaning represented by each indicator is in the same direction. The longer the decision axis, the more reliable the GAIA analysis. Therefore, from the perspective of indicator factors, green education (CD2) in the community development subsystem and richness (HC2) in the landscape protection subsystem have long decision-making axes, which play an important role in the calculation of advantages and disadvantages. From the perspective of different subjects, the opinions of the development team, the design team and the villager team are relatively identical, and they all prefer the entrance square most.

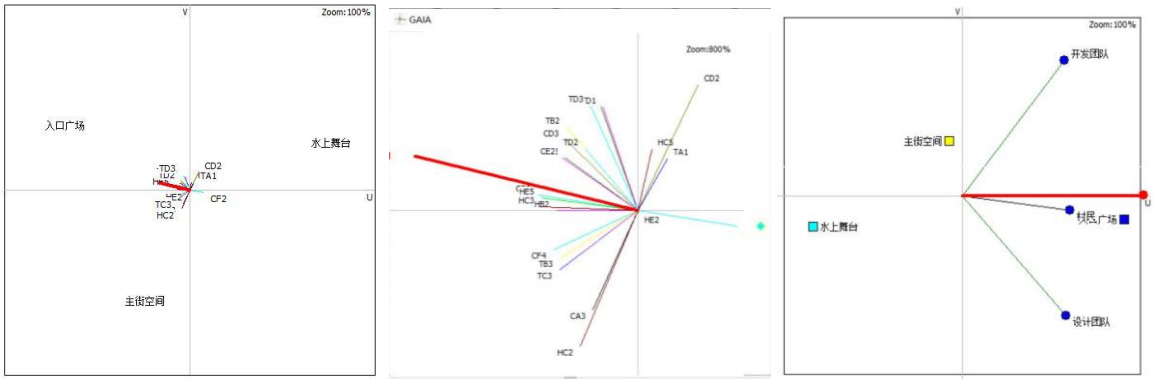


Figure 5-36 Global view of GAIA Planar graph based on multi-objective (a) Local zoom in the circle (b) Multi-agent Based GAIA diagram (c) (Source: Visual PROMETHEE)

In GAIA Web, each evaluation index is distributed isometrically around the display center, and the direction of the decision axis is the same as that of the GAIA plane, so indicators expressing similar preferences are close to each other. For each dimension (single indicator or grouped indicator), the radial distance corresponds to the net flow Phi (Phi in the center is -1, and Phi in the outer circle is 1). For dashed circles, if phi is positive, it is shown in green; If it is negative, it is shown in red. As can be seen from Figure 5-37 below, the entrance square has an equal distribution of advantages. Except for the disadvantage in the greening rate (CF2), it performs well in other indicators. On the other hand, the main street space and the entrance space respectively show advantages in different indicators, which are unbalanced compared with the entrance square. The main street space performs well in terms of richness (HC2), while it is at a disadvantage in terms of green education (CD2) and resident engagement (TD1). The aquatic stage has excellent performance in green education (CD2), greenness (CF2), and has certain advantages in intangible cultural heritage (HE2), but its performance is not so outstanding in other aspects.

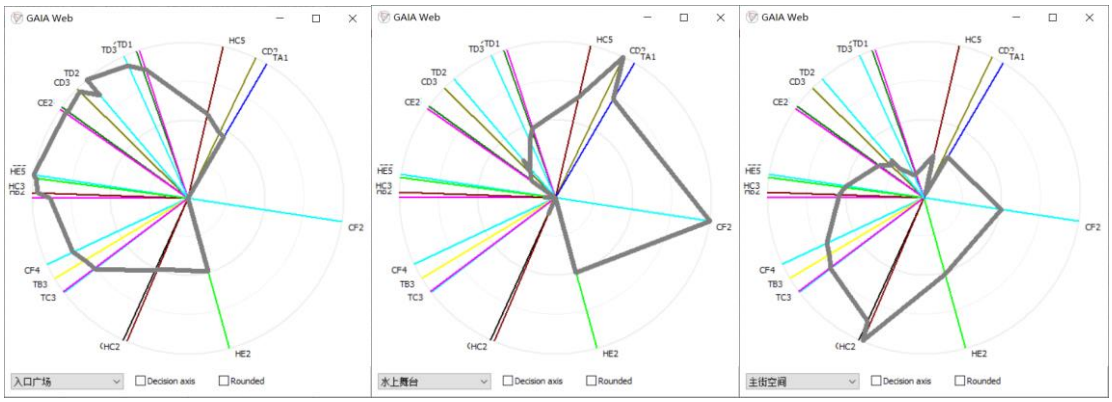


Figure 5-37 Entrance Plaza (a) Water Stage (b) Main Street Space (c) GAIA Web (Source: Visual PROMETHEE)

5.4.4 Improving Policies

According to the current construction results, compared with the three public Spaces, the entrance square of Xinfeng Theater has a relatively high degree of completion, and the overall score of the evaluation after use is relatively the highest, which is also the result expected by all teams. The main street space is still in continuous improvement. In the process of improvement, more attention should be paid to elements such as resident friendliness and community participation ratio, so as to enable the intervention of foreign capital to improve the anti-risk ability of capital sources and achieve a more balanced relationship between the community and foreign capital. The water stage has reached the preliminary construction depth, but still needs to be further optimized. It can carry forward its advantages of strong rural character and high green degree, such as making full use of hydrophilicity and rich plant configuration. Moreover, tourism marketing and intangible cultural heritage elements can be combined to improve the factors of tourists' stay

time. In addition, following up the lighting, water surface wire mesh and other facilities to improve the perfection of public facilities, transportation convenience and other elements, so that the water stage more fully meet the design expectations.

Therefore, the following improvement strategies are proposed for the subsequent construction and the promotion of the second phase of the project: for the public space as a whole,(1) in addition to the shaping of the physical space, pay attention to the diversity of capital sources, introduce social capital, improve commercial value, and gather popularity; Pay attention to the activation of operation, and combine material space with activity planning to obtain lasting vitality. (2) Enhance local residents' sense of participation, reserve more space for residents' daily life, and increase the proportion of community participation in decision-making. (3) The completion of the situation according to a certain period of tracking evaluation, in order to constantly revise and improve the construction results.

5.5 Summary of this chapter

Update evaluation system built by the third chapter of villages and towns that using PROMETHEE preference ordering method, combination of yancheng XinFeng Town village xinfeng 920 block as an example for empirical, with all my heart, on the basis of comprehensive evaluation results, according to the perspective of different stakeholders and analyze the different indicators of total sorts, provide a reference for rural update project comprehensive evaluation of concerns.

It is found that through the evaluation of the pre-event, in-process and post-event stages in the process of village and town renewal, the current value and problems of the existing buildings can be reflected from a relatively objective and systematic perspective in the current situation evaluation, so as to continue or improve the value characteristics of the village and town itself. In the scheme design, the advantages and disadvantages of different schemes can be compared according to the evaluation results and combined with each other to promote the scheme optimization; In the post-implementation evaluation stage, the completion effect can be evaluated to feedback the design and formulate relevant guidelines, which can be used as a reference for the renewal and construction of other similar villages and towns. In this process, the introduction of assistive technology will make the quantitative measurement of indicators more accurate to increase the reliability of evaluation results.

Chapterter VI: The application of PROMETHEE Evaluation method

6.1 Main research results

In this study, the multi-criteria evaluation method (MCDA) was introduced into the design of rural renewal and renovation. According to the idea of multi-objective comprehensive development and multi-subject collaborative symbiosis, the evaluation method was applied in multiple stages, and the qualitative and quantitative research methods were comprehensively used. Including literature analysis method, AHP analytic hierarchy process, PROMETHEE method, questionnaire interview and other research methods, this paper systematically analyzes the conflict of development goals in the process of village and town renewal under the participation of multiple parties, and the operation mode after the intervention of the evaluation system, and puts forward countermeasures for improvement. The main research results are as follows:

(1) This study analyzes the three development goal systems of community development, traditional style and tourism development in the process of village and town renewal. On this basis, AHP is used to establish the corresponding three subsystems, respectively establishing 6, 5, 4 first-level indicators and the second-level indicators for different stages of elasticity adjustment.

(2) Analyze the conflict and coordination in the renewal of villages and towns with multi-objective and multi-subject participation, and analyze the contradictions and conflicts and coordinated development from the aspects of spatial function, spatial landscape, spatial place, spatial interests and spatial management.

(3) The PROMETHEE method is applied in different stages of the reconstruction of villages and towns, so as to make a systematic and reasonable evaluation of the current situation, design and construction effect, so as to realize the sustainable development of similar villages and towns.

6.2 Research limitations and prospects

(1) Subjectivity of indicator construction

Just as Casey O 'Neill mentioned in “WEAPONS OF MATH DESTRUCTION: How Big Data Increases Inequality and Threatens Democracy”, models generate algorithms based on past practical experience and the definition of success. Algorithms seem to be objective, but they are also created by subjective biases, and the black box of models exacerbates the non-transparency of information. In the process of constructing the evaluation system and ranking model, researchers construct different factor layers and index systems by referring to the current standard indicators and the index systems used in previous papers, combining the characteristics of the research objects and considering the availability of data. Therefore, the construction of index system has strong subjectivity, which often occurs in different studies, and the secondary indexes of the same subsystem have great differences. In this process, absolute

objectivity is difficult to achieve.

(2) Adaptability of the research object and the index system

The construction of the evaluation system in this paper is based on current norms and previous studies, and elastic regulation of indicators is carried out in combination with specific research objects. However, when the scale of the study expands or shrinks, the coupling coordination degree of the study area will change, and then the model reliability will be affected. At the same time, there is still no complete counterpoint between the evaluation system and the actual problems, so the system can be repaired in reverse in future research.

(3) Limitation of sample size

In qualitative data acquisition, some indicators from the PRA team, the team members of number is limited, especially the villagers on behalf of the group, due to factors such as age, occupation, level of education the influence of the opinions on the same indicators may be larger differences, such as policy transparency, relative deprivation index, can not completely represent the general opinion of the villagers group.

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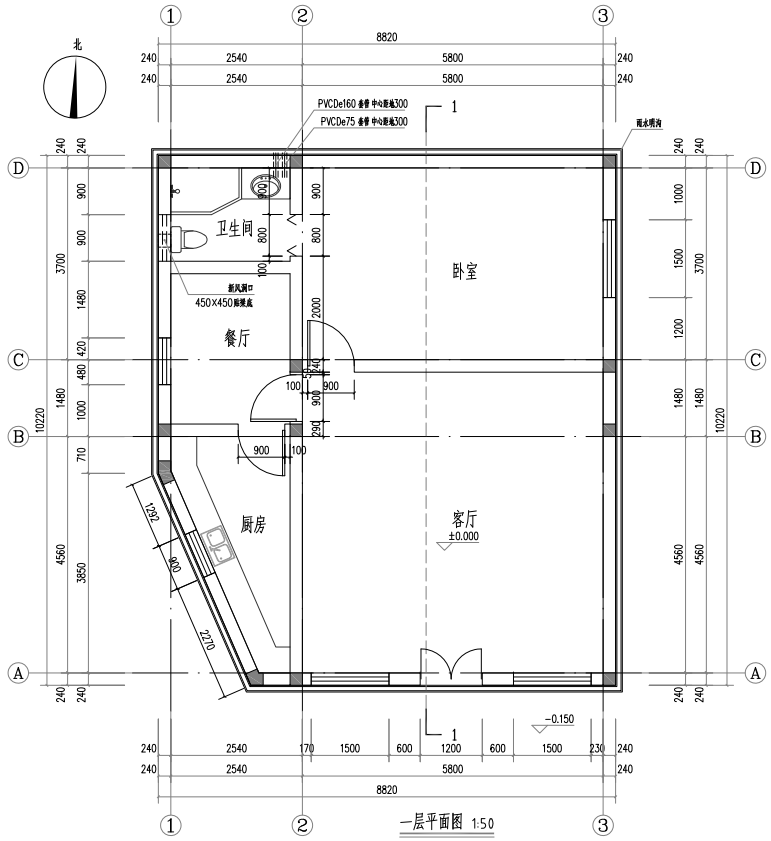
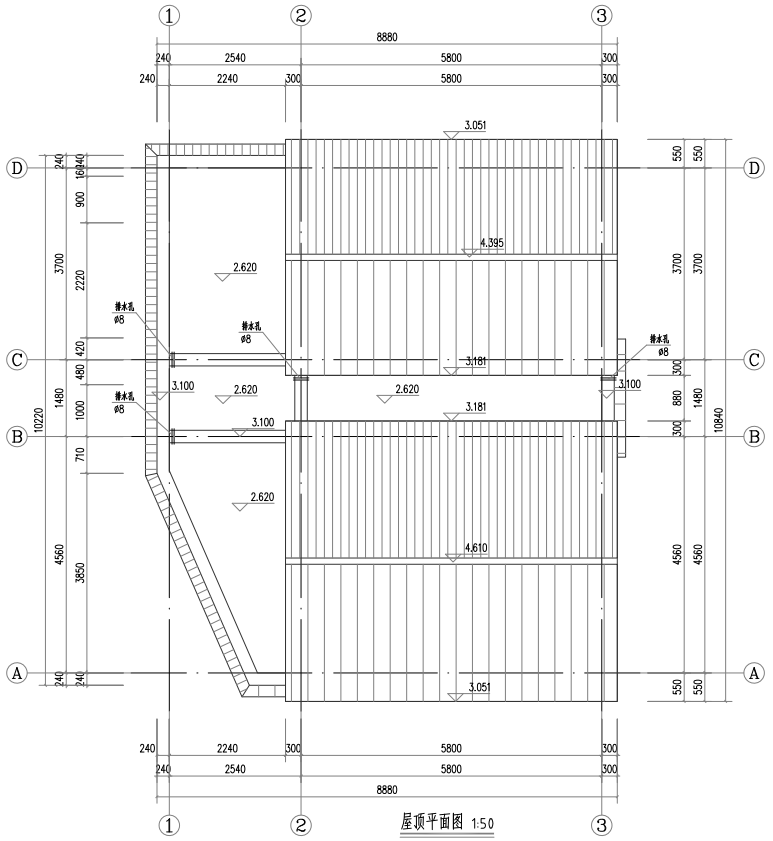
Appendix

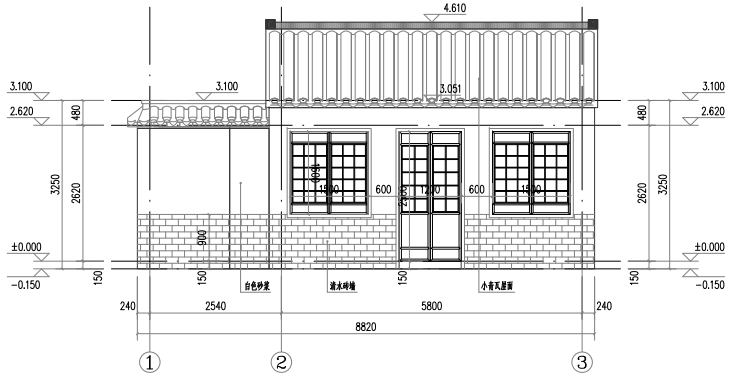
Part of the updated design results of Xinfeng Old Street



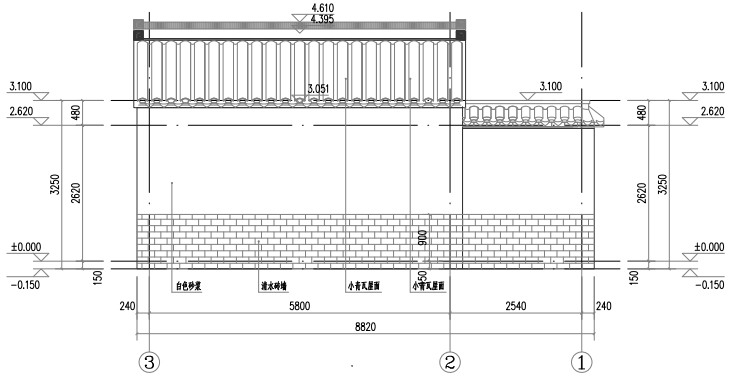
一层平面图 1:50



屋顶平面图 1:50



①-③轴立面图 1:50



③-①轴立面图 1:50

中国乡建院
CHINA NEW RURAL PLANNING AND DESIGN

备注：
1：此图纸未经设计者书面批准，任何部分不得复印
2：此图纸尺寸不能按比例量度，所有尺寸必须核准
3：此图纸与其它图纸有矛盾时，及时通知设计者
4：本图在未取得与之一致的相关政府部门的批准文件之前，仅供施工单位进行施工准备参考使用，不作为正式施工图纸

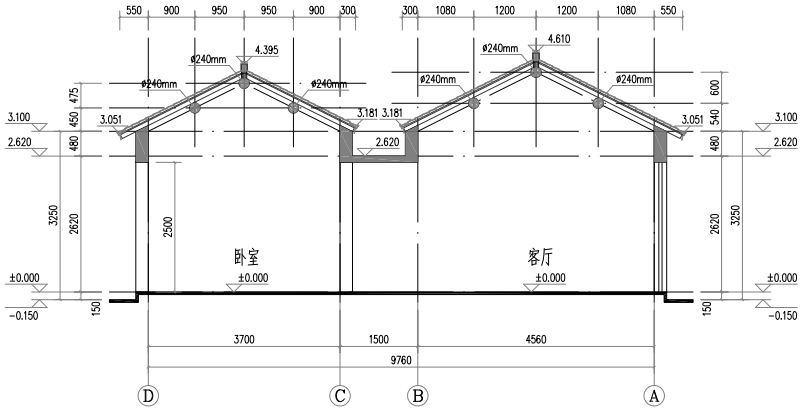
工程名称：
新丰镇老街修缮保护、环境提升工程

子项名称：
146

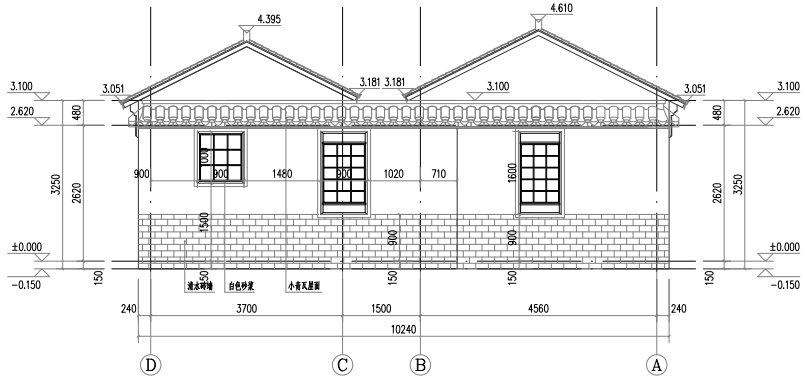
工程负责人		
专业负责人		
校　对		
设　计		
制　图		

图名：
一层平面图、屋顶平面图、
①-③轴立面图、③-①轴立面图

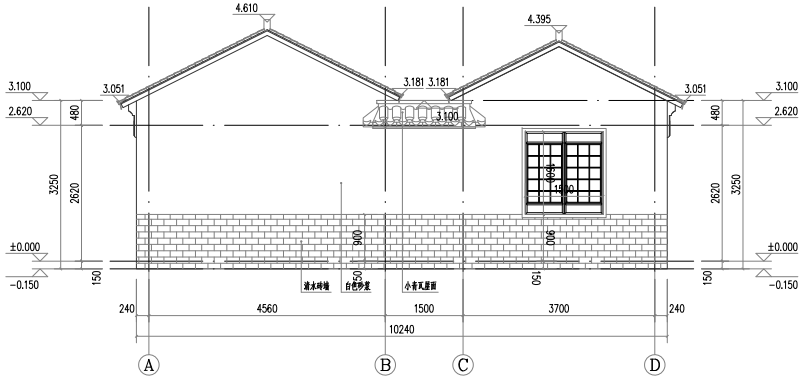
工程编号		版本号	
图　别		图　号	建施-02
日　期	2022年01月22日		



1-1剖面图 1:50



Ⓓ-Ⓐ轴立面图 1:50



Ⓐ-Ⓓ轴立面图 1:50

中国乡建院
CHINA NEW RURAL PLANNING AND DESIGN

备注：
1：此图纸未经设计者书面批准，任何部分不得复印
2：此图纸尺寸不能按比例量度，所有尺寸必须核准
3：此图纸与其它图纸有矛盾时，及时通知设计者
4：本图在未取得与之一致的相关政府部门的批准文件之前，仅供施工单位进行施工准备参考使用，不作为正式施工图纸

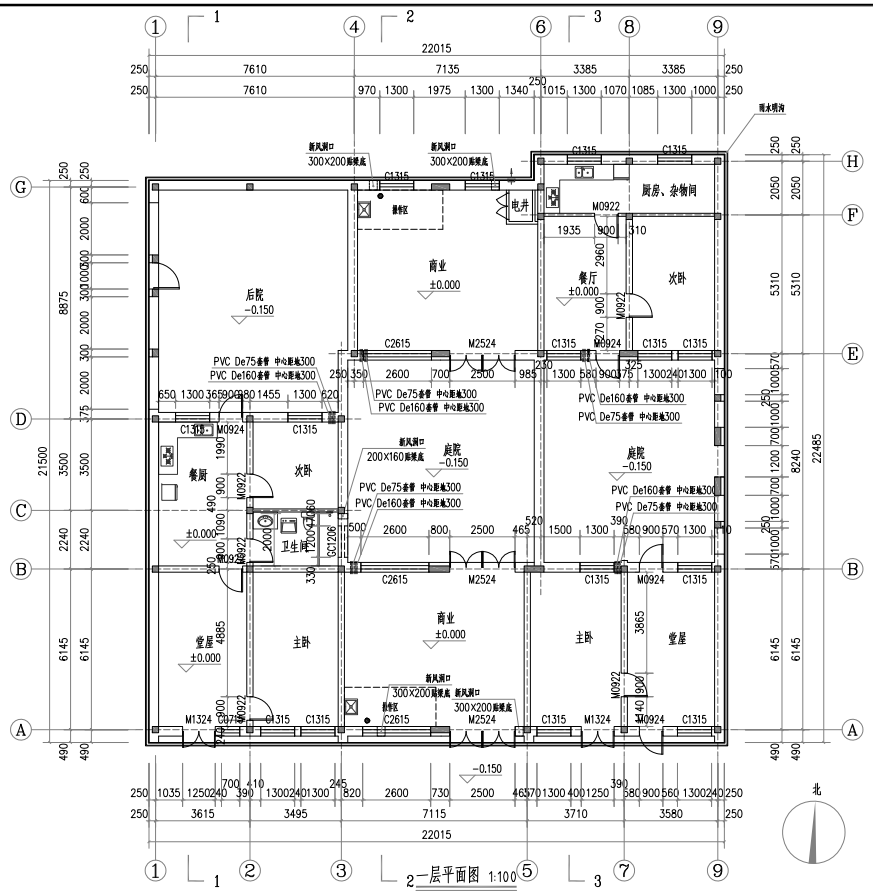
工程名称：
新丰镇老街修缮保护、环境提升工程

子项名称：
146

工程负责人		
专业负责人		
校　对		
设　计		
制　图		

图名：
1-1剖面图
Ⓓ-Ⓐ轴立面图、Ⓐ-Ⓓ轴立面图

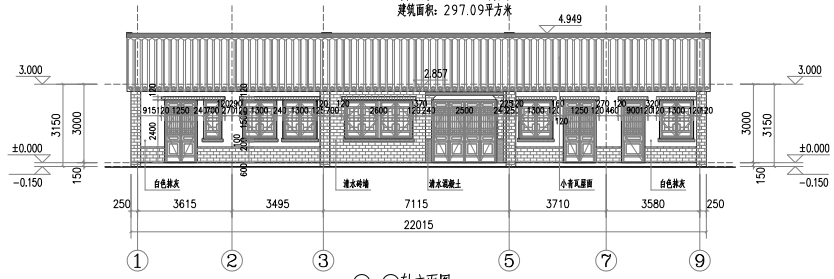
工程编号		版本号	
图　别		图　号	建施-03
日　期	2022年01月22日		



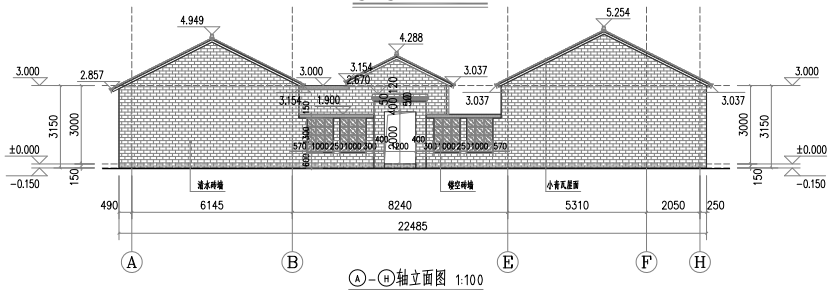
一层平面图 1:100

本层面积：297.09平方米

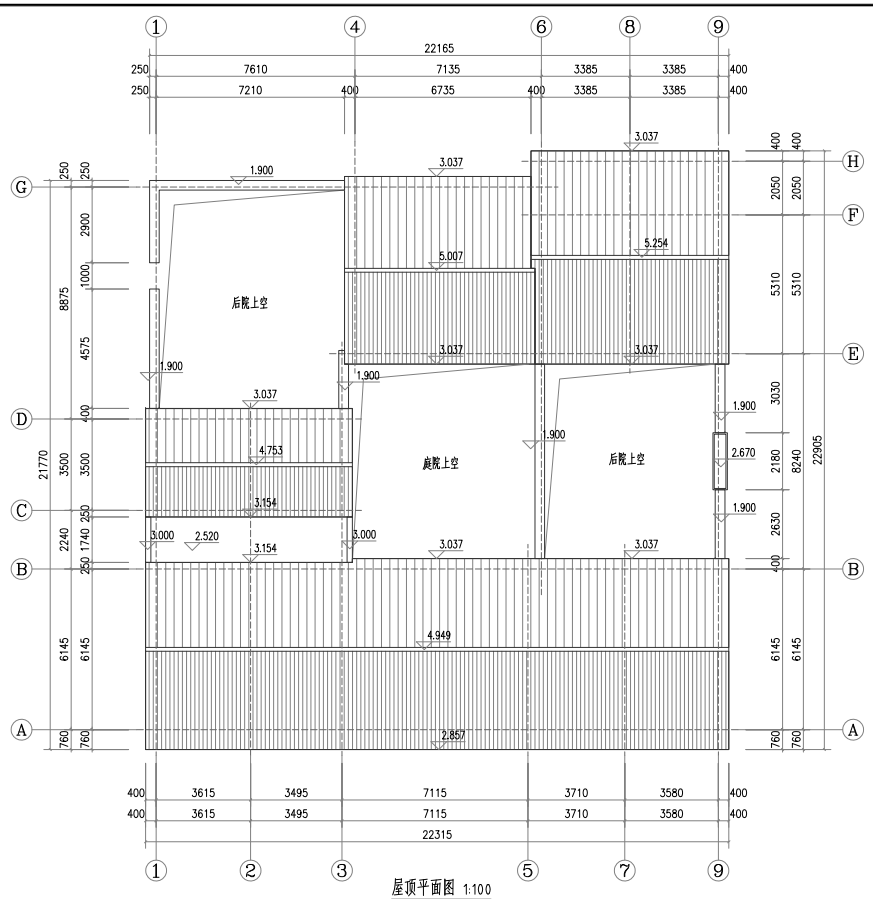
建筑面积：297.09平方米



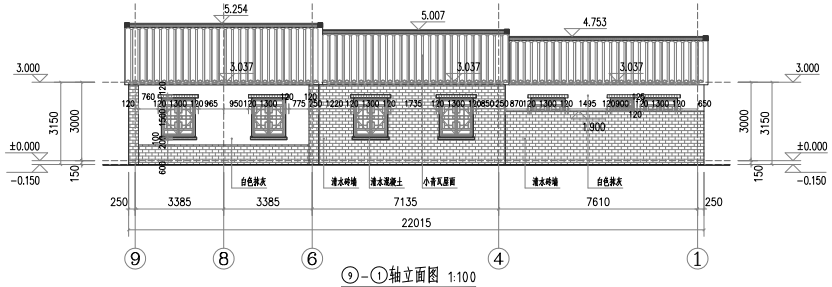
①-⑨轴立面图 1:100



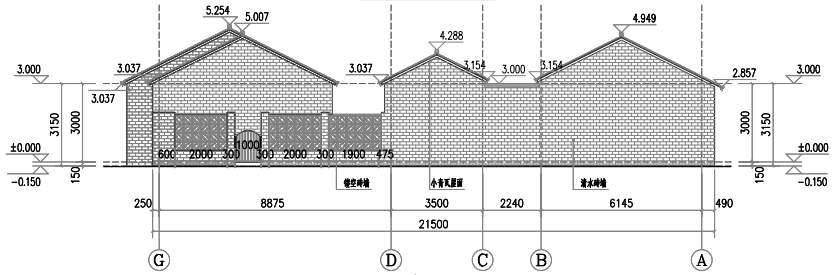
Ⓐ-Ⓗ轴立面图 1:100



屋顶平面图 1:100



⑨-①轴立面图 1:100



Ⓖ-Ⓐ轴立面图 1:100

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CHINA NEW RURAL PLANNING AND DESIGN

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工程名称：

新丰镇老街修缮保护、环境提升工程

子项名称：

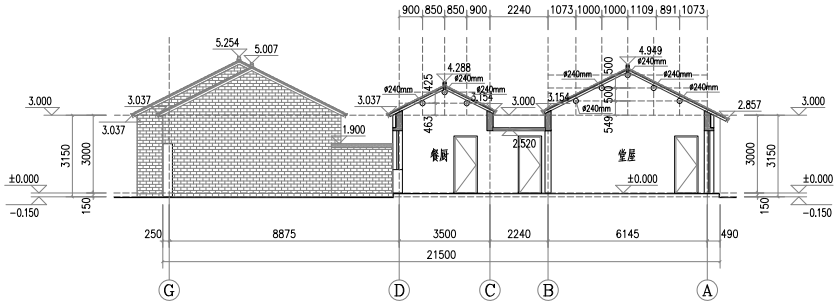
196-190

工程负责人		
专业负责人		
校　对		
设　计		
制　图		

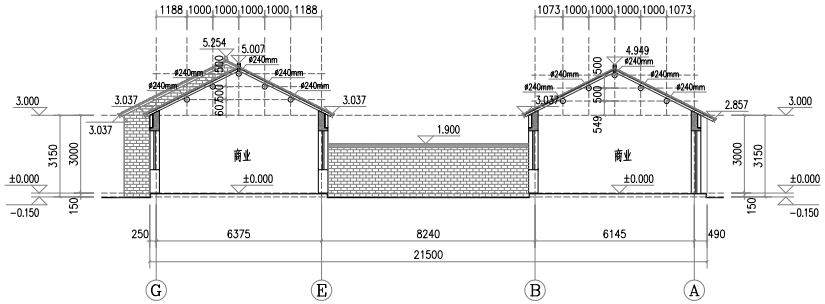
图名：

一层平面图、屋顶平面图、
①-⑨轴立面图、⑨-①轴立面图、
Ⓐ-Ⓗ轴立面图、Ⓖ-Ⓐ轴立面图

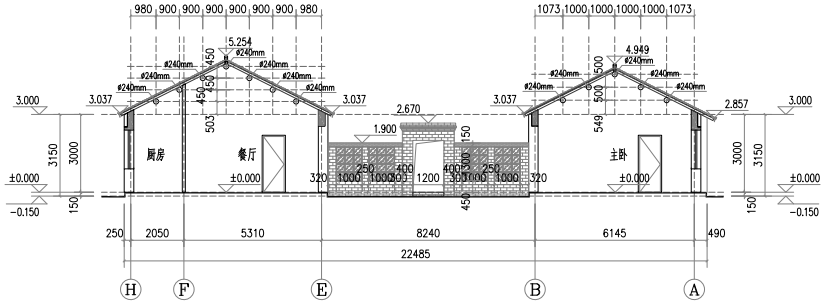
工程编号		版本号	
图　别		图　号	建施-02
日　期	2021年8月31日		



1-1剖面图 1:100



2-2剖面图 1:100

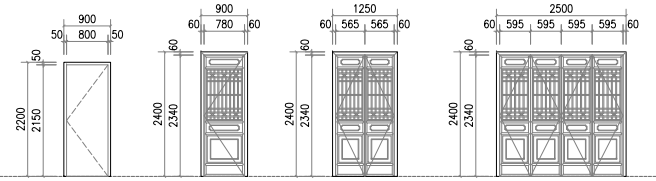


3-3剖面图 1:100

门窗表

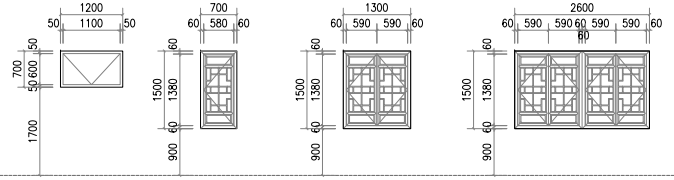
类型	设计编号	洞口尺寸(mm)	数量	备注
普通门	M0922	900X2200	7	平开门
	M0924	900X2400	4	平开门
	M1324	1250X2400	2	平开门
	M1619	1600X1900	1	平开门
高窗	GC1206	1200X600	1	上悬窗
普通窗	C0715	700X1500	1	平开窗
	C1315	1300X1500	15	平开窗
	C2615	2600X1500	3	平开窗

立面



编号	M0922	M0924	M1324	M2524
尺寸	900X2200	900X2400	1250X2400	2500X2100
种类	平开门	平开门	平开门	平开门
位置	住宅内部	堂屋、餐厅	堂屋、主卧	商业
材质	钢、木	木	木	木

立面



编号	GC1206	C0715	C1315	C2615
尺寸	1200X600	700X1500	1300X1500	2600X1500
种类	上悬窗	平开窗	平开窗	平开窗
位置	住宅卫生间	住宅	住宅、商业	商业
材质	木	木	木	木

中国乡建院
CHINA NEW RURAL PLANNING AND DESIGN

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工程名称：
新丰镇老街修缮保护、环境提升工程

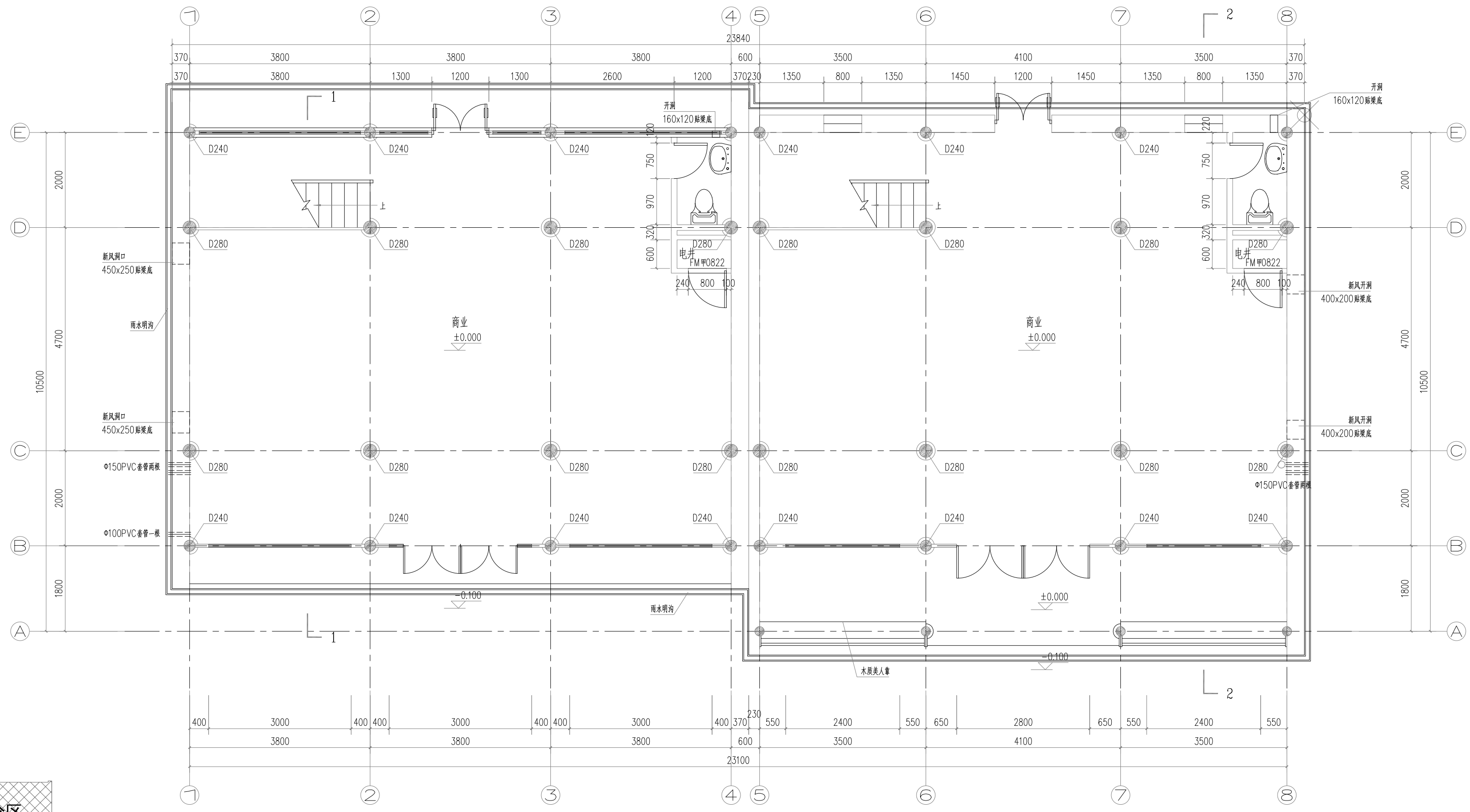
子项名称：
196-190

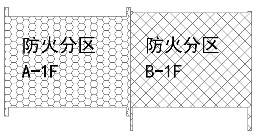
工程负责人		
专业负责人		
校　对		
设　计		
制　图		

图名：
1-1剖面图、2-2剖面图、3-3剖面图、门窗大样、门窗表

工程编号		版本号	
图　别		图　号	建施-03
日　期	2021年8月31日		

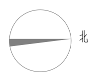
会签专业	姓 名	日 期	会签专业	姓 名	日 期
建 筑			电 气		
结 构			暖 通		
给水排水			燃 气		





一层平面图 1:50

一层面积：228.28平方米
总面积：439.29平方米
注：门窗及装饰小木构件经业主论证后再定



中国乡建院
CHINA NEW RURAL
PLANNING AND DESIGN

备注：
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5：此图纸未加盖出图章无效

工程名称：
新丰镇老街修缮保护、环境提升工程

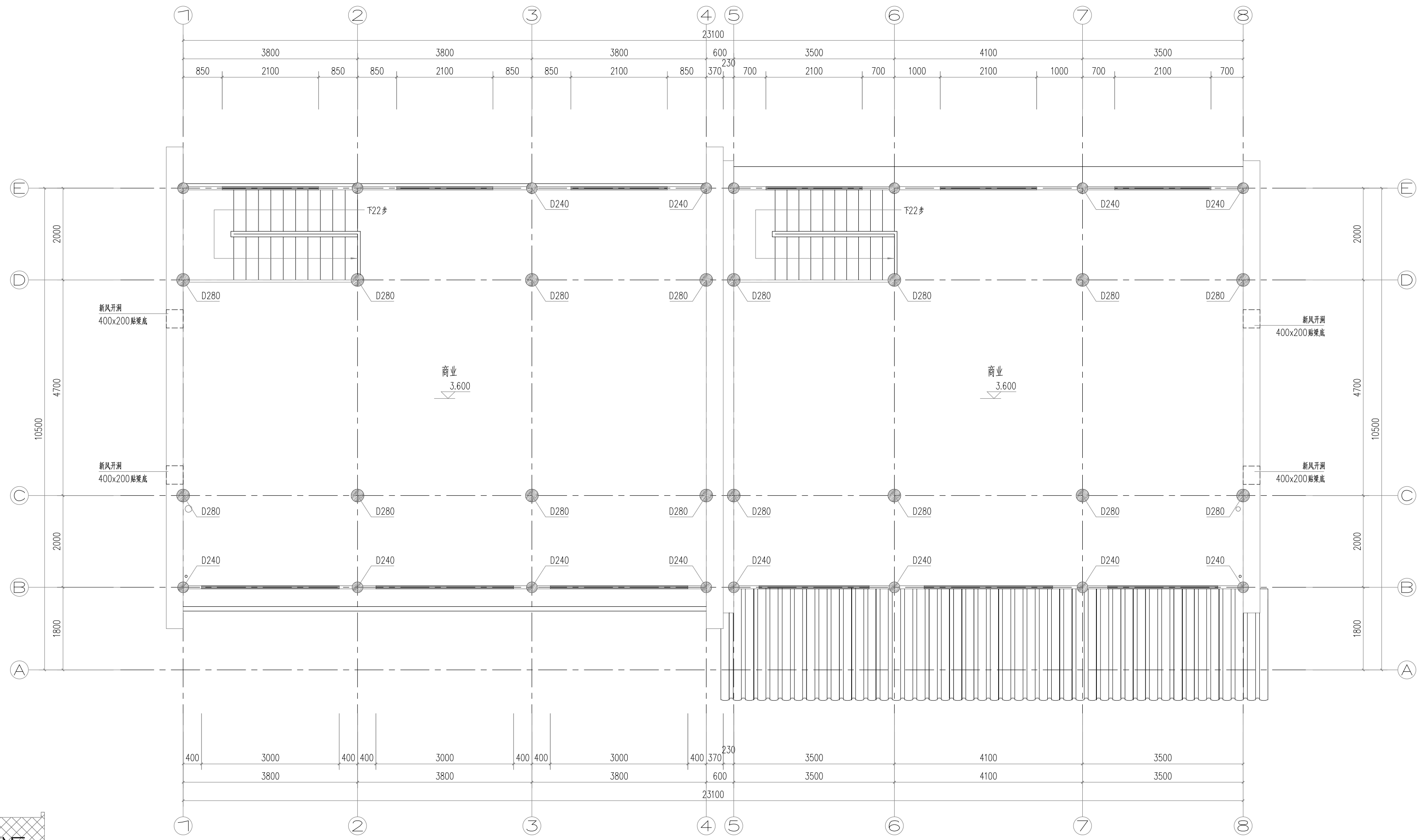
子项名称：
D1-1

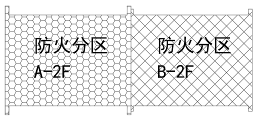
工程负责人		
专业负责人		
校 对		
设 计		
制 图		

图名：
一层平面

工程编号		版本号	
图 别		图 号	建施-02
日 期	2021年07月18日		

会签专业	姓名	日期	会签专业	姓名	日期
建筑			电气		
结构			暖通		
给水排水			燃气		





二层平面图 1:50

二层面积：211.01平方米

中国乡建院
CHINA NEW RURAL
PLANNING AND DESIGN

备注：
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4：本图在未取得与之一致的相关政府部门的批准文件之前，仅供施工单位进行施工准备参考使用，不作为正式施工图纸
5：此图纸未加盖出图章无效

工程名称：
新丰镇老街修缮保护、环境提升工程

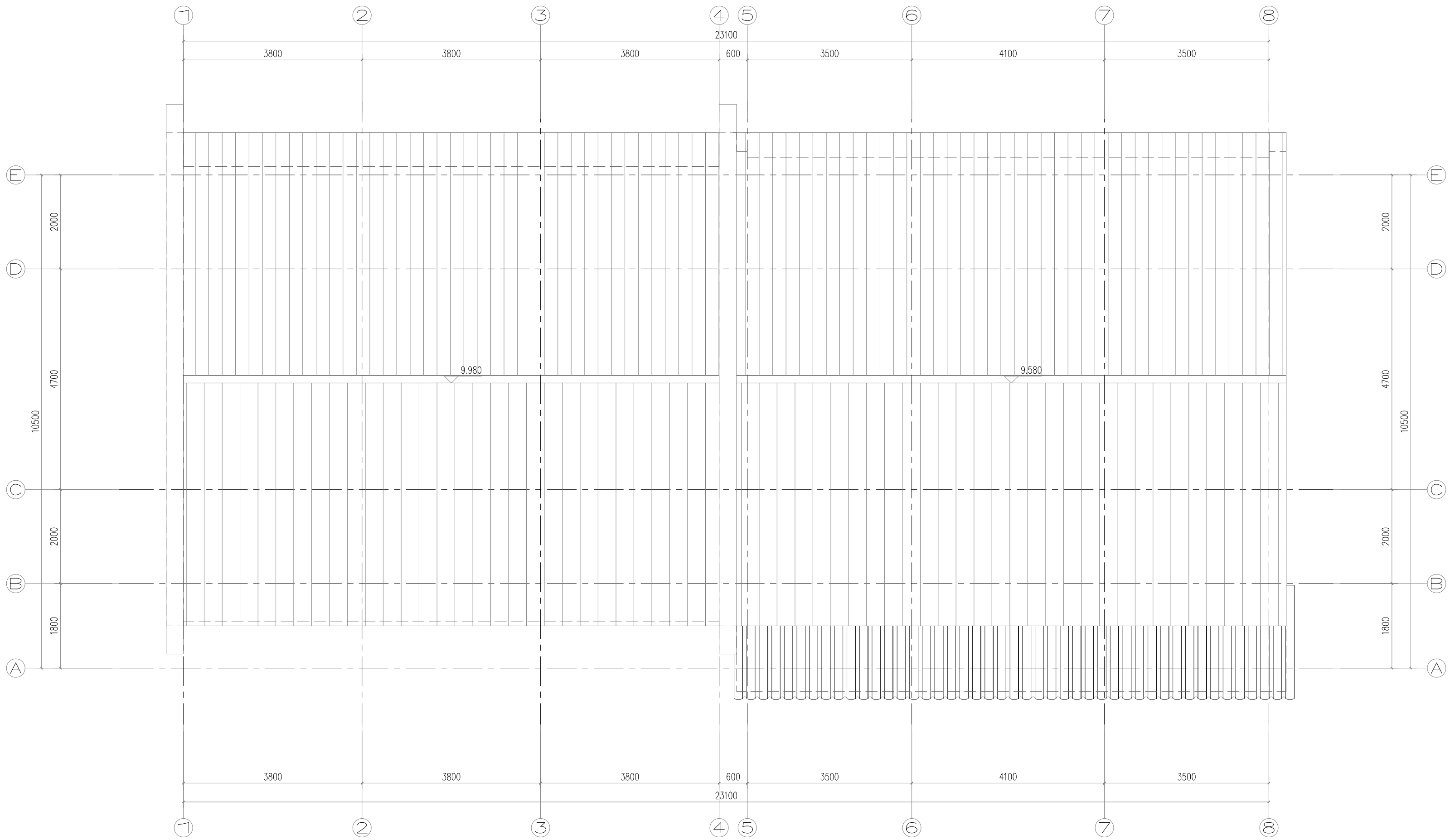
子项名称：
D1-1

工程负责人		
专业负责人		
校对		
设计		
制图		

图名：
二层平面

工程编号		版本号	
图别		图号	建施-03
日期	2021年07月18日		

会签专业	姓名	日期	会签专业	姓名	日期
建筑			电气		
结构			暖通		
给水排水			燃气		



屋顶平面图 1:50

中国乡建院
CHINA NEW RURAL
PLANNING AND DESIGN

备注：
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3：此图纸与其它图纸有矛盾时，及时通知设计者
4：本图在未取得与之一致的相关政府部门的批准文件之前，仅供施工单位进行施工准备参考使用，不作为正式施工图纸
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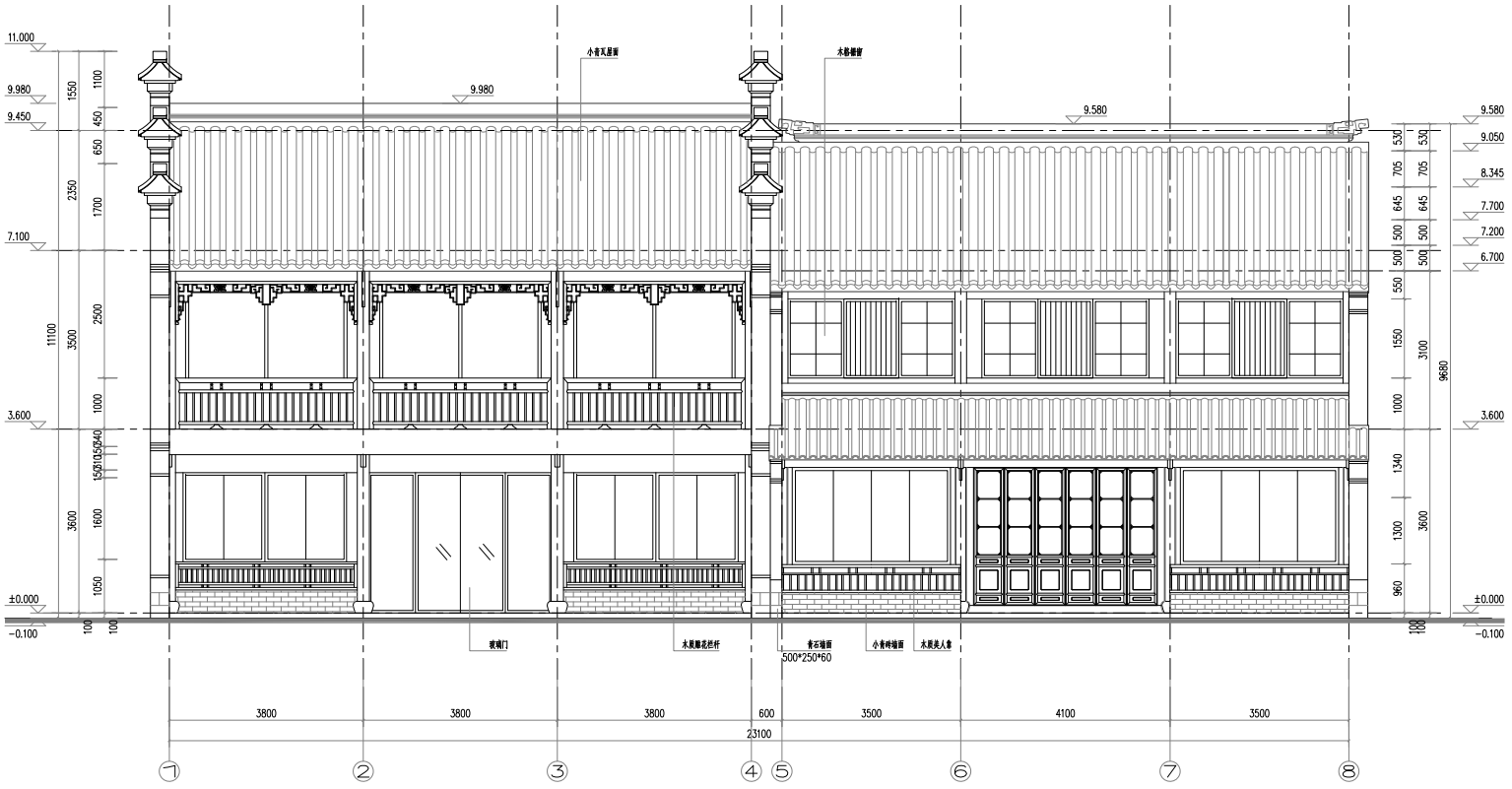
工程名称：
新丰镇老街修缮保护、环境提升工程

子项名称：
D1-1

工程负责人		
专业负责人		
校 对		
设 计		
制 图		

图名：
屋顶平面

工程编号		版本号	
图 别		图 号	建施-04
日 期	2021年07月18日		



①-⑧立面图 1:50

注：门窗及装饰小木构件经业主论证后再定

中国乡建院
CHINA NEW RURAL PLANNING AND DESIGN

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3：此图纸与其它图纸若不符时，及时通知设计者
4：本图在未取得与之一致的相关政府部门的批准文件之前，仅供施工单位进行施工准备参考使用，不作为正式施工图纸
5：此图纸未加盖自图章无效

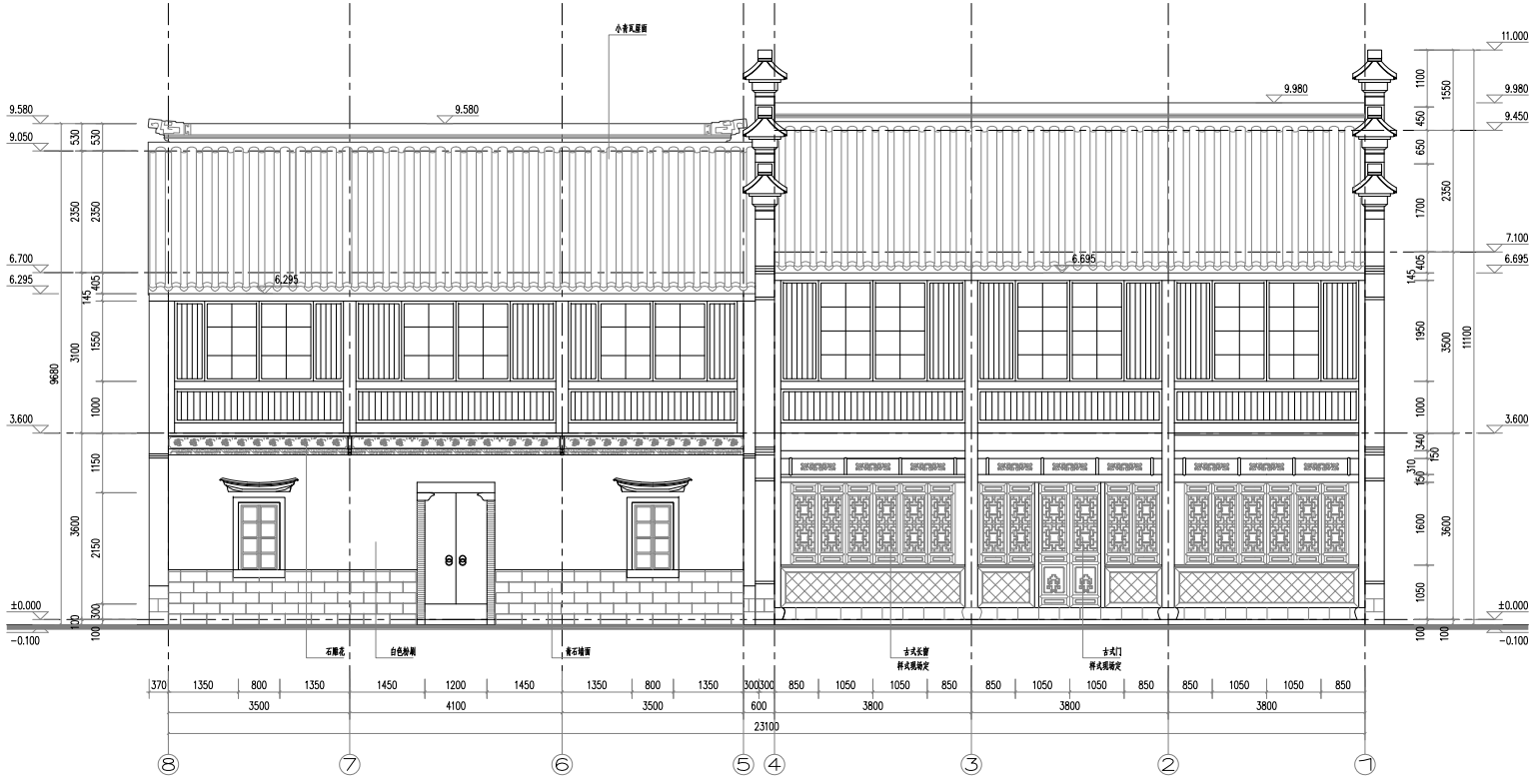
工程名称：
新丰镇龙钢修缮保护、环境提升工程

子项名称：
D1-1

工程负责人		
专业负责人		
校　对		
设　计		
制　图		

图名：
○ ○

工程编号		版本号	
图　别		图　号	建施-05
日　期	2021年07月18日		



⑧-①立面图 1:50

注：门窗及装饰小木构件经业主论证后再定

中国乡建院
CHINA NEW RURAL PLANNING AND DESIGN

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4：本图在未取得与之一致的相关政府部门的批准文件之前，仅供施工单位进行施工准备参考使用，不作为正式施工图纸
5：此图纸未加盖自图章无效

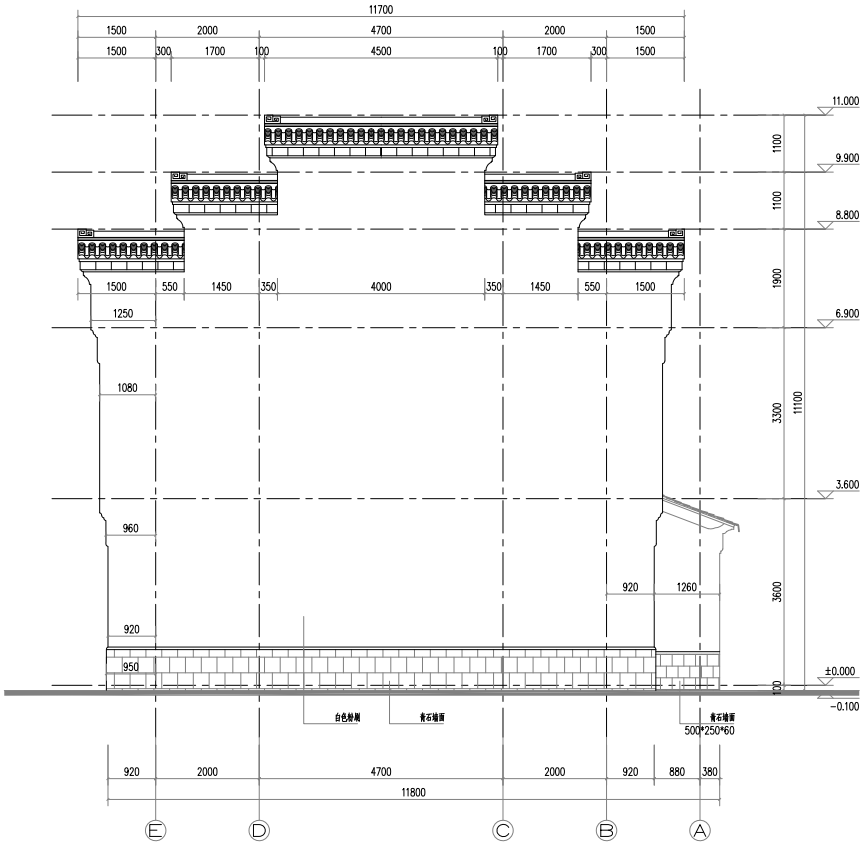
工程名称：
新市镇龙钢修缮保护、环境提升工程

子项名称：
D1-1

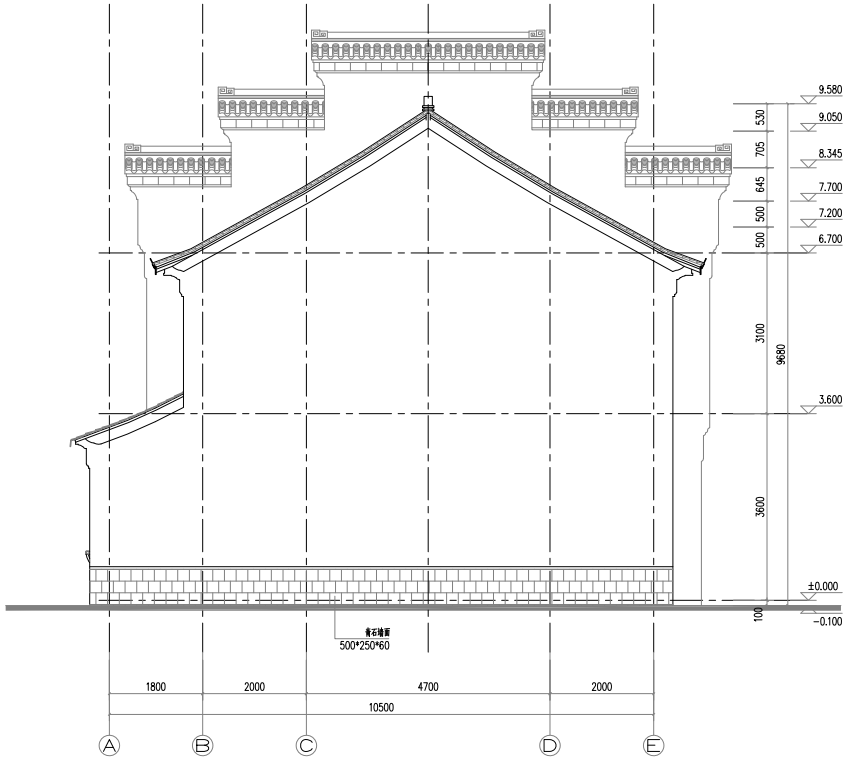
工程负责人		
专业负责人		
校　对		
设　计		
制　图		

图名：
○ ○

工程编号		版本号	
图　别		图　号	建施-06
日　期	2021年07月18日		



Ⓔ-Ⓐ立面图 1:50



Ⓐ-Ⓔ立面图 1:50

中国乡建院
CHINA NEW RURAL PLANNING AND DESIGN

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5：此图纸未加盖自图章无效

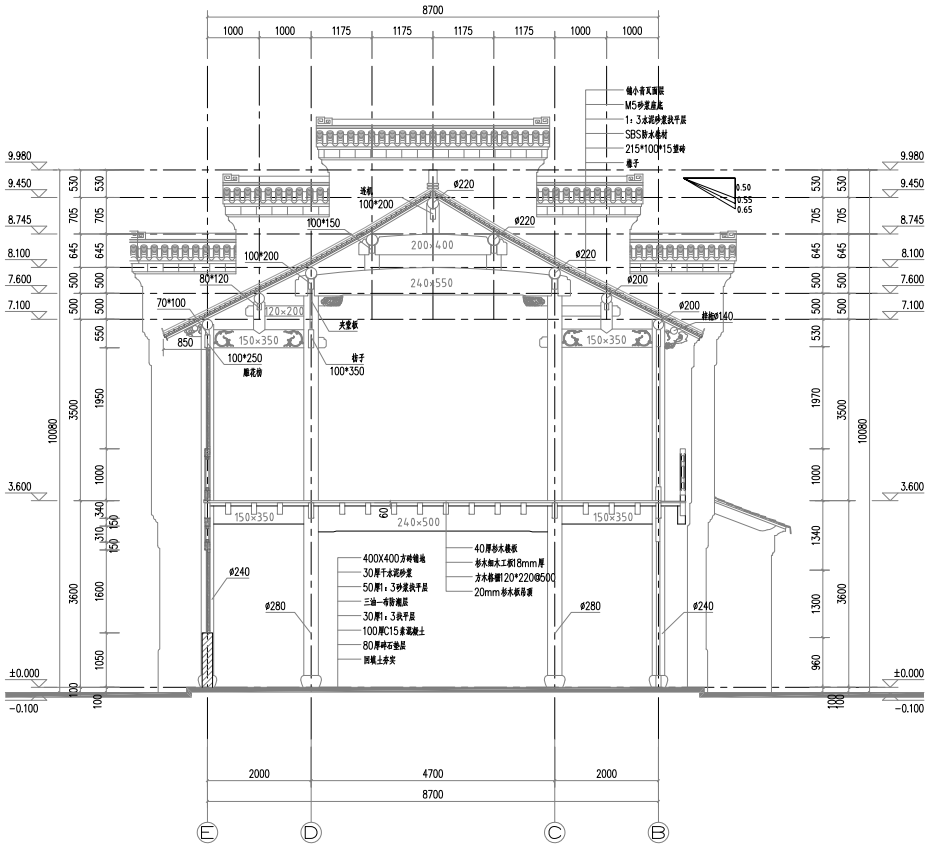
工程名称：
新丰镇龙钢修缮保护、环境提升工程

子项名称：
D1-1

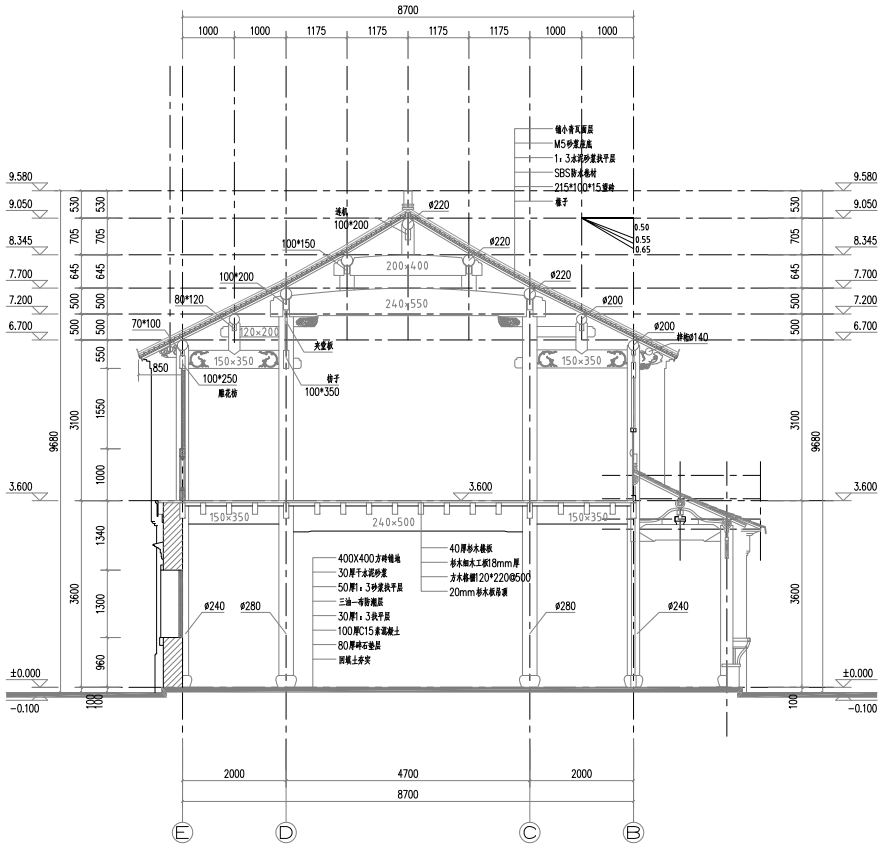
工程负责人		
专业负责人		
校　对		
设　计		
制　图		

图名：

工程编号		版本号	
图　别		图　号	建施-07
日　期	2021年07月18日		



1-1剖面 1:50



2-2剖面 1:50

中国乡建院
CHINA NEW RURAL PLANNING AND DESIGN

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工程名称：
新丰镇龙钟修缮保护、环境提升工程

子项名称：
D1-1

工程负责人		
专业负责人		
校　对		
设　计		
制　图		

图名：

工程编号		版本号	
图　别		图　号	建施-08
日　期	2021年07月18日		

Case Village Tourist Survey Outline

Briefly describe the village in your heart:

1. Age:
2. Gender: male; female.
3. The average number of rural trips per year: 3 times or less: 4-8 times: more than 8 times
4. If you go to travel, the most likely time you choose is: weekends; Spring Festival; National Day; Yuanqi; Qingming; May 1; Dragon Boat Festival: Mid-Autumn Festival: your own annual leave
5. Where do you usually get information about rural tourism: TV broadcast, Internet, newspapers and magazines, introductions from relatives and friends
6. What is the main purpose of your rural tourism: decompression, enjoy the rural scenery, escape from the city, farmhouse characteristics, buy green and organic food, cultivate inspiration for work, and enhance feelings
7. Your travel mode: self-driving tour, travel agency, transportation and bus travel
8. What are the advantages of your rural tourism (compared to scenic spots, amusement parks, etc.): fewer people, tasting fresh vegetable tea, experiencing another way of life, enhancing happiness, if you go to rural tourism, you will choose Country accommodation: No, depends on companion's wishes, depends on living conditions
9. What type of farmhouse do you plan to choose: business type, holiday type, farmhouse characteristic, economy type
10. Your perception of expenses in rural tourism (per person per day): within 100, 100-300, 300-500, over 500 and it doesn’t matter
11. When you go to rural tourism, the primary determinants of choosing a destination are: travel distance, sanitary conditions, characteristic culture and catering, beautiful environment, and what do you think the current rural tourism needs to be improved: should add more modern Technology and tourism content should be more enriched, tourism management needs to be improved, it should be closer to folk customs, and tourism facilities need to be strengthened
12. If you choose to live in a country house for a long time, the most important factors are: the rural natural environment is good (clear air, beautiful mountains and rivers). The rural lifestyle is slow and quiet, which can release pressure, and whether the surrounding infrastructure is complete (transportation, shopping, Internet), being able to grow tea by yourself, eating organic vegetable tea (health preservation, old age care), rural humanistic feelings, nostalgia

Case Village Aboriginal Investigation Survey Outline

Briefly describe your life:

I. Basic Information

1. Age:

2. Gender: male; female.

3. Household registration: local household registration; foreign household registration

4. Occupation: pure farming; mainly farming, going out to work in slack farming; mainly part-time work, busy farming; working yearly; students; self-employed; village cadres; cadres above townships; employees of enterprises or institutions; , forest farmers),

5. Years of residence: 05 years; 610 years; 1120 years: 2130 years: more than 30 years.

6. Residential construction method: self-construction; government agency construction; entrusted tourism industry enterprises to build

7. Housing renovation time:

8. Form of housing renovation: self-funded; government-funded; both funded

9. Annual income level: 50,000 and below: 50,000-100,000: 100,000-200,000: 200,000 and above (among which, the main income is grain income/cash crop income/breeding income/part-time job income/operating income/land rental Income/Wage Income/Other)

10. Someone in your family is working abroad? Where is the working destination: A. People in this county: B. People in cities outside the county c. People in the province outside the city: D. People from outside the province: B. Abroad

II. Settlement space

1. What are the public activities in the village? A. open-air movie B. farmers market C. sports competition D. village meeting B. local drama performance F. others

2. Do you think traditional architecture, traditional customs, and village regulations still have value for the village: A. very important B. have a certain role C. optional D. have a certain negative impact B. the negative impact is very large

3. How do you think the local government attaches great importance to traditional architecture, traditional customs, and village regulations?

4. Do you think local culture is "conservative and backward" and urban culture is "civilized and advanced": A. I agree very much B. I agree C. Can't tell D. I disagree B. I disagree very much

5. Do you think traditional architecture, traditional customs, and village regulations still have value for the village: A. Very important B. Has a certain role C. Is it optional D. Has a certain negative impact B. The negative impact is very large 4. , Economic space (is your family involved in the operation of tourism?)

III. Social space

1. What is the ability of the village cadres to handle affairs and disputes?

2. What do you think about the partnership between the local government and you?

3. What do you think is the cooperative relationship between the local enterprises in the village and the residents of the village?

4. How much trust do you have in the village cadres?

IV.Tourism

1. Compared with before, how do you think the ecological environment of this village has changed? (Cultivated land, forest land, lakes, air quality) . Obviously worse

2. What do you think is the reason for this change? (Land transfer; fishing ban; aquaculture restrictions; village construction and tourism development: industrial pollution; others)

3. With the development of tourism, what are the benefits to the rural areas and farmers? A. Improved living conditions B. More convenient public services C. More distinctive villages D. Increase the appreciation potential of rural housing B. Contribute to farmers' income P. Improve the village's attractiveness G. Drive the village-level economy B. More civilized lifestyle 1. Other)

4. According to your current situation, where do you want yourself and your family to live: A rural area B. Xiaoyu town C. County town D. Dazhongyu city B. It doesn't matter @ If you choose BCD, the reasons are: (urban household registration, social security Good, many employment opportunities, easy to learn and train, other)

Case Village Development Company Survey Outline

Briefly describe your management:

1. What policies and systems have been implemented in the process of developing tourism in this village (ecological environment, agricultural economy, rural community cultural construction, infrastructure construction, etc.)? What are the impacts (village development, ecological environment, farmers' livelihood, etc.)?

2. During the development of rural tourism, what measures did the village take to protect the material environment and ecological environment of the village?

3. What is the attitude of the aboriginal people towards the development of rural tourism? Are the aboriginal people willing to participate in the construction of rural tourism? Are there other demands? what?

4. What is the cultural atmosphere of the village? Are you willing to take part in cultural exchange activities? For example, movies to the countryside, art performances, sports, competitions, etc. Are these activities helpful to improve the cohesion of the village and the relationship between neighbors?

5. To what extent does the village protect and attach importance to traditional culture, traditional architecture, and village regulations? What specific measures have been implemented (government, company, individual)? What is the effect? Can these traditions be accepted by the younger generation? And why ?

6. What is the relationship between the local government, developers and the indigenous people? Do the indigenous people have a certain say in the management of village public affairs?

7. What are the changes in the agricultural planting structure and breeding situation in the village? What are the reasons? What impact does this change have on the ecological environment and the development of the village?

8. Does the local government management agency provide support to enterprises, residents, and village collectives? Please describe in detail. What new industrial measures and investment have the local government made in agriculture and deep processing? What is the reason for choosing such investment?

9. Does the local government know how satisfied the villagers are with their current living conditions after developing rural tourism?

10. What are the management methods of the foreign operators in the village? How to manage? Does it obey the management? Influence on all aspects of the village?

11. What do the aboriginal people think about the tourists who come to the village? The influence of tourists on the village? Does the government and residents have any requirements for tourists?

Thanks

In 2022, the new crown virus is still raging, and the artillery fire in Eastern Europe is still rumbling. I am fortunate to be able to settle in a corner of the scholarly campus and write the last chapter of my postgraduate time. Three years have passed, repeated chapters and chapters, and occasional ups and downs. Once lost in the grand narrative that is abstract and out of control, he also returns to the specific and subtle characters to find inner stability. During this period, all kinds of people passed by and gave me warmth and help.

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