

# **DOCTOR THESIS**

**Research on the industrial transformation of coastal fishing villages in China**

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## Abstract

In China, rural settlements are experiencing dynamic changes in the process of rapid urbanization, globalization, and industrialization. Especially, in the coastal areas, the industrial transformation has brought huge changes to local fishing village development. Qingdao West Coast New Area is one of the most rapidly urbanization coastal areas in China, the fishing villages there are experiencing unprecedented transformation. In this paper, the relationship between industrial transformation and fishing village development has been researched.

The industrial transformation has been regarded as a significant measure for promoting fishery prosperity, fishing village revitalization, and fishermen's living conditions, and draws attention in coastal areas since the turn of the new millennium. Although this relationship is recognized, it is poorly studied in terms of the impact of industrial transformation on fishing village revitalization, especially at the level of fishing villages. This paper makes the definitions of four typical fishing village transformation types, i.e., fishery dominated type (FT), fishing products processing dominated type (FPPT), fishing village tourism dominated type (FVTT), and Diversified development type (DDT), and takes four typical transformed coastal fishing villages in Qingdao West Coast New Area as our research objects: Xiyangjiawa Village, Dingshiwa Village, Wangjiataihou Village, and Taixitou Village. They are all located in this most rapidly urbanized area and were selected as case studies to empirically investigate the industrial transformation in fishing villages through in-depth interviews and observations.

Firstly, this paper research the current developing situations of coastal fishing villages in Qingdao West Coast New Area and try to summarize the current developing problems. Secondly, a new composite indicator is proposed to evaluate the impact of industrial transformation on fishing villages based on the "Three F" dimension: Fishery, Fishing Village, and Fishermen, and its development process, internal logic, driving forces, and mechanisms have also been explored. Thirdly, the background driving forces and the transformation mechanism of these four different types of industrial transformations have been detailed researched. And finally, we analyze the relations between industrial transformation and village spatial evaluation and propose several village renewals and reconstruction strategies.

The results show that these four fishing Villages have undergone an industrial transformation from the primary industry: fishery to the second industry: fishing products processing or the tertiary industry: fishing village tourism around 2000. With the evolution and restructuring of socio-economic morphology, significant changes have occurred in the "Three F". On the whole, the industrial transformation has boosted the overall revitalization to a certain degree. However, there are still some problems that exist, such as the loss of attractiveness and competitiveness and the low participation of villagers in decision-making. Accordingly, this paper puts forward some suggestions, which aim to optimize industrial development and promote the revitalization of fishing villages, including accelerating infrastructure construction, diversifying tourism products and activities with local fishing culture, and exploring new driving forces and mechanisms to adapt to the new developing patterns of fishing villages.

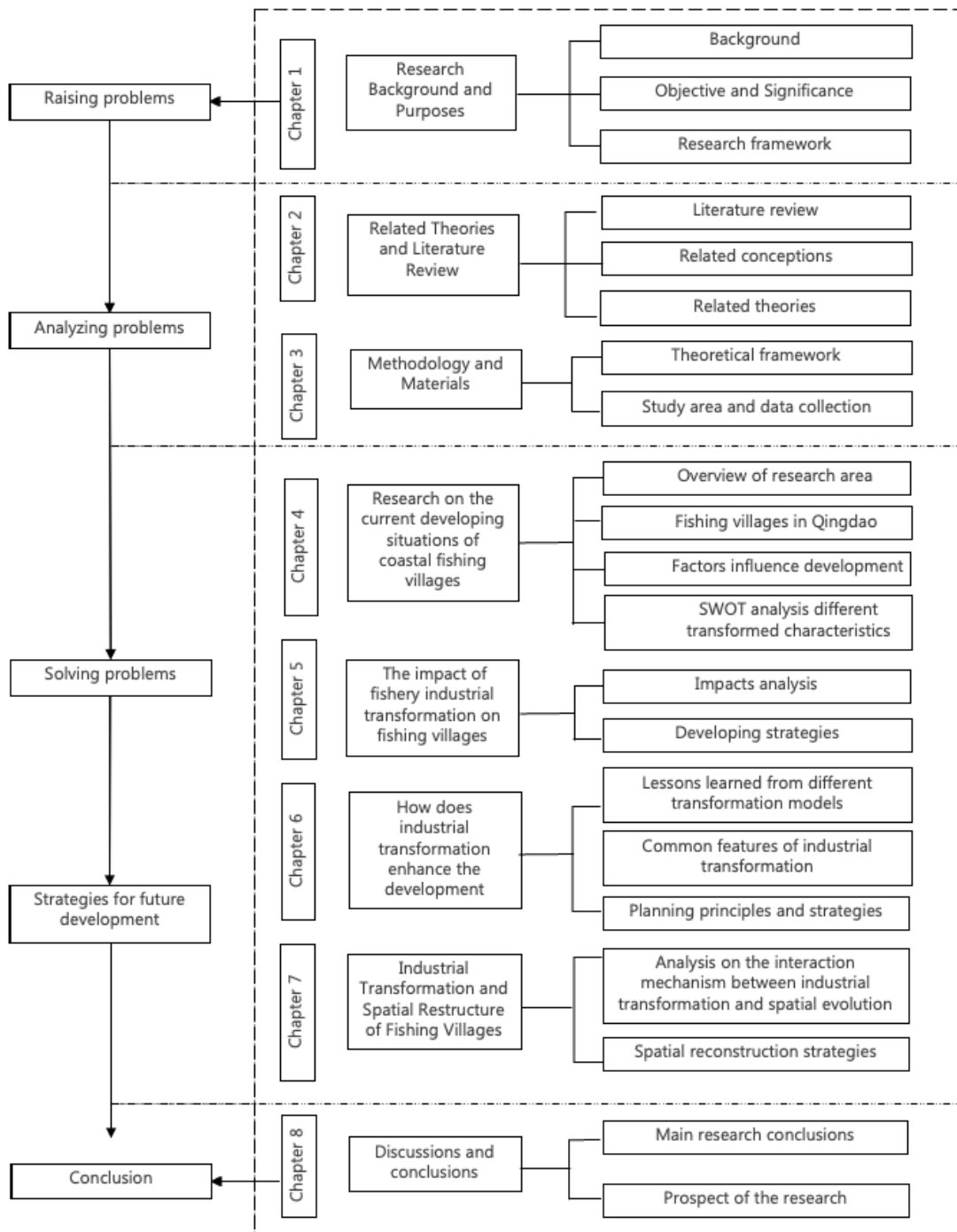
Based on field observation and comparison of typically transformed fishing villages, this paper also explores how industrial transformation enhances the development of coastal fishing villages and what makes better industrial transformation in these villages. Several different driving forces are analyzed and summarized the different driving forces in different transformation stages for different fishing villages. More importantly, the findings from these four different transformed cases illustrate how central and local government, elite, public participatory, enterprises, the cultural and technological creativity can promote village revitalization. This study could help better understand the development process and different driving forces functions in the process of industrial transformation in coastal fishing villages. In addition, the relationship between industrial transformation and the spatial evaluation of fishing villages has also been researched by the GIS technology, which shows that the interactive mechanism of industrial transformation and spatial evolution, so as to provide a reference for the following strategies.

The research on fishing villages in coastal areas with rapid urbanization has both academic and practical implications since fishing villages usually contain tangible and intangible heritage which needs to be protected, and as a place to engage in livelihood activities, local villagers still need to live there. Our purpose of this study is to provide a better understanding of recent trends of industrial transformation happening in the coastal fishing villages, to research how it accelerating the diversification of organizational structure in fishing villages and the restructuring of fishermen's employment, improving the current problem of abandoned villages, underpopulation, and aging, improve fishery management and infrastructure in fishing villages, and promote social development in fishing villages (health care, culture, and education). All the results of this research can make up for shortages and fill the gap in the industrial transformation of coastal fishing villages, especially at the level of fishing villages. This paper hopes to be used as a reference for rural revitalization research in the future economic and sustainable development of coastal fishing villages.

**Keywords:** *Fishing village; Industrial transformation; Effectiveness evaluation; driving forces; spatial evolution;*

## Research framework

### Research on the industrial transformation of coastal fishing villages in China



## List of Contents

<b>1</b>	<b>Introduction .....</b>	<b>1</b>
1.1	Research background.....	1
1.1.1	Domestic background.....	1
1.1.1.1	The status of the fishery economy in the national economy .....	3
1.1.1.2	Analysis of the transformation of traditional fisheries to modern fishery.....	7
1.1.1.3	The development tendency of transformation from traditional fishery to modern fishery	7
1.1.1.4	The meaning and value of fishing village fisheries transformation .....	7
1.1.2	Regional background.....	8
1.2	Research objective and significance.....	12
1.2.1	Research objective.....	12
1.2.2	Research significance .....	13
1.3	Research methodology and contents .....	14
1.3.1	Research Methodology.....	14
1.3.2	Research contents .....	15
1.3.3	Research innovative points.....	16
	Reference.....	18
<b>2</b>	<b>Literature review .....</b>	<b>20</b>
2.1	Literature review .....	20
2.1.1	Revitalization of fishing villages.....	21
2.1.2	Transformation research of coastal fishing villages.....	21
2.1.3	Research on the coastal fishing village tourism .....	24
2.2	Related conceptions.....	26
2.2.1	Coastal fishing village .....	26
2.2.2	The transformation of “Three F” .....	27
2.2.2.1	Fishing village transformation.....	28
2.2.2.2	Fishery transformation.....	29
2.2.2.3	Fishermen transformation.....	30
2.3	Related theories .....	30
2.3.1	The evaluation of industrial construction in fishing villages .....	30
2.3.2	Sustainable development .....	31
2.3.3	Leisure fishery .....	32
2.3.4	Village industrial transformation and village space .....	33
2.4	Conclusion and discussion .....	34
	Reference.....	35
<b>3</b>	<b>Methodology and Materials.....</b>	<b>40</b>
3.1	Theoretical framework .....	40
3.1.1	Inner relationship among the “Three F”: fishery, fishing village, and fishermen.....	40
3.1.2	Current problems of “Three F”: Fishery, Fishing Village, and Fishermen.....	41
3.1.2.1	Current problems of fishery.....	41

3.1.2.2	Current problems of fishing villages .....	42
3.1.2.3	Current problems of fishermen.....	42
3.1.2.4	The core of “Three F”: Fishery, Fishing Village, and Fishermen .....	43
3.1.3	Mechanism of industrial transformation for the revitalization of fishing villages .....	45
3.1.4	Evaluation of industrial transformation on the fishing village revitalization at the village level .....	46
3.2	Research materials and methods .....	51
3.2.1	Study Area.....	51
3.2.2	Data collection and process .....	54
3.3	Conclusions .....	58
	Reference.....	59
<b>4</b>	<b>Current developing situation research .....</b>	<b>60</b>
4.1	Overview of the research area .....	60
4.1.1	Overview of the Qingdao West Coast New Area.....	60
4.1.2	Overview of the research area: Langya Town.....	66
4.2	Overview of fishing villages in Langya Town .....	68
4.2.1	Distribution characteristics of fishing villages .....	68
4.2.2	Classification of development types for coastal fishing villages .....	70
4.2.3	Developing the history of fishing villages.....	72
4.2.4	Cultural characteristics of the fishing villages .....	73
4.2.5	Main problems of fishing villages during industrial transformation.....	75
4.2.6	Main reasons for fishing villages’ transformation in Qingdao West Coast New Area.....	79
4.3	Factors influence the fishing villages’ development .....	81
4.3.1	Fishery factors .....	81
4.3.1.1	Fishery resource.....	81
4.3.1.2	Ocean environment.....	81
4.3.2	Fishing village factors .....	82
4.3.2.1	Public service.....	82
4.3.2.2	Infrastructure .....	82
4.3.2.3	Insufficient financial investment .....	82
4.3.2.4	Basic level organization .....	83
4.3.3	Fishermen .....	83
4.3.3.1	The overall quality of fishermen is low.....	83
4.3.3.2	Fishermen are usually without a good education and lack related abilities .....	84
4.4	Analysis of industrial transformations in fishing villages by the SWOT analysis method .....	84
4.4.1	Weakness .....	87
4.4.2	Opportunities .....	88
4.4.3	Threats .....	89
4.5	Conclusion and discussion .....	90
	Reference.....	92

<b>5</b>	<b>The impact of fishery industrial transformation on rural revitalization at the village level: a case study of Chinese fishing villages .....</b>	<b>94</b>
5.1	Industrial transformation and fishing villages' development of case study Villages..	94
5.1.1	Industrial transformation and fishing villages' development of Wangjiataihou .....	98
5.1.2	Industrial transformation and fishing villages' development of Xiyangjiawa .....	100
5.1.3	Industrial transformation and fishing villages' development of Dingshiwa .....	101
5.1.4	Industrial transformation and fishing villages' development of Taixitou .....	102
5.2	Revitalization of fishing villages and fishermen .....	103
5.2.1	Revitalization of Wangjiataihou.....	103
5.2.2	Revitalization of Taixitou.....	104
5.2.3	Revitalization of Xiyangjiawa .....	106
5.2.4	Revitalization of Dingshiwa .....	106
5.3	The overall effectiveness of industrial transformation on fishing villages .....	108
5.3.1	The overall effectiveness of industrial transformation on Wangjiataihou Village....	108
5.3.2	The overall effectiveness of industrial transformation on Xiyangjiawa Village.....	109
5.3.3	The overall effectiveness of industrial transformation on Dingshiwa Village.....	110
5.3.4	The overall effectiveness of industrial transformation on Taixitou Village.....	111
5.4	The main considerations of local villagers.....	112
5.5	Discussion and conclusion .....	117
5.5.1	Did all industrial transformations bring good impacts on fishing villages' revitalization? .....	117
5.5.2	Negative changes along with the industrial transformation in fishing villages.....	118
5.5.3	Recommendations for the villages to transform from traditional fishery to fishing village tourism and for the future development of Wangjiataihou Village.....	119
5.6	Conclusion.....	123
	Reference.....	125
<b>6</b>	<b>How does industrial transformation enhance the development of coastal fishing villages: Lessons learned from different transformation models in Qingdao, China .....</b>	<b>126</b>
6.1	Research materials and methods .....	126
6.2	Lessons learned from different transformation models in the coastal fishing village	127
6.2.1	Key factors influencing village industrial transformation.....	128
6.2.1.1	Government acts as an important serving role .....	128
6.2.1.2	Elite acts as one of the main driving forces.....	129
6.2.1.3	High awareness of public participation .....	129
6.2.1.4	Enterprises speed up the industrial transformation .....	131
6.2.2	Common features of industrial transformation in four fishing villages .....	131
6.2.2.1	Improving the value-added industrial chain .....	131
6.2.2.2	Technological and culture-oriented development .....	132
6.3	Development goals for coastal fishing villages in Qingdao West Coast New Area .	133
6.3.1	Fishery revitalization.....	133
6.3.2	Fishing village revitalization .....	133



6.3.3	Fishermen revitalization .....	133
6.4	Planning principles for coastal fishing villages in Qingdao West Coast New Area .	134
6.4.1	The principle of active and extensive transformation .....	134
6.4.2	The principle of intensive and economical land use .....	134
6.4.3	The principle of multi-participation management.....	135
6.5	Village developing strategies .....	135
6.5.1	Fishery planning strategy .....	135
6.5.2	Fishing village planning strategy.....	137
6.5.3	Fishermen planning strategy.....	139
6.5.4	Differentiation strategies for fishing villages with different development models...	140
6.6	Discussion and conclusion .....	143
	Reference.....	147
<b>7</b>	<b>Industrial Transformation and Spatial Restructure of Fishing Villages in Qingdao West Coast New Area.....</b>	<b>149</b>
7.1	Analysis of the influence of industrial transformation on the spatial evolution of coastal fishing villages .....	149
7.1.1	Directly influence .....	150
7.1.1.1	The impact of the overall industrial transformation on the village space .....	150
7.1.1.2	The summary of the impact of different industry types on village space .....	156
7.1.1.3	The existing problems of current village space: Macro, Meso, and Micro .....	157
7.1.2	Indirectly influence.....	171
7.1.2.1	Industrial transformation changes the production and lifestyle of residents.....	171
7.1.2.2	Industrial transformation changes the population structure in fishing villages.....	171
7.2	Analysis of the influence of the spatial evolution of coastal fishing villages on industrial transformation .....	173
7.2.1	Directly influence .....	173
7.2.1.1	The space transformation provides the material basis for industrial transformation	173
7.2.1.2	Industrial space layout affects industrial development .....	173
7.2.2	Indirectly influence.....	174
7.3	Analysis of the interaction mechanism between industrial transformation and spatial evolution.....	174
7.4	Spatial reconstruction strategy of coastal fishing villages under industrial transformation.....	176
7.4.1	Macro: restoration and protection of the overall the village space .....	176
7.4.1.1	The adjustment of the industrial land layout.....	179
7.4.1.2	Integration of the spatial functions .....	181
7.4.2	Meso: renewal and conservation within the living settlement space .....	182
7.4.3	Micro: Conservation and construction control of building units.....	184
7.5	Conclusion.....	191
	Reference.....	192
<b>8</b>	<b>Conclusions and prospects.....</b>	<b>194</b>
8.1	Main research conclusions .....	194

8.2	Limitations.....	196
8.3	Prospect of the research.....	196
<b>Appendix Questionnaire on the industrial transformation</b>		
<b>Acknowledgment</b>		

## List of Figures

Figure 1.1 Urbanization rate in China (Source: China Statistical Yearbook) .....	1
Figure 1.2 Related Policies (drawn by the author) .....	2
Figure 1.3 1995-2020 total output value of fishery economy in China.....	4
Figure 1.4 Towns and Villages Level Planning in West Coast New Area, Qingdao.....	10
Figure 1.5 Decline trends in the fishing villages and fishing population in China .....	11
Figure 1.6 Decline trends in fishing villages and fishing population in Shandong Province .....	11
Figure 1.7 Decline trends in the fishing village and fishing population in Qingdao, China .....	12
Figure 1.8 Research contents.....	15
Figure 1.10 Research Framework.....	17
Figure 2.1 Inner relationship among the “Three F”: Fishery, Fishing Village, and Fishermen.....	27
Figure 2.2 The transformation logic of “Three F”: Fishery, Fishing village, Fishermen.....	28
Figure 3.1 The effective logic of industrial transformation in fishing village revitalization .....	46
Figure 3.2 Location of four villages in China .....	54
Figure 3.3 The data collection and processing .....	55
Figure 3.4 The interview with village committee members and the village secretaries .....	56
Figure 4.1 The location of Qingdao West Coast New Area.....	60
Figure 4.3 The number of administrative villages and natural villages in Qingdao in 2019 .....	62
Figure 4.4 Annual income per capita in rural areas of Qingdao (10,000 yuan) .....	62
Figure 4.5 GDP proportion of different industries in Qingdao West Coast New Area.....	63
Figure 4.6 The distribution of fishing ports in Qingdao West Coast New Area.....	64
Figure 4.7 Industrial distribution map in Qingdao West Coast New Area .....	64
Figure 4.8 Industrial chain map in Qingdao West Coast New Area .....	65
Figure 4.9 Layout planning of "one pole, two belts, and three zones" in Qingdao West Coast New Area .....	65
Figure 4.10 The map of Langya town .....	67
Figure 4.11 The map of Langya Resort.....	68
Figure 4.12 Fishing villages in Langya Town.....	69
Figure 4.13 The present situation of modern fishery-dominated village type: Xiyangjiawa Village .....	71
Figure 4.14 The present situation of Fishing products processes dominated type: Dingshiwa .....	71
Figure 4.15 The present situation of Fishing village tourism dominated type: Wangjiataihou .....	72
Figure 4.16 The present situation of Balanced development village type: Taixitou Village .....	72
Figure 4.17 Panorama of the typical fishing village in Qingdao New Area .....	73
Figure 4.18 Harmonious neighborhoods in the typical fishing village in Qingdao New Area .....	74
Figure 4.19 Abandoned house for all year and seasonal abandoned house .....	76
Figure 4.20 The elders stay in fishing villages.....	77
Figure 4.21 The percentage of different age in the respondents .....	77
Figure 4.22 Poor living conditions of original dwellings in fishing villages .....	78
Figure 4.23 Common phenomena of unfinished construction .....	78
Figure 4.24 “Rural diseases” in coastal fishing villages .....	79

Figure 4.25 The distribution of educational background for the respondents.....	84
Figure 4.26 Swot analysis diagram of each conclusive element.....	85
Figure 4.27 Langyatai tourist area is the main tourism resource .....	86
Figure 4.28 Spatial distribution of Dingshiwa Village and Taixitou Village.....	86
Figure 4.29 Spatial distribution of Xiyangjiawa Village and Wangjiataihou Village .....	87
Figure 5.1 The total annual revenue of four fishing villages from 2000-2020 .....	97
Figure 5.2 Basic stages in the industrial transformation in coastal fishing villages.....	98
Figure 5.3 The value of the gross social output.....	100
Figure 5.4 The marine fishery output of Xiyangjiawa fishing village .....	101
Figure 5.5 The value of the gross social output in Xiyangjiawa .....	101
Figure 5.6 The value of the gross social output in Dingshiwa .....	102
Figure 5.10 The evolution of infrastructure for tourism in Wangjiataihou Village 2010 and 2020 .....	104
Figure 5.12 The transformation of vernacular dwellings .....	105
Figure 5.13 Present infrastructure .....	105
Figure 5.14 Present situation of Xiyangjiawa village .....	106
Figure 5.15 Newly built vernacular dwellings .....	106
Figure 5.16 The improvement of village infrastructure .....	107
Figure 5.17 The current living environment in Dingshiwa Village .....	107
Figure 5.18 The effectiveness of FVR on “Three F” in Wangjiataihou Village.....	108
Figure 5.19 The overall effectiveness of FVR on the development of Wangjiataihou Village ....	109
Figure 5.20 The effectiveness on “Three F” in Xiyangjiawa Village .....	110
Figure 5.21 The overall effectiveness of FVR on the development of XiyangjiawaVillage .....	110
Figure 5.22 The effectiveness on “Three F” in Dingshiwa Village .....	111
Figure 5.23 The overall effectiveness of FVR on the development of Dingshiwa Village .....	111
Figure 5.24 The effectiveness of FVR on “Three F” in TaixitouVillage .....	112
Figure 5.25 The overall effectiveness of FVR on the development of Taixitou Village .....	112
Figure 5.26 Distribution of male and female respondents .....	113
Figure 5.27 Respondents to the question : “To what extent do you satisfy the current life in the fishing village?”.....	113
Figure 5.28 Satisfaction level on the road.....	114
Figure 5.29 Satisfaction level on education facility .....	114
Figure 5.30 Satisfaction level on medical facilities.....	115
Figure 5.31 Satisfaction level on senior care facilities.....	115
Figure 5.32 Satisfaction level on garbage disposal facilities .....	116
Figure 5.33 Satisfaction level on sewage treatment facilities .....	116
Figure 5.34 Satisfaction level on the infrastructure.....	117
Figure 5.35 The transportation net around Wangjiataihou Village .....	120
Figure 5.36 Different developing planning areas around Wangjiataihou Village.....	120
Figure 5.37 Fishing village revitalization and tourism developing model.....	122
Figure 6.1 Location of four villages in China .....	126

Figure 6.2 The relationship between industrial transformation and rural revitalization in fishing villages.....	127
Figure 6.3 Land usage management in fishing villages .....	137
Figure 6.4 Planning for the enhancement of coastal landscape.....	138
Figure 6.5 The smile curve of fishing village tourism development.....	143
Figure 6.6 Main forces in the industrial transformation in coastal fishing villages .....	145
Figure 6.7 The external and internal driving forces for industrial transformation in fishing villages .....	145
Figure 7.1 The logical relationship between industrial transformation and village spatial reconstruction .....	149
Figure 7.2 Analysis framework of Chapter 7 .....	150
Figure 7.3 The influence mechanism between industrial transformation and village spatial evolution .....	150
Figure 7.4 The spatial distribution change from 2000 to 2020 in Xiyangjiawa Village .....	151
Figure 7.5 The spatial distribution change from 2000 to 2020 in Dingshiwa Village .....	152
Figure 7.6 The spatial distribution change from 2000 to 2020 in Wangjiataihou Village.....	153
Figure 7.7 The spatial distribution change from 2000 to 2020 in Taixitou Village.....	153
Figure 7.8 Road service facility and the newly built village entrance road .....	154
Figure 7.9 The evolution of the vernacular dwellings.....	155
Figure 7.10 The modern vernacular dwellings in Wangjiataihou Village .....	156
Figure 7.11 The inner relationship between the industrial transformation and its impacts on spatial evolution in fishing villages .....	156
Figure 7.12 No buffer zone between the residential area and industrial area in Taixitou village.	157
Figure 7.13 No buffer zone between residential area and industrial area in Dingshiwa village...	158
Figure 7.14 The evolution of ecological land usage in Dingshiwa village .....	159
Figure 7.15 The evolution of ecological land usage in Xiyangjiawa village .....	159
Figure 7.16 The evolution of ecological land usage in Taixitou village.....	160
Figure 7.17 The evolution of ecological land usage in Wangjiataihou village .....	160
Figure 7.18 Village planning .....	161
Figure 7.19 The distribution of traditional residential areas and newly built residential areas....	162
Figure 7.20 The abandoned traditional dwellings .....	162
Figure 7.21 The traditional architectural materials .....	164
Figure 7.22 The current modern architectural materials .....	165
Figure 7.23 The storage room .....	166
Figure 7.24 The room situation in current vernacular dwellings .....	167
Figure 7.25 Layout of typical vernacular dwelling .....	167
Figure 7.26 Frequency distribution of satisfaction on indoor thermal environment.....	168
Figure 7.27 Frequency distribution of satisfaction on heating energy cost in winter .....	169
Figure 7.28 Energy cost and the proportion of heating cost during winter in dwellings .....	170
Figure 7.29 The production and lifestyle transformation of villages' spatial change.....	171
Figure 7.30 The proportion of 65 years old residents in the fishing villages.....	172
Figure 7.31 The percentage of different ages in the respondents.....	172

Figure 7.32 The change of population structure on spatial evaluation.....	173
Figure 7.33 The indirect influence of spacial evolution on industrial transformation .....	174
Figure 7.34 The impact of industrial development on spatial evolution.....	175
Figure 7.35 The impact of spatial evolution on industrial development.....	175
Figure 7.36 The interactive relationships between industrial development and spatial evolution	176
Figure 7.37 Diagram of spatial restoration and integration in Wangjiataihou village .....	177
Figure 7.38 Diagram of spatial restoration and integration in Dingshiwa village .....	177
Figure 7.39 Buffer zone between the residential area and industrial area in Dingshiwa village ..	178
Figure 7.40 Buffer zone between the residential area and industrial area in Taixitou Village .....	178
Figure 7.41 The division of residential area and coastal tourism area .....	179
Figure 7.42 The functional area redivision for Wangjiataihou Village.....	180
Figure 7.43 The functional area redivision for Dingshiwa Village.....	180
Figure 7.44 Village sharing mechanism.....	182
Figure 7.45 The newly built public space in Wangjiataihou Village .....	183
Figure 7.46 Thermal-climatic zones and geographical location of Qingdao city .....	184
Figure 7.47 Current status and plans of the typical dwellings .....	185
Figure 7.48 Photos of heating equipment and its construction .....	187
Figure 7.49 Traditional vernacular dwellings in Qingdao.....	189
Figure 7.50 Inner logical relationship of traditional fishing village destruction.....	190

## List of Tables

Table 1.1 Urban-rural relations and rural development in China since 1949.....	3
Table 1.2 Decline trends in fishing town, fishing village, fishing population, marine capture yield	6
Table 1.3 Key industrial integrated projects in Qingdao West Coast New Area.....	9
Table 2.1 The summary of the literature review following the different themes.....	20
Table 3.1 Indicators used for evaluating the impact of industrial transformation ( from traditional fishery to fishing village tourism)on fishing village revitalization .....	47
Table 3.2 Indicators used for evaluating the impacts of industrial transformation (from traditional fishery to fishing products processing) on fishing village revitalization .....	48
Table 3.3 Indicators used for evaluating the impacts of industrial transformation (from traditional fishery to modern fishery) on fishing village revitalization .....	49
Table 3.4 Indicators used for evaluating the impacts of industrial transformation (from traditional fishery to balanced industrial model) on fishing village revitalization .....	50
Table 3.5 The comparison between traditional fishing villages and inland fishing villages in Shandong .....	52
Table 3.7 Interviewees and the core content of the interview for the four villages .....	57
Table 4.1 Comparison of the characteristics of different types of villages.....	69
Table 4.2 Different developing stages for the Three F in Langya Town .....	73
Table 4.3 Summaries of SWOT analyses.....	90
Table 5.1 Situation, development situation, and main characteristics of industrial transformation	94
Table 5.2 The timeline of industrial transformation in Wangjiataihou Village .....	99
Table 5.3 The approximate annual tourist amount from 2004 to 2020.....	99
Table 6.1 Local participation during the process of industrial transformation in four village.....	130
Table 7.1 The impacts of industrial transformation on spatial evaluation in fishing villages.....	157
Table 7.2 Evolution of homestead area and size .....	165
Table 7.3 Evolution of storage room.....	166
Table 7.4 The size changes of living room.....	168
Table 7.5 Summarized the current problems.....	170
Table 7.6 Space composition of vernacular dwelling .....	185
Table 7.7 Mainly used room heating equipment and heating time .....	186

**CHAPTER 1**  
**RESEARCH BACKGROUND AND PURPOSE**



- 1 Introduction
  - 1.1 Research background
    - 1.1.1 National background
    - 1.1.2 Regional background
  - 1.2 Research objective and significance
    - 1.2.1 Research objective
    - 1.2.2 Research significance
  - 1.3 Research methodology and contents
    - 1.3.1 Research Methodology
    - 1.3.2 Research contents
    - 1.3.3 Research framework
    - 1.3.4 Research innovative points

## 1 Introduction

### 1.1 Research background

#### 1.1.1 Domestic background

In the last three decades, China is experiencing rapid urbanization, the urbanization rate improves from 19.39% in 1980 to 64.72% in 2021 (Figure 1.1). Although it is comparatively lower than that in Europe and North America, it still causes unprecedented transformation in rural areas, including economic, social, and ecological transformation.

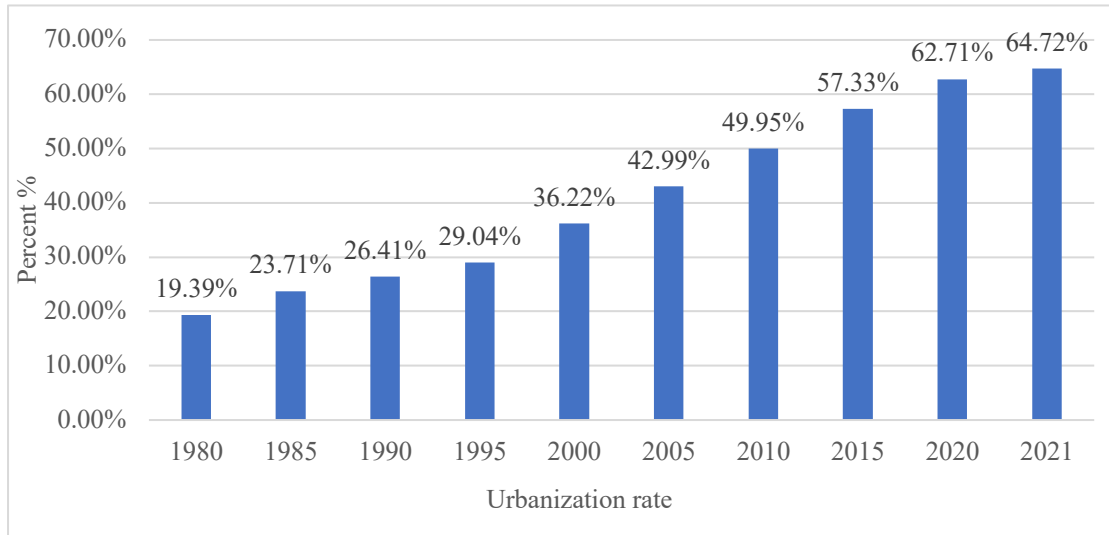


Figure 1.1 Urbanization rate in China (Source: China Statistical Yearbook)

Along with this rapid urbanization trend, China's central government made lots of policy support for rural development (Figure 1.1). In 2016, the central government invested more than 917 billion yuan in village construction. Fiscal expenditure on agriculture and rural restructuring projects totaled 646 billion yuan and 151 billion yuan, respectively [1]. The National Rural Revitalization Strategic Plan (2018–2022) aims to revive China's rural areas through spatial agglomeration and upgrading, village relocation and merger, suburban integration, and pastoral specialization. It has triggered a new round of rural development research about the impact of the new national scheme. From 2013 to 2018, the Chinese central government implements a series of policies to promote rural revitalization, shown in Figure 1.2.

With the rise in new fishery industries such as marine pastures, mariculture and marine biopharmaceuticals, improving the effectiveness of supporting the sustainable development of the fishery industry has become a new challenge to fishery finance, especially considering the influence of the financial crisis in 2008. With the proposal of the "12th five-year Plan for National Fisheries Development (2011–2015)" [22] and the "13th Five-Year Plan for National Fisheries Development (2016–2020)" [2], as well as the marine fishery development strategy of "Maritime power" [3] [4], China's fishery financial policies have entered a new stage. The country began to build a diversified fishery investment and financing pattern according to the high-frequency words of "investment", "financing", "diversification" and "guarantee". The "12th Five-Year Plan of National Fisheries Development (2011–2015)" issued by the Ministry of Agriculture and Rural Affairs of the People's

Republic of China in 2011 proposed to build a mutual insurance system for fisheries and support financial product innovation, increase support for fisheries microcredit and explore fisheries pledge loans, and promote the formation of a diversified and multi-channel fishery investment and financing pattern <sup>[5]</sup>. This was the first time raising the fishery investment and financing support policies to the national strategic planning became more important. Credit guarantees, discount loans, mortgage loans and other specific financial support methods for fisheries, including industrial funds, debt instrument financing and asset securitization, had been adopted by the state <sup>[6]</sup> <sup>[7]</sup>. After the COVID-19 pandemic started, China immediately implemented temporary deferred repayment arrangements for loan principal of qualified merchants with liquidity difficulties, with CNY 100 billion (US\$ 15.6 billion) in re-loans for agriculture, and cut the interest rate of loans for agriculture by 0.25–2.5% <sup>[8]</sup>. Moreover, Anhui Province, Shandong Province, Hainan Province and other provinces also introduced many measures, such as providing preferential re-loans for agriculture-related small and micro enterprises, delaying the repayment of principal and interest, and reducing the overdue loans to support the resumption of work and production of fishery enterprises <sup>[9]</sup> <sup>[10]</sup>. The current policies are adjusted to provide a better service to fishermen to support rural poverty reduction, under the guidance of the rural revitalization strategy. In order to encourage the development of projects with rural characteristics such as leisure fisheries, local governments have successively launched products such as industrial investment and special revitalization funds for the integration of government and social capital <sup>[11]</sup> <sup>[12]</sup>. At the same time, the high-frequency words such as “management”, “regulation”, and “supervision” also indicated that China began to formulate the supervisory and management policies for fishery finance. In 2020, the Ministry of Agriculture and Rural Affairs put forward an overall fishery insurance reform plan of “Divesting the insurance business of the association and setting up professional insurance institutions to undertake”, and the Bank of China and Insurance Regulatory Commission and the Ministry of Agriculture and Rural Affairs would be responsible for the supervision <sup>[13]</sup>.

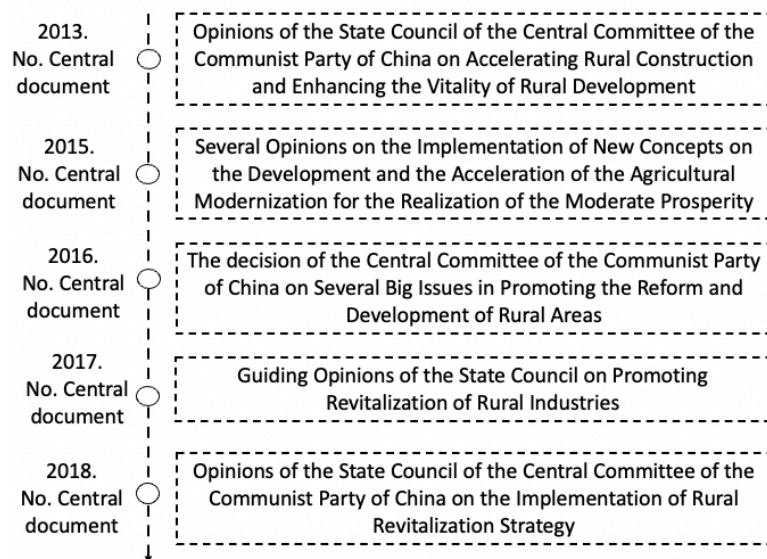


Figure 1.2 Related Policies (drawn by the author)

Since the founding of the People's Republic of China in 1949, urban-rural relations and rural development can be divided into three stages. These different stages have their own agricultural and rural development policies, systems, and characteristics Table 1.1.

Table 1.1 Urban-rural relations and rural development in China since 1949.

Time	Urban-rural relationship	Economic development model	Rural Transformation stage	Main characteristics
1949-1978	Urban-rural separation	Agriculture supports priority industrial development	1949-1953	Land reform revived farmers' enthusiasm for production; a Dual urban-rural economic system; Natural disasters occurred frequently, large scale migration between urban and rural areas
			1954-1958	
			1959-1978	
1978-2003	Urban-rural disparity	Centering on city economic construction	1979-1983	The household contract responsibility system promoted the vitality of rural development; Township enterprises promoted the transformation; urban-rural unbalancing began
			1984-1996	
			1997-2003	
Since 2003	Urban-rural coordinated trend	Industry supporting agriculture and urban supporting villages	2004-2005	Urban-rural balanced development; New socialist countryside construction; Beautiful countryside; Precise poverty alleviation; Rural revitalization
			2006-2012	
			2013-2017	
			Since 2018	

Along with the above policies, the Chinese rural area, especially the eastern coastal rural has experienced rapid industrialization and urbanization, nearly half of the population still lives in these rural areas. The regional differentiation of fishing villages in eastern coastal rural is obvious, due to the influences of physical conditions, the existing economic fundamentals, historical and cultural background together with the location and traffic conditions, and other factors.

#### 1.1.1.1 The status of the fishery economy in the national economy

In China, the fisheries economy, like agriculture, forestry, and industry, is an important part of the national economy, the result of fishermen's economic activities in various types of marine industries, a process that relies on and delivers products to marine resources, and an indispensable asset for our human survival. The overall development trend of the fishery economy has increased as shown in Figure 1.3, and the marine industry has gradually become a pillar industry of the national economy.

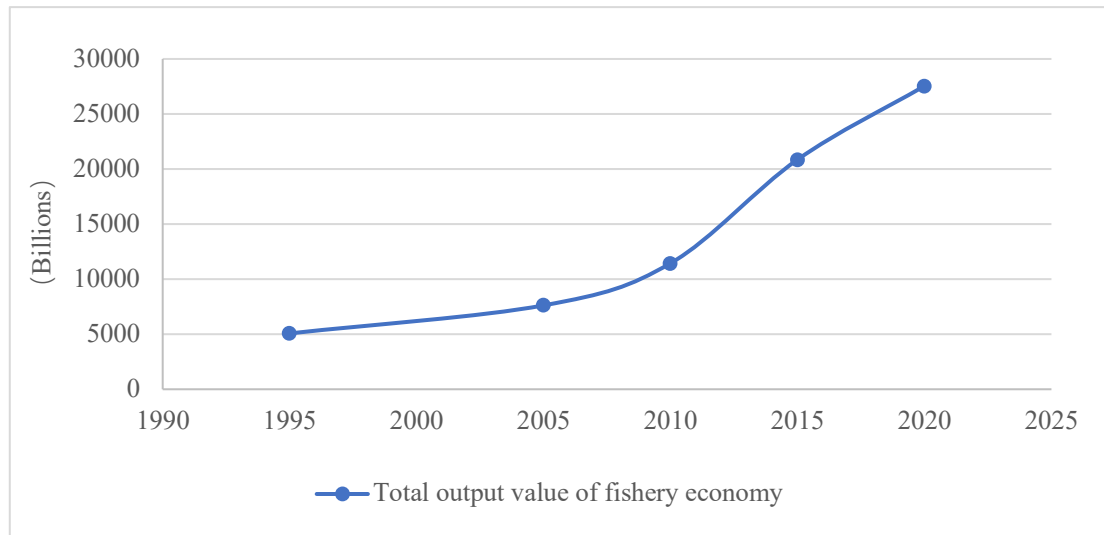


Figure 1.3 1995-2020 total output value of fishery economy in China

(Source: China fishery Statistical Yearbook)

According to *The State of World Fisheries and Aquaculture 2020* by the Food and Agriculture Organization of the United Nations, China has already become the largest producer of fish and seafood all over the world, and its fishery industry is playing an important role in ensuring food security and improving the dietary structure of Chinese people <sup>[14]</sup>. The development of fishery is essential for food security. The role of fishery in the national economy is mainly to provide food, especially high-quality protein food, which plays an important role in improving people's health and pursuing national food safety strategies. Fishery becomes an important part of modern agriculture in China and its contribution to the national economy is also increasing. According to the latest statistics from the Ministry of Agriculture, the proportion of fishery output value to the total agricultural output value increased from 1.4% in 1978 to 10.7% in 2018 <sup>[15]</sup>. In addition, fishery plays a key role in the optimization and integration of the primary, secondary, and tertiary industries and in increasing fishermen's productivity and income. The fishery industry, mainly in small and medium coastal cities, rural areas, and islands, plays an important role in specific regional economies. The diversified development of fishery promotes the economic development of the fishing village, which will contribute to the prosperity of the fishing village and play a role in solving the surplus labor in fishing villages.

The trend of industrial transformation in coastal fishing villages:

First, the regionalization of industrial layout. With the development of social productivity, the phenomenon of industry clustering to advantageous areas is becoming more and more obvious. In order to achieve the optimization of resource allocation and the effective concentration of production factors, the layout of fisheries began to tilt to the advantageous regions, and gradually formed several special fishery industry clusters. Some areas with superior natural conditions, abundant water resources and biological resources, convenient transportation, and obvious advantages in science and technology have gradually formed industrial clusters with advantageous products as the core. In these areas, the leading industries with comparative advantages and leading

fishery enterprises with strong driving capacity, generally smooth product distribution channels, large wholesale markets, and strong social service capacity. Second, the continued integration of industrial structure. In the traditional fishery, the fishery mainly provides aquatic products to consumers, and primary production accounts for an absolute proportion. In modern fisheries, some inefficient traditional fisheries will be separated, and some efficient fisheries processing and service industries will develop rapidly. With the change in consumption concept, people's demand for fishery will be upgraded and diversified, and organic fishery and leisure fishery will develop rapidly. Third, the growth mode from rough to intensive change. Traditional fisheries are labor-intensive, crude industries, emphasizing the development of speed and quantity. Modern fisheries have changed the traditional crude operation of fisheries and the development of fisheries has obvious characteristics of intensive and sustainable development through the elements of intensive investment, especially intensive investment in a wide range of capital and technology, rather than investment in resources and labor. Fourth, the continuous improvement of industrial organization. Generally speaking, the basic production unit of the traditional fishery is fishermen. The main industrial unit of modern fisheries is the modern industrial organization, which mainly includes leading enterprises and various professional cooperative organizations.

However, the longtime development of the fishery economy and rapid urbanization in the last decade has come at the expense of resource depletion and the decline of fishing villages. Problems, such as the depletion of fishery resources, decline of fishery populations and aquaculture areas, abandoned fishing villages, and water soil pollution are intertwined with each other and increased the vulnerability of these fishing villages. Table 1.2 shows that Chinese fishing towns, fishing villages, fishing populations, and marine capture yields have been decreasing year by year, especially the marine capture yield. This phenomenon is much worse in our research area-Shandong Province. There are mainly three reasons. The first one is the shortage of fishery resources and marine environmental pollution. Since the 1970s, China's marine fishing vessels have witnessed rapid growth which, in turn, caused the decline of fishery resources, and even the extinction of some traditional economic fish resources <sup>[16]</sup>. To remedy the situation, China has put forward the policy of “zero growth” of marine fishing for realizing sustainable fishery development <sup>[17]</sup>. The second is the development of new international marine conventions. Based on the United Nations Convention on the Law of the Sea, China has signed the China-Korea Fisheries Agreement, the China-Japan Fisheries Agreement, and the China-Vietnam Fisheries Cooperation Agreement. According to these agreements, fishing is forbidden in high sea areas and could be proceeded only within the exclusive economic zones of each country, which has led to a significant contraction in the range of fishing areas. The third reason is the Chinese fishery policy. The local government are entitled to the rights of fishery management and enforcement. In order to improve local fishery output, effective fishery management has been generally neglected <sup>[18]</sup>. In addition, Villages with deep-rooted fishing traditions have experienced a decline in the productivity of the sector in recent years, not only because of over-exploitation, and rising costs, but also because of strong competition from imports and rapid urbanization <sup>[19]</sup>. Under these circumstances, the change of development mode and improvements of the industrial structure is urgently needed for the long-term development of these fishing villages.

Table 1.2 Decline trends in fishing town, fishing village, fishing population, marine capture yield

	China				Shandong Province			
	Fishing town	Fishing village	Fishing population	Marine capture yield (Ton)	Fishing town	Fishing village	Fishing population	Marine capture yield (Ton)
1994	325	4225	5,267,392	10,268,373	37	680	1,015,802	1,618,119
1999	429	4280	5,554,665	14,774,524	51	820	1,006,002	3,078,395
2004	391	4004	5,359,854	14,532,984	70	943	926,393	2,680,834
2009	405	3793	5,756,318	11,786,109	68	925	880,333	2,370,891
2014	378	4177	5,707,101	12,808,371	62	857	901,572	2,297,194
2019	379	3271	5,257,826	9,474,104	61	803	884,689	1,655,165

Source: China Fishery Statistical Yearbook 1995,2000,2005,2015,2020

In China, rural settlements are experiencing dynamic changes in the process of rapid urbanization, globalization, and industrialization <sup>[20]</sup>. Especially, in the southeast coastal areas, the industrial transformation has brought huge changes to local village development by reducing pressures on natural resources <sup>[21]</sup>. The most famous and successful transformation happened in Zhoushan Island, Zhejiang Province. It shows that, in the past 20 years, more than 30 thousand fishermen and 6000 trawlers have been industrially transformed. Another successful example is Changdao Island, Shandong Province, which is located in the same big area as our research fishing village. The development of Yujiale fishing tourism has long been one of the driving forces for socio-economic development on Changdao Island <sup>[22]</sup>. This study contributes to the body of knowledge on industrial transformation in coastal rural areas as it focuses on the former fishing village of Wangjiataihou Village in Qingdao West Coast New Area, one of the most rapidly urbanized areas in Qingdao city, Shandong province of China. Qingdao West Coast New Area conducts vigorous fishery activities along the coastline, with a total of 16 fishing ports in the area, where the fishing villages are generally located. With the continuous boost of the rapid urbanization of Qingdao coastal area and the implementation of China's Rural Revitalization Strategy, fishing villages are confronted with an unprecedented challenge and opportunity, the number of fishing villages and the fishing population is declining year by year, especially in recent two years as is shown in Figure 1. With the changes in population and industrial structure, the original industrial structure, population structure, and villages' outlook have been transformed as well, and the fishing villages have been universally facing the problems like insufficient motivation in industrial development, increasingly abandoned fishing villages, the shortage of public facilities, the persistent outflow of young adults, the aging problem of the fishing industry population, and shortage of employment opportunities, etc. <sup>[23]</sup> These problems trigger the restructuring of the fishing villages and pose a number of challenges to the sustainable development of fishing villages.

### **1.1.1.2 Analysis of the transformation of traditional fisheries to modern fishery**

In the long process of human production activities, coastal areas rely on natural recourses, from marine fishing to gradually accumulate experience in aquaculture, and then to the storage and processing of fishing products. In the process of fishery development, each region has gradually formed a set of fishery production methods that are in line with the actual situation of the region, with local characteristics, which are all collectively known as traditional fishery<sup>[24]</sup>. Although China has rich marine resources, the marine ecological system has suffered serious damage due to high-intensity fishing. Because of the small investment in the fishery and high income, some fishermen only look at the immediate interests, ignoring marine environmental protection, maintenance of the ecosystem, and other sustainable development issues, the traditional fishery resources gradually reduced, and the marine environment gradually deteriorated. The slow development of fishery, the poor living environment of coastal fishing villages, and the reduced income of fishermen are all practical problems for the industrial transformation.

### **1.1.1.3 The development tendency of transformation from traditional fishery to modern fishery**

First is the industrial layout regionalization. With the development of social productivity, the phenomenon of industry clustering to advantageous areas is becoming more and more obvious. In order to achieve the optimization of resource allocation and effective concentration, the fishery gradually formed a number of special fishery industry clusters. Some areas with superior natural conditions, abundant water resources and biological resources, convenient transportation, and obvious advantages in science and technology have gradually formed industrial clusters. In these areas, there are leading industries, leading fishery enterprises, generally smooth product distribution channels, large wholesale markets, and strong social service capacity. Second, the continued integration of industrial structure. In the traditional fishery, the fishery mainly provides aquatic products to consumers. In modern fishery, some inefficient traditional fisheries will be separated, and some efficient fisheries processing and service industries develop rapidly. With the change in consumption concept, people's demand for fishery will be upgraded and diversified, and organic fishery and leisure fishery develop rapidly. Third, the growth mode change from rough to intensive. The traditional fishery is a labor-intensive industry, emphasizing the development of speed and quantity. The modern fishery has changed the traditional crude operation and the development of fisheries through the elements of intensive investment, especially intensive investment in capital and technology rather than investment in resources and labor. Fourth, the continuous improvement of industrial organization. Generally speaking, the basic production unit of the traditional fishery is fishermen. The main industrial unit of modern fisheries is the modern industrial organization, which mainly includes leading enterprises and various professional cooperative organizations<sup>[25]</sup>.

### **1.1.1.4 The meaning and value of fishing village fisheries transformation**

First, fishery transformation can effectively increase fishermen's income. Fishermen from a single traditional fishing industry to diversified industries: from crude operation to fishing products processing, the modern fishery, aquaculture, processing, and refrigeration. Encourage fishermen to develop leisure fisheries, develop new fishery projects such as "fishermen's play", and prosper the



economy of fishing villages. Secondly, the development of fishery transformation can promote the development of related industries, for example, the development of leisure fisheries can promote the development of fishing gear, catering, tourism, logistics, and transportation. Promote the development of offshore fishing, the water transportation industry can not only effectively increase the economic growth of the fishing boat construction industry, but also promote the development of ship machinery manufacturing, fishing gear, and other supporting industries, while the logistics industry and fishing products processing industry can also be gotten the positive benefits. In addition, the transformation of the fishery can increase a large number of jobs, solve the problem of surplus labor in fishing villages and accelerate the transformation of fishermen.

### 1.1.2 Regional background

Qingdao is located on the east coast of the mainland on the Yellow Sea, in the north temperate monsoon region, and has a temperate monsoon-type climate. Qingdao is located in the cold zone in China's architectural zoning, and the zoning code is IIA. Surrounded by the sea on three sides, Qingdao is directly regulated by the marine environment, showing an obvious oceanic climate with moist air, abundant rainfall, and moderate temperature, forming the climate characteristics of "late spring, cool summer, cool autumn and long winter" [26]. In spring, the temperature rises slowly, one month later than inland; in summer, it is hot and humid, but there is no heat, and the duration is short, about one-half of the winter time; in autumn, the sky is high and cool, with little precipitation and strong evaporation; in winter, the wind is strong and the temperature is low, and the duration is about five months. According to more than 100 years of meteorological data since 1898, the annual average temperature in the city is 12.2°C, with an extremely high temperature of 38.9°C (July 15, 2002) and an extremely low temperature of -16.4°C (January 10, 1931). August is the hottest month of the year, with an average temperature of 25.1°C; January is the coldest, with an average temperature of -1.2°C.

Qingdao, once a fishing village on the southeast coast of Jiaozhou Bay, has a history of 600 years. During its long history, a large number of people lived on the sea and were engaged in marine fishing, the salt industry, and marine transportation. Qingdao has a long and winding coastline with many islands and bays, both in the Yellow Sea offshore and in Jiaozhou Bay, where marine fisheries have been developed since ancient times, with a large fishing population. Local villagers build houses according to their ancestral experience and according to local natural conditions and traditions, and the layout and construction methods have been passed down from generation to generation without major changes. Like all northern villages, most of the buildings are triple and quadruple courtyards, and the layout and use of houses follow the patriarchal family ethical hierarchy principle of "the north is the most important, the two compartments are second, and the seat is the guest". Villages are also formed naturally, according to the law of first come, first served, and the rule of choosing the best to live in.

In 2012, Qingdao West Coast New Area was established, which combined the original Huang Dao district and Jiao Nan City. In 2014, West Coast New Area (Huang Dao New District) was approved by the State Council to be the ninth national new zone. The total land area is 2127 square kilometers,

the sea area is more than 5000 square kilometers, the beach area is 83 square kilometers, and there are 21 islands, the coastline is 282 kilometers.

West Coast New Area is located at the southwest end of Jiaodong Peninsula, in the blue economic zone of Shandong Peninsula, and belongs to the "Qingdao-Weifang-Rizhao town group". It is located in the west of Qingdao city, in the coastal blue economic development zone of Qingdao city, bordering the Yellow Sea in the southeast, adjacent to Jiaozhou city in the north, and connected to Weifang city in the west Figure XX. It is a strategic point for the country to extend from land area to marine economy and promote the integration of land and sea.

Promoting the integrated development of three industries in rural areas can meet the requirements of promoting rural revitalization, it is also an important way to promote agricultural reform and improve the comprehensive efficiency of agriculture, thus it can seem as a necessary way to build a modern industrial system in rural areas in the future. With the in-depth promotion of "rural revitalization strategy" in recent years, a variety of industrial integration development modes, including "trade logistics and food processing", have begun to appear. Industrial projects related to the integration of different industries have been carried out, including the Longma Edible Mushroom Wholesale Trading Center in Dacun Town, the E-commerce Logistics Park in Baoshan Town, the New Town Business Tourism Project (Tea Exhibition Center) in Haiqing Town, and the Yudongjia Fruit and Vegetable Cold Chain Storage and Logistics Project in Jiaohe Economic Zone, etc., all of which have provided a useful model for the industrial integration, and these projects have provided useful explorations for the integration of industries and the development of the town and village linkages and injected new impetus into the industrial development Table 1.3.

Table 1.3 Key industrial integrated projects in Qingdao West Coast New Area

Town	Industrial integration projects
Baoshan	Baoshan E-commerce logistics
	Baoshan commercial complex project
	Food processing project
Liuwang	Food processing project
Jiaoheguan	Cold chain warehouse logistics
	Food processing project
Dachang	Phoenix central business district
	Food processing project
Dacun	Qingdao West Coast Edible Mushroom Wholesale Trading Center
Haiqing	Haiqing new city business project
	Tea exhibition and sale center
Langya	North China International Aquatic Trade Center and Cold Chain Logistics Base

Qingdao West Coast New Area has 26 towns and districts, among them 520 villages belong to the urban areas, and 636 villages are located in rural areas. There are 58 fishing ports and the fishing

villages are all located near these fishing ports Figure 1.4. Compared with other areas in Qingdao, the urbanization rate in the new area is the highest and the development speed is the fastest.

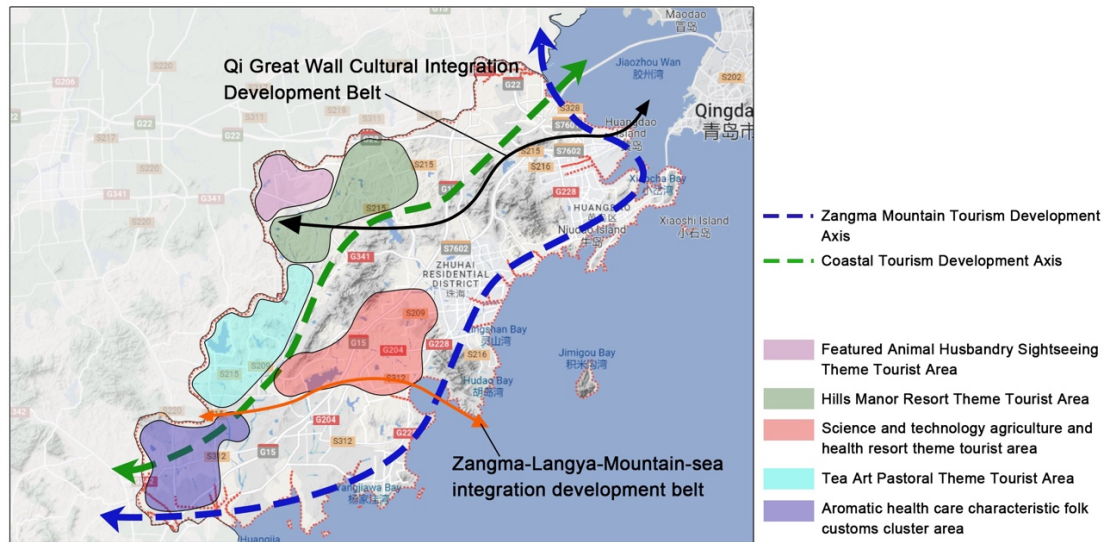


Figure 1.4 Towns and Villages Level Planning in West Coast New Area, Qingdao

Source: Master Planning West Coast New Area, Qingdao, 2017-2035

Under rapid urbanization, the local fishing villages are experiencing transformation:

(1) The phenomenon of vanishing fishing villages and the fishing population

During our field investigation, ten fishing villages have been researched in-depth, it is found that only one keeps marine capture as their main industry, all others have transformed into other related industries, such as fishing products processing, and fishing village tourism. Some villages even changed into non-fishing villages. To solve these problems, proper guidance and timely actions are urgently needed from the government and residents so as to adjust to the new transformation patterns. The effective methods are restructuring fishing villages, transforming the traditional fishing industry, and improving local living standards. Therefore, this paper is regarded as a typical case study that focuses on rural revitalization at the fishing village level under rapid urbanization in coastal areas of China. The research findings would provide an invaluable reference for policymakers who are working on the prevention of fishing villages' recession to better understand the relationship between industrial transformation and fishing villages' revitalization.

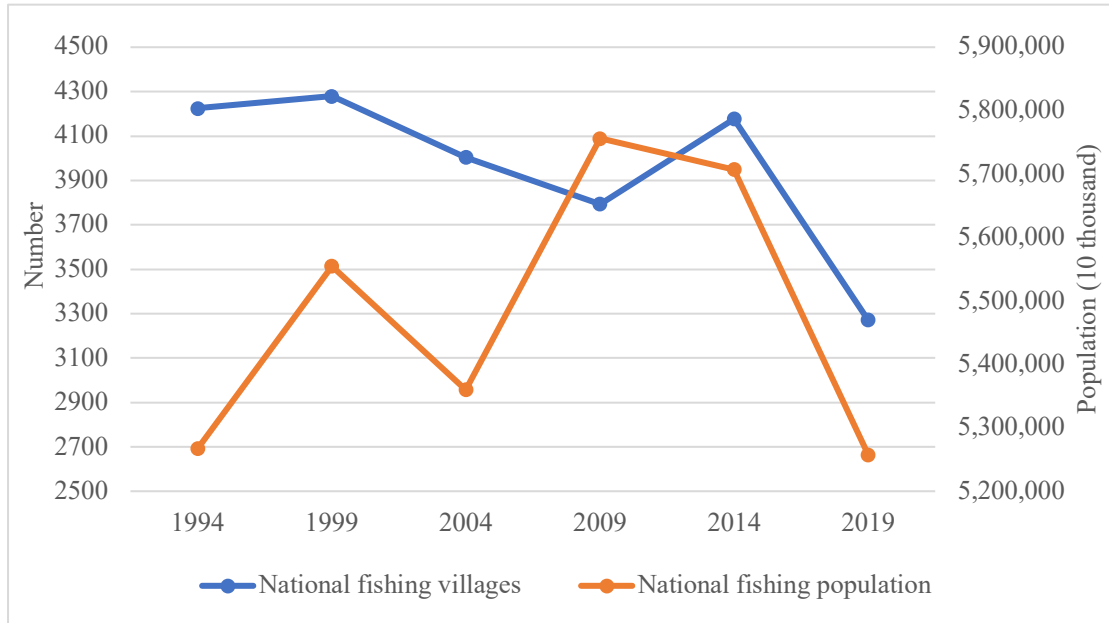


Figure 1.5 Decline trends in the fishing villages and fishing population in China

Source: Marine Development Bureau

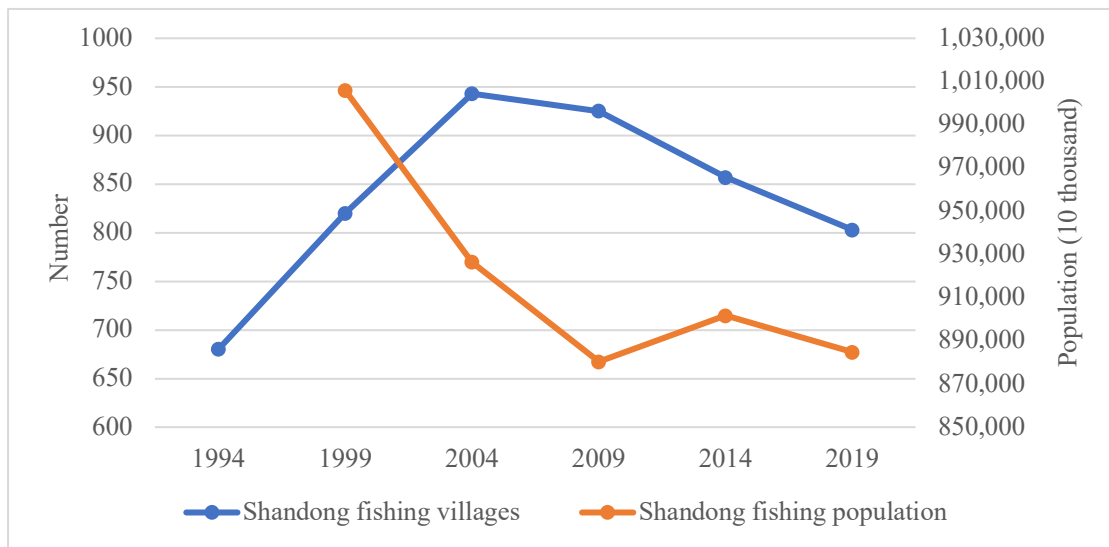


Figure 1.6 Decline trends in fishing villages and fishing population in Shandong Province

Source: Marine Development Bureau

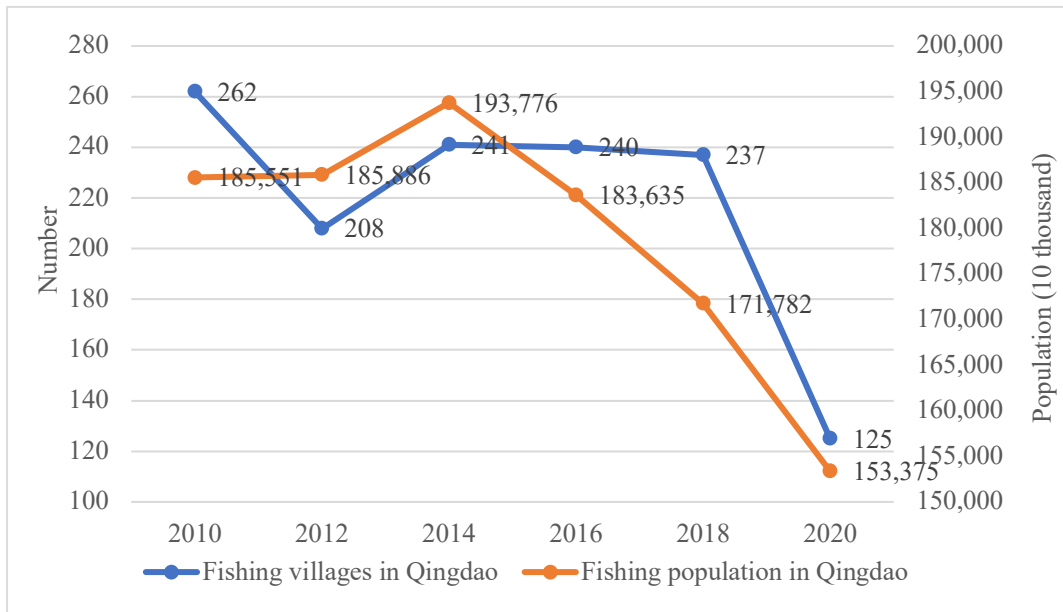


Figure 1.7 Decline trends in the fishing village and fishing population in Qingdao, China

Source: Qingdao Municipal Marine Development Bureau

In 2002, the Chinese fishery population exceeded 20 million for the first time, with 230 scientific research institutions and 3306 scientific and technological personnel <sup>[27]</sup>. In 2007, the Chinese fishery population was 21.115 million, reaching its historical peak <sup>[28]</sup>. In 2019, the Chinese fishery population was 18.282 million, and the number of fishery employees reached 12.917 million, of which 7.021 million were professional employees, accounting for 38.4% of the national fishery population. The number of fishery scientific research institutions has dropped to 87, and the number of scientific and technological activities personnel has dropped to 5165<sup>[29]</sup>.

## (2) Problems in the industrial transformation of coastal fishing villages in Qingdao, China

Fishing village, as the smallest social unit in coastal rural areas, is the main living and productivity place. During the process of new countryside construction and rapid urbanization, a large number of people who originally lived in the village moved to cities. Figure 1.5 also shows that the fishing population has been declining year by year. Because of a lack of theoretical planning guidance, the land usage, spatial layout, and architectural forms are all facing great challenges caused by the industrial transformation in the coastal fishing villages of Qingdao.

## 1.2 Research objective and significance

### 1.2.1 Research objective

Under the background of rural revitalization, industrial transformation is the evitable developing road for improving the living environment, promoting economic prosperity, and sustainable development. Our purpose of this study is to provide a better understanding of recent trends of industrial transformation happening in fishing villages, to research how it accelerating the diversification of organizational structure in fishing villages and the restructuring of fishermen's

employment, improving the current problem of abandoned villages, underpopulation, and aging, improve fishery management and infrastructure in fishing villages, and promote social development in fishing villages (health care, culture, and education). Although the relationship between industrial transformation and the villages' development, has been recognized, it was poorly studied in terms of the impact on fishing village revitalization, especially at the level of fishing villages. In this study, a new composite indicator is proposed to evaluate the impact of industrial transformation on fishing villages based on the "Three F" dimension, namely Fishery, Fishing Village, and Fishermen, and their development process, internal logic, driving forces, and mechanisms have also been explored. Wangjiataihou Village, Dingshiwa Village, Xiyangjiawa Village, and Taixitou Village are located in the most rapid urbanized area, Qingdao West Coast New Area of China, were selected as case studies to empirically investigate the industrial transformation in fishing villages through in-depth interviews and observations. In addition, based on the evaluation results, the current development degree and problems have been analyzed and new developing planning has been proposed. We aim to optimize industrial development and promote the revitalization of coastal fishing villages, including accelerating infrastructure construction, enriching the local culture by diversifying tourism products and activities, and exploring new driving forces and mechanisms to adapt to the new developing patterns of fishing villages.

### 1.2.2 Research significance

The current rapid urbanization in coastal areas of China is leading to many problems like the disappearance of fishing villages, depopulation, abandoned villages, and poor living conditions. The questions of how to preserve and revitalize these fishing villages, how to make local industry flourish, and how to improve fishermen's living environment and income, have become important practical and academic issues. The research on fishing villages in coastal areas with rapid urbanization has both academic and practical implications since fishing villages usually contain tangible and intangible heritage which needs to be protected, and as a place to engage in livelihood activities, local villagers still need to live there.

#### (1) Academic implication

Fishing villages are the basic and important carrier for local social development in coastal areas. Since rural industrial transformation is subject to the different social and economic environments in different areas, it develops along different paths and has different impacts. In addition, less attention has been paid to empirically study the process of village revitalization at the level of fishing villages, especially fishing villages in coastal areas with rapid urbanization. Therefore, in-depth field investigation and micro-level investigations will be more straightforward to measure the effectiveness of industrial transformation and provide practical insights into the practice of industrial transformation in villages.

#### (2) Practical implication

Industrial transformation comes to be an inevitable trend in coastal development. Firstly, it is an urgent need for better fishery development. At present, coastal fishing villages are experiencing unprecedented development under the Chinese Rural Revitalization and New Countryside

Construction, while the theory and practical research are seriously backward. If these coastal fishing villages are transforming blindly, the economic, social, and ecological will be all destroyed even disappear. Therefore, the research on the transformation, including its different models, driving forces, and mechanisms, are significant and own practical implications for local fishing villages. Located in the important transformation and developing time, fishing villages lack of effective guidance and developing references. Thus, this research combines theory and reality together, systematically analysis the impacts brought by the industrial transformation of coastal fishing villages, and proposes optimization strategies and suggestions for better development, which owns practical implications, and can play as guidance and developing reference for local fishing villages.

### **1.3 Research methodology and contents**

#### **1.3.1 Research Methodology**

Rural development is a comprehensive and complicated research, which includes politics, economy, society, and so on. Currently, the study of village construction and planning cannot focus on architecture or planning research, the social and economic transformation should be paid more attention. Because the village's spatial construction reflects social and economic transformation. Therefore, the research of village construction and planning, and transformation research are in the relationship of interaction and interconnection.

This paper deeply researches the impact of industrial transformation on fishing village based on the "Three F" dimension, namely Fishery, Fishing Village and Fishermen, and their development process, internal logic, driving forces and mechanisms have also been explored. On this base, further construction and planning suggestions for new village construction are proposed.

##### (1) Literature analysis method

Through reading domestic and foreign literature, books, and national policy documents, the development model and dilemmas of Qingdao coastal fishing villages were summarized and sorted out. The literature review supplies basic research ideas and theory bases.

##### (2) Scientific field investigation method

This paper takes four typical coastal transformed fishing Villages as research objects, to verify the composite impact evaluation indicator system. Thus, do the evaluation impact of this fishing village and propose further development suggestions. The transformation of the coastal fishing village is a composite research topic, which includes the transformation of the economy, society, and ecology. This paper combines in-deep interviews and a questionnaire method, to establish the evaluation system.

The preliminary investigation revealed that existing statistical data are mainly concentrated at the county or town level, relatively little at the village level. Therefore, to collect data and uncover the process, characteristics, driving forces and mechanism of industrial transformation in the revitalization of fishing villages at the village level, the methods of semi-structured interview, questionnaire surveys and observations are adopted and combined. The initial interviews and investigation were conducted from December 27th to 31th in 2021, and supplementary interviews

were conducted during January 13th to 17th in 2022. Socio-economic data were initially collected through questionnaire surveys and interviews. Household-based questionnaires were distributed to a sample of nearly 10% of all rural households (310 households) in Wangjiataihou Village. The information collected through the questionnaire is mainly about the family size, living area, income, employment structure, living environment. Of the 30 questionnaires distributed to villagers, 15 households engaged in tourism and 15 worked on other jobs as their livelihoods, 25 questionnaires were withdrawn validly. 10 villagers were then voluntarily interviewed for 15–20 min at their homes or at the open space of the village. In order to understand the basic conditions of industrial transformation, the fishing village tourism development, planning and management, changes, and the developing process of Wangjiataihou Village, five cadres, including three main village committees and two town cadres who are in charge of the local economy, were interviewed for 90 min together in the village committee office and town office, and they filled out a questionnaire about socioeconomic and industrial transformation.

(3) Systematic analyses and comprehensive research

The transformation of coastal fishing villages is a systematic project, this research is based on the “Three F” dimension, namely Fishery, Fishing Village, and Fishermen, research the transformation of these three aspects and do the evaluation, thus further proposing suggestions for future transformation.

(4) Guidance based on the

Based on the research of related theories on the industrial transformation of the coastal fishing village at home and abroad, this research puts forward a new composite impact evaluation system for research on industrial transformation, and research on village reconstruction and revitalization paths.

### 1.3.2 Research contents

Background	<b>Chapter One</b> Research background and purposes
Literature Review and Methodology	<b>Chapter Two</b> Related theories and literature review
Current situation	<b>Chapter Three</b> Methodology and Materials
Impact analysis	<b>Chapter Four</b> Research on the current developing situations of coastal fishing villages in Qingdao (Two Conference papers)
Transformation mechanism	<b>Chapter Five</b> The impact of fishery industrial transformation on rural revitalization at the village level: A case study of Chinese fishing villages (SCI Journal paper)
Transformation and spatial evolution	<b>Chapter Six</b> How does industrial transformation enhance the development of coastal fishing villages: Lessons learned from different transformation models in Qingdao, China (SCI Journal paper)
Conclusion	<b>Chapter Seven</b> Industrial Transformation and Spatial Restructuring of Fishing Villages in Qingdao West Coast New Area
	<b>Chapter Eight</b> Discussions and conclusions

Figure 1.8 Research contents



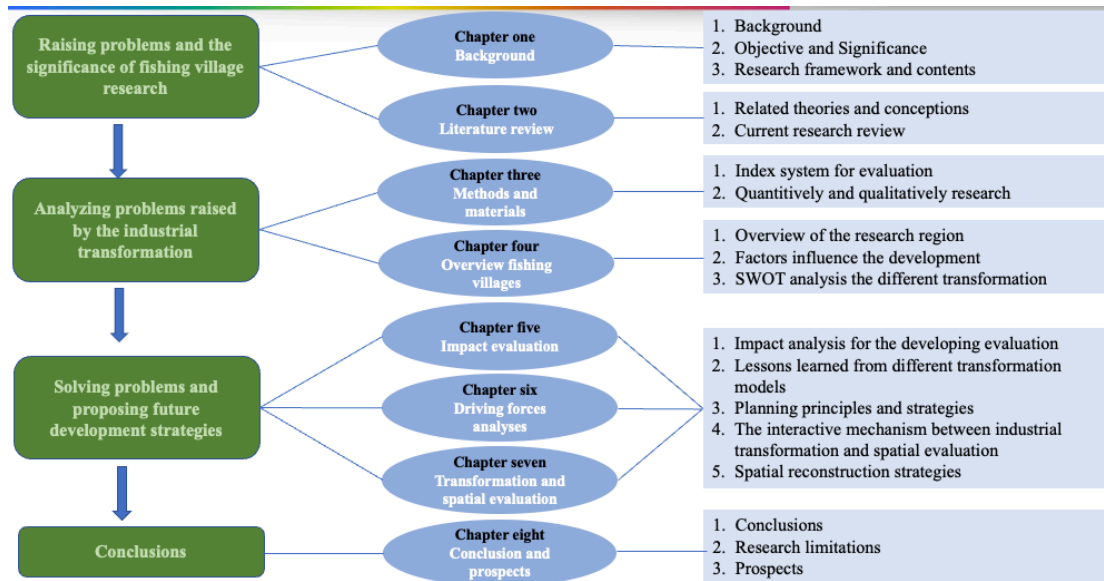


Figure 1.9 Research contents in detail

### 1.3.3 Research innovative points

This research hopes to have creativity in both research ideas and methods, which can be shown in the following:

Coastal

- (1) Under the background of Chinese New Countryside Construction and Rural Revitalization, the transformation of coastal fishing villages has been research from various aspects, such as economic, social, cultural, and so on. In this research, a new composite indicator is proposed to evaluate the industrial transformation.
- (2) Industrial transformation has been regarded as a significant measure for promoting fishery prosperity, fishing village revitalization, and fishermen living conditions, and draws attention in coastal areas since the turn of the new millennium. Although this relationship has been recognized, it was poorly studied in terms of the impact on fishing village revitalization, especially at the level of fishing villages. In this study, a new composite indicator is proposed to evaluate the impact of industrial transformation on fishing villages based on the “Three F” dimension, namely Fishery, Fishing Village, and Fishermen, and their development process, internal logic, driving forces, and mechanisms have also been explored.
- (3) Among rural research, counties have always been considered the critical linkage between rural and urban, and most research are at the county level. In contrast, rural research at the village level, especially at the fishing village level are few and received scant attention. In this research, fishing villages are selected as research objects, to show systematic research of the transformation that happened in coastal fishing villages.

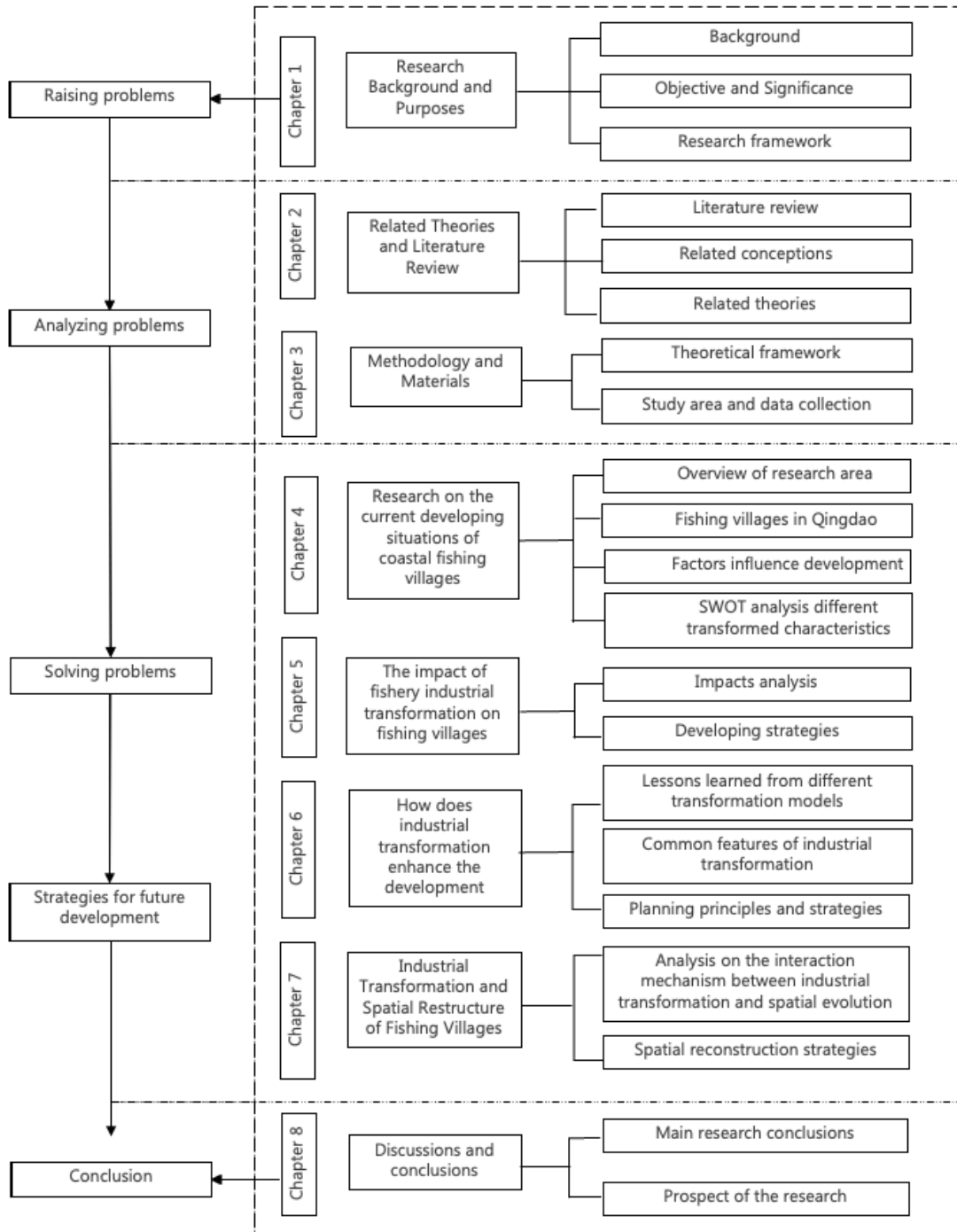


Figure 1.10 Research Framework

## Reference

- [1] Murray, M., & Dunn, L. (1995). Capacity building for rural development in the United States. *Journal of Rural Studies*, 11(1), 89–97. [https://doi.org/10.1016/0743-0167\(94\)00056-F](https://doi.org/10.1016/0743-0167(94)00056-F)
- [2] Ministry of Agriculture and Rural Affairs of the People’s Republic of China, The 13th Five-Year Plan for National Fisheries Development (2016–2020), (2017)
- [3] The 18th National Congress of the Communist Party of China, Report of the 18th National Congress of the Communist Party of China, (2012). Available from: [http://www.gov.cn/ldhd/2012-11/17/content\\_2268826.htm](http://www.gov.cn/ldhd/2012-11/17/content_2268826.htm)
- [4] The 19th National Congress of the Communist Party of China, Report of the 19th National Congress of the Communist Party of China, (2017). Available from: [http://www.gov.cn/zhuanti/2017-10/27/content\\_5234876.htm](http://www.gov.cn/zhuanti/2017-10/27/content_5234876.htm)
- [5] Ministry of Agriculture and Rural Affairs of the People’s Republic of China, The 12th Five-Year Plan for National Fisheries Development (2011–2015), (2011). Available from: [http://www.moa.gov.cn/ztzl/shierwu/hyftz/201110/t20111017\\_2357716.htm](http://www.moa.gov.cn/ztzl/shierwu/hyftz/201110/t20111017_2357716.htm)
- [6] Ministry of Agriculture and Rural Affairs of the People’s Republic of China, The 13th Five-Year Plan for National Fisheries Development, (2017). Available from: [http://www.moa.gov.cn/hdllm/zbft/hyyyzyglzdg/xgxw/201701/t20170106\\_5426228.htm](http://www.moa.gov.cn/hdllm/zbft/hyyyzyglzdg/xgxw/201701/t20170106_5426228.htm)
- [7] The State Council of the People’s Republic of China, Some Opinions on the Development of Financial Services for Agriculture, Rural Affairs and Farmers, (2014). Available from: [http://www.gov.cn/zhengce/content/2014-04/22/content\\_8771.htm](http://www.gov.cn/zhengce/content/2014-04/22/content_8771.htm)
- [8] Department of Planning and Finance of the Ministry of Agriculture and Rural Affairs, Notice on Implementing the Spirit of the Executive Meeting of the State Council and Further Promoting and Increasing the Credit Support for Small, Medium and Micro Agricultural Enterprises to Resume Work and Production, (2020). Available from: <http://nync.ah.gov.cn/public/7021/53884221.html>
- [9] Agricultural and Rural Affairs Department of Anhui Province, Notice on Further Promoting and Increasing Credit Support for Small, Medium and Micro Agricultural Enterprises to Resume Work and Production, (2020). Available from: <http://nync.ah.gov.cn/public/7021/54167791.html>
- [10] People’s Government of Shandong Province, Some Measures on Taking Care of The COVID-19 Epidemic Situation and Accelerating the Resumption of Agricultural Production to Ensure the Stable Production and Supply of Important Agricultural Products in Shandong Province, (2020). Available from: [http://nync.shandong.gov.cn/zwgk/zcwj/zcfg/202002/t20200214\\_3331233.html](http://nync.shandong.gov.cn/zwgk/zcwj/zcfg/202002/t20200214_3331233.html)
- [11] People’s Government of Hainan Province, Ten Measures on Financial Support for Agricultural Production Recovery and Poverty Alleviation of Hainan Province, (2020). Available from: <http://www.hainan.gov.cn/hainan/xjlr/202003/2de519f5f3a74ad9903f526930bd9366.shtml>
- [12] Ministry of Agriculture and Rural Affairs of the People’s Republic of China, Notice of the Ministry of Agriculture and Rural Affairs on Standardizing the Development of Rice and Fisheries Comprehensive Planting and Breeding Industry, (2019). Available from: [http://www.moa.gov.cn/gk/zcfg/nybgz/201904/t20190423\\_6212471.htm](http://www.moa.gov.cn/gk/zcfg/nybgz/201904/t20190423_6212471.htm)

- [13] Ministry of Agriculture and Rural Affairs of the People's Republic of China, Notice on the Action Plan for Poverty Alleviation and Aid to Xinjiang and Tibet Province, (2017) Available from: <http://www.yyj.moa.gov.cn/bjwj/201904/t201904196197432.htm>
- [14] Food and Agriculture Organization, The state of world fisheries and aquaculture 2020, 2020. <http://www.fao.org/state-of-fisheries-aquaculture>.
- [15] Ministry of Agriculture of the People's Republic of China, China Agriculture Yearbook (1980–2019). China Agricultural Press, Beijing, <https://data.cnki.net/yearbook/Single/N2019120061>.
- [16] Song L Q, An analysis of the problem causes by fishermen's transformation in the coastal areas of China [J]. China Fisheries Economy, 2005, (5): 18-20.
- [17] Hu F, Zhong H, Wu C, et al. Development of fisheries in China[J]. Reproduction and Breeding, 2021, 1(1): 64-79.
- [18] Wang, M.X., A study on the upgrading and turning of marine fisheries: taking Zhoushan Archipelago New Area for example [D]. Zhejiang Ocean University, 2017.
- [19] Gascuel D, Bez N, Forest A, et al. A future for marine fisheries in Europe (Manifesto of the Association Française d'Halieumétrie)[J]. Fisheries Research, 2011, 109(1): 1-6.
- [20] Dumreicher, H. (2008). Chinese villages and their sustainable future: The European Union-China-Research Project "SUCCESS". Journal of Environmental Management, 87, 204–215.
- [21] Fabinyi M. The role of land tenure in livelihood transitions from fishing to tourism[J]. Maritime Studies, 2020, 19(1): 29-39.
- [22] Su M M, Wall G, Wang S. Yujiale fishing tourism and island development in Changshan Archipelago, Changdao, China[J]. Island Studies Journal, 2017, 12(2): 127-142.
- [23] Chen J L, Hsu K, Chuang C T. How do fishery resources enhance the development of coastal fishing communities: lessons learned from a community-based sea farming project in Taiwan[J]. Ocean & Coastal Management, 2020, 184: 105015.
- [24] Wang Lijun, Research on the transformation of island fishing villages based on the investigation of Daishan Nanfeng, [D]. Zhejiang Ocean University. 2020
- [25] Shi Lei, Gao Qiang. The connotation, characteristics, and development trend of modern fishery(J). Fishery Economic Research. 2009.3
- [26] Li Yufan. Research on Traditional Settlements and Climate Adaptation in Qingdao Coastal Area[D]. Xi'an University of Architecture and Technology, 2015.
- [27] B.o.F. Fisheries, China Fishery Statistical Yearbook, Bureau of Fisheries, Chinese Ministry of Agriculture, Beijing, 2002 (in Chinese).
- [28] B.o.F. Fisheries, China Fishery Statistical Yearbook, Bureau of Fisheries, Chinese Ministry of Agriculture, Beijing, 2009 (in Chinese).
- [29] B.o.F., China Fishery Statistical Yearbook, Bureau of Fisheries, 2020. Chinese Ministry of Agriculture, Beijing. (in Chinese).

**CHAPTER 2**  
**LITERATURE REVIEW**

- 2.1 Literature review
  - 2.1.1 Revitalization of fishing villages
  - 2.1.2 Transformation of coastal fishing villages research
  - 2.1.3 Research on the coastal fishing village tourism
- 2.2 Related conceptions
  - 2.2.1 Coastal fishing village
  - 2.2.2 The transformation of “Three F”
    - 2.2.2.1 Fishing village transformation
    - 2.2.2.2 Fishery transformation
    - 2.2.2.3 Fishermen transformation
- 2.3 Related theories
  - 2.3.1 The evaluation of industrial construction in fishing villages
  - 2.3.2 Sustainable development
  - 2.3.3 Leisure fishery
  - 2.3.4 Village industrial transformation and village space
- 2.4 Conclusion and discussion

## 2 Literature review

### 2.1 Literature review

The longtime development of the fishery economy and rapid urbanization in the last decade has come at the expense of resource depletion and the decline of fishing villages. Problems, such as the depletion of fishery resources, decline of fishery populations and aquaculture areas, abandoned fishing villages, and water soil pollution are intertwined with each other and increased the vulnerability of these fishing villages. Therefore, the fishing villages have been researched from multiple perspectives by scholars. Under the background of Chinese New Countryside Construction and Rural Revitalization, fishing village revitalization, especially those located in the rapid urbanization coastal areas should draw more attention from academics.

In order to accurately analyze the research on the construction and development of fishing villages, the theme word "fishing village + X" as the subject term and applied in the database of Chinese academic journals, CNKI, and obtain a total of 2413 journal articles related to fishing villages in the Database. Based on the 2413 searched papers, it was found that the research on fishing villages at home and abroad started in the 1930s, and after the initial and gradual development stages, it began to show a rapid growth trend in 2000 and reached its peak in 2011, and then entered a stable development stage and has continued until now. The 532 literatures on the theme term "fishing village + X" in the past ten years is shown in Table 2.1.

Table 2.1 The summary of the literature review following the different themes

Theme	2010	2012	2014	2016	2019	2021	Total
Fishing village + Construction	21	30	23	24	24	20	142
Fishing village + Problems	11	14	12	13	12	15	77
Fishing village + Industry	8	13	12	11	17	15	76
Fishing village + Leisure fishery	1	12	4	5	6	10	38
Fishing village + Ecology	9	12	8	12	12	11	64
Fishing village + Culture	15	20	23	25	24	28	135
Total	65	101	82	90	95	99	532

As shown in Table 2.1, "fishing village+industry" "fishing village+leisure fishery" "fishing village+tourism", these research about the industrial transformation in fishing villages are not many in 2010, but it has attracted scholars' attention and become one of the hot issues in the coastal rural research.

### 2.1.1 Revitalization of fishing villages

Extensive studies and efforts have been focused on exploring the development paths for fishing villages, Yang Zijiang et al. focused on the policies and proposed three developing paths from three dimensions, which can be used as theory support for optimizing fishing villages' development <sup>[1]</sup>. Zhang Xiaopeng et al. summarized three developing strategies from economic conditions, living environment, and community training, based on the new countryside construction strategies submitted by the Chinese central government <sup>[2]</sup>. For the coastal fishing villages' development models, Wu Yingyan et al. focused on the leisure fishing model and divided it into two operation models. On the one hand, for the fishing village whose economical condition is related backward, the development model should be a unified management type. On the other hand, for those villages that own higher development levels or higher urbanization level, the development model should be a self-monitoring type. According to area characteristics, Zhou Zuo et al. proposed a model called "3S", which means sea, sand, and sun <sup>[3]</sup>.

For coastal fishing villages, the future development is decided by its industrial development trend. Therefore, lots of researchers use the industrial structure as their research focus in the study of fishing villages' revitalization. Zhou Xiaojun explored the functions of fishing villages' industrial structure on fishing villages' reconstruction and suggested that the construction of modern fishing villages should base on industrial development. Through the construction of the modern industrial system, a modern coastal fishing village with good ecology, and a beautiful living environment can be established <sup>[4]</sup>. Liu Longteng's research show that industrial structure owns a significant role in marine fishery development and a series of strategies were proposed to develop marine by improving the industrial structure <sup>[5]</sup>. Jiang Zhuyu took Zhejiang Province as an example, systematically researched the results of rural revitalization policy on fishing villages, and further submitted suggestions for future industrial construction readjustment <sup>[6]</sup>.

In recent years, some researchers studied fishing village revitalization all over the world. Lou Xiaobo studied the dilemma of the Japanese fishing village economy and countermeasures, which detailed explain the reasons for fishing village crises in Japanese fishing villages and suggestions for solving them <sup>[7]</sup>.

### 2.1.2 Transformation research of coastal fishing villages

Transformation research of coastal fishing villages is one of the important research directions in coastal rural research. The transformation has been researched from multiple perspectives by scholars. There are mainly three perspectives: the fishery policy transformation, the industrial transformation, and the fishermen transformation.



From the fishery policy transformation point of view, Lin Xianghong submitted suggestions for the current Chinese marine fishery policy. The research shows that marine fishing resource is the bases of fishery development, thus they should protect the present fishing resource, speed up the modern fishing production model, continue to propose the offshore fishery, and improve the policy support for fishery development <sup>[8]</sup>. Liu Jingjing et al. paid attention on policy support for the marine fishery, income during the closed season, and the current fishing subsidy policy <sup>[9]</sup>.

From the industrial transformation point of view, there are many researches dealing with the industrial transformation in rural areas, many attempts to study the different types of rural industrial transformation, the economic evolution in rural areas, the driving mechanism, and the effectiveness of industrial transformation <sup>[9] [10] [11] [12] [13] [14]</sup>. For the coastal rural areas, the industrial transformation of fishing villages in developed countries happened at the same time with urbanization, Lan Rkirkegaard system analyzed marine policies and submitted a series of evaluation index to evaluate the sustainability of fishery development <sup>[15]</sup>. Drius M et al. researched fishing villages, fishermen, and the fishing industry from an ecological point of view, leading to proposals for improving the living environment <sup>[16]</sup>. In fact, one of the most profitable industries in coastal areas is tourism <sup>[17]</sup>. Coastal tourism, as an important transformation pattern that happened in the traditional fishing village, was analyzed by the elements of tourism, tourism in rural areas, and tourism in coastal areas. A coastal tourism development model in rural areas was proposed <sup>[18] [19]</sup>. To ensure the long-term existence of coastal tourism, the balance between economic advantages and socio-cultural and environmental sustainability has been analyzed <sup>[20]</sup>. In order to improve the attractiveness and competitiveness in the face of emerging tourism destinations, Brandao F et al. explained that organizational networks play an important role in the innovation and internationalization of coastal tourism development <sup>[21]</sup>.

The research about fishing village construction in Chinese academic is relatively late <sup>[22]</sup>. Since 2009, the domestic academics start to turn their attention to the coastal fishing villages, their research mainly focuses on three aspects: fishing policy, industrial transformation of fishery, and fishermen job change. The researches on industrial transformation are mainly conducted from the perspective of income demand, labor productivity, human capital, and policy regulations <sup>[23]</sup>. Gao Chaoyong, Wang Shuming et al. pointed out that the transformation from traditional fishing to modern fishing and the realization of industrial transformation in fishing villages are the inevitable consequences of rapid urbanization <sup>[24]</sup>. Sheng Fengming explained that the transformation from traditional fishery to coastal fishing tourism can increase fishermen's employment and income, which has a positive impact on the sustainable development of coastal areas <sup>[25]</sup>. In terms of industrial transformation and upgrading of fishing villages, Xu Wenfei pointed out that traditional fishery should expand the cultivation of value-added species, reduce the intensity of marine fishing, optimize the integration

of marine resources, and expand the scale of operation. In addition, primary and secondary industries should be integrated into the tertiary industry, integrating fishery with the service industry and tourism to extend the fishery industry chain [26]. Considering the problems encountered in fishing village transformation, Qiu Jinjing et al. emphasized that water pollution and lack of technology are the major threats to the fishery, the lack of overall planning and design, and the relatively homogeneous tourism form are the current challenges for developing coastal tourism [27]. Due to a lack of connections among the three industries: marine fishing and fishing farming; fishing products processing; and fishing village tourism, the industrial structures are imbalanced during the transformation process, the whole industrial chain is incomplete and the industrialization level is not high [28]. Nevertheless, fishing village tourism, as a green and newly developing industry, can not only improve fishermen's living standards and village appearance but also drive the development of the regional fishing processing industry and fishing farms [29].

On this basis, the study of industrial transformation and its relationship with the development of fishing villages will provide important technical support for the revitalization of fishing villages. Since rural industrial transformation is subject to the different social and economic environments in different areas, it develops along different paths and has different impacts. In addition, less attention has been paid to empirically study the process of village revitalization at the level of fishing villages, especially fishing villages in coastal areas with rapid urbanization. Therefore, in-depth field investigation and micro-level investigations will be more straightforward to measure the effectiveness of industrial transformation and provide practical insights into the practice of industrial transformation in villages. Based on the research status above, this paper aims to, firstly, explore the impacts of industrial transformation on the revitalization of fishing villages at the village level from the perspective of the "Three F"; secondly, systematically explore the development process of a typical fishing village; thirdly, analyze the internal logic of industrial transformation, the driving forces, mechanisms, and further revitalization strategies. In addition, a case study of Wangjiataihou Village will be conducted to clarify the framework of the industrial transformation. The village is located in one of the most rapidly urbanized coastal areas, Qingdao West Coast New Area.

From the fishermen transformation point of view, Zhou Li researched the women's social status and education level during the fishing village transformation, the results show that the industrial transformation that happened in the fishing village improved women's social status and roles [30]. Cui Feng et al. detailed researched the process of fishermen's transformation and their relationships with the ocean, which showed that the dependent relationship has been weakened by the industrial transformation [31]. During the industrial transformation, lots of fishermen are facing job

transformation. Lin Sijie researched these ocean-logged fishermen and submitted a series of proposals for guiding their job transformation and protecting the basic needs of these fishermen [32].

In recent years, the research on the industrial transformation of coastal fishing villages are not limited in domestic coastal rural areas, lots of successfully transformed fishing villages in foreign countries have also been researched. Shen Mengyi et al. collated, classified, and summarized the relevant documents and laws, and regulations formulated by Taiwan after 1990 for the construction of rich and beautiful fishing villages, identified the problems of demographic changes in the development of coastal fishing villages and changes in the social organization of rural community and provided the reference for the construction of coastal fishing villages in China by drawing on Taiwan's mature fisheries development experience [33]. Wang Hui et al. conducted a study on the construction of coastal fishing villages in South Korea, where a new fishing village construction campaign was first held in Gangwon Province in 1999 to develop a targeted development model according to the different characteristics of different fishing villages, and to make effective improvements in the lives of fishermen by strengthening their developing awareness and upgrading their development techniques [34]. Hu Weiwei studied the five fishing villages in northern Italy, which are mainly built for leisure tourism, and proposed that Chinese fishing villages can learn from the experience of the five fishing villages in integrating the space of mountains, cities, and fields, and according to the characteristics of fishing villages in different regions, reasonably layout the space, architectural combinations and colors of fishing villages to build fishing villages that can represent the regional characteristics of the seashore [35]. Liou Furong studied the construction of fishing villages in Japan with green planning as the main line and suggested that China can learn from the experience of Japanese fishing village construction and complete the development of modern marine fishing villages in China by creating future industries and attracting young people to fishery production [36].

### **2.1.3 Research on the coastal fishing village tourism**

#### **(1) Study on village tourism development strategy**

In recent years, international society has paid close attention to rural development, and governments from different countries have made efforts to actively promote rural development by adjusting rural economic and employment structures, improving taxation policies, improving government public expenditure policies and social security systems, and increasing investment in poverty alleviation in a variety of different ways [37] [38] [39]. Among various rural development strategies, rural tourism shows significant impacts on regional economic, ecological, social, and cultural development. They also create jobs and are stimuli for the local industry, thereby enabling diversification of the local economy, particularly in rural areas, where employment in agriculture may be sporadic or insufficient.

Filippo Randelli et al. showed that has grown in many rural regions worldwide and today it is a stable driver of rural social and economic development, while its rapid development makes a threat to local natural resources and traditional culture <sup>[40]</sup>. The relationship between the development of coastal fishing village tourism and the natural ecology is a two-way coupling relationship, which means that the tourism development is based on the local natural environment and its own influence on the natural environment. At the same time, the natural environment can improve tourism development. Phillips M.R. analyzed the influence of tourism on the coastal environment and got the result that tourism development, especially the tourism infrastructure makes the coastal environment worse <sup>[41]</sup>. The Research of Phinn E. H. et al. shows that a large number of tourists come to coastal areas, and their tourism activities cause serious water pollution and destroy the ecological system along the coastal line and the biodiversity. Researchers also analyze the relationship between coastal fishing village tourism and the development of the economy and culture <sup>[42]</sup>. Snoussi M et al. proposed that the competition between industrial resources and space got worse due to the development of coastal tourism, and it also has impacts on other industrial development in coastal areas. Thus, coastal fishing village tourism should pay more attention to economic improvement and employment, and its coordination development with other industries <sup>[43]</sup>. Clogan C.S researched the change in America coastal economy, it shows that coastal tourism come to be the main industry pattern instead of traditional industry. In order to get better development, the relationship among coastal tourism, marine fishery, boating manufacturing, and marine transportation, should be coordinated development <sup>[44]</sup>. Therefore, scientific planning is the most effective measure for the sustainable development of coastal tourism. Inskeep E. took Phuket, Thailand, Bali, Indonesia, and other six famous tourism sites as research objects, and did systematic research on land usage and management <sup>[45]</sup>. Goodhead T. and Johnson D. summarized a series of problems caused by the development of coastal tourism and proposed countermeasures <sup>[46]</sup>.

## (2) Evaluation of village tourism development

Along with the rapid industrial transformation and coastal tourism development, the evaluation system for coastal fishing village tourism has developed in recent years. Liu Zhiping adopted hierarchical analysis, expert scoring method, to establish Hainan civilized ecological village evaluation system from functional, ecological, ornamental, cultural, social, and economic six aspects, accomplishing the evaluation of the civilized ecological village development level <sup>[47]</sup>. Yu Xinru used hierarchical analysis, established an evaluation index system for low-carbon tourism development in rural areas from four aspects: government, enterprises, rural residents, and tourists, and proposed suggestions for future healthy and sustainable development <sup>[48]</sup>.

Xu Li established a rural tourism evaluation index system from the relationship between ecology and tourism development, did the evaluation on Ba Jiao Village development situation, and proposed suggestions and countermeasures for the current developing problems <sup>[49]</sup>. Wang Liu selected mountain tourism villages as research objects, the evaluation indicators are focused on 18 indicators from the three aspects of the environment, economy, and society <sup>[50]</sup>. The final developing evaluation index was established by a multi factors complex evaluation model. Wei Ling used an expert scoring method and network hierarchy analysis, 24 indicators were determined from four aspects: tourism resources, development foundation, building an evaluation index system for evaluating rural ecotourism development potential and using this system to evaluate 14 towns in Nanchuan District, Chongqing <sup>[51]</sup>.

## **2.2 Related conceptions**

### **2.2.1 Coastal fishing village**

The classification of coastal fishing villages is mainly based on geographical location and production function. According to the geographical location, coastal fishing villages can be mainly classified into island fishing villages, suburban fishing villages, and seaside fishing villages <sup>[52]</sup>. Island villages refer to the villages located on the island, surrounded by the sea, and the dominant industry in these villages is fishery. Suburban fishing villages are villages located in the fringe areas of coastal cities.

The fishing village fishery in a narrow sense covers mainly fishing, aquaculture, aquatic processing industry, and recreational fishing. Marine aquaculture and seawater fishing, the pillar industries of fisheries, fall within the scope of the primary industry of fisheries, aquatic product processing tests the pillar industries of the secondary industry of fisheries, and recreational fisheries tests the tertiary industry of fisheries. The fishing village fishery in a broad sense includes fishing boat repair, fishing equipment manufacturing, fishing capital supply, fishing port construction, fishery products storage, distribution, sales, fisheries research, and other value-added industries related to fisheries, which are more extensive, and these value-added industries also belong to the scope of the fisheries tertiary industry.

With the development of social production, the content of the fishing village fishery is consistent in the corresponding changes, the early fishery is limited to fishing, with the development of society, and the development of captive breeding technology, the fishery includes the content of aquaculture. With the development of industry and technological innovation, the development of fishery in modern society has entered a new period, green development, and ecological priority has become the development goal of the modern fishery, so people began to pay attention to the development of fishing village tourism and other related value-added industries. The sustainable and efficient

development of primary, secondary, and tertiary industries in fishing villages is an important trend in the development of modern fishery. On the basis of developing the primary and secondary industries in fishery, strengthening the transformation and integration of fishery and tertiary industries such as aquatic processing, leisure tourism, scientific research services, etc. is a way to create a new system for the development of modern fishery, and then promote the revitalization of fishing villages.

These fishing villages are experiencing unprecedented urbanization and usually transform into recreational fishery due to the convenient traffic conditions. The seaside fishing villages are villages located nearby the sea; fishery is the long-time dominant industry in these villages. According to the production function, the coastal fishing village can be classified as a fishery-dominated type village, a fishing village tourism-dominated type village, and a balanced development fishing village. Fishery-dominated type of village refers to a village mainly depending on the fishery as its income source. A fishing village tourism-dominated type of village refers to a village developing its village industry through tourism, and such kind of industry transformation is one of the common and successful development models for traditional coastal fishing villages. Balanced-development fishing villages usually own several different industrial development models.

### 2.2.2 The transformation of “Three F”

Based on China's rural revitalization strategy, the “Three Rural Issues”: agriculture, rural areas, and farmers, we defined the fishing village revitalization strategy as the “Three Fishing Issues”, which we called here “Three F”: Fishery, Fishing Villages, and Fishermen. The primary cause of the “Three F” problem is the unsustainability of marine fisheries.

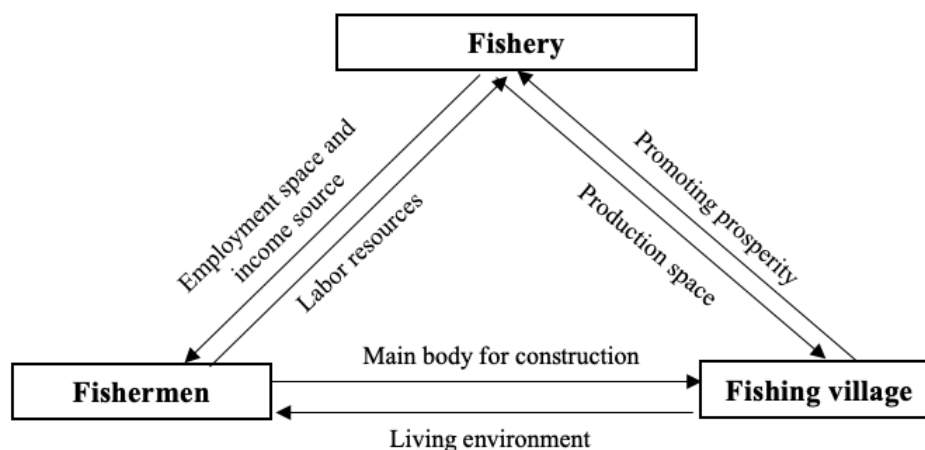


Figure 2.1 Inner relationship among the “Three F”: Fishery, Fishing Village, and Fishermen

The revitalization of fishing villages should take the sustainable development of fisheries resources as the premise, the fishermen as the main body and fishing villages as the landing point. The transformation of the “Three F” is not isolated.

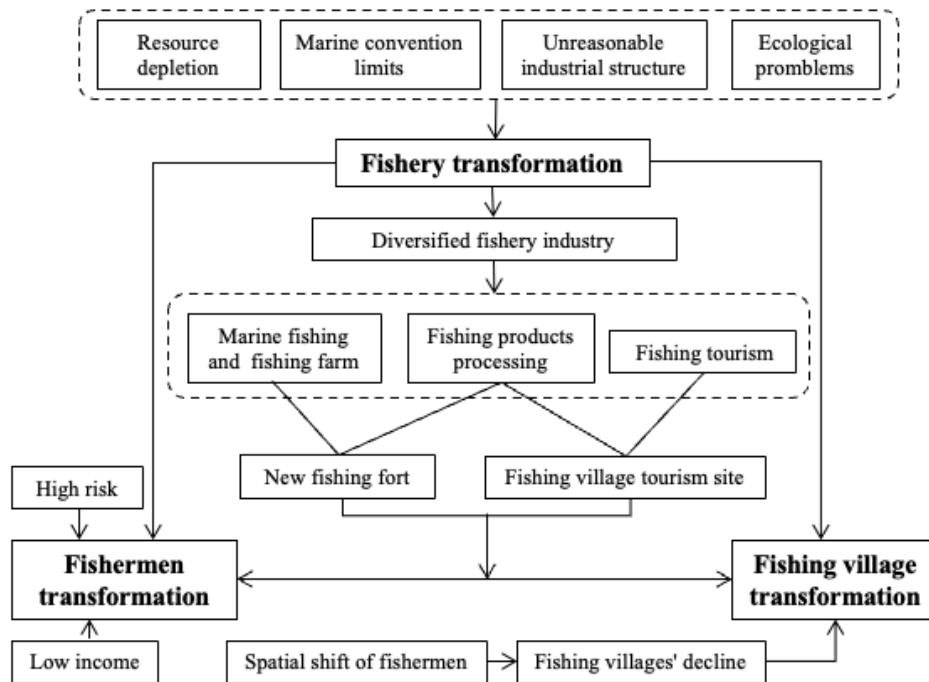


Figure 2.2 The transformation logic of “Three F”: Fishery, Fishing village, Fishermen

There is an internal logical connection as shown in Figure 2.2. In the process of transformation, if marine resources can be used to develop advanced aquaculture, processing industry, and fishing village tourism, the traditional declining fisheries will be transformed into secondary and tertiary industries. Nevertheless, the decline of fishing villages will be further intensified if there are no industrial transformation because, with the rapid urbanization and industrialization, a large number of fishermen will participate in urban employment or become urban residents. The problem of the “Three F” in China is complicated, since it is a problem of "low comprehensive production capacity of fisheries, the backwardness of fishing villages and poverty of fishermen", and these problems are interrelated and mutually constrained.

### 2.2.2.1 Fishing village transformation

The fishing village is a material carrier for fishermen to gain self-identity as well as social identity, and a spiritual home for them to maintain. In the process of continuous social development and change, the socialist economy has been improved and developed, and the main body of the fishing village economy has also been significantly affected, which has developed from the traditional collective economy to the current economic development mode of joint stock cooperative system or multiple ownership systems. Now the main body of the fishing village economy can be divided into four kinds: the first kind is the joint stock cooperative management, which is mainly the

cooperative of small enterprises by fishermen through the combination of labor and capital. The second kind is the fisheries company, farm, aquatic processing plant, and some other company institutions. The third kind is shared cooperatives and professional associations. The fourth type is the individual private units, mainly the family-based structure type <sup>[53]</sup>. In terms of carrying out industrial restructuring, the development of primary, secondary, and tertiary industries in fishing villages is seriously uncoordinated. The primary industry, represented by fishing and farming, has a large share in the process of economic development. The industrial construction of the secondary industry fishing and the development of the tertiary industry service industry is relatively lagging. In the process of fishery development, some fishing villages are not strong in productivity and have an unreasonable economic structure in the process of development transformation. Economic growth is not strong enough, and the contradiction between economic development and resources and the environment is increasingly prominent. The transformation of coastal fishing villages will generally free fishery production from excessive dependence on the sea, further avoiding the impact of marine pollution problems on fishery development, to achieve the sustainable development of the entire fisheries industry chain. This transformation development also affects the transformation of the economy, politics, culture, and other aspects <sup>[54]</sup>.

#### **2.2.2.2 Fishery transformation**

Industrial transformation can be divided into a narrow sense and a broad sense from the perspective of economics. In the narrow sense, industrial transformation is the elimination of industries with high resource consumption and lack of competitiveness, and the replacement of old industries with new industries to complete the upgrading and transformation of industries. In a broad sense, industrial transformation is the transformation of the industrial structure by optimizing the institutional structure, labor force technological innovation, environmental improvement, etc. <sup>[55]</sup>. Marine fishery mainly refers to the marine aquaculture industry, which covers mainly the activities engaged in using marine resources or other related production activities <sup>[56]</sup>. The current transformation of the marine fishery is the gradual shift of marine fishery to diversification and sustainable development by relying on marine organisms for production and development activities, and the upgrading of the industrial chain by avoiding the depletion of marine biological resources. However, the upgrading of the marine aquaculture industry should not only be regarded as a replacement for the traditional marine fishery but also as a change affecting the economy, society, culture, and ecological environment, which is also a reorganization of social systems. The most essential purpose in carrying out the transformation of the marine fishery is to promote the development of marine fishery by the transformation of the development mode, so as to achieve the sustainable use of marine resources. The transformation of the fishery is mainly to get rid of excessive dependence on the sea, further avoid the impact of marine pollution problems, and achieve the sustainable development of the entire fishery industry chain. The transformation of the



traditional fishery will certainly inject new vitality into the current fishery industry and show the developing way to the current fishery industry, thus to change the existing fishery structure and make the fishery industry develop in a sustainable direction <sup>[57]</sup>.

### **2.2.2.3 Fishermen transformation**

Marine fishermen are a special group of people who mainly make their living by fishing at sea, and they are an important force in the marine fishery. The sea is an important production material and livelihood guarantee for their work. In the process of transformation from a traditional fishery to a modern fishery, it must be accompanied by the transformation of traditional marine fishermen to modern fishermen development, along with the transformation of marine development concept, knowledge structure, and operational methods. By analyzing the connotation of marine fishery transformation, the transformation of marine fishermen includes at least the following contents. The first is the process of transformation of traditional marine fishermen to modern fishermen, the original jobs of fishermen, and their work status have not changed, the only change is to the knowledge structure, knowledge concept, work style, and production mode of transformation. The second refers to the transformation of the marine fishery industry into the industry. In this process, marine fishermen expand outward through the original industry or carry out the transformation of the industry, thus leading to the transformation of the original job position. For example, from the primary industry to the tertiary industry service industry. The phenomenon of fishermen's transformation is also a result of the development of modern society, the change of thinking way in the process of social development, which is also a concrete expression of the improvement of human quality and the inner transformation of fishermen <sup>[58]</sup>.

## **2.3 Related theories**

### **2.3.1 The evaluation of industrial construction in fishing villages**

To carry out industrial restructuring is to make relevant adjustments to the initial undesirable industrial structure, thus achieving industrial structure optimization. Industrial restructuring is mainly carried out in the following two situations. One is the industrial structure is lagging the normal demand, and the other is the industrial structure itself is not reasonable. Although the former is also an unreasonable industrial structure, this unreasonable is relative to the demand structure, while the latter refers to the industrial structure itself as not in line with the requirements of the input-output relationship of unreasonable, lack of structural convergence. Therefore, the goals of industrial restructuring in these two cases are different. The former is mainly to realize the advanced industrial structure, while the latter is mainly to realize the rationalization of industrial structure. Therefore, the rationalization and heightening of industrial structure also constitute the main content of industrial institution optimization <sup>[59]</sup>.

- (1) The rationalization of industrial structure means strengthening the mutual coordination ability, improving the association between industries, and promoting the dynamic equilibrium between the industry and the external industrial systems, and the dynamic equilibrium of the internal sectors and components. The transformation of the traditional fishery to the modern fishery, fish processing industry, and leisure fishery is to rationalize these different forms of industries in coordination with each other.
- (2) Heightening industrial structure means that on the basis of the rationalization of industrial structure, the scientific and technological progress, and social labor division should be fully used to make the industrial structure continuously develop in the direction of the development of resources and high value-added output, so as to continuously improve the technical composition of the industry. Therefore, the heightened industrial structure is marked by technological progress and the dynamic process of continuous innovation and development. Specifically, the heightened industrial structure mainly includes the following aspects.

First is the high output structure, which means that in the total output of an industry, the output ratio of high value-added industries increases, the development rate accelerates, and will drive the total output of the whole industry to increase rapidly. Second is the high technological structure, which means that the role of scientific and technological progress in the industrial economy has increased significantly, various new technologies, the application of high technology in the industry is expanding, the economic and technological links between various sectors in the industry are closer, the division of labor in the industry is further deepened, the correlation between various industries is further improved, and the role of technological progress in promoting the industrial economy becomes stronger and stronger. The third is the high level of asset structure, which refers to the rationalization of the asset structure to adapt to economic development. Industrial expansion and contraction have an increasingly strong chain effect. Scale industry economies further increase, presenting large-scale, increasing competition among enterprises, and contributing to the weakening of the cyclicity of industrial structure changes. Fourth is the high employment structure, which refers to the rapid increase in the scale of employment in response to the requirements of the rapid industrial economy, the increasing proportion of skilled workers, and brain workers.

### **2.3.2 Sustainable development**

The World Tourism Organization (WTO), according to the Brundtland Report, defines sustainable tourism as one that satisfies “the needs of tourists and host regions, while at the same time, protects and improves the opportunities for the future”. It focuses on the management of all resources so that all economic, social, and aesthetic needs are met while cultural integrity, main ecological processes, biodiversity, and life support systems will be respected <sup>[60]</sup>. Sustainable rural tourism, in the

economic sense of it, according to Walmsley, is a lifestyle-led business opportunity associated closely with the surging leisure industry and the general rising affluence of the middle-class [61].

### 2.3.3 Leisure fishery

Rapid industrialization and urbanization are inextricably bound up with population migration, urban sprawl, and industrial transformation, all of which can be recognized as the impetus to changing rural industrial patterns, especially in terms of structure and function. There is a strong link between small-scale fishing and tourism has become a global trend mainly caused by the decrease in the income generated by fishing, and the search for economic diversification alternatives by the fishermen [62] [63].

The relationships between small-scale fishing and tourist activities as a source of complementary income for the populations of coastal communities have been increasingly frequent. There is a broad and imprecise conception of the term coastal tourism, an umbrella that includes a large number of marine and land activities. Fishing village tourism can be conceptualized as culture-based tourism: the culture-motivated, -inspired, and -attracted tourism, thus fishing village tourism shares lots of similarities and owns roots with rural tourism. It is characterized by varied functionality: economic, social, cultural, and environmental. The development of fishing village tourism allows local fishermen to transform their work contents, diversify and complement their income, generate new employment opportunities, and reduce pressure on fishing resources.

Yujiale is a distinctive Chinese version of tourism that takes place on islands and in coastal regions. It can be viewed as a particular form of Nongjiale (happy farmer) tourism that has been 129Ming Ming Su, Geoffrey Wall, & Sangui Wang promoted as a means of rural development [64]. Different from the resort developments that line the shores of the Mediterranean and the Caribbean, and also occur in Sanya in Hainan and some other locations in China, Yujiale requires the involvement of fishing families and encourages host-guest interactions through the provision of participatory experiences to tourists, thereby promoting the lifestyles and cultures of fishing communities [65] [66] [67]. Yujiale tourism commonly involves staying in fishing villages, eating homemade seafood meals, participating in fishing activities, and attending the cultural events of fishing communities [68]. Responding to tourists' expectations of acquiring a brief exposure to the life of a fishing family, Yujiale tourism encourages the local fishing families to participate in and benefit from hosting or serving visitors using their existing fishing resources and local knowledge.

Community-based Yujiale tourism, incorporating fishing culture and island lifestyles with tourism experiences, has been developed on many islands in China and has achieved positive outcomes in boosting regional economic development, enhancing island livelihood sustainability, and promoting

and reinforcing island identity. Yujiale tourism has thus been widely acknowledged as a suitable development opportunity for island communities.

#### **2.3.4 Village industrial transformation and village space**

At present, a large number of scholars have conducted correlational studies on rural industries as well as rural spaces in China. Among them, Gu Renxu<sup>[69]</sup> studied the urbanization process of rural areas in southern Jiangsu and argued whether industrialization development played a role in promoting or hindering the urbanization development of rural areas in the region. Li, L.<sup>[70]</sup>, in his book *Rural Settlements: Morphology, Types, and Evolution*, correlated the evolution of rural settlements in the Jiangnan region with their economic development. Wang Yong<sup>[71]</sup> conducted a study on the functions and spatial patterns of rural settlements in the southern Jiangsu region and concluded that the functions of rural settlements in the region have undergone three transformations, and along with this transformation process, the production and living spaces of the settlements have gradually differentiated. Tao Ran<sup>[72]</sup> interpreted the interaction between the industrial development of rural settlements and the morphological evolution of settlements from the perspective of industrial development. Zhang Guoqin<sup>[73]</sup> explored the interaction mechanism between two factors: industry and people, and rural space by three types of villages in southern Jiangsu; and proposed corresponding countermeasures from three levels: rural development path, rural spatial operation mechanism, and rural governance mechanism for the existing problems in the development of villages. Zhang Guoqin et al<sup>[73]</sup> explored three transformation modes of rural space in southern Jiangsu under the development of industrial integration and summarized the problems that exist in rural industry and space in the development of industrial integration. Li Bohua and Zhou Xin et al.<sup>[74]</sup> (2018) conducted a study on the settlement function and spatial structure of Zhang Guying village, emphasizing the influence of industrial development on the settlement function and spatial form, summarizing the evolutionary dynamics of the settlement function, and constructing the reconfiguration mechanism of the settlement space. In recent years, the development of rural tourism in China is flourishing, and the development of tourism in traditional villages is also very rapid, and more and more scholars have studied the spatial evolution of traditional villages in tourism development. For example, Shang Fang<sup>[75]</sup> studied the evolution of the function and form of village space in the context of tourism transformation in Lingshui village and concluded that the transformation of tourism is indirectly influencing the function and form of village space by affecting the users and the ways of using village space. Xi Jianchao et al.<sup>[76]</sup> summarized and analyzed the evolutionary characteristics of village space under tourism development and the mechanism on village space, taking three tourist towns in the Nosanpo tourist area as examples. According to the above studies, most scholars believe that there is an interactive relationship between industry and space in the countryside, and in the study of the interaction between industry

and space, some scholars have focused on the changes in the spatial subject "people" in the industrial development, and there is a mutual relationship between industry, people and space.

## 2.4 Conclusion and discussion

<p><b>Previous research</b></p> <ol style="list-style-type: none"> <li>1. The previous study focused more on <b>large-scale areas</b>, likely, national scale analysis and provincial scale analysis.</li> <li>2. Less attention has been paid to empirically studying the process of village revitalization at the level of fishing villages, especially fishing villages in <b>coastal areas with rapid urbanization</b></li> <li>3. There is <b>no comprehensive research</b> on fishing villages revitalization, the focus is usually on the fishery transformation, fishing village land usage, or fishermen transformation</li> </ol>	<p><b>Research object</b></p> <p>The purpose of this study is to <b>provide a better understanding of recent trends of industrial transformation</b> happening in the coastal fishing villages, including transformation driving forces, mechanisms, impacts, and its relationship with the spatial evolution</p>
<p><b>Questions</b></p> <ol style="list-style-type: none"> <li>1. However, it still remains to be figured out that for the village level, especially the fishing villages located in rapidly urbanized areas, whether the industrial transformation promotes their rural revitalization.</li> <li>2. What are the background driving forces and mechanisms in the process of industrial transformation?</li> <li>3. What is the relationship between the village industrial transformation with their spatial evolution?</li> <li>4. Do the different transformed models have same results?</li> </ol>	<p><b>Research scale</b></p> <p><b>In-depth field investigation</b> and <b>micro-level investigations</b> will be more straightforward to measure the effectiveness of industrial transformation and provide practical insights into the practice of industrial transformation in villages, this research focus on the village level.</p>
	<p><b>Research model</b></p> <p>A <b>new composite indicator system</b> is proposed to evaluate the impact of industrial transformation on fishing villages <b>based on the "Three F" dimension</b>: Fishery, Fishing Village, and Fishermen</p>
	<p><b>Innovative points</b></p> <ol style="list-style-type: none"> <li>1. Based on the <b>fishing village level investigation</b>, a <b>new composite indicator system</b> is proposed to do the impact evaluation.</li> <li>2. Research from the <b>"Three F" dimension</b>, namely Fishery, Fishing village, and Fishermen.</li> <li>3. The researched fishing villages are located <b>in the most rapidly urbanized area</b> in China.</li> </ol>

Figure 2.3 The summary of literature review

## Reference

- [1] Yang Zijiang et al. On the object of modern fisheries public policy-- Analysis of the object of public policy based on fisheries modernization (J) Chinese Fishery Economy, 2019, (6);24-31
- [2] Zhang Xiaopeng et al. Research on the new countryside construction strategy of fishing villages in Guang Zhou. (J) Development of Small Cities & Towns, 2018, (16) : 50-51
- [3] Hua Chen, et al. Study on the Development Model of New Fishing Villages for Ethnic Minorities in the Beibu Gulf Economic Circle—A Case Study of Fishing Village in Jiangpin Town, Dongxing City of Guangxi Province, (J) Corssroad: Southeast Asian Studies, 2018, (2):83-87
- [4] Zhou Xiaojun et al. Ecological revitalization makes fishing village change into fairytale town (J) Country Agriculture Farmers (A) 2018, (07):34-35
- [5] Liu Longteng et al. Implementing the Revitalization of Fishing Villages: Reference, Path and Countermeasures, (J) Ocean Development and Management, 2019, (08): 36-41
- [6] Research on the development of Zhejiang fishing village under the background of rural revitalization strategy, Zhejiang Ocean University.
- [7] Lou Xiaobo, The dilemma of the Japanese fishing village economy and countermeasures, Expert Seminar on China's Fishery Economy, 2015
- [8] Lin Xianghong et al. Research on China's marine fisheries development policy and countermeasure suggestions (J) China's Fishery Economy,2014,32 (05):12-18
- [9] (Liu Jingjing et al. Research on China's marine fishing policy and its transformation direction (J) China's Fishery Economy,2014,32 (02):29-34
- [10] Song, Z.; Liu, L. Spatial Characteristics Analysis for Multifunctional Transition of Suburban Agricultural Areas in Beijing. *Sci. Geogr. Sin.* 2011, 31, 427–433.
- [11] Lin M, Jian J, Yu H, et al. Research on the Spatial Pattern and Influence Mechanism of Industrial Transformation and Development of Traditional Villages[J]. *Sustainability*, 2021, 13(16): 8898.
- [12] Gao C, Cheng L. Tourism-driven rural spatial restructuring in the metropolitan fringe: An empirical observation[J]. *Land Use Policy*, 2020, 95: 104609.
- [13] Li, T.; Zhu, H.; Wang, Z. The cluster characteristics and structural model about rural tourism in South Jiangsu. *Geogr. Res.* 2020, 39, 2281–2294.
- [14] Revitalizing the Rural Economy: The Power to Make a Change. Available online:<https://www.ifpri.org/blog/revitalizing-ruraleconomy-power-make-change> (accessed on 31 October 2019).
- [15] Kirkegaard I R, Gartside D F. Performance indicators for management of marine recreational fisheries[J]. *Marine Policy*, 1998, 22(4-5): 413-422.
- [16] Drius M, Bongiorno L, Depellegrin D, et al. Tackling challenges for Mediterranean sustainable coastal tourism: An ecosystem service perspective[J]. *Science of the Total Environment*, 2019, 652: 1302-1317.
- [17] European Commission (1999). Towards a European integrated coastal zone management strategy: General principles and policy options. Brussels: European Commission.
- [18] Ramos D M B, Costa C M M D. Coastal tourism in rural areas: Development model[J]. *International Journal of Entrepreneurship and Innovation Management*, 2017, 21(3): 242-260.

- [19] Amir A F, Abd Ghapar A, Jamal S A, et al. Sustainable tourism development: A study on community resilience for rural tourism in Malaysia[J]. *Procedia-social and behavioral sciences*, 2015, 168: 116-122.
- [20] Mustapha M, Zulkifli F Z, Awang K W. Enhancing sustainability through implementation of balanced scorecard: a case study of beach resorts[J]. *J Sustain Sci Manag*, 2020, 15(1): 136-147.
- [21] Brandão F, Breda Z, Costa C. Innovation and internationalization as development strategies for coastal tourism destinations: The role of organizational networks[J]. *Journal of Hospitality and Tourism Management*, 2019, 41: 219-230.
- [22] Wang, Y.J., Research on the transformation of island fishing villages based on the investigation of Daishan Nanfeng Fishing village [D]. Zhejiang Ocean University.
- [23] He, Y., Li, X.Q., Literature Review and Prospects of Domestic Marine Fishing Village Construction Studies [J]. *China's Fishery Economy*, 2016, 34 (03): 104-112.
- [24] Gao, C.Y., Wang, S.M., Transformation of marine fishing villages in the context of urbanization-based on domestic research literature[J]. *Chinese Ocean Sociology Studies*, 2016(00):101-109.
- [25] Sheng, F.M., Recreational Fishing Development and Discussion[J]. *Agriculture and Technology*, 2015,35(20): 180.
- [26] Xu W.F., Research on the transformation from traditional fishery to modern fishery (D). Liaoning Normal University. 2018
- [27] Qiu J.J., Zhang Ping, Jiang Huashuai, Liu Yu. The current situation and strategies for fishery transformation in Zhou Shan City[J]. *Anhui Agricultural Science*. 2014,42 (14):4521-4522.
- [28] Su M M, Wall G, Jin M. Island livelihoods: Tourism and fishing at long islands, Shandong Province, China[J]. *Ocean & Coastal Management*, 2016, 122: 20-29.
- [29] He, G.Y., Study on problems and countermeasures of new fishing village construction [D]. China Ocean University, Qingdao, 2008.
- [30] Zhou Li, A Study on the Impact of Fisheries Economic Transformation on Women's Employment in Fishing Villages - A Case Study of Jinshanzui Fishing Village in Shanghai, China *Fisheries Economy* 2015:61-66)
- [31] Cui Feng et al. From homogeneity to diversity: The changing relationship between coastal fishermen and the sea in the process of shifting production and employment (J). *Chinese Ocean Sociology Studies*, 2016:80-86
- [32] Lin sijie, Research on both causes and countermeasure of land-and-sea-lost peasants' re-employment plight---take Xindian town of Xiamen city as example, Fujian Agriculture And Forestry University, 2014
- [33] Shen Mengyi, Liu Yang, Study on the problem of old-age security and countermeasures in fishing and rural areas of Zhoushan (J). *China Rural Economy and Technology*, 2016,27 (09):223-225
- [34] Wang Hui, Yang Meiyi, the state of Zhoushan fishery economy under the decline of resources, problems, and countermeasures (J). *China Rural Economy and Technology*, 2016, 27 (05):42-44
- [35] Hu Weiwei A study of social change in China's island fishing villages (1990-2013): a survey based on the closure of fishing villages in Zhangzhou (J). *Zhejiang China Fisheries Economy*, 2016 (02):26-36

- [36] Liu Furong, Establish the development model for two types of fishing villages, (J). *Guidance for the Fishery*. 2013 (09):21-22
- [37] Liu, C.; Dou, X.; Li, J.; Cai, L.A. Analyzing government role in rural tourism development: An empirical investigation from China. *J. Rural. Stud.* 2020, 79, 177–188.
- [38] Simões, O.; Cruz, C.; Teodoro, A. Understanding the impact of intentions in the adoption of local development practices by rural tourism hosts in Portugal. *J. Rural. Stud.* 2019, 72, 92–103.
- [39] Su, M.M.; Wall, G.; Wang, Y.; Jin, M. Livelihood sustainability in a rural tourism destination-Hetu Town, Anhui Province, China. *Tour. Manag.* 2019, 71, 272–281.
- [40] Randelli F, Martellozzo F. Is rural tourism-induced built-up growth a threat for the sustainability of rural areas? The case study of Tuscany[J]. *Land Use Policy*, 2019, 86: 387-398
- [41] Phillips M R, Jones A L. Erosion and tourism infrastructure in the coastal zone: Problems, consequences, and management[J]. *Tourism Management*, 2006, 27(3): 517-524.
- [42] Pinn E H, Rodgers M. The influence of visitors on intertidal biodiversity[J]. *Journal of the Marine Biological Association of the United Kingdom*, 2005, 85(2): 263-268.
- [43] Pinn E H, Rodgers M. The influence of visitors on intertidal biodiversity[J]. *Journal of the Marine Biological Association of the United Kingdom*, 2005, 85(2): 263-268.
- [44] Colgan C S. The ocean economy of the United States: Measurement, distribution, & trends[J]. *Ocean & coastal management*, 2013, 71: 334-343.
- [45] Inskeep E. *National and regional tourism planning: methodologies and case studies*[M]. Routledge, 1994.
- [46] *Coastal recreation management: The sustainable development of maritime leisure*[M]. Taylor & Francis, 1996.
- [47] Liu Zhiping, Survey and evaluation research of settlement landscape of civilized ecological village in Hainan, (D) Hai Nan University, 2016.
- [48] Yu Xinru. Research on the construction of an evaluation index system of rural low-carbon tourism development level[D]. Anhui Agricultural University, 2014.
- [49] Xu Li, Evaluation research of integration development between rural tourism development and the construction of ecological civilization---taking the village of Bajiao in Linshui County of Sichuan Province as an example, (D) Wuhan University of Science and Technology, 2018.
- [50] Wang Liu, Study on evaluation and planning of mountain eco-tourism village development ---taking Weigan Village, Pingtong Town, Pingwu County as an example.
- [51] Wei Ling, Evaluation and development of rural ecological experience tourism ---Take Nanchuan District of Chongqing as an example, Chongqing University of Technology, 2020.
- [52] Tang Guojian: The "End" of Marine Fishing Villages M Beijing, Ocean Press 2012:135-158
- [53] Yu Zibin,Geng Xiangkui. Exploration of the development path of fishing family in Zhoushan City under the strategy of rural revitalization[J]. *Rural Economy and Technology*, 2019,30(01):92-94.
- [54] Ren Qun-wei. Dilemmas and strategies of rural governance capacity enhancement in the context of rural revitalization--an analysis based on the perspective of village cadres[J]. *Journal of Xingtai College*,2019,34(01):74-80.



- [55] Tong, Chun-Fen, Yan, Yu. A review of research on the social development of fishermen in the transformation of marine fisheries[J]. *Journal of Dalian Maritime University (Social Science Edition)*,2016,15(01):76-83.
- [56] Chen Y. The historical evolution and transformation and development of marine fishing villages in China[J]. *Journal of Zhejiang Ocean College (Humanities Edition)*,2016,33(02):20-28.
- [57] Tong, Chun-Fen, Feng, Hao-Zhou. Exploration of factors influencing health risks of marine fishing fishermen during social transition[J]. *Medicine and Society*,2014,27(05):54-57.
- [58] SOU Jinjin, ZHANG Ping, JIANG Huasai, LIU Yu. Study on the current situation and countermeasures of transformation of fishing villages in Zhoushan City[J]. *Anhui Agricultural Science*,2014,42(14):4521-4525.
- [59] Ma Xuefeng, Research on the dynamic mechanism and dynamic evolution of tourism industry structure upgrading (J) *Xinjiang Social Science*, 2010(5):21-26
- [60] OMT – Organização Mundial do Turismo (1993) *Guia de Desenvolvimento do Turismo Sustentável*, OMT, Porto Alegre.
- [61] Walmsley, D. Rural Tourism: A case of lifestyle-led opportunities. *Aust. Geogr.* 2003, 34, 61–72.
- [62] Chen, C.; Chang, Y. A transition beyond traditional fisheries: Taiwan’s experience with developing fishing tourism. *Mar. Policy* 2017, 79, 84–91.
- [63] Voyer, M.; Barclay, K.; McIlgorm, A.; Mazur, N. Connections or conflict? A social and economic analysis of the interconnections between the professional fishing industry, recreational fishing and marine tourism in coastal communities in NSW, Australia. *Mar. Policy.* 2017, 76, 114–121.
- [64] Wu, M.Y., Pearce, P. L., Huang, K.J., & Fan, T.T. (2014), ‘Gap year’ in China: views from the participants and implications for the future. *Current Issues in Tourism*, 18(2), 158-174. <https://doi.org/10.1080/13683500.2014.946478>
- [65] Chen, M.B., & Ren, G.Y. (2007). Study on the recreational fishery development and countermeasure of Changdao County. *Fisheries Economy Research*, 3, 37-40.
- [66] Su, M.M., Wall, G., & Jin, M. (2016). Island livelihoods: tourism and fishing at Long Islands, Shandong Province, China. *Ocean & Coastal Management*, 122, 2029.<https://doi.org/10.1016/j.ocecoaman.2015.11.014>
- [67] Xiong, T., Feng, Z.B., Qi, L.H., Tu, Y.Q., Shen, Q.F., Cheng, C.M., & Yu, C.Y. (2011). Analysis of influencing factors of Yujiale tourism in Changdao County. *Hunan Agricultural Sciences*, 11, 44-47. (in Chinese)
- [68] Chen, M.B., & Ren, G.Y. (2007). Study on the recreational fishery development and countermeasure of Changdao County. *Fisheries Economy Research*, 3, 37-40. (in Chinese)
- [69] Gu Renxu, Qian Zhigang. A study on the coordinated development of urbanization and industrialization in rural areas of southern Jiangsu[J]. *Agricultural Economic Issues*, 2000(12): 28-32.
- [70] Li L. *Rural Settlements: Form, Type and Evolution* [M]. Nanjing: Southeast University Press, 2007.

- [71] Wang Y, Li GB. The Three Transformations of Rural Settlements in Southern Jiangsu and Their Spatial Form Reconfiguration: The Case of Suzhou[J]. *Urban Planning*, 2011, 35(07): 54-60.
- [72] Tao Ran. Study on Traditional Settlement and Dwelling Form under the Influence of "Karma"[D]. Shandong University of Architecture, 2013.
- [73] Zhang Guoqin. Research on the spatial development of contemporary rural areas in southern Jiangsu under the dual dimension of "people-production"[D]. Southeast University, 2017.
- [74] Li Bohua, Zhou Xin, Liu Peilin, et al. Functional transformation and spatial reconfiguration of Zhang Guying village in the process of urbanization[J]. *Geoscience*, 2018, 38(08): 1310-1318.
- [75] Shang Fang. Study on the Spatial Form and Functional Transformation of Ling Shui Village in the Context of Industrial Transformation[D]. Beijing Institute of Construction Engineering, 2012.
- [76] Xi Jianchao, Wang Xinge, Kong Qinqin, et al. Evolution of rural settlements and land use patterns in tourist areas: a case study of three tourist villages in the Nosanpo tourist area[J]. *Journal of Geography*, 2014, 69(04): 531-540

**CHAPTER 3**  
**METHODOLOGY AND MATERIALS**

### 3.1 Theoretical framework

3.1.1 Inner relationship among the “Three F”: fishery, fishing village, and fishermen

3.1.2 Mechanism of industrial transformation for the revitalization of fishing villages

3.1.3 Evaluation of industrial transformation on the fishing village revitalization at the village level

### 3.2 Research materials and methods

3.2.1 Study area

3.2.2 Data collection and process

3.3 Conclusions

### 3 Methodology and Materials

#### 3.1 Theoretical framework

##### 3.1.1 Inner relationship among the “Three F”: fishery, fishing village, and fishermen

The so-called "three fisheries" problem is a general term for the three problems of fisheries, fishing villages, and fishermen. In the process of the rapid growth of the national economy, some deep-rooted conflicts that have long plagued the economic development of fishery and fishing villages have not been fundamentally solved, while many new situations and problems have arisen due to changes in various environmental conditions inside and outside fishing villages. The issues of the fishery, fishing village, and fishermen are a mutually promoting and constraining whole. The rapid development of fishery not only increases the economic income of fishermen, optimizes their living environment, and improves their quality of life, but also promotes the development and growth of the fishing village economy, optimizes the industrial structure of fishing villages, and provides industrial support for the economic development of fishing villages. The construction of fishing villages not only provides the necessary material conditions for the development of fishery but also improves the quality of fishermen and provides excellent production and living environment for fishermen. As the main body of the fishery economy and fishing village society, fishermen play an important role, and the improvement of fishermen's abilities is very important. On the one hand, the optimization and adjustment of fishery economic structure and the promotion of fishery industrialization must be premised on the improvement of fishermen's ability, on the other hand, the improvement of fishermen's income and the continuous addition of fishery investment provide important economic sources for the construction of fishing villages.

On the contrary, if the fishery industry still stays in the traditional fishery stage for a long time, it is difficult to improve the fishery productivity and fishermen's income, and the construction of new fishing villages will lack financial resources; if the fishing villages are backward, the fishery development lacks the necessary infrastructure guarantee, and fishermen cannot have a good production and living environment; a large number of surplus fishery laborers remain in the fishing villages, which affect the social stability of the fishing villages. Without improving the quality of fishermen, it is difficult to master modern fishery equipment, and it is difficult to support the development of the modern fishery economy and social progress of the fishing villages. It can be seen that solving the problem of "Three Fishing Issues" is a systematic project, which is not only an economic issue, but also a political and social issue, involving natural, economic and social aspects, and cannot be done in isolation. It should be considered and positioned in the context of urban-rural relations (between fishing villages and cities), industrial-fishery relations (between fisheries and industry), and the overall national income distribution pattern from the perspective of social history and national security.

Based on the above explanation and China's rural revitalization strategy, the “Three Rural Issues”: agriculture, rural areas, and farmers, we defined the fishing village revitalization strategy as the “Three Fishing Issues”, which we called here “Three F”: Fishery, Fishing Villages and Fishermen. The primary cause of the “Three F” problem is the unsustainability of marine fisheries. The revitalization of fishing villages should take the sustainable development of fisheries resources as

the premise, the fishermen as the main body and fishing villages as the landing point. The transformation of the “Three F” is not isolated. There is an internal logical connection as shown in Figure 2.1. In the process of transformation, if marine resources can be used to develop advanced aquaculture, processing industry and fishing village tourism, the traditional declining fisheries will be transformed into secondary and tertiary industries. Nevertheless, the decline of fishing villages will be further intensified if there are no industrial transformation because with the rapid urbanization and industrialization, a large number of fishermen will participate in the urban employment or become urban residents, The problem of the “Three F” in China is complicated, since it is a problem of “low comprehensive production capacity of fisheries, the backwardness of fishing villages and poverty of fishermen”, and these problems are interrelated and mutually constrained.

### **3.1.2 Current problems of “Three F”: Fishery, Fishing Village, and Fishermen.**

#### **3.1.2.1 Current problems of fishery**

The fishery is people who rely on fishing waters, through the rational development, use and protection, and increase of aquatic resources, in order to obtain aquatic products that meet the needs of society. Fisheries in a narrow sense include fishing and aquaculture. Fisheries in a broad sense also include the construction and supply of fishing boats, fishing gear, fishing instruments, processing, storage, transportation, and marketing of aquatic products. At present, China's fishery industry is in the transition period from traditional fishery to modern fishery. The words "ecological fisheries", "sustainable fisheries" "pollution-free fisheries" and other modern forms of fisheries, to a certain extent, reflect the direction of fisheries development. At present, the main problems of the Chinese fishery are:

- (1) The current situation of the marine fishery is not optimistic. In the process of industrialization and urbanization, good fishing waters and mudflats are heavily occupied, traditional breeding areas are squeezed, a large amount of industrial and domestic sewage, and sudden pollution accidents damage fish habitats. The ecological environment of fishing waters is seriously polluted and infringed. After the establishment of the new marine system, the international community has become increasingly strict in the management of high-seas fishery resources, and the competition for the development of high-seas resources has become increasingly intense. The rigid constraints of resources and the environment become the main factors that limit the sustainable development of China's fishery.
- (2) Industrial restructuring cannot keep up with the needs of development. China's fishery is still at a certain blindness development stage in the resources and markets, which causes resources and markets regional and structural product surplus, falling prices, and other problems. The promotion and guarantee mechanism of industrial transformation is not yet completed, the development of the aquatic products processing industry lags, the wholesale market construction is backward, and the seed and disease control system and aquatic products quality inspection management system is also not completed. The fishery industrialization level is very low, and the developing process is slow.
- (3) The fishery products lack international competitiveness. Under the conditions of the market economy, fishermen have to face fierce competition in the domestic market and international

market, only those fishermen groups with comparative advantages in resources, technology, and the system can obtain the ability of sustainable development. However, Chinese fishery products lack international competitiveness due to low marketability, shortage of new species and technological innovation, and the problems of quality and pollution.

- (4) The legal system of fishery management needs to be strengthened. China's fishery laws and regulations are not perfect, fishery management Institutional settings are not standardized, the contradiction between the development and protection of fishery resources is increasingly prominent. In addition, due to the financial constraints of China's fisheries law enforcement agencies, it is difficult to improve law enforcement equipment, and the quality of law enforcement officers needs to be further improved, which can significantly affect the fairness and effectiveness of fishery administrative law enforcement.

### **3.1.2.2 Current problems of fishing villages**

Fishing villages refer to a social community that is based on a certain geographical area, with a low level of settlement and fishery as the main source of livelihood. The social and labor structure in fishing villages is relatively simple, with low population density, poor quality, strong homogeneity, low mobility, and strong vernacular culture. Currently, the problems that fishing villages are facing are as follows:

- (1) The economic development is relatively backward. In some fishing villages, productivity is extremely underdeveloped and the economic structure is unreasonable. The crude economic growth mode has not been fundamentally changed, the economic growth based on technology is very low, thus the contradiction between economic development and resources and environment is becoming increasingly prominent.
- (2) The infrastructure conditions are not perfect. Fishing villages are not well planned, with narrow roads and inconvenient traffic. Besides, they lack systematic water supply and power supply facilities. Fishery ports, as the important infrastructure are also not well planned, the communication conditions are poor, energy construction is inadequate, and institutions such as finance, insurance, information services, technology promotion, and inspection and testing are not well planned and constructed.
- (3) The development of social public institutions lags behind. For example, the lack of funding mechanisms for education and skills training in fishing villages. In fishing villages, medical and health resources are seriously inadequate and of low standard, and the construction of the public health system is very weak. Cultural information resources are scarce, and the service system is imperfect, making it difficult to meet the multi-level and multi-faceted spiritual and cultural needs of the fishermen. The social security system has not yet been established, and some fishermen lack basic livelihood security.

### **3.1.2.3 Current problems of fishermen**

Fishermen are the workers who are engaged in the fishery. In the traditional fishery, fishermen mainly operate in breeding, fishing, and fish processing. In modern fisheries, fishermen adopt new theories, new technologies, new materials, and new methods for fishery production, and the products

they provide include not only fishery products but also fishery-based service products, and their goal is to pursue the unification of economic, ecological, and social benefits. Currently, the problems that fishermen are facing are as follows:

- (1) The total fishing labor force is in surplus and difficult to transfer. With the growth of marine fishing capacity, the limited fishing grounds, and fragile fishery resources, the fishing pressure is too great and the resources are in serious decline, which makes the total amount of fishing labor surplus, and it is inevitable for fishing fishermen to switch to other industries. However, most fishermen have low education levels and lack the skills to engage in other industries, coupled with the low degree of industrialization of fisheries, the single economic structure, and the lack of capital, fishermen are difficult to transform into other industries.
- (2) Fishermen's income is growing slowly. Although the income has increased in recent years, it is still difficult to reverse the decline of marine fishery resources in the near future, and the increased cost of fishing production, such as fuel. In addition, with a wide range of fishery-related taxes and fees, multiple management, and duplication of fees, fishermen's burden is still very heavy.
- (3) The economic interests and equal rights of fishermen cannot be effectively maintained. Fishermen have a low bargaining position in the market and have long been passive recipients of fish prices, with little ability to resist risk. Fishermen do not fully enjoy the same rights as urban residents and are unable to benefit from public health, medical care, and education.
- (4) The phenomenon of fishermen losing sea and unemployment is becoming more and more prominent. Due to urban development, port construction, submarine cable laying, beach reclamation, etc., the phenomenon of occupying fishery waters and beaches is increasing year by year, coupled with the implementation of paid use system and the auction system for certain sea areas, which cause a large number of fishermen lost their work. While the corresponding resettlement and compensation measures for fishermen are in shortage, which has led to serious unemployment and seriously damaged the interests of fishermen.

#### **3.1.2.4 The core of "Three F": Fishery, Fishing Village, and Fishermen.**

At present, China's "three fishery" problem can be summarized as "the comprehensive production capacity of fisheries is relatively low, fishing villages are relatively backward and fishermen live in poverty" problem. The fishery is the occupation of fishermen, the fishing village is the production and living community of fishermen, and fishermen are the main body to promote the development of fishery and the construction of the fishing village. Therefore, the "three fisheries" issues, with fishermen as the core, are an interconnected and mutually constrained whole.

- (1) Fishery development is the foundation.

The development of the fishery industry is the foundation for fishermen to increase their income and social stability in fishing villages. On the one hand, the healthy and sustainable development of



fishery can strongly promote the growth of fishermen's income, while strengthening the industrial support for the construction of fishing villages and promoting the development and growth of their economy. On the other hand, economic growth provides financial support for the construction of fishing villages, so that infrastructure can be improved, education, medical and cultural construction can be strengthened, and the production and living environment of fishermen can be optimized. To effectively solve the problem of low comprehensive production capacity faced by the current fishery development, the fishery should ungraded from conventional production to technology-based production, from high energy consumption and inefficiency to ecological energy-saving and efficient growth mode of change. Therefore, it should vigorously improve the innovation and transformation capacity of fishery science and technology, actively promote structural adjustment, develop secondary and tertiary industries, especially support deep processing of aquatic products and logistics industry, and develop resource-saving and environment-friendly fishery, so as to continuously improve the comprehensive production capacity, increase the added value and overall efficiency of fishery, and thus realize the comprehensive and sustainable development.

(2) The construction of fishing villages is the guarantee.

The construction of fishing villages provides guaranteed conditions for the development of fishery and the prosperity of fishermen. The systematic construction of productive infrastructure in fishing villages can provide the necessary material conditions for fishery production, improve the ability of fishery production to resist risks, and effectively promote the healthy and rapid development of the fishery. A sound social security system, public health system, education system, and scientific and cultural information service system in fishing villages can effectively guarantee the basic living rights of fishermen, continuously improve their physical and cultural quality, and lay the foundation for further promoting their income. In the face of the opening of the market, economic growth, and improvement of living standards, the existing infrastructure of fishing villages is far from meeting the needs and largely restricted the improvement of fishermen's quality of life. In the future construction of fishing villages, efforts should be made to change the backward situation of fishing villages and strengthen the infrastructure construction through various channels and means, thus promoting the development of the fishery and improving the quality of life of fishermen.

(3) The overall improvement of the living standard and quality of fishermen is the core

One of the main aims of the development of the fishery and the construction of fishing villages is to solve the problem of poor fishermen's life, to improve the living standard of fishermen, and improve the quality of fishermen. Only when the fishermen's income is raised and the fishermen truly live a prosperous life, then the fishing village society can be stable and the fishermen have the initiative and motivation to build the fishing village. On the one hand, it is necessary to expand the development of the fishery, enhance the added value, and promote healthy and sustainable development; on the other hand, in the situation of surplus fishery labor, it is crucial to reduce the number of fishing fishermen, and transform them into other related industries. In addition, the quality of fishermen should be improved comprehensively. In order to change the fishermen into "educated, skilled, and capable of business", the fishermen training projects should be promoted,

thus providing human resources support for the development of fisheries and the progress of fishing villages.

The decrease of primary sector activities in the economy of rural areas in coastal areas has been accompanied by the presence of industrial and tertiary activities, and a growing interest in tourism. Along with national strategy: the “New Rural Construction” and “Rural Revitalization”, the development of rural tourism has come to be the main tool to favor regional economic diversification.

### **3.1.3 Mechanism of industrial transformation for the revitalization of fishing villages**

The concept of transformation was first introduced in the field of engineering and then used in the field of economic management in the Ministry of Agriculture in the 1980s, such as national economic transformation at the macro level, regional economic transformation at the meso level, and enterprise transformation at the micro level. Industrial transformation can also be understood in both narrow and broad senses. In the narrow sense, industrial transformation means the elimination of backward and declining industries that are not competitive, and the promotion of the cultivation and development of new industries, which simply refers to the process of replacing existing industries with new industries to achieve an improvement in the industrial structure. In a broader sense, industrial transformation contains not only the process of replacing declining industries with new industries and achieving structural improvement but also includes institutional changes, labor transfer, technological innovation, and environmental improvement, which accompany the process of industrial renewal <sup>[1]</sup>. According to the 12th Five-Year Plan for National Fisheries Development formulated in 2011, it is proposed that China should actively promote and develop the construction of new rural areas, leisure fisheries and the fishing culture, utilize existing resources and strengthen integration efforts to diversify the fishery industry. The industrial transformation of fishing villages refers to the transformation of the industry in fishing villages from exploitation and processing of marine resources to diversified industries, so as to improve and avoid a series of development problems caused by the decline of traditional fishery and the depletion of resources. The industry transformation is not only a replacement for traditional marine fishing industry, but more importantly, it is a transformation of the social system, involving every aspects of the whole society, including the economic environment, the legal environment, the social environment, the ecological environment, etc. Figure 4.2 shows the internal logical relationship among the “Three F” and explains the reasons of transformation. The transformation of fishery has an important role in the revitalization of the “Three F”. This paper focuses on the transformation from fishery into fishing village tourism so as to examine the effectiveness of this transformation on the “Three F”.

During the process of revitalizing fishing villages, industrial transformation may generate different feedback and reactions from fishing villages and fishermen, thus affecting the overall development level of the “Three F”. To be precise, industrial transformation can promote economic prosperity and sustainable development, accelerate the diversification of organizational structure in fishing villages and the restructuring of fishermen’s employment, improve the current problem of abandoned villages, underpopulation, and aging, improve fishery management and infrastructure in

fishing villages, and promote social development in fishing villages (health care, culture, and education) shown in Figure 3.1 To summarize, the five core objectives: industry boom, better living environment, affluent life, effective governance, and ecological livability, can be achieved during the transformation process, ultimately leading to the revitalization of fishing villages.

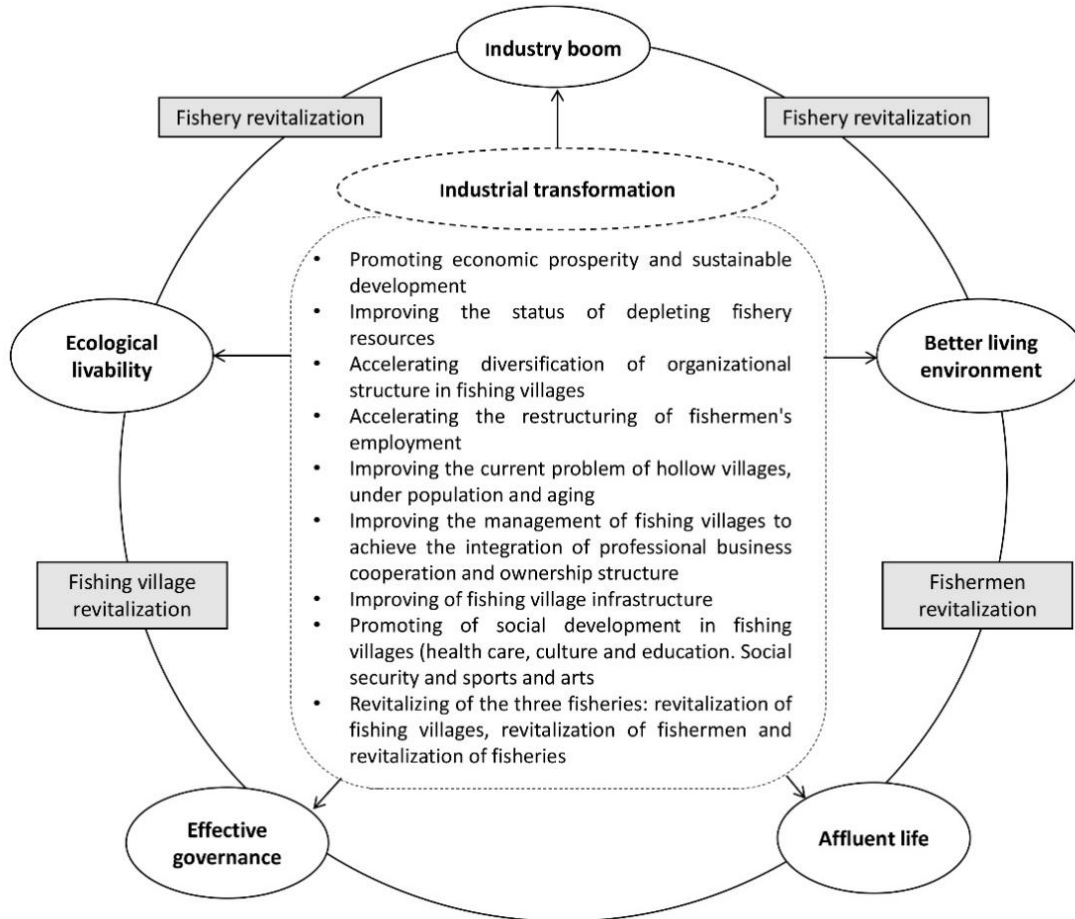


Figure 3.1 The effective logic of industrial transformation in fishing village revitalization

### 3.1.4 Evaluation of industrial transformation on the fishing village revitalization at the village level

As mentioned above, the main objective of revitalizing fishing villages is to revitalize the “Three F”. Based on literature review, field investigation, and discussions with academic experts, this study proposed an index system for evaluating the impact of industrial transformation on fishing villages in coastal areas with rapid urbanization. In this study, we combined expert consultation and the relevant literature review and selected 18 indicators in total Table 3.1, Table 3.2, Table 3.3 and Table 3.4. Table 1 explains the indicators in terms of the logical relationship between industrial transformation and fishing village revitalization Figure 4.2. The indicators are mainly selected from three dimensions, in cooperation with the “Three F” mentioned above. The reasons for selecting the indicators are briefly described below.

1) *Fishery industrial revitalization* Rural recession and transformation, accompanied by urbanization is a global challenge <sup>[2]</sup>. In 2018, the Chinese government implemented rural

revitalization policies<sup>[3]</sup> and further strengthened the value of rural tourism<sup>[4]</sup>. Along with other rural areas, fishing villages are also experiencing such kind of industrial transformation, from primary industry to tertiary industry. Therefore, in this paper, we focus on this type of transformation. In order to evaluate the overall impact of this transformation on the fishery industry, 7 indicators in terms of the industry were selected<sup>[5]</sup>.

- 2) *Fishing village revitalization* Waste-water treatment and garbage treatment can be used to reflect the living environment, while road area ratio, road hardening rate, per capita area of public service, facilitates, health facility ratio and school ratio be the main standard for evaluating village construction condition<sup>[6] [7] [8]</sup>.
- 3) *Fishermen revitalization* depopulation is one of the most important reasons for the decline or even disappearance of fishing villages. Therefore, population, aging index, and fishing population ratio can be used to reflect population structure. And per capita income is the main indicator selected to represent the economic level of fishermen<sup>[9] [10]</sup>.

Table 3.1 Indicators used for evaluating the impact of industrial transformation (from traditional fishery to fishing village tourism) on fishing village revitalization

Goals	Indicators		Explanation	Effect	Weight
Fishery Industrial Revitalization (1/3)	Primary industry (1/6)	Total output value (I1)	Annual output (Yuan)	+	1/24
		Fishing yield (I2)	Annual fishing yield (Ton)	+	1/24
		Mari farming area (I3)	Marine farming area (Hectares)	+	1/24
		Fishing boats (I4)	Numbers of fishing boats	+	1/24
	Tertiary industry (1/6)	Total output value (I5)	Annual output (Yuan)	+	1/18
		Tourism operators (I6)	Numbers of tourism operators	+	1/18
		Tourism visitors (I7)	Numbers of tourism visitors	+	1/18
Fishing Village Revitalization (1/3)	Waste-water treatment (V1)	Numbers of the waste water treatment equipment	+	1/21	
	Garbage treatment (V2)	Numbers of the garbage treatment equipment	+	1/21	
	Road area ratio (V3)	Area of road/total area of the village	+	1/21	
	Village road hardening rate (V4)	Road hardening length/total road length	+	1/21	
	Per capita area of public service facilities (V5)	Area of public service facilities/total population	+	1/21	
	Health facility ratio (V6)	Numbers of health facility/village population	+	1/21	

	School ratio (V7)	Numbers of school/village population	+	1/21
Fishermen Revitalization (1/3)	Population (F1)	Permanent population	+	1/12
	Aging index (F2)	Numbers of the population 65 years /village population	-	1/12
	Per capital income (F3)	Average income of villagers per year (Yuan)	+	1/12
	Fishing population ratio (F4)	Numbers of fishing population/ village population	+	1/12

Note: 1. “+” in the table shows the positive type of indicator. The higher in number suggests better progress in one aspect. 2. “-” shows the negative index. The lower suggests better progress. 3. The measurement unit of the dollar is adopted according to the exchange rate of 6.32 on 1 January 2020.

Table 3.2 Indicators used for evaluating the impacts of industrial transformation (from traditional fishery to fishing products processing) on fishing village revitalization

Goals	Indicators	Explanation	Effect	Weight	
Fishery Industrial Revitalization (1/3)	Primary industry (1/6)	Total output value (I1)	Annual output (Yuan)	+	1/24
		Fishing yield (I2)	Annual fishing yield (Ton)	+	1/24
		Mari farming area (I3)	Mari farming area (Hectares)	+	1/24
		Fishing boats (I4)	Numbers of fishing boats	+	1/24
	Secondary industry (1/6)	Total output value (I5)	Annual output (Yuan)	+	1/12
		Operators (I6)	Numbers of tourism operators	+	1/12
Fishing Village Revitalization (1/3)	Waste-water treatment (V1)	Numbers of the waste water treatment equipment	+	1/21	
	Garbage treatment (V2)	Numbers of the garbage treatment equipment	+	1/21	
	Road area ratio (V3)	Area of road/total area of the village	+	1/21	
	Village road hardening rate (V4)	Road hardening length/total road length	+	1/21	
	Per capita area of public service facilities (V5)	Area of public service facilities/total population	+	1/21	
	Health facility ratio (V6)	Numbers of health facility/village population	+	1/21	
	School ratio (V7)	Numbers of school/village population	+	1/21	
Fishermen Revitalization (1/3)	Population (F1)	Permanent population	+	1/12	
	Aging index (F2)	Numbers of the population 65 years /village population	-	1/12	

	Per capital income (F3)	Average income of villagers per year (Yuan)	+	1/12
	Fishing population ratio (F4)	Numbers of fishing population/ village population	+	1/12

Note: 1. “+” in the table shows the positive type of indicator. The higher in number suggests the better progress in one aspect. 2. “-” shows the negative index. The lower suggests the better progress. 3. The measurement unit of dollar is adopted according to the exchange rate of 6.32 on January 1, 2020.

Table 3.3 Indicators used for evaluating the impacts of industrial transformation (from traditional fishery to modern fishery) on fishing village revitalization

Goals	Indicators	Explanation	Effect	Weight	
Fishery Industrial Revitalization (1/3)	Primary industry (1/3)	Total output value (I1)	Annual output (Yuan)	+	1/12
		Fishing yield (I2)	Annual fishing yield (Ton)	+	1/12
		Marine farming area (I3)	Marine farming area (Hectares)	+	1/12
		Fishing boats (I4)	Numbers of fishing boats	+	1/12
Fishing Village Revitalization (1/3)		Waste-water treatment (V1)	Numbers of the waste water treatment equipment	+	1/21
		Garbage treatment (V2)	Numbers of the garbage treatment equipment	+	1/21
		Road area ratio (V3)	Area of road/total area of the village	+	1/21
		Village road hardening rate (V4)	Road hardening length/total road length	+	1/21
		Per capita area of public service facilities (V5)	Area of public service facilities/total population	+	1/21
		Health facility ratio (V6)	Numbers of health facility/village population	+	1/21
		School ratio (V7)	Numbers of school/village population	+	1/21
Fishermen Revitalization (1/3)		Population (F1)	Permanent population	+	1/12
		Aging index (F2)	Numbers of the population 65 years /village population	-	1/12
		Per capital income (F3)	Average income of villagers per year (Yuan)	+	1/12
		Fishing population ratio (F4)	Numbers of fishing population/ village population	+	1/12

Note: 1. “+” in the table shows the positive type of indicator. The higher in number suggests the better progress in one aspect. 2. “-” shows the negative index. The lower suggests the better progress. 3. The measurement unit of dollar is adopted according to the exchange rate of 6.32 on January 1, 2020.

Table 3.4 Indicators used for evaluating the impacts of industrial transformation (from traditional fishery to balanced industrial model) on fishing village revitalization

Goals	Indicators	Explanation	Effect	Weight	
Fishery Industrial Revitalization (1/3)	Primary industry (1/9)	Total output value (I1)	Annual output (Yuan)	+	1/36
		Fishing yield (I2)	Annual fishing yield (Ton)	+	1/36
		Mari farming area (I3)	Mari farming area (Hectares)	+	1/36
		Fishing boats (I4)	Numbers of fishing boats	+	1/36
	Secondary industry (1/9)	Total output value (I5)	Annual output (Yuan)	+	1/9
	Tertiary industry (1/9)	Total output value (I6)	Annual output (Yuan)	+	1/18
		Tourism operators (I7)	Numbers of tourism operators	+	1/18
	Fishing Village Revitalization (1/3)	Waste-water treatment (V1)	Numbers of the waste water treatment equipment	+	1/21
		Garbage treatment (V2)	Numbers of the garbage treatment equipment	+	1/21
Road area ratio (V3)		Area of road/total area of the village	+	1/21	
Village road hardening rate (V4)		Road hardening length/total road length	+	1/21	
Per capita area of public service facilities (V5)		Area of public service facilities/total population	+	1/21	
Health facility ratio (V6)		Numbers of health facility/village population	+	1/21	
School ratio (V7)		Numbers of school/village population	+	1/21	
Fishermen Revitalization (1/3)	Population (F1)	Permanent population	+	1/12	
	Aging index (F2)	Numbers of the population 65 years /village population	-	1/12	
	Per capital income (F3)	Average income of villagers per year (Yuan)	+	1/12	
	Fishing population ratio (F4)	Numbers of fishing population/ village population	+	1/12	

Note: 1. “+” in the table shows the positive type of indicator. The higher in number suggests the better progress in one aspect. 2. “-” shows the negative index. The lower suggests the better progress. 3. The measurement unit of dollar is adopted according to the exchange rate of 6.32 on January 1, 2020.

## 3.2 Research materials and methods





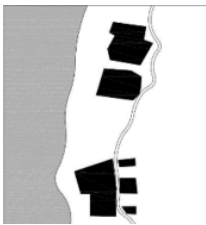

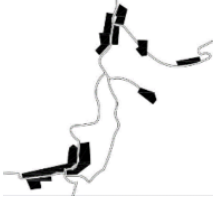
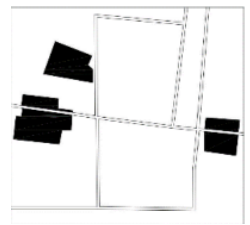
### 3.2.1 Study Area

#### (1) Overview of traditional fishing villages in the Shandong Peninsula

The east of China has a long coastline and island shoreline, which makes our country's marine resources very rich. There are a large number of fishing villages in the coastal areas, such as Wangjiataihou fishing village, Xiyangjiawa fishing village, Taixitou fishing village in Qingdao West Coast New Area. The largest coastal fishing village in China is Chenjia Town Xi Fishing Village and Haixing Fishing Village in Shanghai. As a large marine fishery province, Shandong has obvious advantages in marine location and fishery industry base. Shandong Province is also particularly rich in human resources for developing marine fisheries. There are 137 fishery townships (towns), 2,268 fishing villages, 433,000 fishing households, 1.58 million people in the fishing industry, and more than 2 million people working in the fishing industry in more than 30 cities along the sea<sup>[11]</sup>. In terms of living style, most of the fishing villages in coastal areas of Shandong are in the form of courtyards, represented by seaweed houses, while most of the southern ones are home-based on boats, with food, clothing, housing, and transportation on board. Unlike the various natural types of villages inland, the traditional fishing villages along the coast of Shandong have many unique elements and geographical characteristics Table 3.5. The inland villages each have different regional characteristics, and these characteristics are reflected differently in their spatial planning and layout. For example, in areas where the main landscape is plain, farmland is more widely distributed, and settlements are distributed in a linear pattern along roads with farmland as the core, and the topography has less restrictive conditions for infrastructure construction and engineering, which can actively serve various production activities and has higher development potential. In rural areas with mountainous hills as the main feature, the structure is mostly restricted by the special topography, and the distribution of settlements depends on the mountainous terrain of the area; in rural areas with lake and water network as the main geomorphological feature, the layout of the belt is mostly around the rivers, lakes and other waters in the area, and the rural settlements are denser than other areas. The topography of fishing villages is largely influenced by the adjacent marine factors, and their production and construction are mostly dependent on the adjacent marine resources. At the same time, the spatial layout of such villages is very restricted in Qingdao Polytechnic University's Master's degree thesis in Construction. The spatial layout of these villages is very restricted, and they need to be planned and built according to local conditions. For Shandong Peninsula, fishing villages are different from other inland fishing villages, which are widely researched, thus the research of fishing villages has more research value.






Table 3.5 The comparison between traditional fishing villages and inland fishing villages in Shandong

	Coastal fishing village	River basin area	Mountainous and hilly areas	Plain area
Terrain Type	Complex terrain and mountainous terrain sea	Gentle terrain and rivers interspersed	Terrain undulation	The terrain is gentle, the landscape is single
Climate	Significantly influenced by the ocean	Pleasant climate	Significantly influenced by the mountain	Pleasant climate
Agriculture Type	Marine fisheries, marine farming	Plantation	Forestry, animal husbandry	Plantation
Site Selection	Coastal shelter from the wind	Along rivers	Back along the mountain	Along the transportation lines
Satellite schematic Diagram				
				

Qingdao was once a fishing village on the southeastern shore of Jiaozhou Bay, which has a history of more than 600 years. Qingdao has a long and winding coastline with many islands and bays, both in the Yellow Sea offshore and in Jiaozhou Bay. There are many marine fishing villages with a large fishing population. For a long time, local villages build houses according to their ancestral experiences and local natural conditions and traditions, and the house layout and construction methods have been passed down from generation to generation without much change. The layout and construction methods have been passed down from generation to generation without much change. Like all northern villages, most of the buildings are triple or quadruple courtyards. The layout and use of houses follow the patriarchal family ethical hierarchy of "the north is honored, the two compartments are second, and the seat is the guest". The principle of patriarchal family ethical

hierarchy. For the village industry, the traditional fishery is the dominated village industry for a long time, and has been transformed in the recent two decades.

Table 3.6 The classification of fishing villages in the coastal fishery area

District	Village classification	Characteristics	Typical spatial distribution
Coastal fishery area	Coastal fishing village	(1) The distance to the coastline is less than 2km. (2) The industry is mainly fishery, and the villagers have the highest per capita income level. (3) The living condition of the village is good, the environment is humid.	
	Village in the center of the town	(1) It is close to the town center and basically located in the plain area. (2) The industry is mainly upstream and downstream fisheries, and the villagers' per capita income level is high. (3) The village has good living conditions and convenient transportation.	
	Village around the town	(1) It is far from the town center and the terrain is mainly hilly. (2) The industry is mainly traditional farming, and the villagers' per capita income level is low. (3) The village has poor living conditions and inconvenient transportation.	

## (2) Overview of the research area

Located at the southwestern end of the Jiaodong Peninsula, and belonging to the blue economic zone of the Shandong Peninsula, Qingdao West Coast New Area was approved by the State Council to be the ninth national new zone in China in 2014. The total land area is 2127 km<sup>2</sup>, the sea area is more than 5000 km<sup>2</sup>, the beach area is 83 km<sup>2</sup>, there are 21 islands, and the coastline is 282 km.

There are 26 towns and districts, among them 520 villages belong to the urban areas, 636 villages are located in rural areas and there are 58 fishing ports. According to China city Statistics Yearbooks and Qingdao Statistics Yearbooks, the GDP increased rapidly from 1003.17 million CNY in 2010 to 3554.44 million in 2020. Rapid urbanization and economic development have brought a transformation of local fishing villages.

In this paper, four typical coastal fishing villages located in Qingdao West Coast New Area were selected as our case study area in Figure 3.2, they are Xiyangjiawa village (FT), Taixitou village (DDT), Dingshiwa village (FPPT), Wangjiataihou village (FVTT). Because of the unique locations and the rapid transformation, the comparative studies of four different typical fishing villages in this area, have an important academic and practical significance to explore how industrial transformation changes the coastal fishing villages.

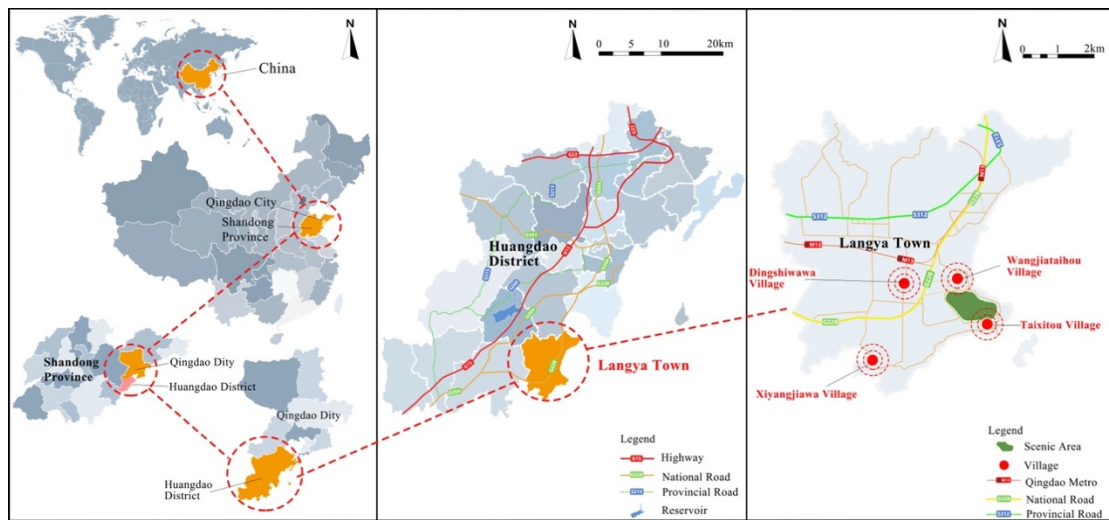


Figure 3.2 Location of four villages in China

The main reasons for choosing these four villages are as follows. First, all these villages are once traditional fishing villages and faced a comprehensive developing crisis, such as the low-living levels, abandoned villages, population aging, ecological deterioration, and a variety of social contradictions. Developing transformation is an urgent requirement for solving these problems. Second, these four villages represent four different developing transformations, which are the main transformation models in coastal rural areas. Third, each of the industrial transformations that happened in these four villages owns obvious positive impacts on fishing village revitalization and achieve great success in economic development, social harmony, and environmental protection. Therefore, the experiences and conclusions summarized by the analysis of these four fishing villages' industrial transformations are particularly informative to answer our research questions.

### 3.2.2 Data collection and process

The preliminary investigation revealed that existing statistical data are mainly concentrated at the county or town level, while there is a lack of statistical data at the village level. Therefore, this research analyzed both secondary data sourced from government documents and primary data

collected through interviews with local government employees and residents at a rural destination in China, Figure 3.3.

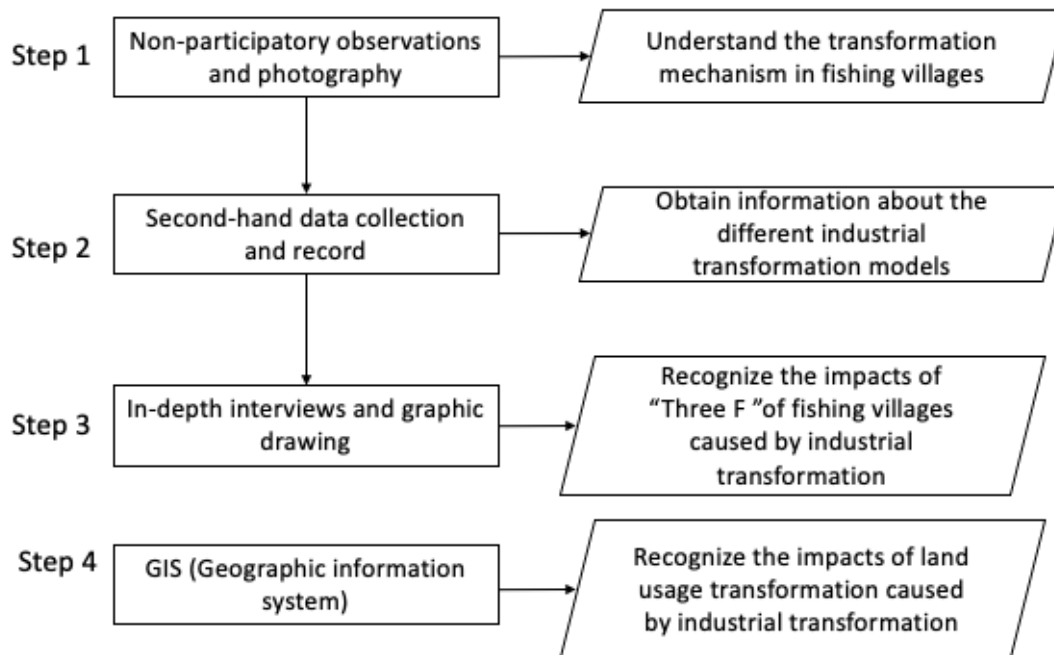


Figure 3.3 The data collection and processing

We conducted field research three times, from December 27th to 31th in 2021 and from January 13th to 17th in 2022, respectively and supplementary interviews were conducted from July 20th to 24th in 2022. A combination of research methods, including non-participatory observations, in-depth interviews, historical documents, and secondary data, data, such as statistics from government departments and relevant policy texts, were applied to the research. In order to understand the basic conditions of industrial transformation of the four fishing villages, planning and management, changes, and the developing process, government cadres, including main village committees and town cadres who are in charge of the local economy were initially interviewed in the village committee office and town office in each village. The subjects of these interviews were as follows: 1) the social, economic, and cultural development of these four villages; 2) the fishing village industry development policies; 3) the assistance or support provided by the government. Secondly, a “face-to-face” interview method was adopted<sup>[12]</sup>. During the three field investigations, the researchers stayed at a family-run hotel (“Yujiale” in Chinese) and hotels in Langya town. The observation research was thus conveniently conducted. A total of 128 in-depth interviews were conducted in the four different transformation villages. There are 105 valid interviews from villagers, which take nearly 10% of all the village households. Socio-economic data were collected through questionnaire surveys and interviews, which mainly related to the family size, living area, income, employment structure, and living environment. In order to understand the current living environment, the question about summer cooling methods, winter heating methods, the energy usage types and the cost for thermal environment have also been investigated in the investigation. Besides, in order to reveal the background driving forces and transformation mechanism, some open questions were

also designed, for example, “What is your main source of household income before the current work?” “What drives you to change your original work?” “Through what channel did you initially change your work?” “Do you think the current income level of your family is significantly higher than you involved in the current work?” “What do you think are the most important factors for the realization of the village revitalization?”, all of which showed in Appendix. Additionally, based on the GIS technology, the land usage transformation was analyzed by visual interpretation of historical color aerial photographs taken in 2000, 2010 and 2020, these were obtained from google earth and local government.



Figure 3.4 The interview with village committee members and the village secretaries

The preliminary investigation revealed that existing statistical data are mainly concentrated at the county or town level, and relatively little at the village level. Therefore, to collect data and uncover the process, characteristics, driving forces, and mechanism of industrial transformation in the revitalization of fishing villages at the village level, the methods of a semi-structured interview, questionnaire surveys, and observations are adopted and combined. The initial interviews and investigation were conducted from December 27th to 31th in 2021, and supplementary interviews were conducted from January 13th to 17th in 2022. Socio-economic data were initially collected through questionnaire surveys and interviews. Household-based questionnaires were distributed to a sample of nearly 10% of all rural households. The information collected through the questionnaire is mainly about the family size, living area, income, employment structure, and living environment. For example, in Wangjiataihou Village, of the 30 questionnaires distributed to villagers, 15 households engaged in tourism, and 15 worked on other jobs as their livelihoods, 25 questionnaires were withdrawn validly. 10 villagers were then voluntarily interviewed for 15–20 min at their homes or at the open space of the village. In order to understand the basic conditions of industrial transformation, the fishing village development, planning and management, changes, and the developing process of the Village, cadres, including three main village committees and two town cadres are in charge of the local economy, were interviewed for 90 min together in the village committee office and town office and they filled out a questionnaire about socioeconomic and industrial transformation.

Table 3.7 Interviewees and the core content of the interview for the four villages

Position of Respondents	Contents	Number of Respondents
Past and current secretaries and directors of villages	The village development process; The general information about the village's industrial structure, income, infrastructure conditions, and local living environment.	12
Village committee members	Key events and timelines in different development stages; Cognition of industrial transformation happened in villages; General information about the village: infrastructure situation, village income, villagers' living conditions, village population situation, etc.	8
Town cabers	Governmental policies on village transformation; Overall development status of local fishing villages; Governmental functions on local industrial transformation; General thought and the development process of the four different transformed fishing villages etc.	3
Villagers	Overall understanding of village development; Cognition of industrial transformation in fishing villages; General information on villagers' living conditions, income, etc.	105

To ensure an easy and unified comparison of different data, we eliminate the units of measurement for data followed by positive or negative impact-oriented sequential rules. All normalized data have values between 0 and 1, using the common Min-Max feature scaling formula as follows:

$$\text{For positive values: } u_{ij}' = \frac{u_{ij} - \min(u_i)}{\max(u_i) - \min(u_i)}$$

$$\text{For negative values: } u_{ij}' = \frac{\max(u_i) - u_{ij}}{\max(u_i) - \min(u_i)}$$

Where  $u_{ij}$  is an original data value of  $i_{th}$  variables in  $j_{th}$  year;  $u_{ij}'$  is a normalized data value;  $\max(u_i)$  and  $\min(u_i)$  means the maximum and minimum data value of all  $i_{th}$  variables in years. Then the comprehensive evaluation method was adopted, and the formula was as follows:

$$\begin{aligned} \text{FVR} = & \text{Ind} \left( \sum_{j=1}^4 u_{ij}' * w_i + \sum_{j=1}^3 u_{ij}' * w_i \right) * w_{\text{ind}} + \text{Vil} \left( \sum_{j=1}^7 u_{ij}' * w_i \right) * w_{\text{vil}} \\ & + \text{Men} \left( \sum_{j=1}^4 u_{ij}' * w_i \right) * w_{\text{men}} \end{aligned}$$

### 3.3 Conclusions

In Chapter 3, research methodology and materials. Firstly, the theoretical framework was established based on the analyses of the Inner relationship among the “Three F”: fishery, fishing village, Current problems of “Three F”, and the Mechanism of industrial transformation for the revitalization of fishing villages. Secondly, a new composite indicator is proposed to evaluate the impact of industrial transformation on fishing villages based on the “Three F” dimension: Fishery, Fishing Village, and Fishermen, and its development process, internal logic, driving forces, and mechanisms have also been explored. Thirdly, we detailed to illustrate the process of data collection and processing, and the related formula. In order to analyze the background driving forces and the transformation mechanism of these four different types of industrial transformations, the questionnaire and interview questions were designed and the methods for got these information were also illustrated in this chapter.

## Reference

- [1] Chen, Y., The history evaluation, and transformation of fishing villages in China[J]. *Journal of Zhejiang Ocean University (Humanities Science)* 2016, 33(2): 20-28.
- [2] Sheng, F.M., Recreational Fishing Development and Discussion[J]. *Agriculture and Technology*, 2015,35(20): 180.
- [3] Liu Y, Li Y. Revitalize the world's countryside[J]. *Nature*, 2017, 548(7667): 275-277.
- [4] Qiu J.J., Zhang Ping, Jiang Huashuai, Liu Yu. The current situation and strategies for fishery transformation in Zhou Shan City[J]. *Anhui Agricultural Science*. 2014,42 (14):4521-4522.
- [5] Su M M, Wall G, Jin M. Island livelihoods: Tourism and fishing at long islands, Shandong Province, China[J]. *Ocean & Coastal Management*, 2016, 122: 20-29.
- [6] He, G.Y., Study on problems and countermeasures of new fishing village construction [D]. China Ocean University, Qingdao, 2008.
- [7] Chen, Y., The history evaluation and transformation of fishing villages in China[J]. *Journal of Zhejiang Ocean University (Humanities Science)* 2016, 33(2): 20-28
- [8] Liu Y, Li Y. Revitalize the world's countryside[J]. *Nature*, 2017, 548(7667): 275-277.
- [9] Liu, Y.S., Yang, Z., Challenges and countermeasures for beautiful countryside construction in China. *J. Agric. Resour. Environ.* 2015,32, 97–105.
- [10] Guo, Z., Sun, L., 2016. The planning, development and management of tourism: the case of Dangjia, an ancient village in China. *Tour. Manag.* 56, 52–62.
- [11] Wang Xiyuan. Study on the development strategy of marine ecological fishery in the Blue Economic Zone of Shandong Peninsula[D]. China Ocean University, 2013.
- [12] Su, M.M.; Geofffrey, W.; Wang, Y.A.; Jin, M.J. Livelihood sustainability in a rural tourism destination—Hetu Town, Anhui Province, China. *Tour. Manag.* 2019, 71, 272–28



**CHAPTER 4**  
**CURRENT DEVELOPING SITUATION RESEARCH**

- 4 Current development situation research
  - 4.1 Overview of the research area
    - 4.1.1 Overview of the Qingdao New Area
    - 4.1.2 Overview of the research area: Langya Town
  - 4.2 Overview of fishing villages in Qingdao New Area
    - 4.2.1 Distribution characteristics of fishing villages
    - 4.2.2 Classification of development types for coastal villages
    - 4.2.3 Developing the history of villages
    - 4.2.4 Cultural characteristics of the villages
    - 4.2.5 Main problems of villages during industrial transformation
    - 4.2.6 Main reasons for fishing villages' transformation
  - 4.3 Factors influence the fishing villages' development
    - 4.3.1 Fishery factors
    - 4.3.2 Fishing village factors
    - 4.3.3 Fishermen
  - 4.4. Analysis of different transformed characteristics based on the SWOT analysis method
  - 4.5 Conclusion and discussion

## 4 Current developing situation research

### 4.1 Overview of the research area

#### 4.1.1 Overview of the Qingdao West Coast New Area

In 2012, Qingdao West Coast New Area was established, which combined the original Huang Dao district and Jiao Nan City. In 2014, West Coast New Area (Huang Dao New District) was approved by the State Council to be the ninth national new zone. The total land area is 2127 square kilometers, the sea area is more than 5000 square kilometers, the beach area is 83 square kilometers, and there are 21 islands, the coastline is 282 kilometers.

West Coast New Area is located at the southwest end of Jiaodong Peninsula, in the blue economic zone of Shandong Peninsula, and belongs to the "Qingdao-Weifang-Rizhao town group". It is in the west of Qingdao city, in the coastal blue economic development zone of Qingdao city, bordering the Yellow Sea in the southeast, adjacent to Jiaozhou city in the north, and connected to Weifang city in the west Figure 4.1. It is a strategic point for the country to extend from land area to marine economy and promote the integration of land and sea.

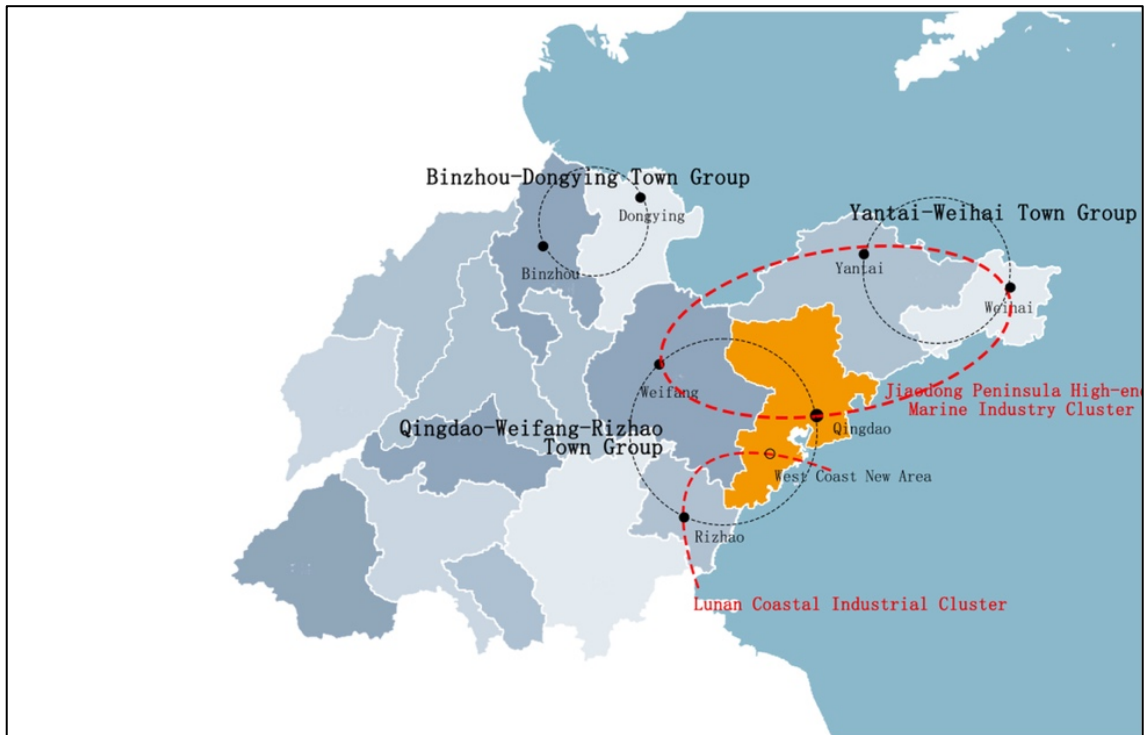


Figure 4.1 The location of Qingdao West Coast New Area

Based on the advantages of location, policy, and financial support, Qingdao West Coast New Area is experiencing unprecedented rapid development. Along with the rapid urbanization in this area, the rural areas have also developed rapidly. According to the Towns and Villages Level Planning in West Coast New Area, Qingdao, made by the government shown in Figure 4.2, the rural area was planned according to the population and their regional characteristics. According to the data from the Bureau of Statistics of the West Coast New Area, the gross value of agriculture, forestry, animal husbandry, and fishery in the region was 13.86 billion yuan by the end of 2018. As shown in Figure

4.2, the share of fishery in the agricultural GDP of the West Coast New Area is the largest, accounting for nearly 70%. Compared with other rural areas in the inland region, where the traditional combination of grain and livestock is used in agricultural production, the Qingdao West Coast New Area has a unique shoreline resource, and the offshore fishing and mariculture industries are gradually forming special industries Figure 4.2.

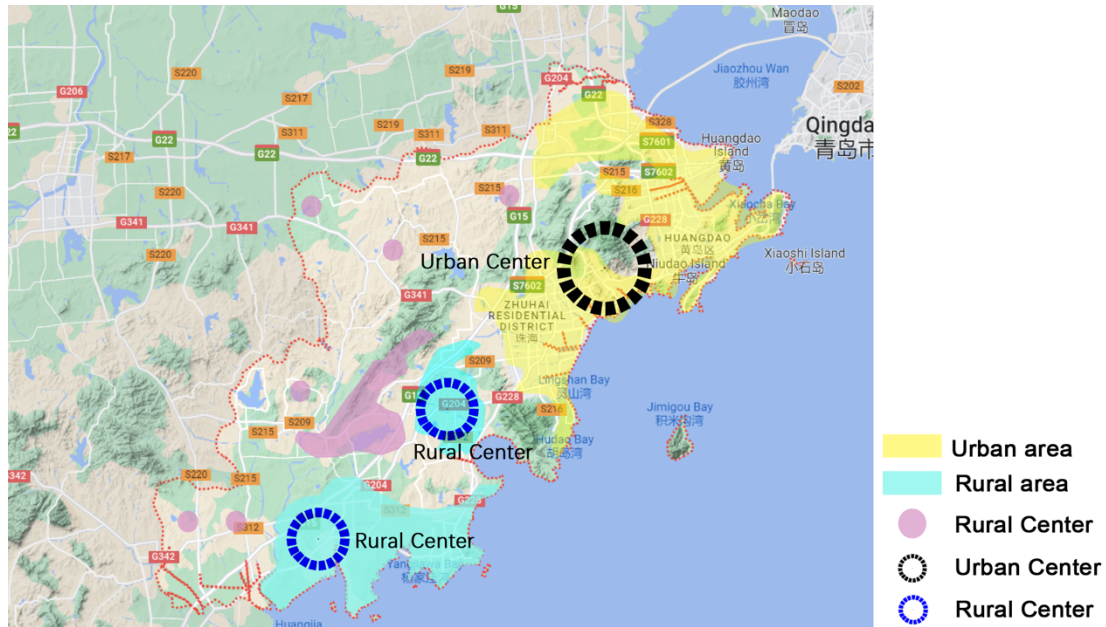


Figure 4.2 Towns and Villages Level Planning in West Coast New Area, Qingdao

Source: Master Planning West Coast New Area, Qingdao, 2017-2035

Qingdao West Coast New Area has 26 towns and districts, among them 520 villages belong to the urban areas, and 634 villages are located in rural areas. There are 58 fishing ports and the fishing villages are all located near these fishing ports Figure 4.4. Compared with other areas in Qingdao, the urbanization rate in the new area is the highest and the development speed is the fastest. A large number of fishery ports are located in Qingdao West Coast New Area, with 8 fishing ports and 36 concentrated mooring points along the coast, among them one is a central fishing port, one is a first-class fishing port, and others are fishing ports not graded.

Figure 4.3 shows that in Qingdao, the village number in West Coast New Area is very high, which means the rural development of this area has significant meanings to the whole development level of Qingdao. Along with the rapid urbanization of this area, the development speed of this rural area will be unprecedentedly rapid. The village's economic structural transformation will become an unstoppable trend. Different from the wide rural area in China, the economic structure owns its unique characteristics, traditional fishery as the long-time dominated village industry, therefore, comes to be the first transformation industry.

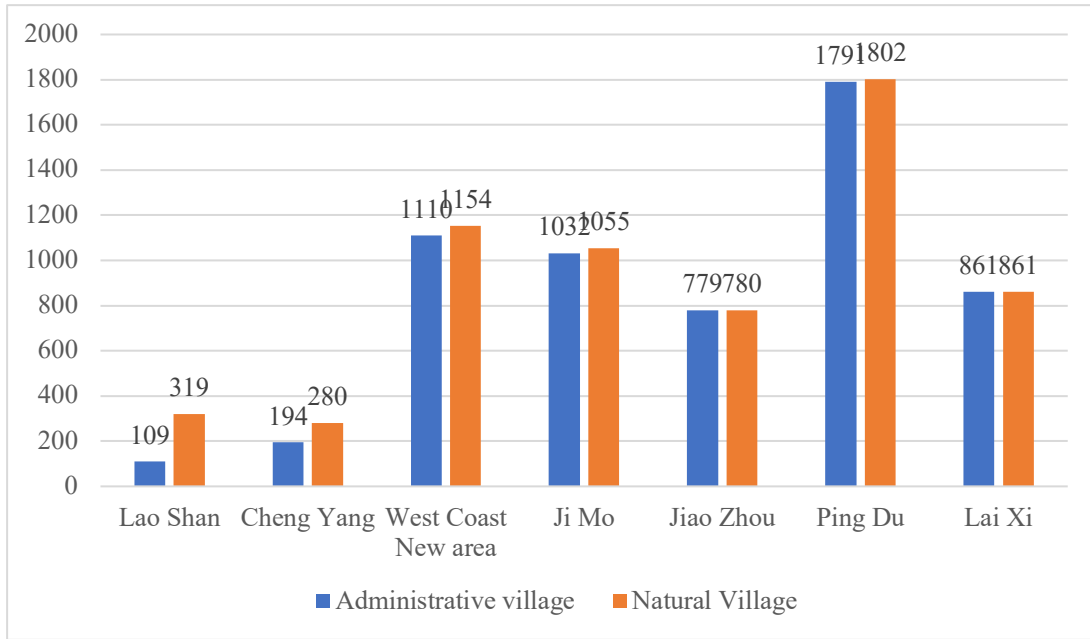


Figure 4.3 The number of administrative villages and natural villages in Qingdao in 2019

(Source: Qingdao Natural Resources and Planning Bureau)

Besides the high number of villages in Qingdao West Coast New Area, the rural development level can also be seen by the annual income per capita. Figure 4.4 shows that the highest annual income per capita is Lao Shan District, and then the second highest is the West Coast New Area.

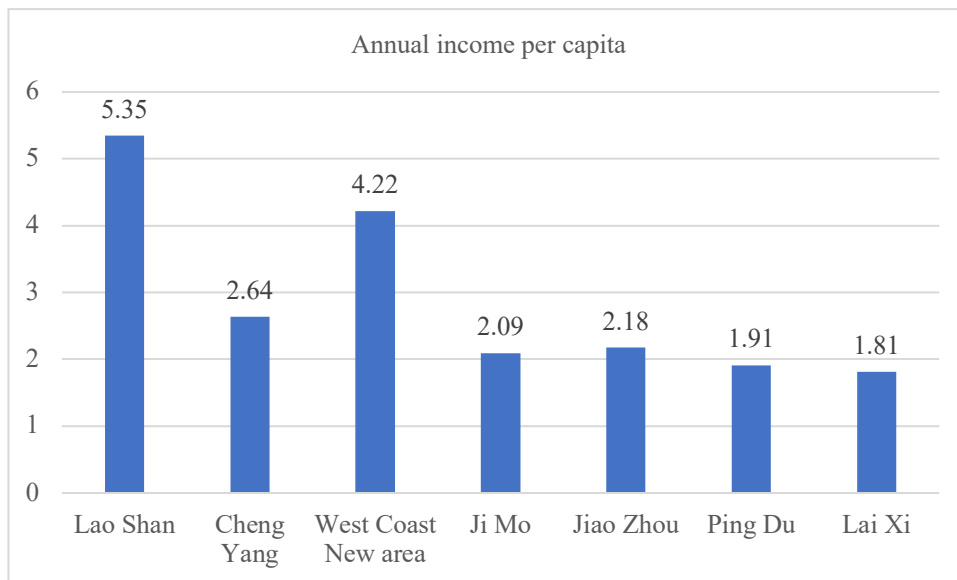


Figure 4.4 Annual income per capita in rural areas of Qingdao (10,000 yuan)

Qingdao West Coast New Area is rich in marine resources, with 282 km of coastline, 83 square kilometers of mudflats, 21 islands, 23 natural harbors and bays, 45.9% forest coverage, excellent ecological environment, obvious location advantages, broad development space, in recent years has gradually formed ports, petrochemical, ship, and marine engineering, machinery manufacturing and other advantageous industrial clusters, comprehensive In 2019, Qingdao West Coast New Area achieved a regional GDP of RMB 355.44 billion, accounting for 30.2% of Qingdao's GDP. According to the "14th Five-Year Plan" of Qingdao West Coast New Area, by 2025, the marine economy of the New Area will maintain rapid and high-quality development, strive for average annual growth of 15%, the marine GDP will exceed RMB 280 billion, the proportion of marine GDP to the regional GDP will exceed 42%, and the proportion of the city's marine GDP will the proportion of marine GDP to the regional GDP exceeds 42%, and the proportion of the city's marine GDP is more than 40%.

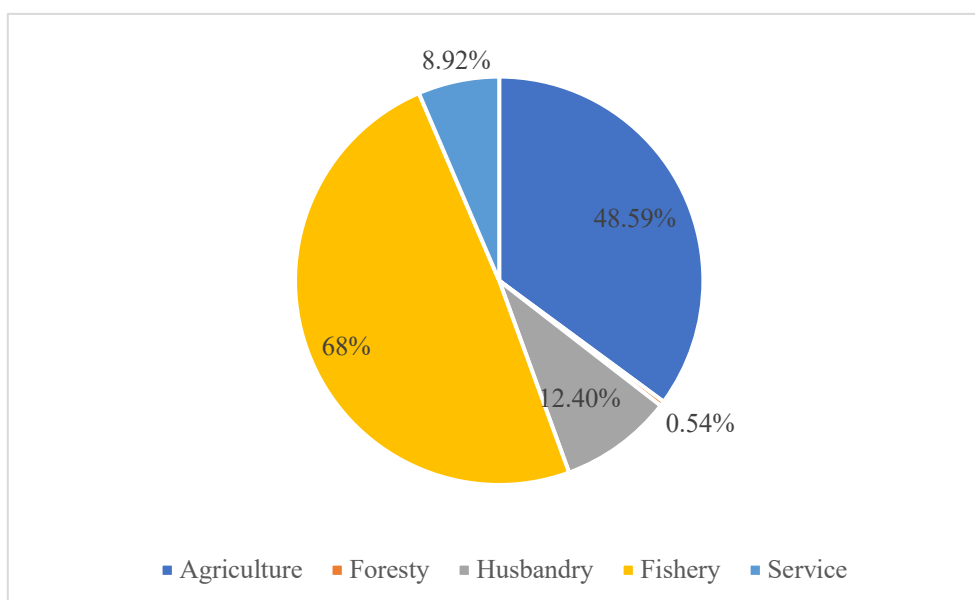


Figure 4.5 GDP proportion of different industries in Qingdao West Coast New Area

As fishery have been the dominated industry for long time, the current fishery development is facing unprecedented challenges. In 2000, the Ministry of Agriculture decided that the main task and goal of fishery economic development would shift from increasing production to improving the quality and efficiency of aquatic products. At the same time, the Chinese Rural Revitalization has supplied the financial and policy support for the new fishing village reconstruction. Facing the new development challenges and new development opportunities, the industrial structure of traditional fishing village started to transform. As an important fishery area in Qingdao, the West Coast New Area integrated and newly planned several modern ports, Figure 4.6 for better transform its traditional fishery into modern fishery, thus diversify the industrial structure, improving fishermen's income and finally realize the fishing village revitalization.

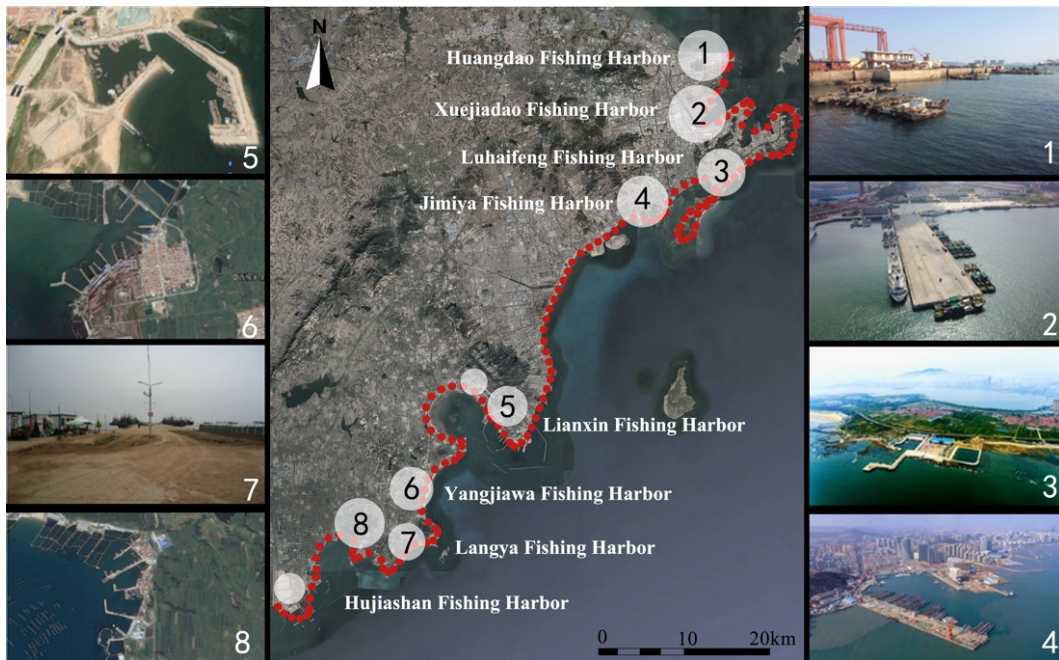


Figure 4.6 The distribution of fishing ports in Qingdao West Coast New Area

According to the governmental planning Figure 4.7 and Figure 4.8, the spatial layout of fishery industry development clusters in the West Coast Fishing Port Economic Zone will be basically completed in 2025, which will form a coastal development zone led by key fishing ports, a leisure fishery industry base established by Jimiya Fishing Port and Dingjiazui Fishing Port, a cold chain logistics industry base by Huijashan Fishing Port Industrial Zone, and a comprehensive industry base by Luhaifeng Fishing Port, and a marine biomedical and marine food industry base by Lianxin fishing port. In addition, it will build two modern fishery industrial clusters for marine biomedical and marine food, thus building an industrial cluster ecosystem with core competitiveness.

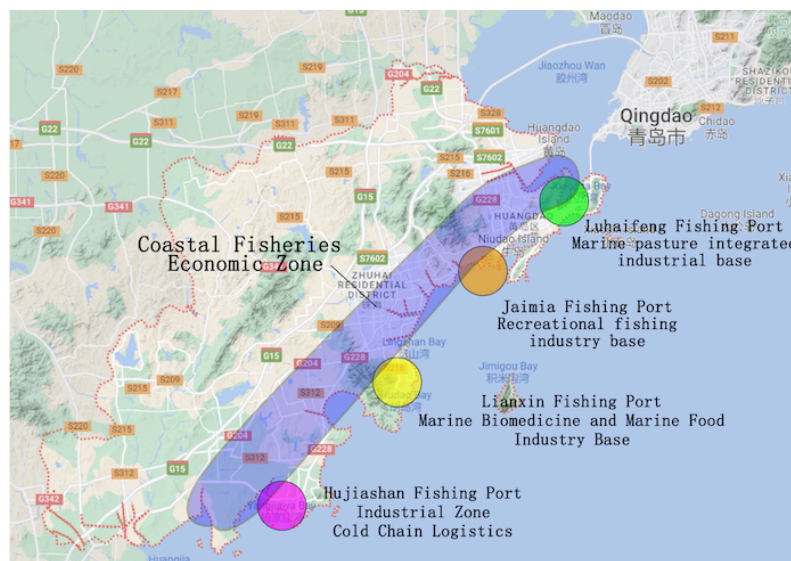


Figure 4.7 Industrial distribution map in Qingdao West Coast New Area



Figure 4.8 Industrial chain map in Qingdao West Coast New Area

Modern fishery industry cluster focus on the development of marine fishing, seafood farming, cold chain logistics, deep processing of aquatic products, leisure fishing, and other industries. Marine food and biomedical industry cluster focus on the development of seaweed processing and functional products, biological medical devices, biopharmaceuticals and preparations, biological medical materials, marine cosmetics, marine functional food, special medical food, and other industries. In order to accelerate the industrial transformation and upgrade, the spatial layout of "one pole, two belts, and three zones", has been proposed Figure 4.7. "One pole" means the pole of offshore fishery development. "Two belts" means the near-shore fishery enhancement belt and offshore fishery expansion belt. "Three zones" means the northern fishing products processing and leisure fishing zone, the central modern fishery industrial park, and the southern aquatic products trading agglomeration area



Figure 4.9 Layout planning of "one pole, two belts, and three zones" in Qingdao West Coast New Area



#### 4.1.2 Overview of the research area: Langya Town

Langya Town is located in the southern part of Qingdao West Coast New Area, Qingdao City, Shandong Province, bordering the Yellow Sea to the east and south, neighboring Poli Town to the west, and connecting Zhanan Town and Zhangjialou Town to the north, with an administrative area of 102.2 square kilometers. By the end of 2020, the household population of Langya Town was 42,511. Langya Town is a typical fishing area in Qingdao, and own long history of marine fishing in China. Along with the newly built Qingdao West Coast New Area, rapid urbanization promotes the developing transformation of this area. Langya Town has been a traditional fishing town since ancient times Figure 3.8. There are 14 coastal fishing villages, and 50 km of coastline with rich fishery resources, which ensures that Langya Town is the leading fishery town in the West Coast New Area.

(1) The current non-construction land in Langya town is 9114.22 hectares, accounting for 89.16% of the total land, mainly including agricultural and forestry land and water. The current construction land is 1107.03 hectares, accounting for 10.84% of the total land. It includes town construction land, village construction land, and mining land. The total town construction land is 145.50 hectares, accounting for 1.4% of the total construction land. There are 64 villages in total, including 57 in Langya Town and 7 in Langya Resort.

(2) Current situation of population and urbanization.

As of the end of 2020, the total population within the town area was 41,000 people, with 64 administrative villages and 39,000 people in villages. The population within the town area is 6,950 people (including 10 villages of Chengdong, Chengqian, Chengxi, Chengbei, Dongling Village, Kusangou, Wolong, Ying Hou, Dashunduo and Beishunduo), with an urbanization level of 16.88%. There are 64 villages in the township, with an average population of 613 people per village, and 51.56% of the villages have more than 500 people, most of which are large.

(3) The current industrial development situation

The current industry in Yangya town is mainly agriculture, fishery, and tourism. The current agriculture is mainly vegetable farming, which has low added value and can hardly become the leading industry in the future. The fishery base is relatively strong, but it is mainly distributed in Gongkou Bay, Yangjiawa Bay, Guzhen (Due to the construction of Dongjiakou Port City, the land for mariculture in Gunkou Bay and Yangjiawa Bay is occupied). In terms of production, the total output of aquatic products in 2020 was 92,941 tons, accounting for 37.00% of the new area. Among them, the production of fishing was 40908 tons, accounting for 70.78% of the new area; the production of mariculture was 51,713 tons, accounting for 27.70% of the new area; and the production of freshwater aquaculture was 320 tons, accounting for 4.77% of the new area. The production composition mainly relies on mariculture and marine fishing. In terms of output value, the total output value of aquatic products in Langya Town accounted for 43.37% of the new area in 2020. The total output value of the fishery economy in Langya Town was 2.081 billion yuan, and the added value of the fishery economy was 1.019 billion yuan.

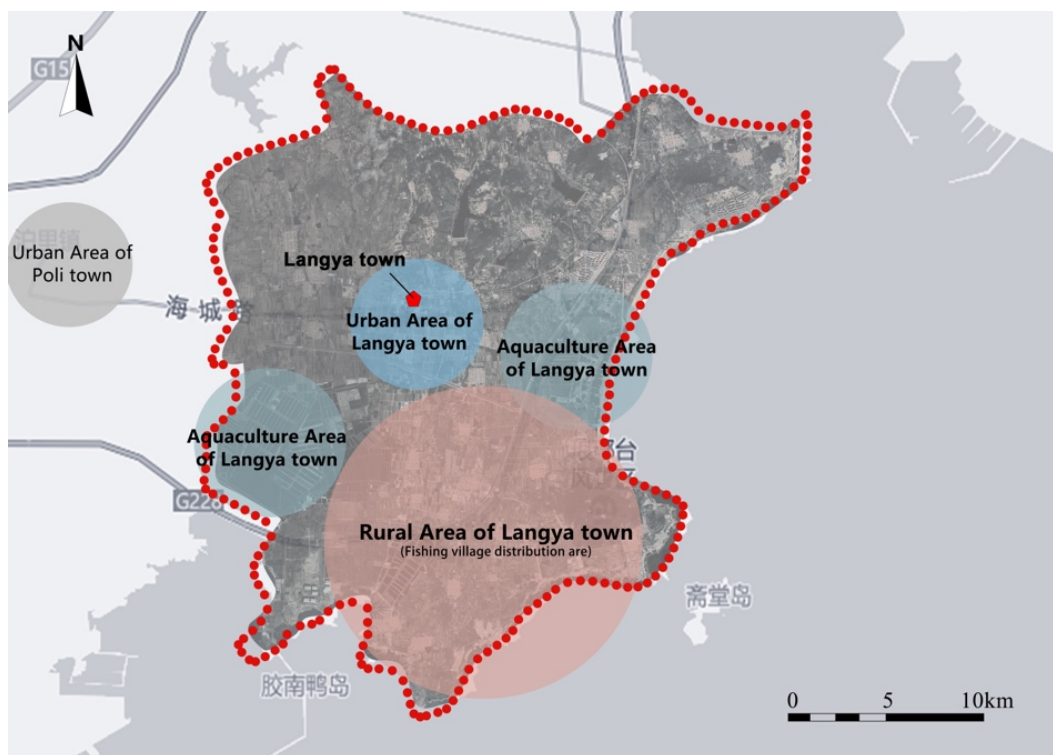


Figure 4.10 The map of Langya town

(4) Overview of the current situation of villages.

There are 57 villages in Langya Town, with a total of 10,955 households and 35,696 people, a total land area of 500 hectares, and a total area of 3,469 hectares in the village. There are mainly two types of villages in the present situation, namely, the East Village of Xiahe City, the Front Village of Xiahe City, the West Village of Xiahe City, and the North Village of Xiahe City, which is urban village, and the rest are remote villages.

(5) Industrial development planning.

Tourism is the first leading industry in Langya town, and fishery is also the main industrial development industry in Langya town. Relying on the long-developed fishery and the development of the cold chain logistics zone in Dongjiakou Port City, the development of fishery in Langya Town needs to create a brand, develop the whole industry chain of "nursery - breeding - scientific research - processing - marketing", and enhance the influence and attractiveness of fishery in Langya Town.



Figure 4.11 The map of Langya Resort

Qingdao Langya Resort is located in the southwest of Huangdao District, with a total area of 9.8 square kilometers, starting from the Wheel Hill in the north, south to the head of the West, west to the town of Langya, east to the Yellow Sea, and Qingdao across the sea, with a coastline of 7.8 kilometers. The resort area of Langya has seven administrative villages under the jurisdiction of Chenjiataihou, Wangjiataihou, Dongqiaozi, Donggangtou, Zhoujiahe, Wheel Hill and Dingguanzhuang, with a total number of 1,242 households and a population of 4,172.

## 4.2 Overview of fishing villages in Langya Town

### 4.2.1 Distribution characteristics of fishing villages

Langya Town has been a traditional fishing town since ancient times. The town has 14 coastal villages, 50 kilometers of coastline, more than 100,000 mu of suitable aquaculture water, and nearly 15,000 mu of shallow mudflats Figure 4.10. Using the rich fishery resources, Langya Town has established an excellent marine ecological fishery base and vigorously developed the fishery culture and tourism industry, ensuring that Langya Town is firmly positioned as the leading fishery town in the new coastal area. The town's fishery industry has been developed to ensure that it is firmly positioned as the leading fishery in the coastal new area Figure 4.12.



Figure 4.12 Fishing villages in Langya Town

In the early days, coastal fishing villagers set their villages in areas closer to the coast for the convenience of fishing at sea, while using the plain and flat beach areas to engage in crop cultivation, gradually evolving into coastal-type villages. Due to the different geographical environments, coastal-type villages differ significantly from inland villages, and according to the topography, inland villages can be divided into plain, hilly mountainous, and near-water lake types, which differ from coastal-type villages in terms of climatic conditions, topography, industrial base, and village layout characteristics (e.g., Table 4.1). The coastal type villages are mainly influenced by marine resources and the environment and are mainly distributed along the coast in terms of village layout, engaging in marine fishery fishing and crop cultivation.

Table 4.1 Comparison of the characteristics of different types of villages

Village Types	Climate	geography	Dominated industries	Village layout
Plain village	Good climatic conditions, less disasters	flat terrain	agricultural cultivation	Large scale
Hilly and mountainous villages	frequent geological hazards	Undulating terrain	Forestry	Follow the topography, linear layout
Near water lake type villages	Humid climate	Many rivers and lake systems	Fish farming	Irregular distribution
Coastal type villages	many disasters	Diverse terrain	complex marine fisheries	Backed by mountains and facing the sea

In recent years, with the introduction of the rural revitalization strategy and the development of rural industry, the four types of villages have different development patterns and approaches due to their own resource endowments.

#### 4.2.2 Classification of development types for coastal fishing villages

Through the field investigation of the current dominated industrial models and combined with the actual situation of the new fishing village construction, this research classifies the industrial transformation types of previous traditional fishing villages into (1) Fishery dominated type (FT); (2) Fishing products processing dominated type (FPPT); (3) Fishing village tourism dominated type (FVTT); and (4) Diversified development type (DDT).

##### (1) Fishery dominated type (FT)

In the Fishery-dominated village-type villages, about 20% of the residents are involved in the fishery, breeding, and primary processing of seafood, have a higher income, and the percentage of "part-time farmers" and "migrant workers" is relatively low. Through continuous technology development and innovation, the traditional fishery has been upgraded and transformed into a modern fishery.

In the long life of fishery production, the traditional fishery is a relatively fixed production method, that was gradually formed by generations. The traditional fishery is a production-oriented fishery, which puts production in the first place, the means of production are primitive, crude, and backward, the production efficiency is underground, the concept of production is barbaric and irrational, and the idea of promoting production relies on simple quantitative increment rather than qualitative fundamental changes. Modern fisheries and traditional fisheries have this essential difference, belonging to the science and technology-led fishery. In the production process, the modern fishery is more rational in the development and utilization of fishery resources, always puts science and technology first, constantly improves the scientific and technological content of production means, and uses new technologies and modern equipment to improve production efficiency. Modern fisheries have a progressive concept of production, the use of scientific methods to implement effective management of the fishery, the importance of environmental and resource protection, and the development of production ideas rely on qualitative rather than quantitative growth. The modern fishery is the use of advanced science, technology, and equipment to arm the fishing industry, by vigorously promoting the regionalization of fishery, standardization, industrialization, and market-oriented alternative to human-based manual labor methods and traditional fishing methods, thus significantly improving the productivity of fisheries labor and commodity rate.

To sum up, modern fisheries have the following basic characteristics.

Firstly, the rational development and use of fishery resources: Modern fishery is moving away from production as the only form of fishery, using scientific research to guide production, so that the organization and management of fishery production can be rationalized. Secondly, with advanced production technology and equipment: Backward production technology and equipment, cannot produce quality products. The transformation and upgrade of traditional fishery in fishing villages can largely promote the healthy development of fishery. Thirdly, rely on scientific and technological progress and constantly improve the level of productivity. The progress of science and technology

has produced many new areas, such as computers, information technology, automation, new energy, etc., modern fisheries application of these new technologies, can greatly improve fisheries production, and efficient development of fisheries production. Fourthly, the use of scientific methods to implement effective management of the fishery. The fishery is a complex system, of production, research, circulation interpenetration, and coordination, thus management should be improved by scientific methods.



Figure 4.13 The present situation of modern fishery-dominated village type: Xiyangjiawa Village

#### (2) Fishing products processing dominated type (FPPT)

Through the construction of cold storage units and establishing their own fishing products brands, the enterprises and village leader desire to improve and upgrade their fishing products' industrial chain and their values. The original fishing village transformed its primary industry: fishery into the second industry: fishing products processing. In such a way, the fishermen's income has been largely improved and the value-added industrial chain has been lengthened following the demand of the market and local conditions.



Figure 4.14 The present situation of Fishing products processes dominated type: Dingshiwa

#### (3) Fishing village tourism dominated type (FVTT)



Figure 4.15 The present situation of Fishing village tourism dominated type: Wangjiataihou

Fishing Villages have undergone an industrial transformation from primary industry, fishery to tertiary industry Coastal tourism, and which become the dominant industry in these fishing villages, is called FTT. Fishing village tourism, as an important transformation pattern that happened in the traditional fishing village, was analyzed by the elements of tourism, tourism in rural areas, and tourism in coastal areas. A coastal tourism development model in rural areas was proposed<sup>[1] [2]</sup>

(4) Diversified development type (DDT),



Figure 4.16 The present situation of Balanced development village type: Taixitou Village

Most of the fishing villages are transformed into one dominated industry, while there are still some villages that can balance developing different kinds of industrial models. In our field investigation, we also figured out one balanced development village in Langya Town.

#### 4.2.3 Developing the history of fishing villages

Villages in Langya Town show different characteristics along with the development of productivity, social conception, and economy cooperated with the different developing stages of industrial transformation. The main transformed driving forces and transform forms are all different in these stages. There are mainly three stages Table 4.2.

Table 4.2 Different developing stages for the Three F in Langya Town

Stages	Fishing village	Fishery	Fishermen
Renovation stage	No clear improvement.	Traditional fishery still is the dominated	Low income and few transformed
Development stage	Investment has been put in infrastructure.	The fishery is rapid declining.	More and more transformed
Revitalization stage	A better living environment is realized.	The fishery has been over whole transformed or upgraded.	The income has been increased.

#### 4.2.4 Cultural characteristics of the fishing villages

A village is a human settlement unit based on nature; thus, it is the intermediate carrier between human beings and nature. During the long history of the coexistence of human beings and nature, the scale and history of villages developed continuously. The traditional characteristics of fishing villages mean the unique landscape and the culture and history after thousands of years of inheritance. Of these traditional characteristics, some of them are common to ordinary villages, and others are unique by themselves. The following can show this:



Figure 4.17 Panorama of the typical fishing village in Qingdao New Area

##### (1) Blood and geo-relationship

Traditional villages are based on the blood relationship of most villagers; they live in relatively centralized areas, which is their common area for productivity and living. The geo-relationship is the visible link for villagers that live together, and the blood relationship is the invisible link for them <sup>[3]</sup>. These traditional villages usually make the blood relationship and religion as the base to build friendly and kind neighborhoods, and they own their own culture and spirit <sup>[4]</sup>. In the coastal



rural areas, the traditional fishing villages usually have almost all the villagers own the same one or several family names, even for the large-scale villages that also have the same one or several family names. Therefore, people living there respect themselves for their blood relationship and live within certain areas.



Figure 4.18 Harmonious neighborhoods in the typical fishing village in Qingdao New Area

### (2) Fishing culture and the requirement of transformation characteristic

The ocean is the main resource of fishing village life and the important natural resource for survival. Fishing village culture owns obvious characteristics, which makes the connection and cooperation among villagers. Villagers usually work together in a certain area of the sea at the same time according to the fishing season. The combination of a small village economy and cottage industry is the main manifestation form in these fishing villages.

The traditional fishery economy decides the cooperation work characteristic. Under the traditional fishery, most of the labor forces are put into fishing production, which means that villagers can just survive on the marine resource to maintain their existence. However, with the improvement of production technology conditions and labor productivity, in order to meet the requirements of residents, the industrial transformation comes to be an irresistible development process. Currently, the economic level still cannot supply a good living level for residents in most fishing villages.

### (3) Closure and openness

The closure is one of the significant characteristics of the traditional fishing villages. Because of the village location, traditional fishing villages are located far away from the urban areas and are not easy to go to due to the long distance and poor traffic conditions. All of these make villages in close, especially for those villages with a small population and far away.

With the rapid urbanization in Qingdao New Area, the modern traffic system is gradually made perfect and media technology is improved. Traditional fishing villages in this area also began to change from the originally closed village to opening themselves to the outside world. Villages along the railway, highway, and other transportation lines, are influenced by the outside industry developing models and start to find out their own developing way. For example, depending on their self-characteristics, some traditional fishing villages start to develop their fishing products processing industry or their fishing village tourism, thus attracting scholars and tourists to visit at home and abroad.

#### 4.2.5 Main problems of fishing villages during industrial transformation

During the industrial transformation, a series of problems occurs in traditional fishing villages, they can be summarized as following five points:

##### (1) The development of traditional fishing villages is challenged and increasingly declining

Fishery labor is scarce. At present, local villagers engaged in marine capture fishery are over 45 years old, and basically, no one under 35 years old is engaged in the fishery. Marine fishing is a very heavy workload, so most fishermen choose to retire at the age of fifty-five. At the same time, the difficulty in recruiting crew members is also a problem faced by the development of the fishing industry. The increasing labor costs coupled with the unskilled and mobile immigrant fishermen have led to fewer fishermen being able to go out fishing. In our field investigation, we found that this is one of the direct reasons why traditional fishing villages are going into decline and starting to seek industrial transformation.

##### (2) The original industrial structure is too homogeneous

The decline of fishing resources and the homogeneous industrial structure are the two challenges faced by fishing villages in Qingdao New Area. Besides the long-time over-fishing and the decline of the ocean environment, fishing villages are facing rapid urbanization, and large numbers of local villagers immigrate to urban areas, causing lots of “rural disease”. All these call for industrial transformation to promote the village economy and revitalize the fishing village.

##### (3) Abandoned villages

The longtime development of the fishery economy and rapid urbanization in the last decade has come at the expense of resource depletion and the decline of fishing villages. At the same time, large numbers of the original fishermen work in cities, which causes the phenomenon of people being separated from their houses. Thus, many houses are idle and useless, and a large number of "abandoned villages" appears, seriously reducing the usage rate of cultivated land Figure 4.19.



Figure 4.19 Abandoned house for all year and seasonal abandoned house

Table 4.3 The situation of abandoned houses

Village	Population	Total houses	Abandoned houses	Abandoned rate	Industrial type
Xiyangjiawa	1567	515	50	10%	MFT
Dingshiwa	430	158	21	13%	FPT
Taixitou	1170	458	35	8%	BFT
Wangjiataihou	682	250	15	6%	FTT

#### (4) Severe population aging

Since the reform and opening, the rapid development of secondary and tertiary industries in the urban areas of the West Coast New Area and the rapid development of urbanization, a large number of young rural laborers have moved to the east and west main urban areas and Dongjiakou port area. As a result, most of the resident population in fishing villages are middle-aged and older than 45 years old, and the aging population is becoming more and more prominent. In Qingdao, the total registered population of villages reaches 4,775,000 and the resident population is 4,568,000, with the highest proportion of middle-aged people aged 41-65, accounting for 36%, and 881,000 people aged 65 and above, accounting for 20%. The aging phenomenon is particularly prominent. Take Langya for example, the current resident population is 23,148, of which 6,074 are over 60 years old. The aging rate is 26%, far exceeding the aging standard of 10% for people over 60 years old. At the end of 2019, the rural household population of the West Coast New Area is about 900,000, with a resident population of 305,500. Each year, the rural household population decreases by about 20,000 people, and the rural population shows an outflow trend. The number of laborers engaged in traditional agricultural activities is decreasing year by year, and the ratio of agricultural laborers is decreasing year by year. In our field investigation, the over 65 years old residents in fishing villages are over 30% of the whole village residents. Along with the industrial transformation, many original fishermen work in urban areas and only the elders stay in villages.



Figure 4.20 The elders stay in fishing villages

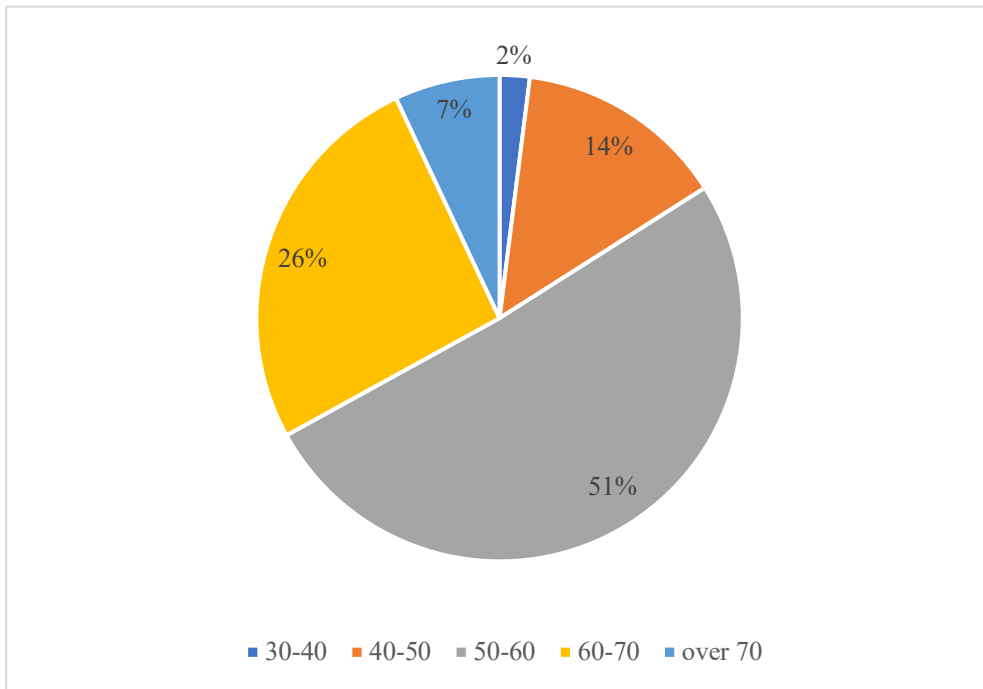


Figure 4.21 The percentage of different age in the respondents

According to the age distribution in Figure 4.21, it can also show that the aging population phenomenon in the current fishing villages. Among the respondents of the investigation, there are around 51% are among 50-60, takes half of the current village population. And around 26% are 60-70. The young villagers are still not the main production force in current villages. Therefore, in the future village industrial transformation, more and more new developed industries should attract more young villagers to stay and work in villages.

(5) Infrastructure is backward, which cannot satisfy modern life

With the improvement in living standards, residents who live in fishing villages have more requirements for their life. However, the original living environment cannot meet their requirements because of the backward infrastructure, such as communication, water supply, power supply, heating, and so on. There are also other environmental problems; for example, improper waste disposal is very serious. However, compared with the original living environment before the industrial transformation, there are also many problems for the newly-built fishing village, such as

single house type, unrepeatable function design, and most of the houses are built with poor technology and in poor quality Figure 4.22.



Figure 4.22 Poor living conditions of original dwellings in fishing villages

(6) The management of village construction is chaotic

Because of the shortage of necessary planning and management in rural construction, the village construction is usually managed by the villagers themselves, thus chaotic is caused by these unreasonable constructions. What is more, there are many problems, such as many villages are scattered, lands are taken unplanned, net roads are short of reasonable planning, the chaotic traffic system and so on. In order to connect all villages, the local government constructs roads blindly without reasonable and symmetrical planning at the expense of people's interest, which makes people move out of their original living area Figure 4.23. It seems that such kind of action increases the local GDP, but people's interests are sacrificed and cannot improve people's living standards. What is more, many roads are built blindly and abandoned after it is completed.



Figure 4.23 Common phenomena of unfinished construction

(7) Unreasonable subsidies

In order to reduce the production costs of fishery and promote the development of modern fishery, the government issues a certain number of subsidies to fishery producers every year. Since 2009 this subsidy policy has clearly defined the scope, conditions, standards, and time for the issuance of subsidies. In recent years, the subsidies have been gradually increased, on the one hand, it has promoted the upgrading of fishery and mobilized fishermen's enthusiasm for production, and on the

other hand, it has greatly contributed to the transformation of the industrial structure in fishing villages.

However, in the implementation of these subsidies, there are many unreasonable phenomena. For example, the subsidies are calculated according to the horsepower of the fishing boats, and only the owners of the boats but not the fishermen are directly subsidized, and the auxiliary boats that buy seafood are not entitled to these subsidies. For a long time, fishing boat subsidies have failed to directly help fishermen but instead increased the income gap between fishermen with and without boats. Secondly, fishermen who get the subsidies often use the subsidies to buy cars and houses instead of developing products or developing transformations. Finally, with these subsidies policy, the purchase price of fishing boats climbs higher every year, original boat about 700,000 RMB, because of the increase in these subsidies, now boat prices doubled.

(8) The relationship between fishermen, government, and enterprises is separated

In the management of fishing villages, there is a lack of communication between villagers and government officials, and enterprises. In our field investigation, we deeply feel that many villagers have great opinions about the village government, they think that in village planning and development, the villagers' grassroots ideas and opinions are not reasonably adopted and recognized. At the same time, the management of village affairs is not open and transparent enough to accept the supervision of the villagers.

The mainly six “rural diseases” in coastal fishing villages can be summarized as Figure 4.24.

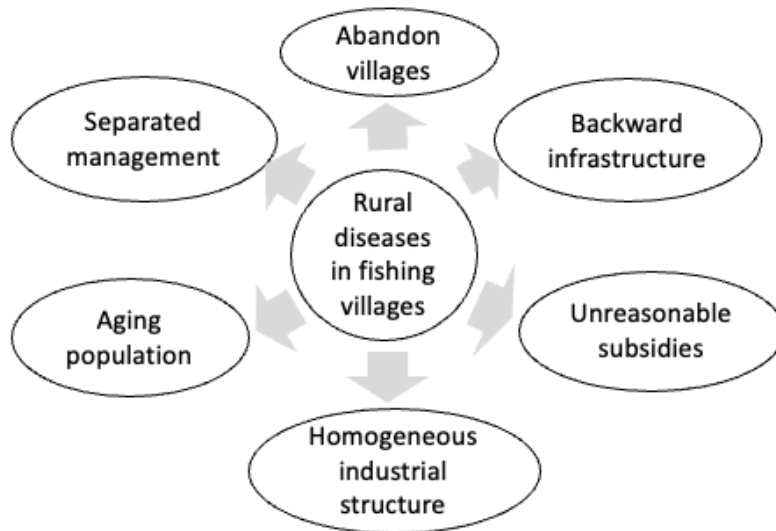


Figure 4.24 “Rural diseases” in coastal fishing villages

#### 4.2.6 Main reasons for fishing villages’ transformation in Qingdao West Coast New Area

The marine industry covers a wide range and many types, and marine fishery occupies an extremely important position in the whole marine industry, which also plays an important role in the marine economy, even the whole national economy. With the continuous development of the social economy, people's demand for the marine fishery is expanding, the exploitation of fishery resources

is becoming crazier, thus the marine ecosystem is becoming more and more fragile, and the sustainable development of marine fishery is beginning to face great challenges [5]. Therefore, the transformation of the marine fishery is an inevitable behavior in today's coastal fishing villages. The transformation of coastal fishing villages usually refers to the gradual transformation of marine fishing villages from relying entirely on the development and processing of fishery resources to diversified industries, so that they do not have to rely excessively on fishery resources and can effectively avoid the great risks brought by the decay of industries and the exhaustion of resources, and can achieve healthy and stable development [6]. The transformation of coastal fishing villages has its own developmental reasons, such as the transformation of the marine fishery, the high-speed urbanization of coastal areas, and large-scale marine development, which all prompt the transformation of coastal fishing villages in China.

#### (1) Transformation of marine fisheries

With the increasing human demand for marine resources and the expanding development of marine fishery, the ecological environment has suffered serious damage, and many former excellent spawning and hatchery farms, fertilization farms, and enrichment farms have gradually lost their original functions of the fishery, and the recovery capacity has gradually decreased. The development of marine fishery directly affects the development of China's national economy, and in order to protect marine fishery resources, prevent the decline of resources, and enhance the recovery capacity of resources, the country began to advocate the transformation of marine fisheries from the original crude type to the ecological and environmental protection type [7].

Coastal fishing villages, as an important part of the marine fishery, have also started the transformation path.

#### (2) High-speed urbanization in coastal areas

As entering the 21st century, the urbanization process in China is accelerating, and various industries and investments are gradually gathering in the cities and towns, and the infrastructure in cities and towns is becoming more and more perfect, which greatly promotes the growth of China's economy. At the same time, a large number of villagers are moving from rural areas to cities and towns. From the regional aspect, compared with the mainland, the coastal areas are urbanizing faster, and the coastal fishing villages have become an important place for population migration. On the one hand, the older generation of fishermen does not want their offspring to continue to engage in marine fishing, on the other hand, the new generation of fishermen themselves are not willing to engage in marine fishing. Therefore, more and more fishermen from marine fishing villages are moving to the cities to work and settle in the cities, which to a certain extent promotes the transformation of coastal fishing villages.

#### (3) Large-scale exploitation of the ocean

Along with the rapid urbanization of Qingdao East New Area, the marine resources have been exploited in depth. With the continuous improvement of the development of marine resources, the diversity of marine industries and the richness of marine resources have been fully reflected, such as marine fisheries, marine oil, and gas industry, marine mining, marine salt industry, marine

shipping industry, marine chemical industry, marine biological medicine industry, marine engineering, and construction industry, marine power industry, seawater utilization industry, marine transportation industry, coastal tourism, etc. With the expansion of marine industries, the importance of marine fishery is gradually decreasing, and other marine industries with higher added value are gradually taking over the position of the marine fishery, therefore, the transformation of marine fishing villages is inevitable.

### **4.3 Factors influence the fishing villages' development**

#### **4.3.1 Fishery factors**

##### **4.3.1.1 Fishery resource**

Traditional fishermen in Shandong province mainly focus on "offshore fishing", and due to overfishing in recent years, fishermen only focus on short-term "development" rather than sustainable development [8]. Offshore fishery resources are gradually decreasing and marine species are declining; fishery resources can no longer support the increasing demand of people for fish protein [9]. In order to alleviate the tension of offshore resources and competition among fishermen, offshore fishing and offshore fishing have gradually flourished; however, the cost of fishing at sea is higher and more dangerous, and the risks are unpredictable. In Shandong province, each year accidents or natural disasters caused billions of economic losses. Fishermen go to sea to work at high risk, the protection mechanism is not perfect. Not only will have an impact on the personal safety of fishermen, but also make fishermen's lives in hardship. Due to the lack of legal protection and policy support for offshore operations, offshore fishing can also lead to the depletion of fishery resources. The fishery resources of China's oceans have two characteristics, namely open access and common rights, which make a lot of marine resources depleted. Shandong Province is located on the west coast of the East China Sea, with a vast sea area and a wide range of marine species. For a long time, the poor management of the fishery administration supervision department, excessive fishing, and secret fishing in the closed period resulted in fishery resources, being declined. The fishery in Shandong Province is highly dependent on marine resources, and enterprises mainly focus on processing seafood. The fishing industry is fragmented and highly mobile, and fishing product processing requires a lot of human and material resources. With the improvement in living standards, the demand for seafood has increased substantially and the supply of enterprises has increased, which also resulted in a gradual decrease in fishery resources.

##### **4.3.1.2 Ocean environment**

Influenced by the constraint of offshore fishery resources, the aquaculture industry has gradually emerged, coupled with the promotion of urban-rural integration, the government has given residents of fishing villages certain entrepreneurial policies and financial investment, which has led many fishermen to set up seafood processing plants. Along with the development of these seafood processing plants, a large amount of artificial fish bait, nutrients, fertilizers, and other chemical substances have been imposed in the sea, which leads to marine pollution, destroys the original marine ecology, and degrades or even endangers marine species. In recent year, red tides have happened in Qingdao every summary, the main reason is the pollution caused by random discharge of sewage. In addition, oil spills also pollute the sea and cause huge losses. In January 2018, a ship



collision oil spill occurred in the eastern waters of Shandong Province, in which a Panamanian oil tanker collided with a Hong Kong bulk carrier and 136,000 tons of condensate flowed into the sea, causing a serious impact on marine ecology and marine organisms, resulting in the phenomenon of death of a large number of marine organisms. The fishery ecology is polluted, and a large part of the reason is the imperfect construction of the legal system, the lack of legal protection for the development of fisheries, coupled with the failure of government agencies to promote laws and regulations in the countryside.

#### **4.3.2 Fishing village factors**

##### **4.3.2.1 Public service**

Due to the geographical location, most fishing villages in Qingdao have a low level of public services, with insufficient quantity and an unbalanced supply structure. Lack of public service, there is a big gap between the fishermen in fishing villages and urban areas, and fishermen can hardly enjoy public services. The shortage of public service can be summarized as follows: lack of cultural, science, and technology support in fishing villages, lack of funding sponsorship for training, relatively poor schooling conditions, insufficient medical resources and health system, low professional capacity of medical personnel, etc.; all these lead to the livelihood for fishing village residents cannot be protected. Fishing villages in Qingdao are mostly laid out near islands and coastlines, with relatively closed transportation, less connection with the outside world, serious lack of cultural information as well as the inadequate social security system, etc., which all caused the low development of public services.

##### **4.3.2.2 Infrastructure**

Since the implementation of the rural revitalization strategy, the public infrastructure of fishing villages in Qingdao has been improved to a certain extent, but according to the survey, there are still some fishing villages with poor living environments and imperfect infrastructure. Almost all the fishing villages in Qingdao lack scientific planning in construction, fishing ports are backward, and the industrial efficiency grows slowly, which results in the low living standard of fishermen. Even some fishing villages seek economic development, destroying historical buildings and destroying cultural relics, mainly due to the lack of long-term vision of the planners, who only seek immediate economic benefits without concern for future development. Industrial wastewater and house-used sewage are discharged freely in some fishing villages, creating a series of drinking water safety problems, groundwater is not drinkable. In some fishing villages, the fishing boats and fishing port infrastructure are backward, resulting in low production efficiency; the lack of recreational facilities in fishing villages, fishermen's daily pastime can only be achieved by playing cards, gossiping, and The lack of recreational facilities in fishing villages, the fishermen's daily pastime can only be through playing cards, gossiping, walking, etc., and their spiritual life is not satisfied.

##### **4.3.2.3 Insufficient financial investment**

In the process of new fishing village construction, Shandong Province has invested fewer funds in fishing villages for a long time, and the funds directly used to support the development of fishery fishing villages are even more limited. Fishing villages without sufficient financial support are

difficult to get long-term development. The financial capacity of the local government is limited, and most of the facilities in fishing villages are in poor conditions, which greatly affects the villages' development. Fishermen cannot provide effective services to meet consumer demand <sup>[10]</sup>. The infrastructure of fishing villages cannot be improved, and facilities like fishing ports, docks, tunnels, and cross-sea bridges lack funds for maintenance, resulting in aging and weakening, which cannot function for the development of fishing villages and may even lead to dangerous accidents. Due to the shortage of financial investment, some fishing enterprises are unable to carry out fishing economic projects, with low innovation and decreasing productivity. The medical technology in fishing villages is slow to be updated and the development of education is backward.

#### **4.3.2.4 Basic level organization**

Inadequate grassroots organization is an important factor hindering rural revitalization. Fishermen's democratic rights are not brought into play, which weakens the effectiveness of fishing village organizations. Fishermen always think that fishing village affairs are only the business of the two village committees and have nothing to do with them, so there is a lack of public participation in village affairs; bribery in elections is common, which hinders the construction of democratic politics. The leaders of the two committees in some fishing villages only know to vigorously develop the economy, but ignore the legal and political construction, so the fishermen's legal concept is weak and their political awareness is also weak. In the long run, fishermen will not use the law to protect their personal safety and legitimate rights and interests. Some cadres in fishing villages are inactive, and corrupt, resulting in a dysfunctional party organization at the grassroots level and increasing the number of internal and external problems in fishing villages. The lack of civil associations and public organizations in fishing villages and the absence of a cohesive point among fishermen are not conducive to the openness and exchange of information.

### **4.3.3 Fishermen**

#### **4.3.3.1 The overall quality of fishermen is low**

Due to the closed traffic and backward economy, some coastal fishing villages in Qingdao have a relatively monotonous life. Coupled with the fact that fishermen do not have contact with the outside world for a long time when they go fishing at sea, they are more traditional in their thinking and generally have not received a good education. These fishermen are difficult to accept new things from the outside and only believe in immediate benefits, without regard to long-term development. The low quality of fishermen will not only affect their personal image but also have a bad influence on the surrounding fishermen. Some fishermen disregard the regulations of the fishing closed season and go fishing in the sea privately, which affects the marine biological system and destroys the reproduction system, leading to the decline of total fishery resources. Fishermen do not pay attention to environmental protection in their daily life, which leads to the untidy face of fishing villages and serious damage to infrastructure. The government departments do not play their functional role, and lack communication with fishermen; nor do they select typical models for fishermen to learn from, resulting in the overall quality of fishermen not being improved and hindering the pace of new fishing village construction.

#### 4.3.3.2 Fishermen are usually without a good education and lack related abilities

The rapid development of the marine economy has objectively promoted the transformation of fishermen. Fishermen have moved to live in towns and cities due to the level of medical care, children's schooling, and government policies. The fishermen who moved out had no confidence in entrepreneurship and employment due to their lack of work skills and traditional employment concepts, which produced the phenomenon of difficulty in changing jobs. In addition, traditional fishermen have difficulty in changing their production and lifestyle, have a single set of skills, are old, and have a low level of education show in Figure 4.25, so they can only engage in the assembly line or manual work in the towns. The phenomenon of "no land, no sea, no way to change jobs, and no door to employment" has emerged<sup>[11]</sup>. Due to the lack of connection between the fishery industry and other industries in the town, and the lack of sound facilities, the development of many fishermen is in a difficult situation. The government also did not give skills training and financial subsidies to these fishermen in a timely manner, which made it difficult for these fishermen to live normally. Fishermen who have difficulties in changing jobs not only do not promote the development of the urban economy, but also their own income is not improved, so they will soon return to their old jobs in fishing villages.

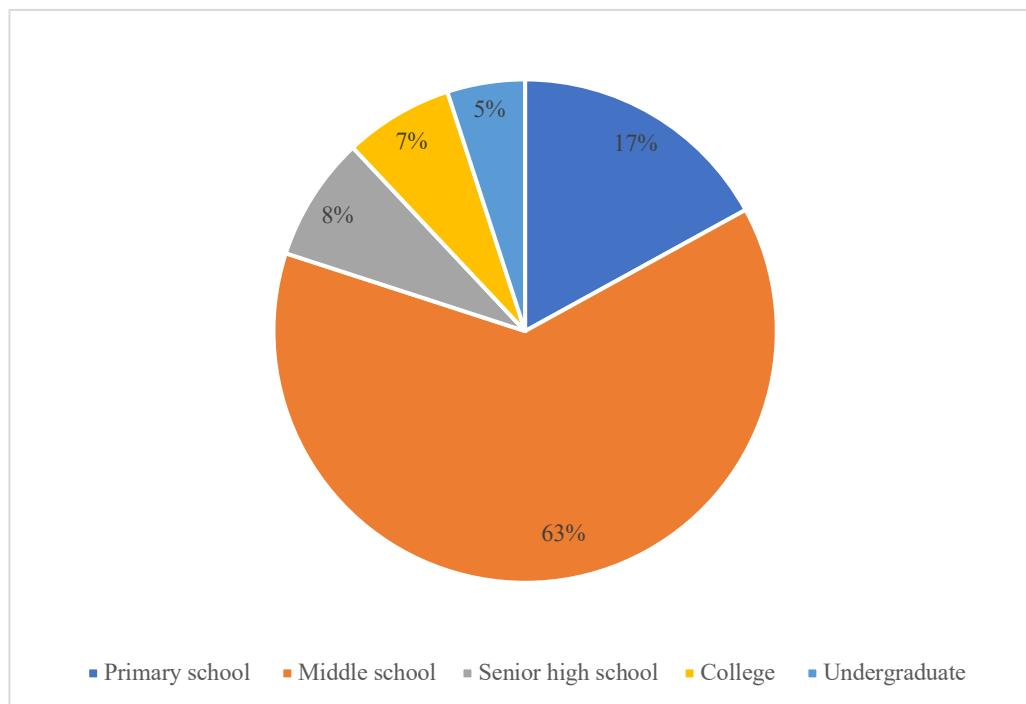


Figure 4.25 The distribution of educational background for the respondents

#### 4.4 Analysis of industrial transformations in fishing villages by the SWOT analysis method

A SWOT analysis is a structured planning technique applied to make a necessary evaluation of the strengths, weaknesses, opportunities, and threats integrated into a particular problem. A SWOT analysis can be also applied to city development, which involves specifying the objective of the business venture or project and detecting the internal and external factors, which are considered as advantages/disadvantages to reach that objective. The following summarizes various perspectives of SWOT,

- Strengths: characteristics of the business, which provide an advantage over others,
- Weaknesses: characteristics that pose the business at a disadvantage compared with others,
- Opportunities: elements the project could exploit to its advantage,
- Threats: elements in the environment, which could generate trouble for the business.

For improving the level of coastal fishing village industrial transformation and regional rural revitalization, SWOT analysis (Strengths, Weaknesses, Opportunities, and Threats) is adopted in this research to make a comprehensive evaluation and analysis of the development of coastal fishing villages in Qingdao, China. Identification of SWOTs is essential because they can inform later steps in planning to reach the objective Figure 4.26.

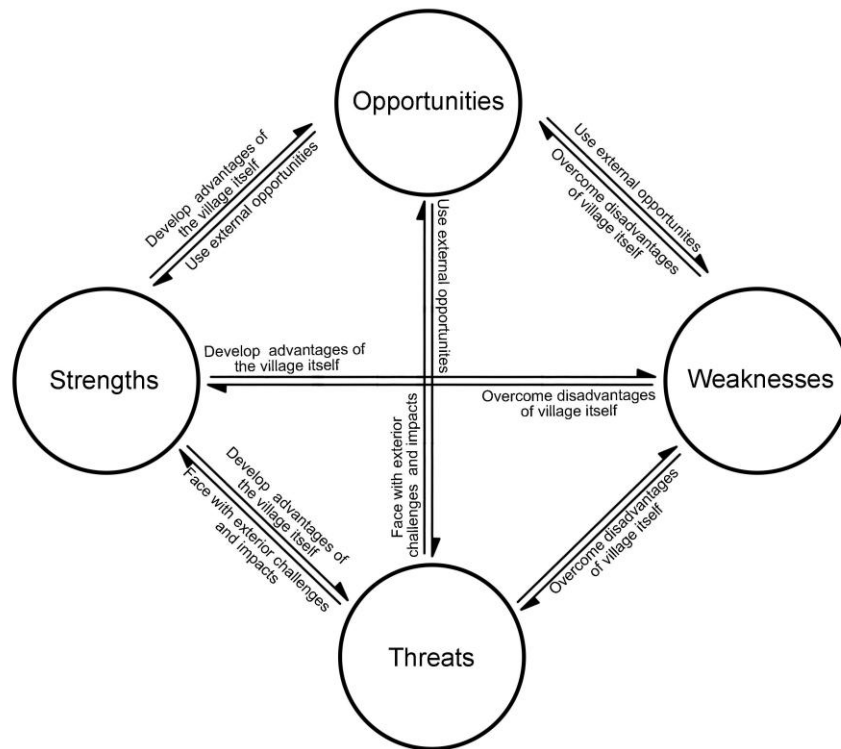


Figure 4.26 Swot analysis diagram of each conclusive element

(1) Excellent Natural Conditions

Qingdao has a long and winding coastline with many islands and bays, both in the Yellow Sea offshore and in Jiaozhou Bay. Langya town is not far from the Qingdao downtown area as Figure 1. Nowadays, traditional fishing villages experience significant change along the rapid urbanization. Most traditional fishing villages are located in the rural area Qingdao New Area, where traditional fishing culture and fishing villages are still existing. Langya Town has been a traditional fishing town since ancient times- 14 coastal villages, 50 kilometers of coastline, more than 100,000 mu of aquaculture-friendly water, and nearly 15,000 mu of shallow mud flats.

(2) Tourism Resource Strength

Qingdao Langyatai Resort Figure 4.27 is in the southwest of Qingdao New Area, with a total area of 9.8 square kilometers. Starting from the Wheel Hill in the north, south to the head of Taixi, west

to Langya Town, east to the Yellow Sea, and Qing, the coastline is 7.8 km long. There are 7 villages within the Langyatai Resort, 1242 households, and around 4172 residents. Among them, Wangjiatai hou Village is a typical successfully transformed fishing village.



Figure 4.27 Langyatai tourist area is the main tourism resource

(3) Convenient traffic conditions

Along with the Chinese rural revitalization, government has put large amount of investment on rural infrastructure construction. Transportation, as one of the most important infostructure has also been invested, no matter the roads within villages or outside the villages. They all are the important basis for the future industrial transformation and development. The following four figures show that the current traffic conditions in these four transformed fishing villages.

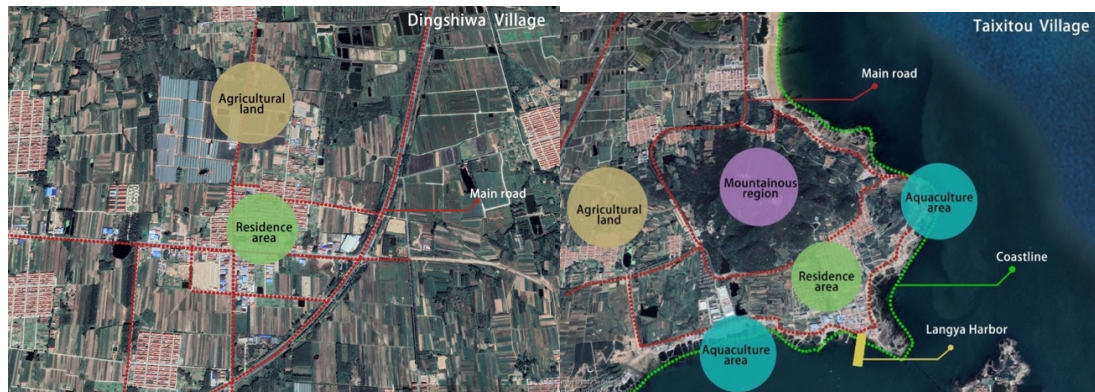


Figure 4.28 Spatial distribution of Dingshiwa Village and Taixitou Village

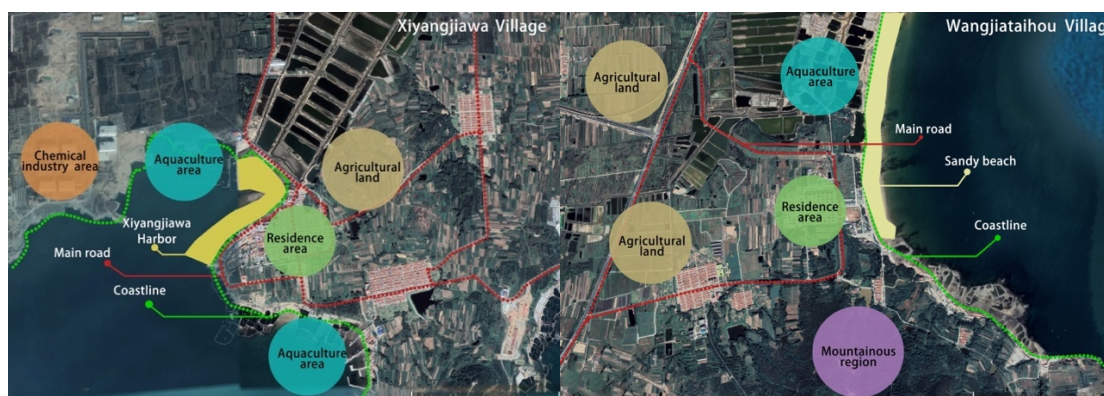


Figure 4.29 Spatial distribution of Xiyangjiawa Village and Wangjiataihou Village

In 2007, in order to improve the traffic of the West Coast New Area, a total investment of 14.792 billion yuan, with a total length of 36.48 kilometers, Jiaozhou Bay cross-sea bridge is the longest cross-sea bridge built in the world. Meanwhile, Jiaozhou Bay Tunnel, the longest undersea tunnel in China, with a total length of 9.47 kilometers, was completed. The entrance is Binhai Avenue in West Coast New Area, the exit is located at the intersection of Tuandao Road and Qutangxia Road in downtown Qingdao. Jiaozhou Bay Tunnel has been under construction for nearly 4 years, with a total investment of 7.062 billion yuan, built with two-way 6 lanes and a design speed of 80 km/h.

### (3) Policy Strength

In recent years, in response to the national policy of promoting rural development, a series of investments have been invested in the region's rural roads and the improvement of infrastructure. Besides the large investment, policy support for local industrial transformation comes to be an important driving force.

In addition, Shandong Province has the unique advantage of marine scientific research and is one of the strongest marine science and technology in China, there is marine scientific research, teaching institutions 55, including the Chinese Academy of Sciences Institute of Oceanography, China Ocean University, the State Oceanic Administration of the First Institute of Oceanography, etc., with more than 10,000 marine science and technology personnel, accounting for more than 40% of the country. The strong marine science and technology force also provides strong scientific and technological support for the transformation of traditional fishing villages.

#### 4.4.1 Weakness

##### (1) Resources Have Not Been Fully Protected and Developed

In Fishing Village, the unique fishing village culture has not been fully protected and developed. Currently, most of the farming and fishing villages are operated by residents, due to the limitations of their knowledge, only seek immediate economic benefits and blindly develop tourism to meet the consumption needs of tourists, which causes irreversible damage to the cultural heritage and ecological environment, and hinders the sustainable development of local tourism.

### (2) Land Resources Are Scarce

Fishing villages are generally surrounded by mountains and the sea, so the available land is small and can only be built on the gentle slope at the foot of the mountains. With the development of local industries, the limited land is hard to meet the large demand for future development.

### (3) Weak Management and Collaboration

The economic transformation of traditional fishing villages is a complex process that requires managers with management skills in various industries, such as management, planning, marketing, and product development. In addition, unlike the transformation of in other rural areas in China, the transformation of coastal fishing villages is unique and the development is relatively late, thus the corresponding management mechanisms are relatively backward.

Generally, there are two extremes in the management and collaboration of fishing villages. One is that towns and villages often seek the direction of transformation in accordance with their own resources, and in this process, lack of unified management and planning, guidance, and reasonable layout of relevant policies, is one of the weaknesses in management and collaboration. The other is the local government makes the plan without scientific evaluation and the participation of residents, which will cause serious developing problems in the future.

### (4) Low degree of industrial marketization and poor market operation ability

Current Nongjiale and Yujiale are mainly in the form of family-based, without much collaboration within the village. Although the local government has taken action to support village tourism, particularly for supportive policies, and infrastructure improvement investment, the management, and collaboration relationship between the government and villagers are weak. To address this, the village committee, rooted in the community, with a deep understanding of its resources and development prospects, should play an active leadership role in supporting and facilitating fishing village tourism development, and act as a bridge of villagers and the government.

## 4.4.2 Opportunities

### (1) Opportunities brought by policy guidance

The fishery is an important part of agriculture, and fishing villages are an important part of China's vast rural communities. Building new socialist fishing villages is to implement the Central Government's Document No. 1 in coastal rural areas. The construction of new fishing villages will involve the transformation of the economic structure of fishing villages. In April 2009, General Secretary Hu Jintao pointed out that it is necessary to vigorously develop the marine economy, scientifically develop marine resources, cultivate marine industries, and build the Shandong Peninsula Blue Economic Zone. In January 2011, the development plan of the Shandong Peninsula Blue Economic Zone was approved by the State Council. The plan proposed that the development of modern marine fishery should focus on improving the comprehensive benefits, developing modern fishery, upgrading the tertiary industry, and focusing on the development of marine transportation and logistics industry and marine cultural tourism.

## (2) Investment and New Village Planning

Taking the opportunity of industrial structure adjustment and vigorously developing the blue economy in Qingdao city, the local government has invested more than 20 million yuan in the infrastructure building new ports for the modern fishery, new village roads, tourism dock, etc. And through investment, villages have been renovated and strived to build featured fishing villages to meet the needs of tourists to eat, live, travel, purchase, and entertainment.

## (3) Large Demand from the improvement of residents' life

Since the reform and opening of China, economic and social development has progressed by leaps and bounds, with gross national income (GNI) rising from US\$220 per capita in 1980 to US\$10,410 in 2019, large demand for recreational tourism is largely improved. Laoshan Scenic Area is a national 5A-level tourist attraction. In September 2019, Laoshan was selected as one of the first national demonstration areas for all-area tourism, receiving about 20 million visitors each year, of which, Laoshan Tourist Scenic Area receives 4.62 million visitors, especially in the summer, with a huge consumer market. Since 2015, under the encouragement of the local government, there are more than 120 registered Nongjiale and Yujiale in Qingshan fishing village. The tourist who visits the fishing village can be classified into two types: tourists who come from other areas to visit Langyatai Resort; and tourists who come to taste local seafood. There are many tourists who come to visit the fishing village, especially during the holiday period.

### 4.4.3 Threats

#### (1) Competition and Threats from Neighboring Fishing Villages

There are lots of fishing villages are distributed along the coastline in Qingdao. In recent years, these fishing villages gradually enter the stage of tourism development. Featured fishing villages have been built in the same form as Wangjiataihou Village, and further tourism development is facing competition and threat.

#### (2) Potential threats from the entry of urbanized elements

As the urbanization of Qingdao West Coast New Area continues to expand, the flow of people increases, and the influx of different cultural backgrounds, values, and consumption concepts is a fundamental change for the fishery, fishing village, and fishermen. Without scientific design planning, these urbanization factors tend to be the construction of fishing villages to lose their own characteristics and tend to be more and more uniform, which comes to be a potential threat for the future development

#### (3) Environmental Pollution

According to the national marine environmental quality bulletin, the seawater quality in China's Laizhou Bay and the waters in Qingdao's West Coast New Area are in poor condition, with heavy metal pollution. In addition, due to global climate change, eutrophication of marine waters has caused frequent outbreaks of green tides of marine macroalgae.



The tourism development of coastal fishing villages is highly dependent on the environment, as the latter is its developmental basis <sup>[12]</sup>. Considering sustainable development, coastal tourism development is found that has a significant negative impact on the ecological system, especially on the marine environment <sup>[13]</sup>. Generally, the relationship between tourism and ecological protection and sustainable development in villages shows different characteristics in different developing stages: tourism development owns a positive impact on environmental protection and sustainable development at the beginning stage, but had a negative impact in the late stage. Currently, the tourism of fishing villages of Langyatai Town is at the beginning stage, but the facing threat cannot be neglected. In summary, the SWOT analysis results can be summarized as the following Table 4.3.

Table 4.3 Summaries of SWOT analyses

Strengths	Excellent Natural Conditions
	Tourism Resource Strength
	Convenient traffic conditions
	Policy Strength
Weaknesses	Resources Have Not Been Fully Protected and Developed In Fishing Village
	Land Resources Are Scarce
	Weak Management and Collaboration
	Low degree of industrial marketization and poor market operation ability
Opportunities	Opportunities brought by policy guidance
	Investment and New Village Planning
	Large Demand for Fishing Village Tourism
Threats	Competition and Threats from Neighboring Fishing Villages
	Potential threats from the entry of urbanized elements
	Environmental Pollution

#### 4.5 Conclusion and discussion

In this chapter, the current developing situations of coastal fishing villages in Qingdao West Coast New Area was analyzed and the current developing problems were summarized. In order to better describe the current development situation, the fishing villages are divided into four different types by their different industrial transformation models.

This Chapter makes the definitions of four typical fishing village transformation types, i.e., fishery dominated type (FT), fishing products processing dominated type (FPPT), fishing village tourism dominated type (FVTT), and Diversified development type (DDT), and takes four typical transformed coastal fishing villages in Qingdao West Coast New Area as our research objects: Xiyangjiawa Village, Dingshiwa Village, Wangjiataihou Village, and Taixitou Village. Based on the classification, the developing history, their cultural characteristics, and main problems for industrial transformation have been analyzed. Furthermore, the factors that influence the fishing

villages' development have been summarized. In addition, the future industrial transformation trend has been analyzed based on the SWOT analysis method.

## Reference

- [1] Ramos, D.M.B., Costa, C.M.M.D., 2017. Coastal tourism in rural areas: development model. *Int. J. Enterpren. Innovat. Manag.* 21 (3), 242–260.
- [2] Amir, A.F., Abd Ghapar, A., Jamal, S.A., et al., 2015. Sustainable tourism development: a study on community resilience for rural tourism in Malaysia. *Procedia-social and behavioral sciences* 168, 116–122.
- [3] Zhang T, Hu Q, Ding Q, et al. Towards a Rural Revitalization Strategy for the Courtyard Layout of Vernacular Dwellings Based on Regional Adaptability and Outdoor Thermal Performance in the Gully Regions of the Loess Plateau, China[J]. *Sustainability*, 2021, 13(23): 13074.
- [4] Han Ming Mo, *Rural socialism* [M]. Beijing: Peking University Press, P84
- [5] IJ Winfield. Recreational fisheries in the UK: natural capital, ecosystem services, threats, and management [J]. *Fisheries Science*, 2016, 82 (2):203-212.
- [6] LIU Zi-fei. Fishery development strategy based on rural vitalization in China [J]. *Ecological Economy*, 2018, (01):69-80
- [7] Alpina Begossi. Ecological, cultural, and economic approaches to managing artisanal fisheries [J]. *Environment, Development, and Sustainability*, 2014, 16(01):5-34
- [8] Chen Dagang. Sustainable Development and Marine Aquaculture, *Marine Economy*[J], 2001(1).
- [9] Xu Bolong. The East China Sea is not a good scenario for striped bass, but the experts urge not to kill them all [J], *China Ocean News*, 2000, 12(15).
- [10] Zhu L.X., Li L.F. A brief discussion on the scientific and technological countermeasures of China's fishery development[J], *Modern Fishery Information* 2004,9(19):9.
- [11] Wang JY. Research on "Three Fisheries" and the Citizenship of Fishermen, [M] (98-163), Wuhan University Press, 2014, 3.
- [12] Lu C, Pang M, Yang J, et al. Research on interactions between the economy and environment in tourism development: Case of Qingyang, China [J]. *Sustainability*, 2018, 10(11): 4033.
- [13] Stanciu A C, Dinu R N, Popovici N. Tourism-Environment Impact Relationship on the Romanian Black Sea Coast [J]. *Ovidius Univ. Ann. Econ. Sci*, 2016, 16: 143-147.

**CHAPTER 5**  
**THE IMPACT OF FISHERY INDUSTRIAL TRANSFORMATION ON**  
**RURAL REVITALIZATION**

## **5 The impact of fishery industrial transformation on rural revitalization at the village level: A case study of a Chinese fishing village**

- 5.1 Industrial transformation and fishing villages' development of Wangjiataihou Village
  - 5.1.1 Industrial transformation and fishing villages' development o Wangjiataihou
  - 5.1.2 Industrial transformation and fishing villages' development of Xiyangjiawa
  - 5.1.3 Industrial transformation and fishing villages' development of Dingshiwa
  - 5.1.4 Industrial transformation and fishing villages' development of Taixitou
- 5.2 Revitalization of fishing villages and fishermen
  - 5.2.1 Revitalization of Wangjiataihou
  - 5.2.2 Revitalization of Taixitou
  - 5.2.3 Revitalization of Xiyangjiawa
  - 5.2.4 Revitalization of Dingshiwa
- 5.3 Effectiveness of industrial transformation on fishing villages
  - 5.3.1 Effectiveness of industrial transformation on Wangjiataihou Villag
  - 5.3.2 Effectiveness of industrial transformation on Xiyangjiawa Village
  - 5.3.3 Effectiveness of industrial transformation on Dingshiwa Village
  - 5.3.4 Effectiveness of industrial transformation on Taixitou Village
- 5.4 Discussion and conclusion
  - 5.4.1 Did all industrial transformations bring good impacts on fishing villages' revitalization?
  - 5.4.2 Negative changes along with the industrial transformation in fishing villages
  - 5.4.3 Recommendations for the villages to transform from traditional fishery to fishing village tourism and for the future development of Wangjiataihou Village

## 5 The impact of fishery industrial transformation on rural revitalization at the village level: a case study of Chinese fishing villages

### 5.1 Industrial transformation and fishing villages' development of case study Villages

In general, a common development characteristic summarized from each case study village was the full use of the local resource, labor, and other resources to drive the industrial transformation leading to village revitalization. Through the industrial transformation, the diversified industrial structure speed up the development of these traditional coastal fishing villages. Dingshiwa village, Wangjiataihou village experienced a transformation from the primary industry: traditional marine fishery to the second and tertiary industry: fishing products processing and fishing village tourism. Taixitou village successfully diversified its industries as combine fishery, fishing products processing, and fishing village tourism. Detailed information about each village's basic developing conditions, current situation, and industrial transformation process are shown in Table 5.1.

Table 5.1 Situation, development situation, and main characteristics of industrial transformation

Village	Basic situation	Development situation	Main characteristics of transformation
Xiyangjiawa (FT)	Located 7.2km southeast of Langya town, Xiyangjiawa village occupies an area of 1.9km <sup>2</sup> and the population is 1567 local residents and around 2000 immigrants in 2020. It has the biggest inner water harbor in Langya town, and 90% of the population engages in fishery and marine farming.	1) From 1985 to 2000, the main village industry is the traditional marine fishery, which resulted in slow village development and a decrease in income. 2) Since 2001, a series of industrial transformations happened and several companies have been established.	1) Since 2001, enterprises, as the main driving force for industrial upgrades and transformation. 2) Local government plays an important role in investment promotion and supply policy support for traditional fishery upgrade.
Dingshiwa village (FPPT)	Owning convenient transportation, Dingshiwa village was located along the both sides of ZhangTao Road, and just 4.5km in the southeast of Langya town. The total village area is 1.3km <sup>2</sup> . In 2020, the village residents are 430, and no immigrants. The village economy is dominated by fishing products processing industry.	1) From 1985 to 2000, the main income for villagers come from the fishery. The decline of the traditional fishery caused economic backwardness in this village. 2) Since 2000, the village industry started to transform into a fishing products process industry.	1) Fishing products processing enterprises were established in the village as a main driving force for industrial transformation. 2) Village elites acted as a bridge between the outcoming enterprises and local fishermen. 3) In recent years, the local government planned it as a model

		village for rural revitalization.
Wangjiataihou village (FVTT)	Located in the south of resort area in Langya town, and nearby Longwan beach, Wangjiataihou village occupies an area of 2.3 km <sup>2</sup> and has 310 households with 682 residents in 2020. Fishing village tourism is the dominated industry in this village.	1) From 1985 to 2000, it had been dominated by the traditional marine fishery. 2) Along with the completion of Coastal Road in 2003, the industrial transformation started. 3) Since 2008, fishing village tourism has developed rapidly and become dominant industry.
Taixitou (DDT)	Located 7.6km southeast of Langya town, Xiyangjiawa village occupies an area of 2.7km <sup>2</sup> and the population is 1170 residents and around 200 immigrants in 2020. The village economy is the combination of the marine fishery, fishery processing industry, and fishing village tourism.	1) From 1985 to 2000, it is a traditional fishing village and the development is very slow. 2) Since the industrial transformation started in 2000, the industrial structure has been diversified and several different industrial development models have been mutually developed.

The development and transformation process in these four fishing villages can follow three stages: Firstly, from 1985 to 2000, the four case villages are all traditional coastal fishing villages, were epitomized by traditional marine fishery and gradually declined. The change of the household contract responsibility system in 1984, greatly improve fishermen's production motivation, and the fishery was rapidly developed. Until the mid-1990s, accompanied by increasing fishing costs, long-term overfishing and offshore pollution have led to the increasing decline of fishery resources, and slow development of fishing villages. At the same time, the rapid urbanization process makes fishing villages face the same rural disease as other rural areas: over-fast aging, the increasingly abandoned-out and abandoning of village vernaculars, poor living conditions and environment, and slow economic development<sup>[1]</sup>.

Secondly, since 2000, with the depletion of offshore fishery resources and the implementation of China's new policy on marine fishing, marine fishing production continued to decrease between 2001 and 2008. The traditional coastal fishing villages entered a preliminary transformation stage by different driving forces. According to our research, motivated by governmental guidance and enterprises, Xiyangjiawa village upgraded its traditional marine fishery into a modern marine

fishery and became a modern fishery-dominated fishing village (FT). The essential difference between the current modern fishery and the previous traditional fishery is that the modern fishery is a technology-led fishery. Modern fisheries are more rational in the development and utilization of fishery resources, constantly improving the scientific and technological content of production, using new technologies and modern equipment to improve production efficiency while using scientific methods to implement effective management of the fishery, paying attention to the protection of the environment and resources <sup>[2]</sup>. The local government used advanced science and technology, and equipment to arm their fishing industry, by vigorously promoting the regionalization of fishery, standardization, industrialization, and market-oriented to replace the original human-based manual labor methods and traditional fishing methods, and significantly improve the productivity of fishery labor and commodity rate. In 2001, Xiyangjiawa Village established Qingdao Xiyangjiawa Port Co., Ltd. In 2004, the aquatic products trading market with a total area of 12,000 m<sup>2</sup> and the port trade district was built. In 2007, Qingdao Xiyangjiawa Marine Aquaculture Professional Cooperative was established. Dingshiwa village currently is a fishing product process dominated type village (FPPT), it was transformed mainly by the enterprises' motivation. Several fishing products processing companies were established in this village, among them the Qingdao Sanshengyuan Fishing Products Co., Ltd. Played a leading role during the transformation. The Wangjiataihou village is a fishing village tourism-dominated type village (FVTT). Along with the completion of Coastal Road in 2003, several villagers used their houses as hotels to receive visitors. Village elites acted as the main driving force in this village. Taixitou village, we name it as a diversified development type, it is also the earliest transformed village in this area. It is successfully diversified its industry and balanced them. In 2004, it was identified as one of the 20 well-off model villages by Qingdao City, and in 2005, it was identified as one of the 50 pilot villages for new rural construction by the Jiaonan Municipal Party Committee and Municipal Government. Different from other transformed villages, the successful transformation and industry diversification is driven by the combination of elite guidance, villagers' participation, and enterprises.

Thirdly, since 2010, these villages entered a rapid development and revitalization stage after around ten years of transformation. Xiyangjiawa economic cooperative was established in 2019, which greatly accelerated the development of the modern fishery and the village revitalization. For Dingshiwa Village, 2019 comes to be an important revitalization year, the main road: Daqingguan Road has been enlarged and greatly improve the local transportation conditions. In the same year, Dingshiwa Village was planned to be built as a beautiful fishing village by the government, and the infrastructure conditions and living environment have been improved a lot. In 2020, it has been awarded as a model village for the project of "Ten, hundred and thousand rural revitalization villages" in Shandong Province, China. For Wangjiataihou Village, in 2017, the village committee invested 32 million RMB in village appearance improvement and achieved significant results. The village infrastructure achieved rapid upgrades, such as the complement of rainwater and sewage division, modular sewage treatment, the village road hardening rate reached 100% and the upgrade of road area ratio, two more village squares, and a school has been completed. Based on this, the fishing village tourism also gets unprecedented development, with more than 4200 beds for tourists and



more than 110 households “Yujiale”, (Happy fishermen home), the unique form of rural tourism, involves village families hosting guests in their guesthouses, providing local food and lodging, and which means more than half of the villagers engage in fishing village tourism. Owning one mountain, one port, and one island, Taixitou village is the only village where three industries are balanced development. The ceremony of sacrifice offering to the sea was held in Taixitou Village for the first time in 2014. Currently, this ceremony comes to be an intangible cultural heritage in Qingdao, China and attracts thousands of tourists come to visit every year. This ceremony is a cultural creativity event that gets great support from local government and residents. In 2022, Qingdao Beibao Ocean Technology Co. was established in 2006 and covers an area of 80,000 m<sup>2</sup>, which is invested 10 million in 2022 to enlarge 12,000 m<sup>2</sup> on the sea and 6,000 m<sup>2</sup> on the land.

After three stages of development, the industrial transformation promotes the villages’ economic prosperity and sustainable development as shown in Figure 5.1. It also accelerates the diversification of industrial structure, and restructuring of fishermen’s employment, which will increase villagers’ income, improve the current living conditions, and to a certain degree solve the current village disease: abandoned village, underpopulation and aging, poor infrastructure and so on.

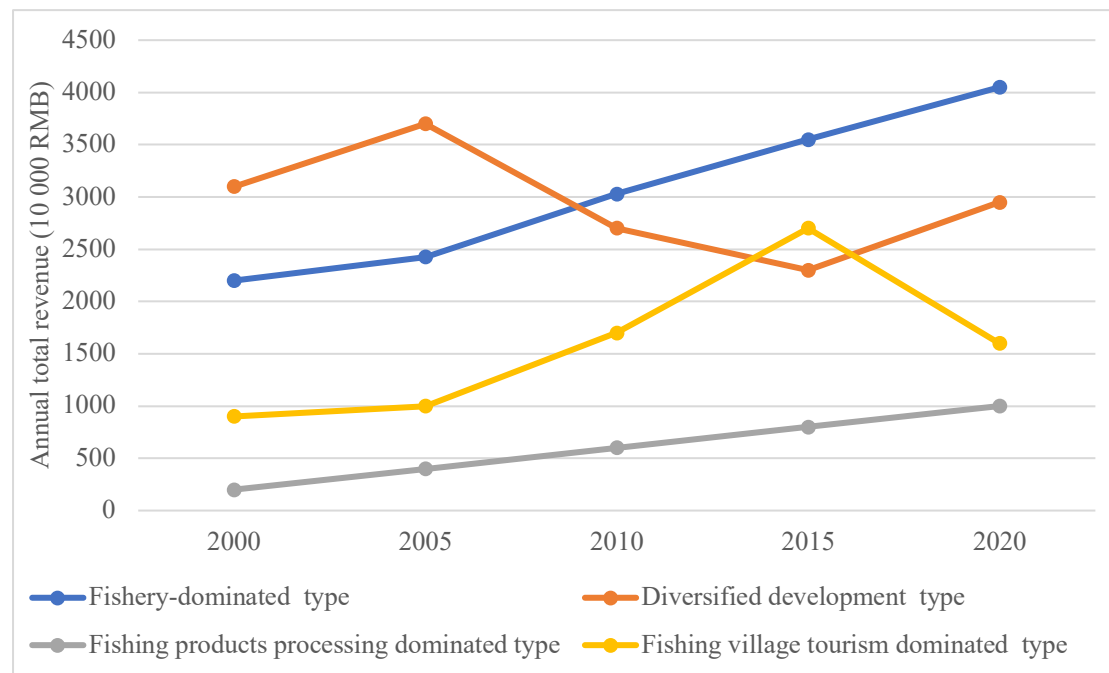


Figure 5.1 The total annual revenue of four fishing villages from 2000-2020

Source: the data was collected from the village committee and town cadres in the field investigation

Overall, we can summarize the basic developing stages as three periods: the renovation stage, the development stage, and the revitalization stage, as Figure 5.2. In the first renovation stage, the transformation direction choice is very important and formed as the base for the future village development. In the second development stage, through the industrial transformation and restructure, villages experienced rapid development by the combination of different driving forces. And finally

comes to be the revitalization stage, based on the previous development stages, industrialization enters scale development and forms a sustainable development trend. During this stage, new driving forces: creativity were added and paid more attention. To be detailed, technology creativity also be added to the revitalization of Fishery dominated village, and Fishing product processing dominated type village and cultural creativity was added in FTT village.

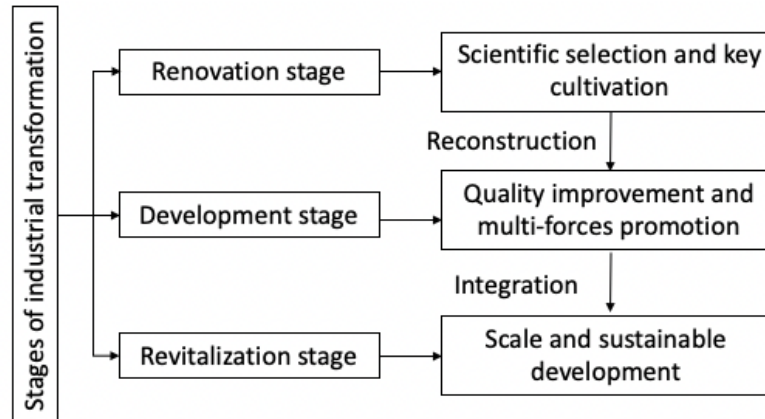


Figure 5.2 Basic stages in the industrial transformation in coastal fishing villages

#### 5.1.1 Industrial transformation and fishing villages' development of Wangjiataihou

Since 1990s, the industrial development in Wangjiataihou Village has experienced a transformation from traditional fishery to modern fishery and fishing village tourism. This transformation mainly attributes to the marine resources and regional advantages of being in Qingdao West Coast New Area, one of the most rapid urbanization coastal areas. Currently, the traditional fishery is declining gradually and the village industrial construction has been transformed as shown in Table 5.2. Economic diversification of coastal areas through tourism leads to job creation, development of small and medium enterprises (SMEs), increased visitor spending, and multiplier effects<sup>[3]</sup>. For a long period of time, Wangjiataihou Village had been dominated by the traditional marine fishery. Along with the completion of Coastal Road in 2003, several villagers used their houses as hotels to receive visitors. After several years of development, a street that features seafood restaurants has been established. In 2008, the first eight villagers invested for further relinquishing fishery and threw themselves into local fishing village tourism, the so-called “Yujiale” (Happy fishermen home). The unique form of rural tourism involves village families hosting guests in their guesthouses, and providing local food and lodging<sup>[4]</sup>. Currently, many leisure fishing activities are conducted, such as leisure fishing, sea netting, ecological sightseeing, fishing customs experience, etc. According to the statistics of the tourism department, Wangjiataihou Village has already received tens of thousands of tourists in 2021 and increased the income of more than 110 households.

Table 5.2 The timeline of industrial transformation in Wangjiataihou Village

Time Period	Development Steps	Development Situation
1984-1993	Marine fishery is the main village industry, and main source of income for fishermen.	Abundant fishery resources, low fishing costs, high motivation for production.
1993-2003	In line with the modern national fisheries reform, the marine fishery is gradually declining while the offshore mariculture is gradually developing	Offshore fishery resources are decreasing year by year, the cost of marine fishery is increasing, and fishing volume is decreasing
2004-now	Combing with marine fishery, offshore mariculture and coastal fishing village tourism come to be the main village industry.	Government has supported and invested to transform and improve the village appearance and the infrastructure construction.

Since Wangjiataihou Village start to develop village tourism in 2004, it has become a successful fishing village tourism destination and attracts numerous citizens from nearby cities especially during holidays. The approximate annual number of tourists have been increased year by year Table 5.3.

Table 5.3 The approximate annual tourist amount from 2004 to 2020

Year	Tourist amount (10 thousand)
2004	0.1
2010	10
2017	30
2019	35
2020	20

Source: a deep-interview with one of the village leaders.

From 2004 to 2019, tourism in Wangjiataihou Village has developed steadily, and the output value of tourism has increased year by year. The output value of fishery has gradually decreased, while the gross social output value has increased due to this industrial transformation shown in Figure 5.3. But in 2020, it shows a declining trend due to the consequences of the COVID-19 pandemic. From 2004, a gradual transformation from fishery to fishing village tourism exerted a significant impact on the increase of gross social output value.

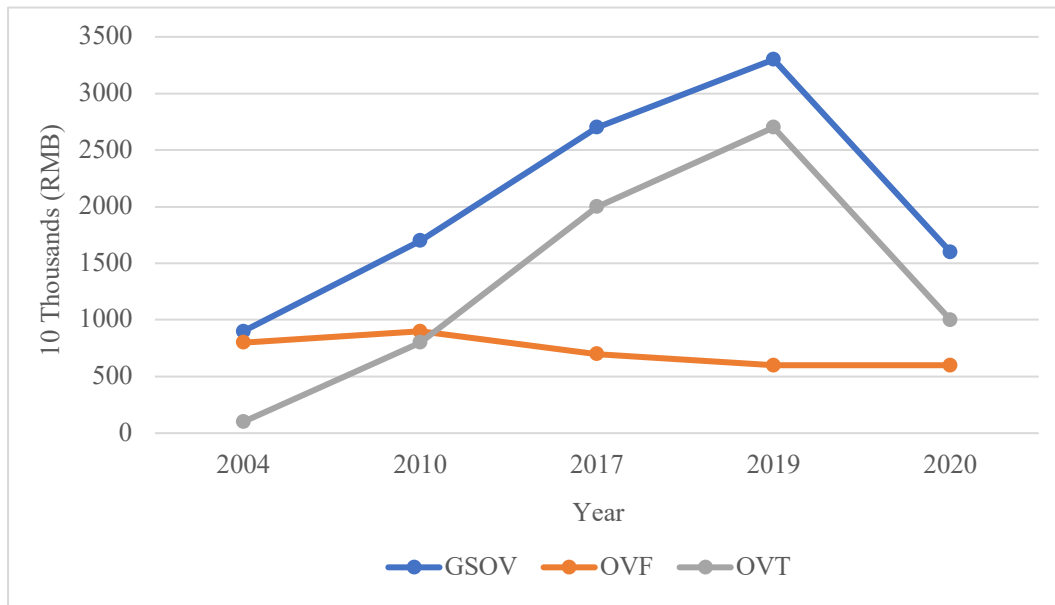


Figure 5.3 The value of the gross social output

(GSOV: gross social output value, OVF: Output value of fishery; OVT: output value of tourism.

The data was collected from Wangjiataihou Village committee in the field investigation.)

### 5.1.2 Industrial transformation and fishing villages' development of Xiyangjiawa

Located 7.2km southeast of Langya town, Xiyangjiawa village occupies an area of 1.9km<sup>2</sup> and the population is 1567 residents and around 2000 immigrants in 2020. It has the biggest inner water harbor in Langya town, and 90% of the population engages in fishery and marine farming. Since the 1990s, due to the increasing scarcity of sea resources and a series of new national policies on sea fishing and fishing boats, most fishing villages have been seeking new development routes. Since 2001, enterprises, as the main driving force for industrial upgrades and transformation. Local government plays an important role in investment promotion and supply policy support for traditional fishery upgrade. As the village with the longest history and the largest scale of fishing development in Langya town, the fishing village has been upgrading its fishing boats in accordance with the requirements of the national standardized fishing village transformation, and there has been obvious development in the quantity and quality of the fishing village, and the fishing production has been increasing year by year as shown below. This also shows that the professionalism and modernization of the fishing boats and fishermen in the village are getting higher and higher. In the transformation of the traditional fishing industry, the village has successfully transformed from a traditional fishing village to a modern fishing village by increasing the technology and upgrading fishing operations

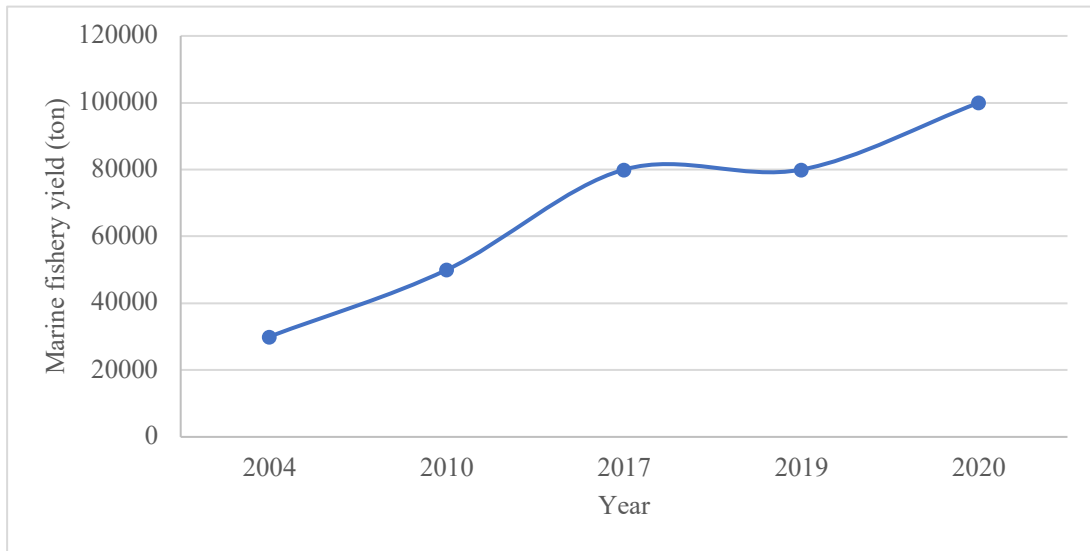


Figure 5.4 The marine fishery output of Xiyangjiawa fishing village

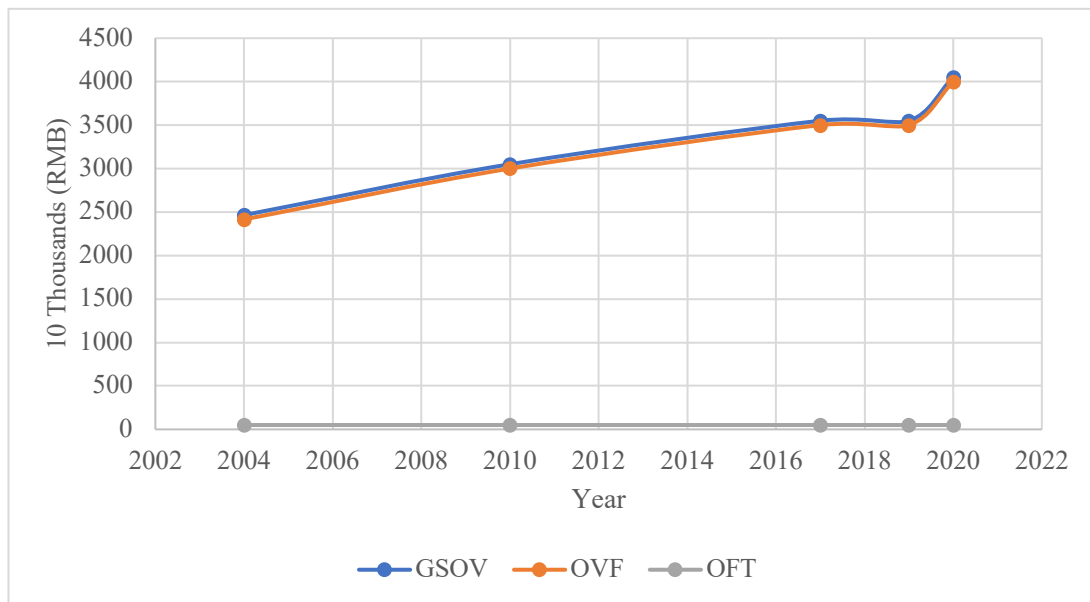


Figure 5.5 The value of the gross social output in Xiyangjiawa

(GSOV: gross social output value, OVF: Output value of fishery; OVT: output value of tourism.  
The data was collected from the Village committee in the field investigation.)

### 5.1.3 Industrial transformation and fishing villages' development of Dingshiwa

Owning convenient transportation, Dingshiwa village was located along both sides of ZhangTao Road, and just 4.5km the southeast of Langya town. The total village area is 1.3 km<sup>2</sup>. In 2020, the village residents are 430, and no immigrants. The village economy is dominated by the fishing products processing industry. From 1985 to 2000, the main income for villagers come from the fishery. The decline of the traditional fishery caused economic backwardness in this village. Since 2000, the village industry started to transform into a fishing products process industry. Fishing products processing enterprises were established in the village as a main driving force for industrial

transformation. Village elites acted as a bridge between the outcoming enterprises and local fishermen. In recent years, the local government planned it as a model village for rural revitalization.

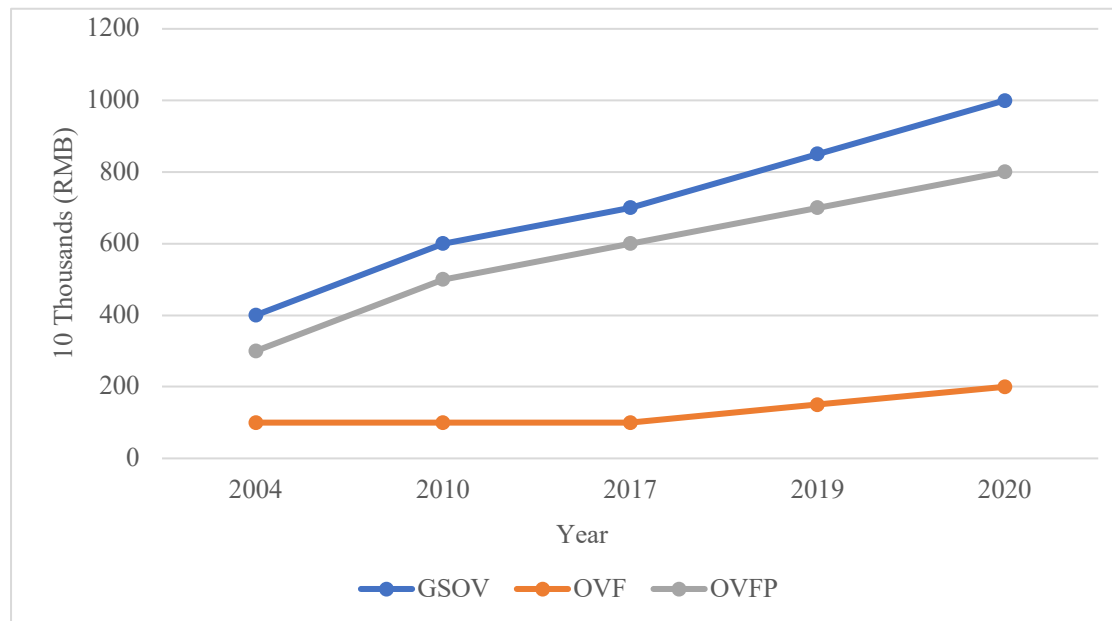


Figure 5.6 The value of the gross social output in Dingshiwa

(GSOV: gross social output value, OVF: Output value of fishery; OVT: output value of tourism.  
The data was collected from Village committee in the field investigation.)

#### 5.1.4 Industrial transformation and fishing villages' development of Taixitou

Located 7.6km southeast of Langya town, Xiyangjiawa village occupies an area of 2.7km<sup>2</sup> and the population is 1170 local residents and around 200 immigrants in 2020. The village economy is the combination of the marine fishery, fishery processing industry, and fishing village tourism. From 1985 to 2000, it is a traditional fishing village and the development is very slow. Since the industrial transformation started in 2000, the industrial structure has been diversified and several different industrial development models have been mutually developed. Cultural creativity played a main driving force for the village's industrial transformation. Government shows great support for their transformation. Early in 2005, it has been planned as the first pilot new village project.

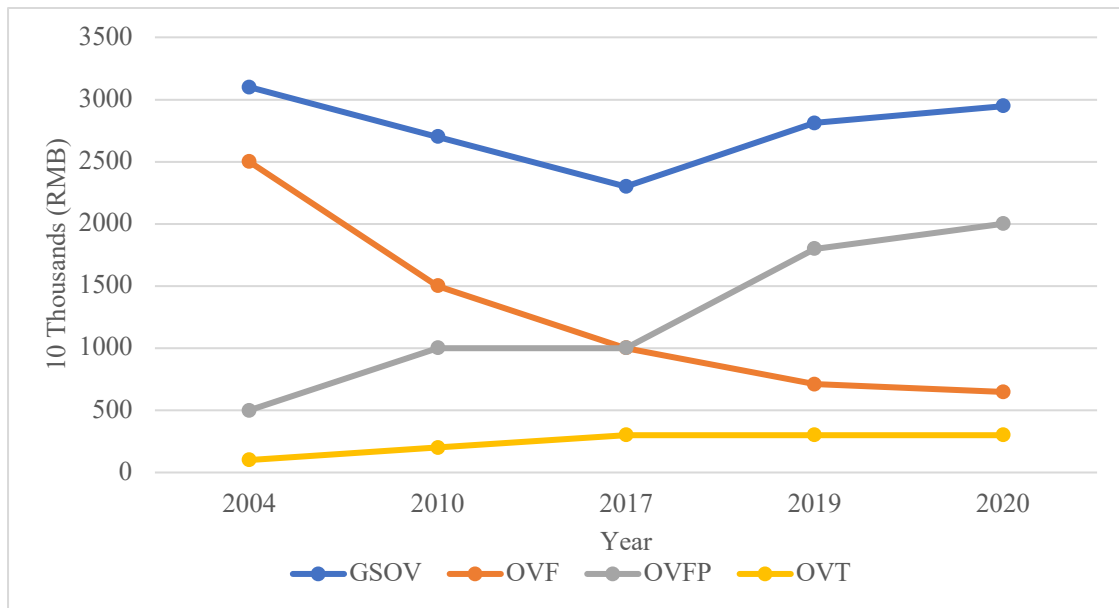


Figure 5.7 The value of the gross social output in Taixitou  
(GSOV: gross social output value, OVF: Output value of fishery; OVT: output value of tourism.  
The data was collected from Village committee in the field investigation.)

## 5.2 Revitalization of fishing villages and fishermen

### 5.2.1 Revitalization of Wangjiataihou

According to the field investigation, there are three types of vernacular dwellings in One-section courtyard, Two-section courtyard, and Three-section courtyard. These dwellings are mainly built in the 1980s and 1990s Figure 7. In Wangjiataihou Village, the vernacular dwellings used for hosting tourists are different from these traditional fishing village dwellings since they are multistory buildings with a building area of about 400 m<sup>2</sup> and built around 2010 Figure 5.8. With the improvement of living standards, dwellings in Wangjiataihou Village have been changed after 2010. The newly built vernacular dwellings are twice the size of the previous dwellings. And the spatial functions of these newly built dwellings are also changed with the lifestyle and living habits of the villagers Figure 5.9.



Figure 5.8 Traditional vernacular dwellings and modern dwellings in Wangjiataihou Village



Figure 5.9 Modern vernacular dwellings in Wangjiataihou Village

The abandoned village, left-behind children and unattended senior citizens, empty houses, and poor infrastructure are a common phenomenon in the research area. Currently, in Wangjiataihou Village, these phenomena have changed due to the village's industrial transformation. In general, fishing village tourism has promoted the change of vernacular dwellings and the improvement of fishermen's living environment. From Figure 5.10, it can be seen that the development of Wangjiataihou Village experienced rapid revitalization between 2010 and 2020. In 2017, the village committee invested 32 million RMB in village appearance improvement and yielded significant achievements. The village infrastructure is upgraded rapidly, such as the complement of rainwater and sewage division, modular sewage treatment, 100% village road hardening and the upgrade of road area ratio, the construction of two more village squares, and a school.



Figure 5.10 The evolution of infrastructure for tourism in Wangjiataihou Village 2010 and 2020

### 5.2.2 Revitalization of Taixitou

Taixitou Village, as the only that balanced development of fishery, fishing village tourism and fishing products processing, owns great transformation on the village appearance and fishermen's life. From Figure 5.11, the aerial view of Taixitou Village, there are large areas of newly built vernacular dwellings next to the traditional residential area. The living areas and architectural style all experienced a great transformation. Besides the dwellings' transformation, the whole view of this village also transformed. The street view shows that the transportation system within village have been improved.





Aerial view of the Taixitou village

Street view of Taixitou village

Figure 5.11 Present situation of Taixitou village



Figure 5.12 The transformation of vernacular dwellings



Figure 5.13 Present infrastructure

For the infrastructure, lot of newly built and arrangements show Figure 5.13, there are recycling box, bus station and the centralized garbage treatment station, which show that the ecological awareness of local villagers have been improved. And the village appearance have improve.

### 5.2.3 Revitalization of Xiyangjiawa

Xiyangjiawa Village is dominated by modern fishery. For a long time, the fishing villages in Langya town are live for fishery, and the environment of traditional fishery cause the dirty and messy village environment. Along with the upgrading of traditional fishery and the improvement of fishermen awareness , the village environment have improved, showed in Figure 5.14.



Aerial view of the Xiyangjiawa village

Street view of Xiyangjiawa village

Figure 5.14 Present situation of Xiyangjiawa village

In recent years, the upgraded fishery has been increasing fishermen’s income level. In orer to improve their living environment, they built lots of new houses, show as Figure 5.15.



Figure 5.15 Newly built vernacular dwellings

### 5.2.4 Revitalization of Dingshiwa

Same the above three transformed fishing villages, the infrastructure of Dingshiwa Village has been improved by the development of village fishing products processing enterprises. The enterprises bring large amount of investment, which used to improve the village environment and it infrastructure standards. Through these improvements, workers from other areas and the residents are willing to stay in the village, thus the abandoned-out village and population aging phenomena can be changed.



Figure 5.16 The improvement of village infrastructure



Figure 5.17 The current living environment in Dingshiwa Village

Traditional fishermen are mainly those who live in the coastal area and engaged in fishing or offshore mariculture as their main source of income <sup>[5]</sup>. With the industrial transformation, traditional fishermen have experienced the transformation from traditional fishermen to modern fishermen, who are engaged in more diversified field to enlarge their income. From 2004 to 2020, fishery employment declined and the rate of tourism employment increased, reflecting a huge transformation in the employment structure of fishermen in Wangjiataihou Village. In 2004, there were around 100 villagers engaged in fishery, but around 40 in 2020. At the same time, villagers transformed into tourism increased from 10 to 100 households from 2004 to 2020 and more young villagers chose to stay in the village for the sake of developing tourism.

According to the field investigation, there are mainly three changes during this transformation. First, the average income of villagers per year increased from 20 to 30 thousand RMB in 2004 to 100 thousand RMB in 2020. In this process, the income doubled from 2017 to 2020. This is mainly because of the development of village tourism and policy subsidies, such as employment and production transformation subsidy and fishery subsidy. The second change is the transformation of women's social roles. For a long time, due to the high risk of the fishery, men have been the main workforce. With the industrial transformation, women have started to participate in the development of village tourism, like working in the hospitality industry and being a guide and service staff. Their social roles become more diversified. The third change is the significant improvements of the living environment. Life in this village is much more convenient. School, community health center, and

two squares have been established in 2017, all these significantly improved the status of abandoned villages, left-behind children and elderly people, and empty nesters in Wangjiataihou Village.

### 5.3 The overall effectiveness of industrial transformation on fishing villages

#### 5.3.1 The overall effectiveness of industrial transformation on Wangjiataihou Village

As mentioned before, the paper aims to propose a new composite indicator to evaluate the impact of industrial transformation on fishing villages based on the “Three F”. Figure 9 shows the development of Wangjiataihou Village in the “Three F” dimension from 2004 to 2020. Based on the indicators in Table 3.1, the analysis results demonstrate that the industrial transformation from fishery to fishing village tourism significantly promoted the revitalization of fishing villages and fishermen, especially from 2010 to 2019. Meanwhile, the effect on the fishing industry revitalization has increased gradually, while the revitalization process seems to be declining from 2017 to 2020. From the perspective of the fishing village and fishermen, the industrial transformation has consistently exerted positive effects since 2004. As manifested by the index for the fishing village, the figure increased from 0 in 2004 to 0.28 in 2020, and as for fishermen, the number increased from 0.08 in 2004 to 0.29 in 2019. The revitalization of the fishing village is mainly derived from the improvement of the village infrastructure, which was promoted by government investment. As for fishery revitalization, the current fishery industry mainly includes the primary industry: fishery; and the tertiary industry: fishing village tourism. In the process of industrial transformation, Figure 10 shows that there is a significant downward trend after 2017 in the fishery industry, which is because of the significant shrinkage of the low-value-added primary industry. Meanwhile, the gross social output value shows a rapid increase trend in Figure 5.18, which means that the high-value-added tertiary industry has experienced rapid development.

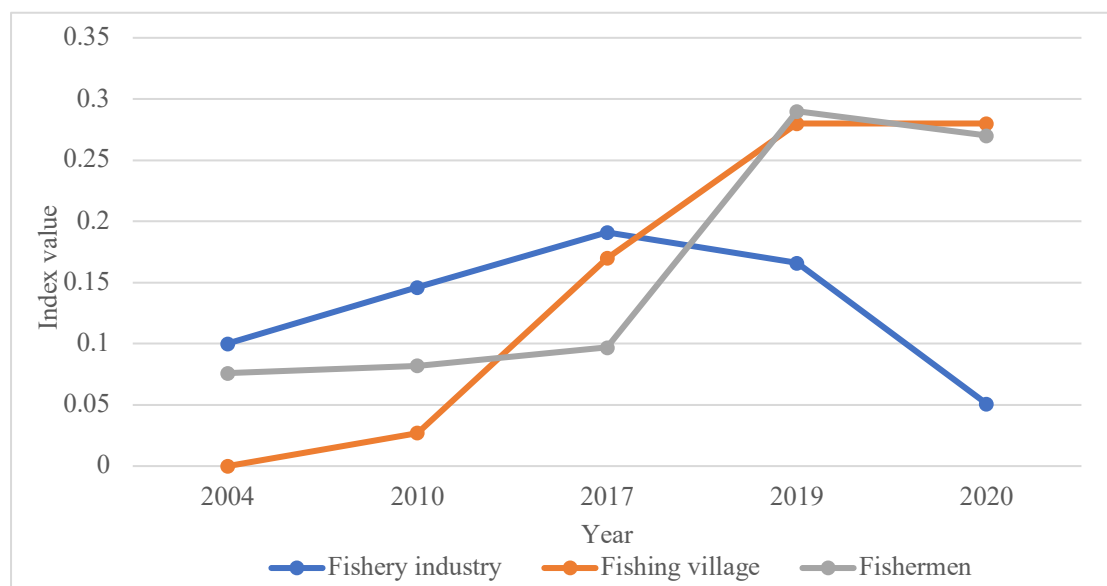


Figure 5.18 The effectiveness of FVR on “Three F” in Wangjiataihou Village

In general, the industrial transformation has promoted the overall revitalization of Wangjiataihou Village to a certain degree shown as in Figure 5.19. Due to the lack of profitability of traditional

fishing, Wangjiataihou Village, has diversified its industrial structure by combining marine fishing, marine farming, and fishing village tourism, Figure 5,19 shows that this transformation has had positive impacts on the revitalization of this fishing village.

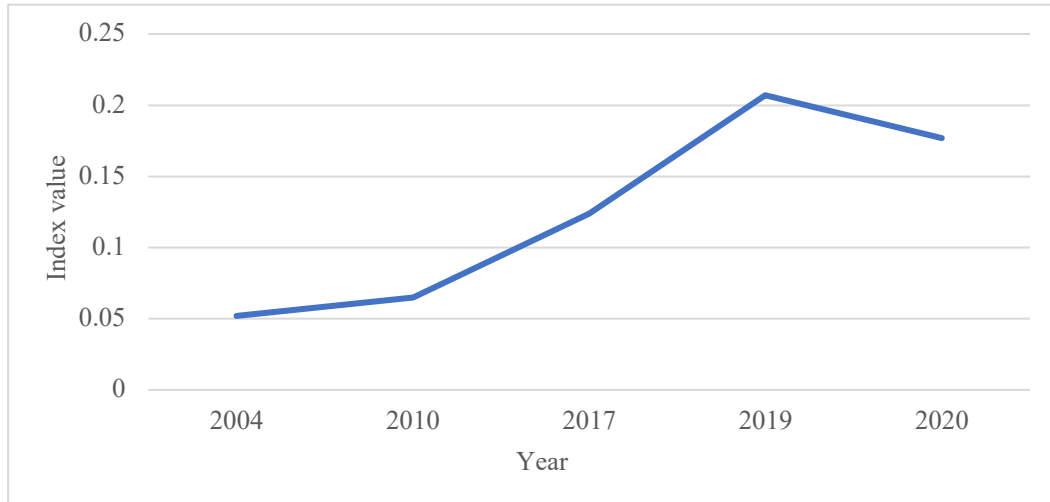


Figure 5.19 The overall effectiveness of FVR on the development of Wangjiataihou Village

### 5.3.2 The overall effectiveness of industrial transformation on Xiyangjiawa Village

Figure 9 shows the development of Xiyangjiawa Village in the “Three F” dimension from 2004 to 2020. Based on the indicators in Table 3.2, the analysis results demonstrate that the industrial transformation of traditional fishery significantly promoted the revitalization of fishing villages and fishermen, especially from 2010 to 2019. Meanwhile, the effect on the fishing industry revitalization has increased gradually, while the revitalization process seems to be declining from 2017 to 2020. From the perspective of the fishing village and fishermen, the industrial transformation has consistently exerted positive effects since 2004. As manifested by the index for the fishing village, the figure increased from 0 in 2004 to 0.28 in 2020, and as for fishermen, the number increased from 0.08 in 2004 to 0.29 in 2019.

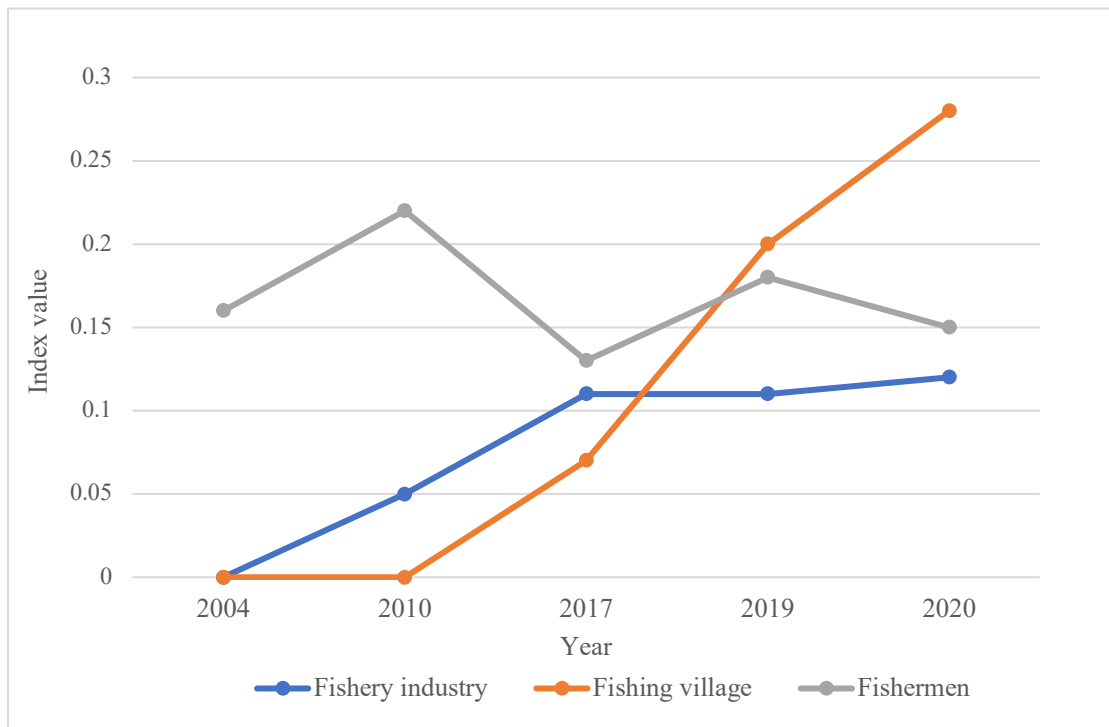


Figure 5.20 The effectiveness on “Three F” in Xiyangjiawa Village

The following Figure 5.21 shows that the industrial transformation has positive effectiveness on the overall development of Xiyangjiawa Village.

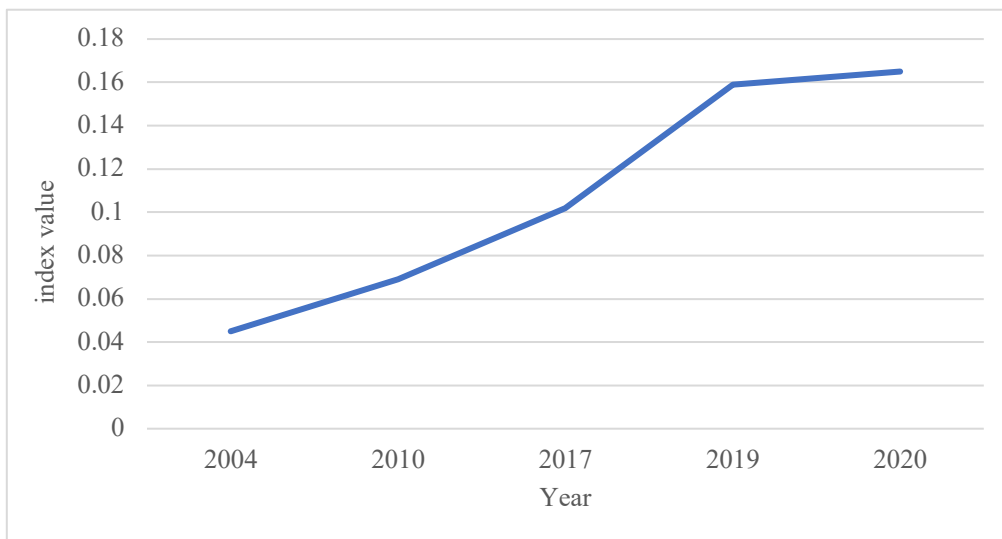


Figure 5.21 The overall effectiveness of FVR on the development of Xiyangjiawa Village

### 5.3.3 The overall effectiveness of industrial transformation on Dingshiwa Village

Figure 5.22 shows the development of Dingshiwa Village in the “Three F” dimension from 2004 to 2020. Based on the indicators in Table 3.3, the analysis results demonstrate that the industrial transformation of traditional fishery significantly promoted the revitalization of fishing villages and fishermen, especially from 2010 to 2019. Meanwhile, the effect on the fishing industry revitalization

has increased gradually, and the revitalization process increased rapidly from 2017. From the perspective of the fishing village and fishermen, the industrial transformation has consistently exerted positive effects since 2004.

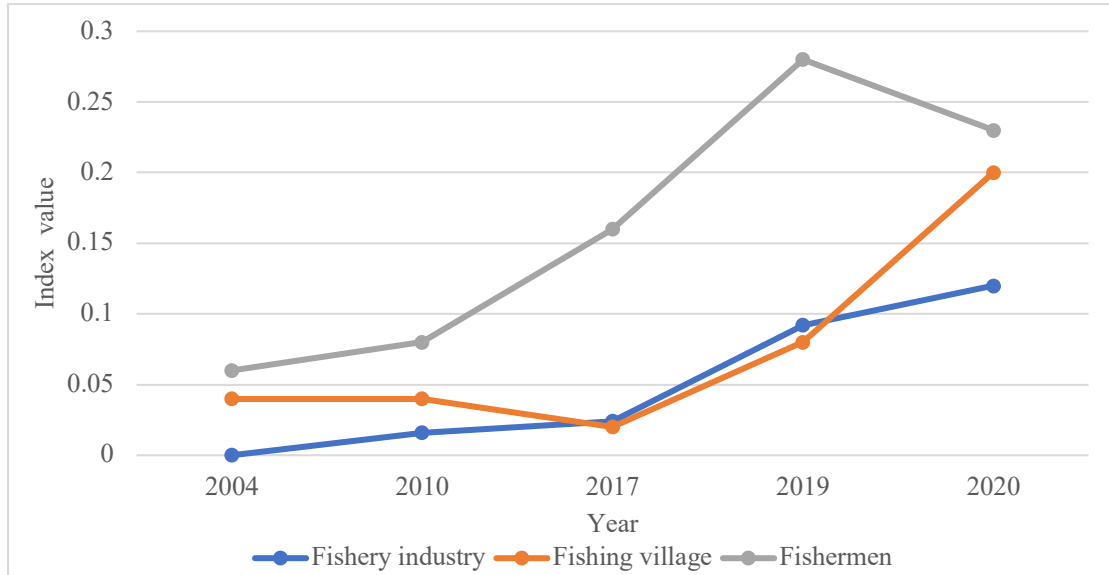


Figure 5.22 The effectiveness on “Three F” in Dingshiwa Village

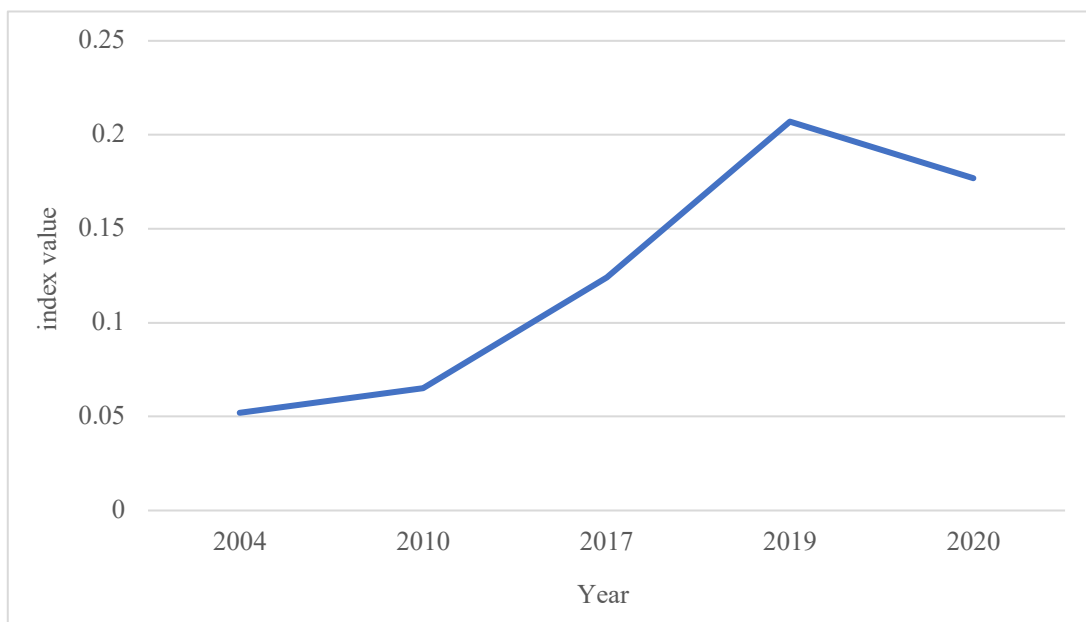


Figure 5.23 The overall effectiveness of FVR on the development of Dingshiwa Village

#### 5.3.4 The overall effectiveness of industrial transformation on Taixitou Village

Based on the indicators in Table 3.4, the analysis results demonstrate that the industrial transformation from fishery to balanced development significantly promoted the revitalization of fishing villages and fishermen, especially from 2017. Meanwhile, the effect on the overall development has increased gradually, Figure 5.24 Figure 5.25. From the perspective of the fishing

village and fishermen, the industrial transformation has consistently exerted positive effects since 2004

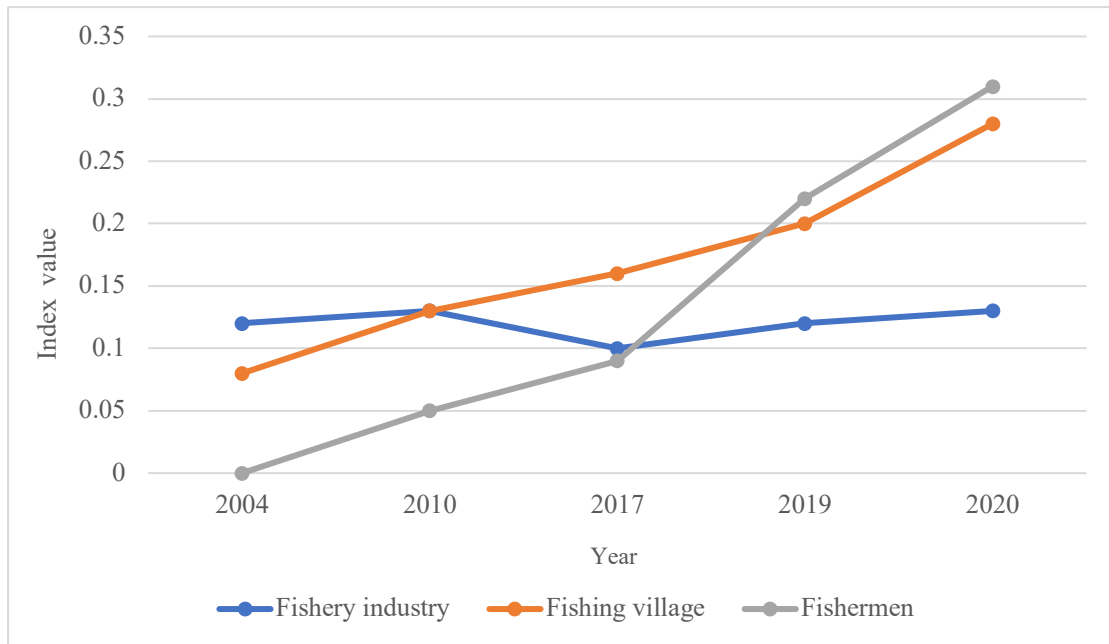


Figure 5.24 The effectiveness of FVR on “Three F” in Taixitou Village

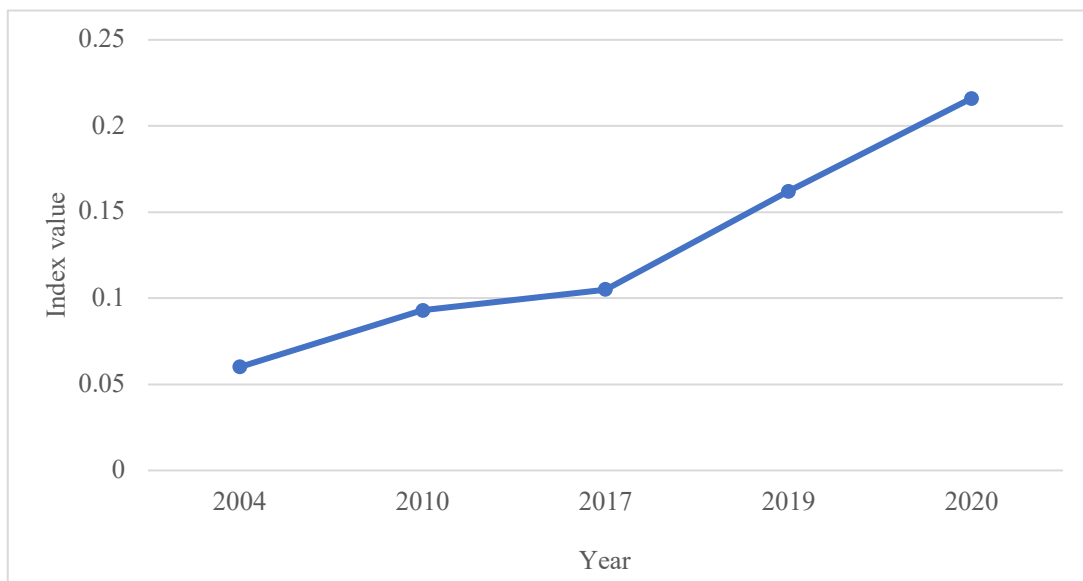


Figure 5.25 The overall effectiveness of FVR on the development of Taixitou Village

#### 5.4 The main considerations of local villagers

The section 5.3 are the effectiveness evaluation of industrial transformation on four different transformed fishing villages, which are all summarized by the newly proposed index evaluation system based on the data. In this section, the main considerations of local villagers are researched.



Although the results from section 5.3 shows that industrial transformation owns positive effectiveness, there are still several considerations from the perspectives of local villagers.

Among the respondents, there are 59% female and 41% male, which show that the population structure in coastal fishing villages. The current indutries in fishing villlage, especially the fishing products processing and fishing villalge tourism, are no longer the heavy phusical labor as the prvious fishery, thus more and more femail villagers take part in new industries.

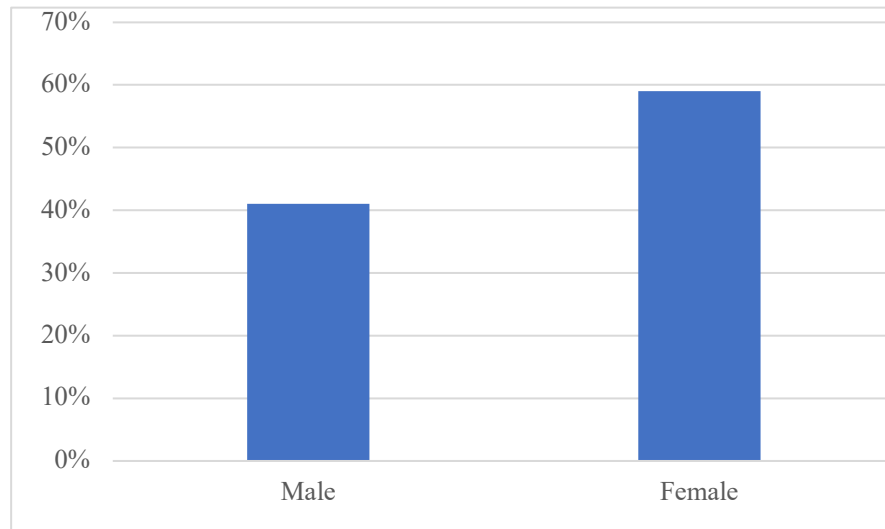


Figure 5.26 Distribution of male and female respondents

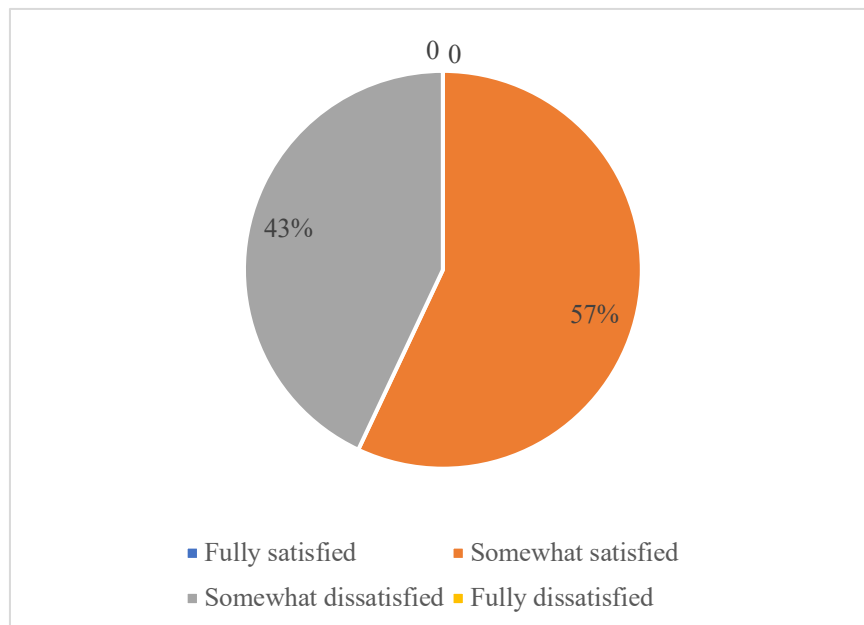


Figure 5.27 Respondents to the question : “To what extent do you satisfy the current life in the fishing village?”

In the previous section, it shows that the industrial transformation owns positive to “Three F”. While for the questionnaire question “To what extent do you satisfy the current life in the fishing village?”, there are 57% respondents show satisfied somewhat, and 43% respondents show dissatisfied somewhat. In order to further research on which aspects that villagers are dissatisfied. To be detailed, the infrastructure, such as road, education facility, medical facilities, senior care facilities, garbage disposal facilities, sewage treatment facilities. Figure 5.28 shows that 68% of the respondents are satisfied fully, 24% are satisfied somewhat, and 8% are dissatisfied somewhat. In recent years, the government make a large investment on the rural transportation development, especially the village road hard projects.

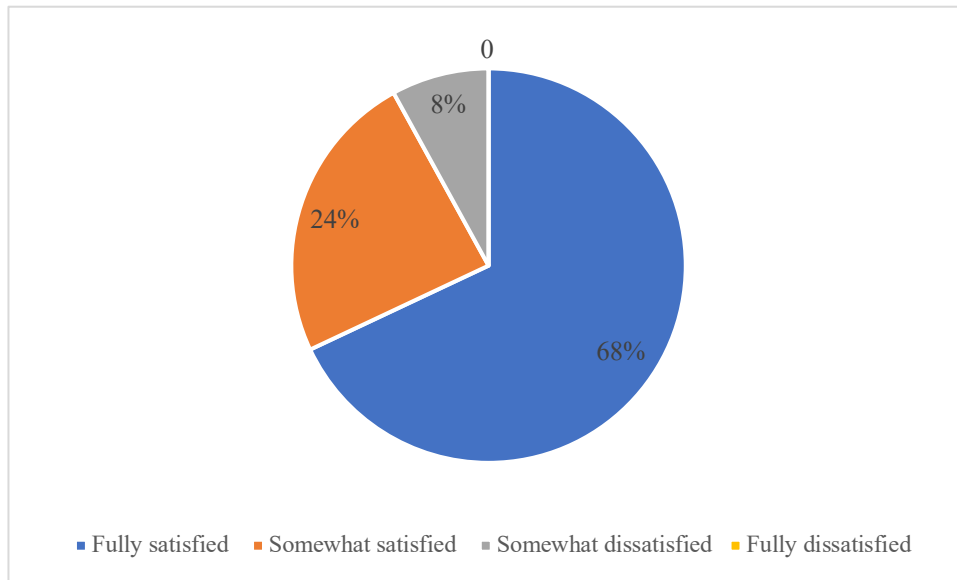


Figure 5.28 Satisfaction level on the road

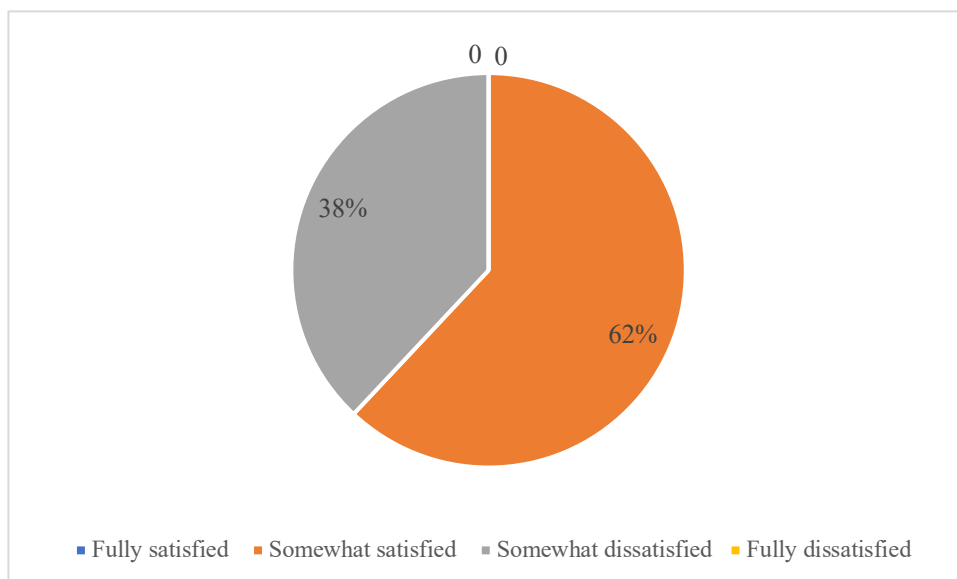


Figure 5.29 Satisfaction level on education facility

For the education facilities, four villages have the situation, they all have one kindergarden and all these kindergardens were built in 2015. Students should go to the schools in the center town or center village.

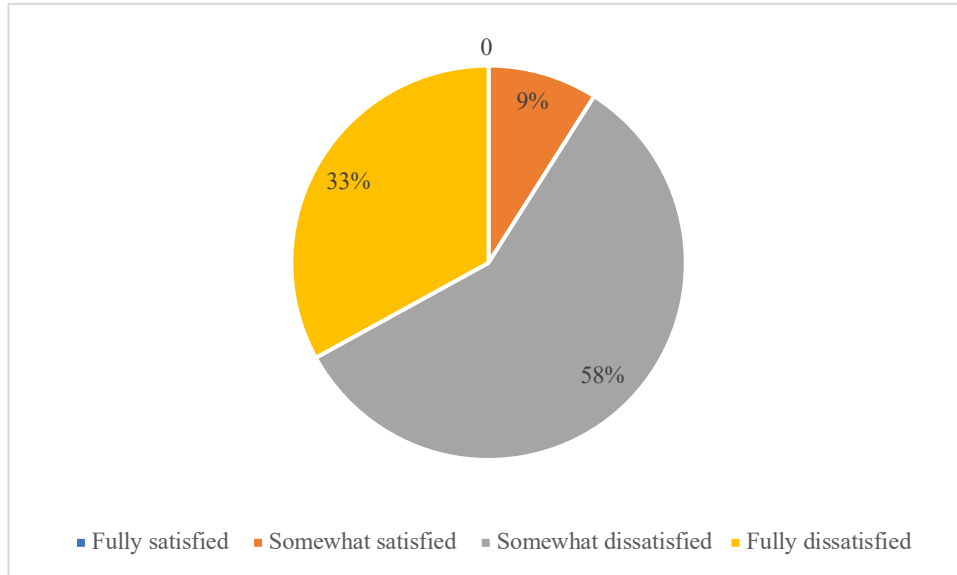


Figure 5.30 Satisfaction level on medical facilities

Among them, the fishing villages are revitalized by the improvement of village infrastructure.

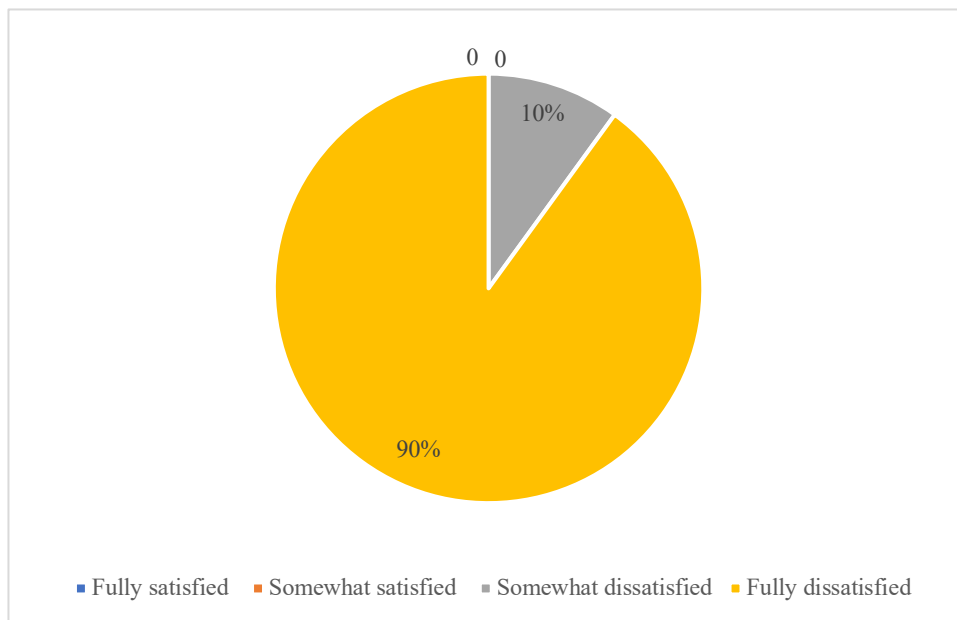


Figure 5.31 Satisfaction level on senior care facilities

For the senior care facilities, villagers commonly own negative attitudes. According to our field investigation, it is found that there are almost no care facilities for seniors. In Wangjiataihou village, there is a public activity room for residents to do some entertainment activities, but for the other

three villages, there is no such kind of care facilities. And that is the reason why such big proportion of respondents choose fully dissatisfied.

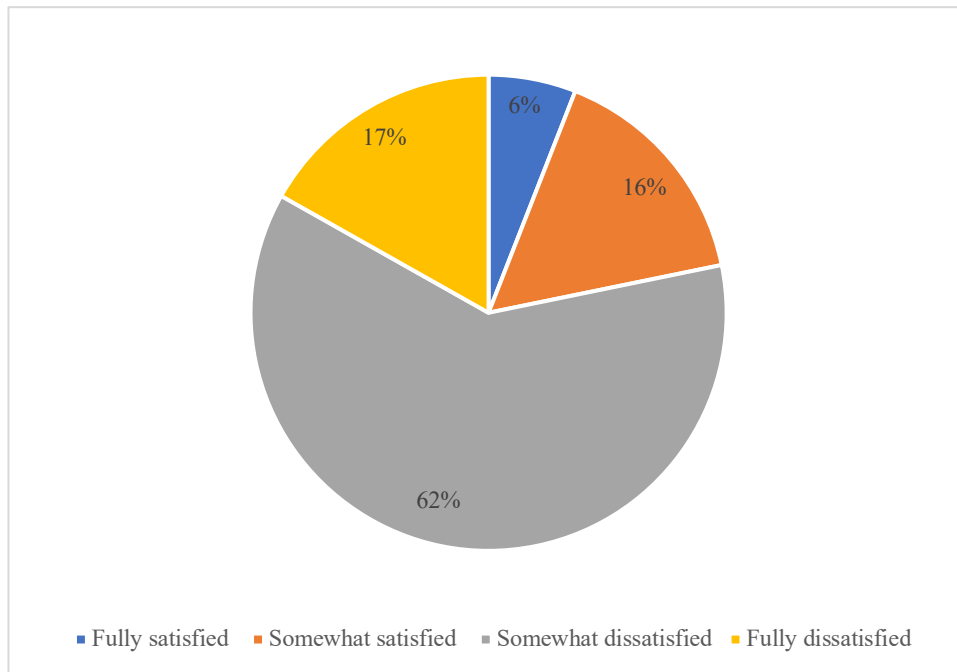


Figure 5.32 Satisfaction level on garbage disposal facilities

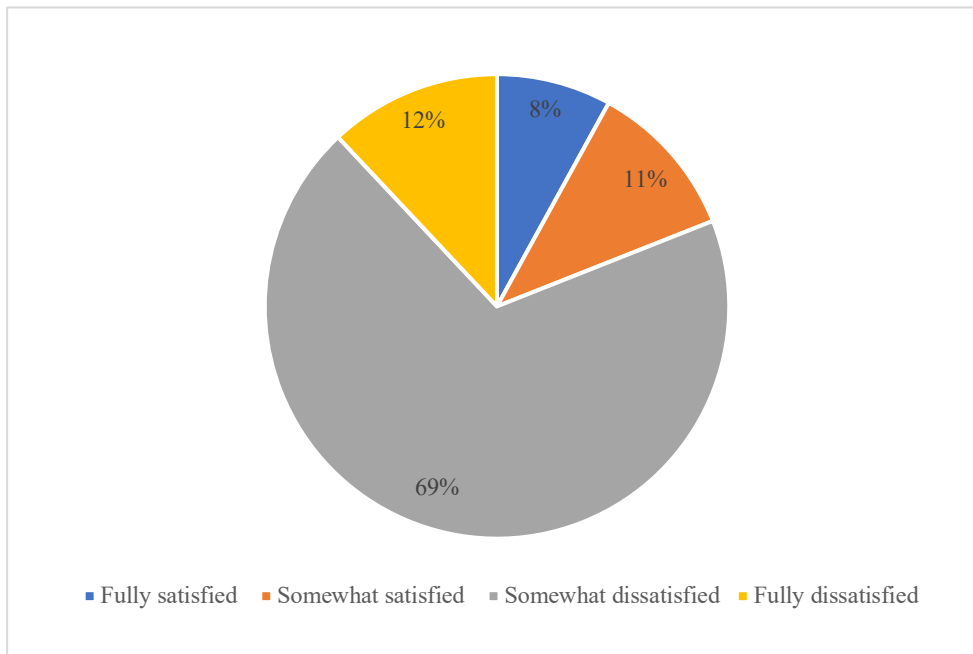


Figure 5.33 Satisfaction level on sewage treatment facilities

Garbage disposal facilities and sewage treatment facilities are the most important factors that influence on the living environment and village appearance. In Firue 5.32 and Figure 5.33, it can see that the local residents are still dissatisfied with these infrastructure.

In summary, Figure 5.34 shows that road is the only infrastructure that residents show fully satisfied. Others, especially for the senior care facilities, residents show the highest dissatisfied level. Along with the aging population tend in rural areas, the requirements of senior care facilities will be more and more, while this section of infrastructure are almost the developing gap in current fishing village development.

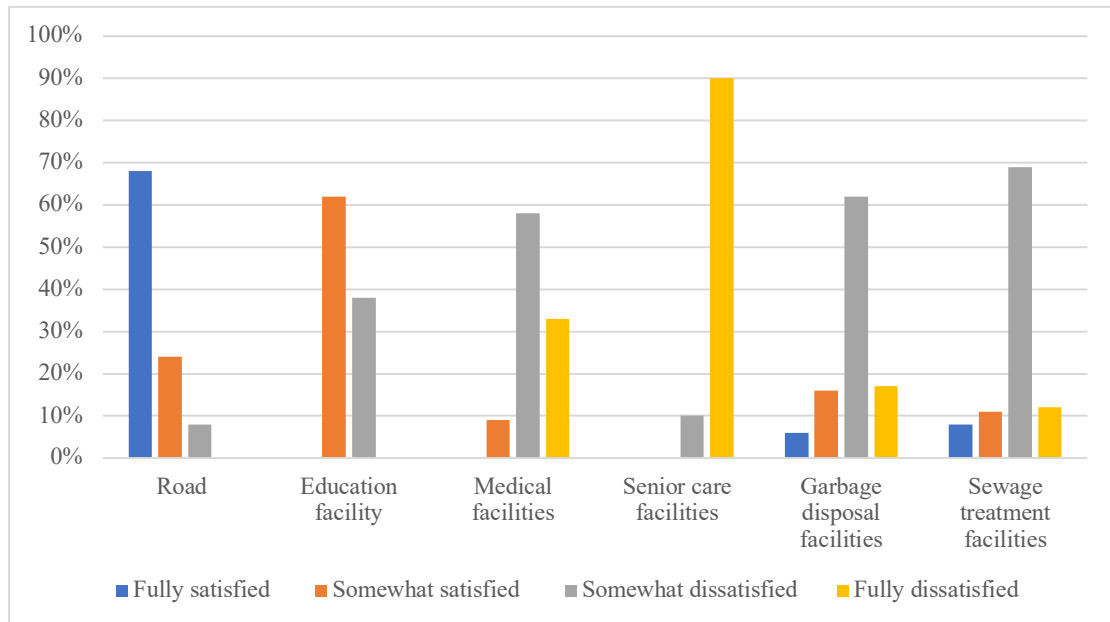


Figure 5.34 Satisfaction level on the infrastructure

## 5.5 Discussion and conclusion

### 5.5.1 Did all industrial transformations bring good impacts on fishing villages' revitalization?

In the case study of Wangjiataihou Village, it is obvious that industrial transformation has beneficial impacts on the “Three F” revitalization. However, there are also some negative impacts and problems which have been found in the field investigation. One of the problems is unreasonable industrial transformation which has already caused serious developing problems to some fishing villages and resulted in lots of local fishermen being heavily in debt. There are three main reasons for the failure of industrial transformation. The first is blind industrial development without planning or awareness of risk. Blindly copying other successful industrial transformation villages without considering self-situations and conditions. In addition, there is no evaluation system and appropriate planning. These will certainly cause a series of problems. The second is the influence of traditional capital consciousness. In China, especially in villages, villagers from the same village usually have very close relationships with each other because they share the same culture and life background. In some villages, villagers share the same family name and have a very strong sense of trust and identity. For the capital that the villagers used in industrial transformation, they follow those “elites” and even use the capital of those “elites”. Due to the poor knowledge of capital

management and liability for loss, villagers suffer greatly from the failure. The third is the lack of relative policy and management in government. Blind investment and industrial transformation are usually accompanied by a lack of relative guidance and management from the local government. Because of their limited knowledge and vision, fishermen usually focus only on short-term benefits. After blind transformation and investment failure, they returned to fishing, which usually leads to problems of illegal fishing. In such a situation, the government should provide correct and practical guidance to fishermen for their industrial transformation. Therefore, it is safe to say that not all the industrial transformations that happened in fishing villages can bring benefits to local fishermen and fishing villages. Only the fishing villages that have a suitable industrial potential, development background, and internal and external driving forces can be the beneficiary of the industrial transformation. The development of Wangjiataihou Village can only be used as a developing model for fishing villages with similar characteristics in the industrial transformation.

### 5.5.2 Negative changes along with the industrial transformation in fishing villages

According to the new proposed evaluation system, the industrial transformation that happened in our four research fishing Villages promoted the overall development of these villages. However, problems caused by this transformation have also been figured out by field investigation.

- (1) The gap between the rich and the poor among villagers is gradually widening. It has been verified that industrial transformation owns obvious impacts on overall economic development. However, there are still some negative changes in these villages. For example, for the village transformed from traditional fishery to fishing village tourism the location and management have direct impacts on villagers' income. Hotels located nearby the main road and own better views generally can earn more, while those hotels far from poor surrounding environments generally cannot make money. Besides the location, management is another important factor that influences villagers' income. Because of the different tourism management experiences, the income among villagers has a huge difference. In this way, the gap between those who earn more money and those who have few incomes is gradually widening. The villages that transform from traditional fishery to modern fishery also have the same problem. Since the subsidies supplied by the government to boat owners in 2006, the income gap among fishermen with or without boats is gradually widening.
  
- (2) The development of fishing tourism results in higher prices and higher costs of living in the surrounding area  
 During the peak tourist season, with a large number of tourists entering, prices of seafood, vegetables, and fruits are driven up throughout the region, which causes negatively impacts the lives of villagers and the surrounding residents. As tourism continues to grow, the already limited land is used for infrastructure and new housing construction, leaving villagers with no land to grow vegetables for self-sufficiency. During the peak season, the demand for seafood, vegetables, and fruits increases significantly, making prices in the area significantly higher than usual. Although the villagers gain economic income from tourism,

the cost of living will be significantly higher for those who are not able to benefit from the tourism industry or who do not operate well. In the field investigation, many villagers said that when the tourist season comes, in addition to the price of seafood, vegetables, and fruits increasing significantly, seafood, vegetables, and fruits are bought in large quantities by the villagers operating “Nongjiale” for entertaining tourists, ordinary villagers cannot buy.

(3) Negative changes in social and cultural changes

As the fishing villages continue to develop, while the fishermen are enriched materially and spiritually, some of the excellent qualities that fishermen used to have are deteriorating.

After the development of the individual economy in fishing villages, fishermen began to run around individually for their own fishing production and livelihood, and no longer have a strong collective cohesion as they did before when they went fishing at sea. Nowadays, the relationship between villagers is slowly alienating, and the sense of alienation between villagers is reinforced by the widening gap between the rich and the poor.

(4) Villagers are increasingly chasing profits and folk customs are gradually worse

Along with the development of fishing village tourism, more and more villagers participate, they hope to earn more money. Driven by economic interests, some villages only chase profit, and the phenomenon of indiscriminate charges, and rip-off phenomena are frequent. Since fishing village tourism has a distinct off-peak season, and the peak season is relatively short. In our research, we found that during the off-season, which can last for half a year, the villagers mostly spent their time playing mahjong, and some of them even turned this entertainment into gambling, which was not good for the healthy development of folk customs.

(5) The large influx of migrant workers increases social instability

Along with the rapid development of tourism in fishing villages, a large number of migrant workers are coming into the villages, which makes the original relatively homogeneous demographic structure become complicated, followed which are various conflicts. In our field investigation, villagers said that stealing, traffic accidents, and fights are much more than before.

### 5.5.3 Recommendations for the villages to transform from traditional fishery to fishing village tourism and for the future development of Wangjiataihou Village

According to the research results, the industrial transformation has promoted the overall revitalization of Wangjiataihou Village to a certain degree. Besides the driving forces mentioned above, the integration of external and internal conditions of Wangjiataihou Village also has played an important role in its successful transformation from traditional fishery to fishing village tourism. Figure 5.35 shows that Wangjiataihou Village is in the Slow-walking system and Blue Bay Coastal Strip, and near Marina Road and National Road, the convenient transportation supplies a good developing condition to tourism development. In addition, according to governmental planning

Figure 5.35, Wangjiataihou Village is located near the Langyatai Senia area, Langyatai heritage Park and Xufu Park Figure 5.36. The rich tourism resources, as important external developing conditions, are indispensable for tourism development.

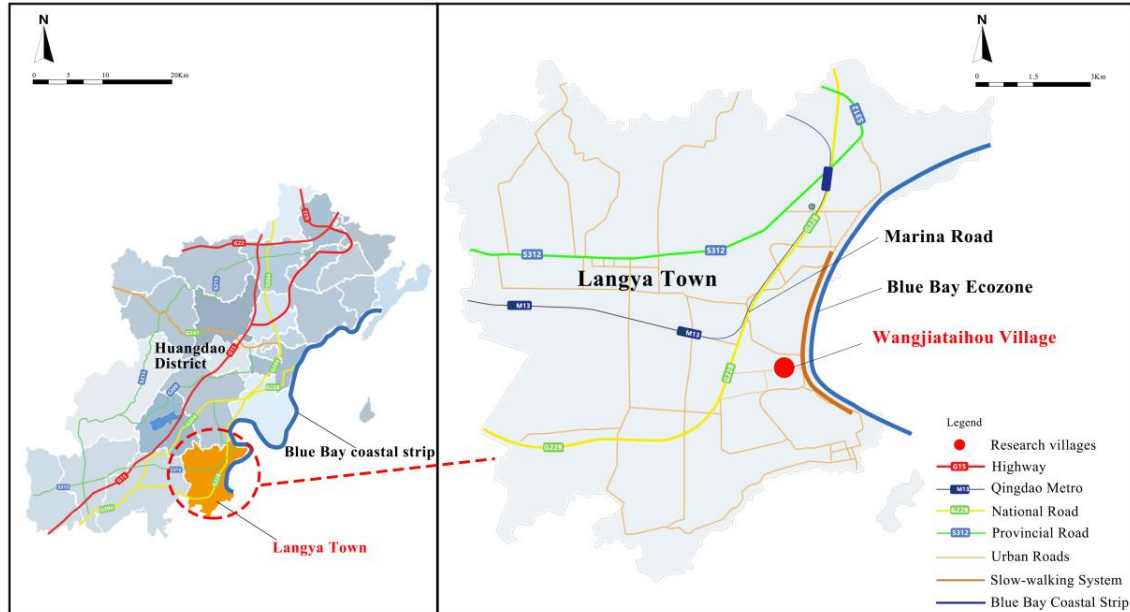


Figure 5.35 The transportation net around Wangjiataihou Village

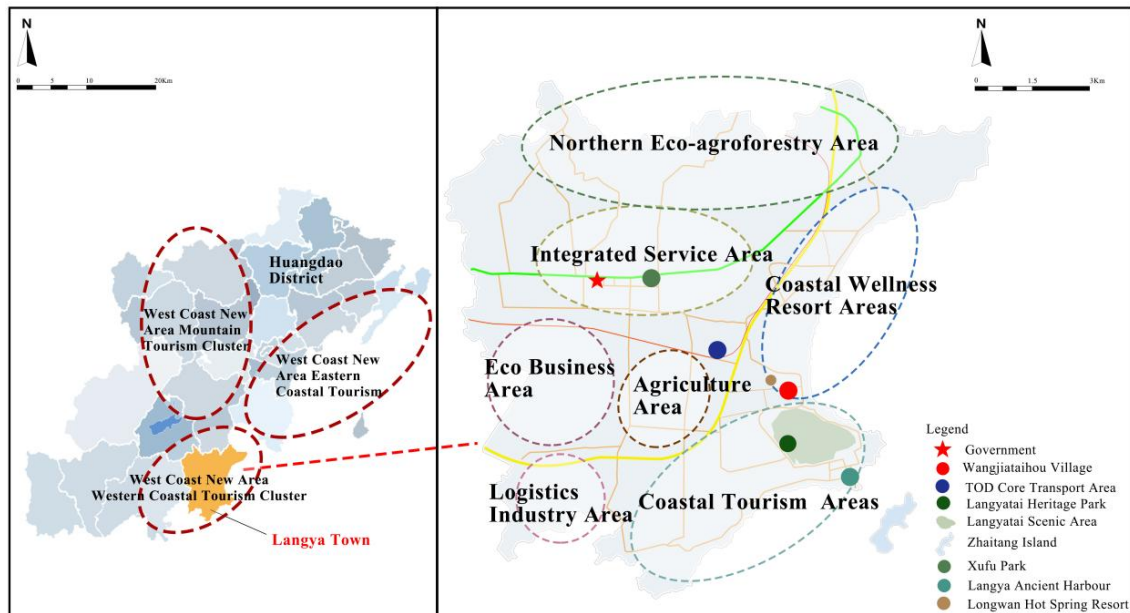


Figure 5.36 Different developing planning areas around Wangjiataihou Village

Fishing Villages, which are experiencing industrial transformation, especially those are transforming from traditional fishery to fishing village tourism. should take the external and internal conditions summarized by Wangjiataihou Village into consideration.



Although industrial transformation has promoted the overall revitalization of Wangjiataihou Village to a certain degree, there are still potential drawbacks for future development. In recent years, the emergence of mass tourism in coastal areas has caused Wangjiataihou Village to lose its attractiveness and competitiveness. To better develop tourism, it should strive for a multifaceted rejuvenation process based on three distinct, but complementary approaches: regeneration, revitalization, and reinvention<sup>[14]</sup>. Local specialty seafood, local handicraft products, the unique architecture of the fishing villages and the special fishing culture and customs, are the factors that reflect the locality and distinguish Wangjiataihou Village from other villages, these factors should be further held and promoted. More tourism products and more tourism activities related to local fishing culture should be created to ensure the positive development and revitalization of the fishing village. Considering the tourism competition between Wangjiataihou Village and other neighboring fishing villages, Wangjiataihou Village should establish its own brand of tourism products and explore special tourism activities. By increasing the variety and strengthening the innovation of tourism products, the popularity of the village will show signs of growth in Shandong Province, even in the whole country.

During the field investigation, we found that many newly built vernacular dwellings and streets in Wangjiataihou Village have lost their original uniqueness of fishing villages because they simply copy the architectural patterns and styles from other rural areas. In fact, buildings, monuments, neighborhoods, and streets show how fishing is related to different social classes and what characteristics the fishing village possesses. These characteristics can be considered intangible heritage because they can distinguish fishing villages from other rural areas. If the fishing village only blindly copies other rural models and blindly turns fishing villages into scenic spots without combining transformation practice with local reality, the transformation will not be fully successful. Therefore, in future village construction, villagers and local policymakers should outreach their efforts to prevent the disappearance of traditional buildings, neighborhoods, and streets. The local characteristics of fishing villages and the cultural resources of fishing should be integrated with tourism in fishing villages and local industrial transformation.

As mentioned above, the driving forces in Wangjiataihou Village mainly come from the village elites and the government's guidance. The development and revitalization of Wangjiataihou Village has initially developed on its own since 2004 and has been gradually supported by local government since 2017. However, to achieve better development and a more reasonable adjustment of the village's industrial structure, more investment and capital support from higher levels of government, organizations, and enterprises are needed. In addition, the involvement and participation of villagers should be improved, and the "top-down" decision-making process should be replaced by one that can increase more involvement and participation of local villagers shown in Figure 5.37. Furthermore, the Central government should be responsible for promoting urban-rural balanced development in terms of infrastructure, public services, and social welfare; thus, the rural area can catch up with cities in various aspects. At the same time, local government should take responsibility of the down-to-earth implementation of the central government's policies and provisions of

multitudes of services and solutions to possible issues in rural tourism development. In China, central and local governments are usually correlated and take over development rights by designating villages as tourism attractions and sharing benefits. Local villagers have received little benefit and, in most cases, had no decision-making power. To avoid the low participation of villagers and over-management of the government and tourism companies, a local village committee should be established as the bridge between the government, tourism companies, and villagers.

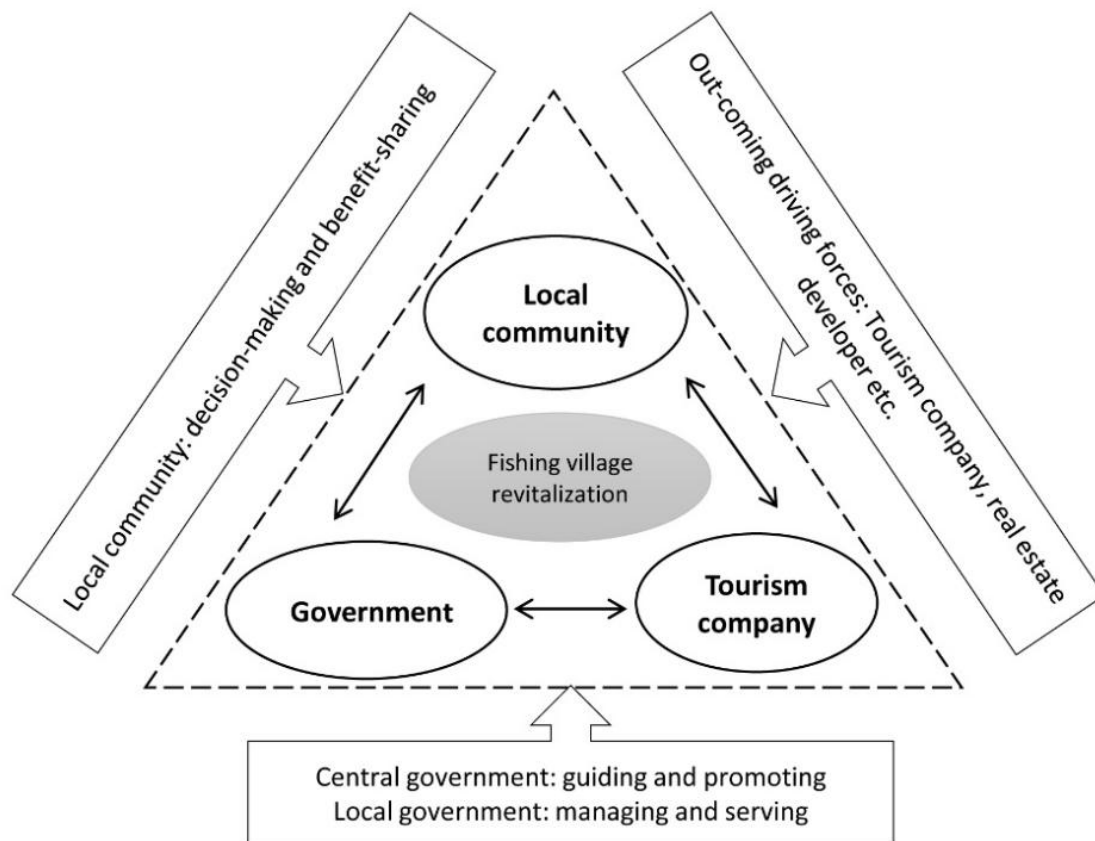


Figure 5.37 Fishing village revitalization and tourism developing model

① Promote vigorously the industrial aggregation of fishing villages. Promote small and medium-sized enterprises in fishing villages. Government should cultivate and support the development of a collective economy provide technical, policy, and service support; guide the cottage industry in most of the fishing villages to gradually change from a small scale. The enterprises also guide the gradual transformation of small-scale cottage industries to the direction of park-based scale, and accelerate the construction of fishing port economic zones. The enterprises should also accelerate the construction of fishing port economic zones, and cultivate several special industries such as machinery manufacturing, textile and garment, marine food, ship repair and construction, and marine chemical industry. Increase the autonomy of enterprises inside and outside the fishing villages, and give full play to local fishermen entrepreneurs. Nowadays. Enterprises in fishing villages are the main body of economic activities in fishing villages, and they are also an important source of environmental problems. Therefore, enterprises should change the old development model

in marine development, and at the same time, they should give full play to their own advantages in resource mobilization and actively participate in the construction of modern marine economic industrial base. ② Vigorously promote the specialization of fishery products. The fishermen should be guided to develop special fishery in accordance with market demand, and realize industrialized operation, brand marketing for the characteristics of the fisheries economy, stable offshore fishing industry, and vigorously develop high-yielding and sophisticated ecological mariculture. ③ Vigorously promote the branding of the tertiary industry. The development of marine transportation, ship repair, etc. Construct the circulation service network of marine fishing village communities. Encourage the development of services such as employment intermediation, food distribution, security, and cleaning in the marine industry. In addition, it should vigorously develop leisure tourism in fishing villages and give full play to the unique landscape, scenery, and ecological environment.

## 5.6 Conclusion

While acknowledging industrial transformation is a significant measure for promoting fishery prosperity, fishing village revitalization and fishermen living conditions, little is known about the extent of the impact of industrial transformation on fishing village revitalization, especially at the level of fishing villages. For government, tourism company or local community, they all have their own evaluation focus, but the new composite indicator proposed in this paper can be used to evaluate the impact of industrial transformation on fishing village from the “Three F” dimension: Fishery, Fishing Village and Fishermen, which will be more comprehensive and objective. Under the rapid urbanization, villages with deep-rooted fishing traditions are experiencing various industrial transformation, this indicator system can be used to do the industrial transformation evaluation, especially for those transform from fishery to fishing village tourism, to determine whether the transformation is appropriate or not.

The research of fishing villages in coastal areas with rapid urbanization has both academic and practical implications, since fishing villages usually contain tangible and intangible heritage which need to be protected, and as a place to engage in livelihood activities, local villagers still need to live there. The current rapid urbanization in coastal areas of China is leading to many problems like the disappearance of fishing villages, depopulation, abandoned villages, and poor living conditions. The questions of how to preserve and revitalize these fishing villages, how to make local industry flourish, how to improve fishermen living environment and income, have become an important practical and academic issue. In this study, a new composite indicator is proposed to evaluate the impacts of industrial transformation on fishing village based on the “Three F” dimension: Fishery, Fishing Village and Fishermen. Wangjiataihou Village, located in the most rapid urbanized area, Qingdao West Coast New Area, was selected as a case study to empirically investigate the process of revitalization in fishing villages through in-depth interviews and observations. The results show that from 2004 to 2020, it has undergone industrial transformation from primary industry: fishery to tertiary industry: fishing village tourism. Based on the field investigation and literature review,

we further analyzed and discussed the effectiveness and the main driving forces of this transformation. The results show that this industrial transformation leads to an improvement in the economic level, the revitalization of the fishing village and fishermen, and a certain degree of overall revitalization level of Wangjiataihou Village. Meanwhile, the main driving forces are the village elites and government guidance. In addition, we found out several potential drawbacks in the current village development and proposed recommendations for the future village revitalization. We hope that the results will provide valuable information to local fishermen and decision makers, and can also be used as a reference for the future revitalization of fishing village.

Despite the above achievements of this study, there are still limitations: First, in this study, the evaluation index system for village-level evaluation and proposal were mainly based on fishing villages in rapidly urbanized coastal area. Therefore, the applicability of this evaluation system has limitations if it's used in other rural regions, especially non-fishing villages. Second, all factors used in this study to construct the evaluation system were derived from field investigation, literature reviews and the discussion with experts, so there may be some discrepancies between the calculated results and the actual situation. Thirdly, facing to the big change caused by industrial transformation in fishing village, the psychological state of fishing community has not been researched. Considering the revitalization of fishermen, this should be paid more attentions. In addition, due to the consequences of the pandemic COVID-19 in 2020, tourism has suffered the most severe blow and the development of the fishing village tourism was greatly affected by the pandemic. Therefore, the data in the year of 2020 in this research is not typical enough as the data in other years in showing the big change caused by industrial transformation. Lastly, the field investigation did not provide more in-depth information about fishing village tourism, such as tourism products, activities, tourists' evaluation and so on. To summarize, future research is needed to further explore the tourism developing situation and the possible mechanisms to better complete the industrial transformation, thus truly offer more assistances in the revitalization of fishing villages.

Reference

- [1] Feng W, Liu Y, Qu L. Effect of land-centered urbanization on rural development: A regional analysis in China[J]. *Land Use Policy*, 2019, 87: 104072.
- [2] Yang J, Yang L, Ma H. Community Participation Strategy for Sustainable Urban Regeneration in Xiamen, China[J]. *Land*, 2022, 11(5): 600.
- [3] Smith, M. K. (2004). Seeing a new side to seashores: Culturally regenerating the English seaside town. *International Journal of Tourism Research*, 6(1), 17–28.
- [4] Qinian H, Tao Z, et al. SWOT Analysis the Development of Fishing Villages Tourism in Qingdao, China [J]. *Journal of Asian Urban Environment*, 2021, 105-110.
- [5] Zhao, W.J., The research about the transformation development of “Fishery, fishing village, and fishermen” under the Background of Rural Revitalization Strategy---the Ant Island of Zhoushan [D]. Zhejiang Ocean University, 2019

## **CHAPTER 6**

### **LESSONS LEARNED FROM DIFFERENT TRANSFORMATION MODELS**

## **6 How does industrial transformation enhance the development of coastal fishing villages: Lessons learned from different transformation models in Qingdao, China**

6.1 Research materials and methods

6.2 Lessons learned from different transformation models in the coastal fishing village

6.2.1 Key factors influencing village industrial transformation

6.2.1.1 Government acts as an important serving role

6.2.1.2 Elite acts as one of the main driving forces

6.2.1.3 High awareness of public participation

6.2.1.4 Enterprises speed up the industrial transformation

6.2.2 Common features of industrial transformation in four fishing villages

6.2.2.1 Improving the value-added industrial chain

6.2.2.2 Technological and culture-oriented development

6.3 Development goals for coastal fishing villages in Qingdao West Coast New Area

6.3.1 Fishery revitalization

6.3.2 Fishing village revitalization

6.3.3 Fishermen revitalization

6.4 Planning principles for coastal fishing villages in Qingdao West Coast New Area

6.4.1 The principle of active and extensive transformation

6.4.2 The principle of intensive and economical land use

6.4.3 The principle of multi-participation management

6.5 Village developing strategies

6.5.1 Fishery planning strategy

6.5.2 Fishing village planning strategy

6.5.3 Fishermen planning strategy

6.5.4 Differentiation strategies for fishing villages with different development models

6.6 Discussion and conclusion

## 6 How does industrial transformation enhance the development of coastal fishing villages: Lessons learned from different transformation models in Qingdao, China

### 6.1 Research materials and methods

Located at the southwestern end of the Jiaodong Peninsula, and belonging to the blue economic zone of the Shandong Peninsula, Qingdao West Coast New Area was approved by the State Council to be the ninth national new zone in China in 2014. The total land area is 2127 km<sup>2</sup>, the sea area is more than 5000 km<sup>2</sup>, the beach area is 83 km<sup>2</sup>, there are 21 islands, and the coastline is 282 km. There are 26 towns and districts, among them 520 villages belong to the urban areas, 636 villages are located in rural areas and there are 58 fishing ports. According to China city Statistics Yearbooks and Qingdao Statistics Yearbooks, the GDP increased rapidly from 1003.17 million CNY in 2010 to 3554.44 million in 2020. Rapid urbanization and economic development have brought a transformation of local fishing villages.

In this paper, four typical coastal fishing villages located in Qingdao West Coast New Area were selected as our case study area in Figure 6.1, they are Xiyangjiawa village (FT), Taixitou village (DDT), Dingshiwa village (FPPT), Wangjiataihou village (FVTT). Because of the unique locations and the rapid transformation, the comparative studies of four different typical fishing villages in this area, have an important academic and practical significance to explore how industrial transformation changes the coastal fishing villages.



Figure 6.1 Location of four villages in China

The results of Chapter 5 shows that the industrial transformation has promoted the overall revitalization of the four fishing Villages to a certain degree. The development of the fishery, fishing



villages, and fishermen meet the requirements of rural revitalization made by the government: thriving businesses, pleasant living environments, social etiquette and civility, effective governance, and village prosperity. Villages' industrial transformation and rural revitalization show an interactive relationship between them, they are the driving forces and support forces for each other Figure 6.2.

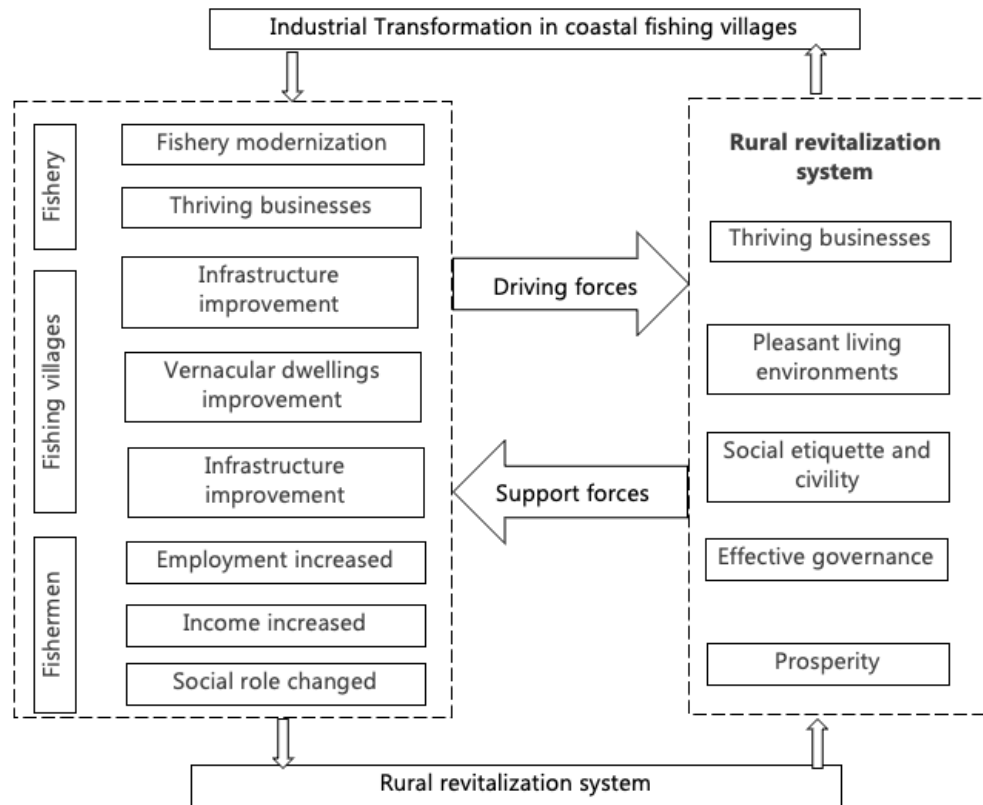


Figure 6.2 The relationship between industrial transformation and rural revitalization in fishing villages

## 6.2 Lessons learned from different transformation models in the coastal fishing village

In the previous chapter, the research on the industrial transformation process in coastal fishing villages of Qingdao New West Area, we summarize the basic developing stages as three periods: the renovation stage, the development stage, and the revitalization stage. In the first renovation stage, the transformation direction choice is very important and formed as the base for the future village development. In the second development stage, through the industrial transformation and restructuring, villages experienced rapid development by the combination of different driving forces. And finally comes to be the revitalization stage, based on the previous development stages, industrialization enters scale development and forms a sustainable development trend. During this stage, new driving forces: creativity were added and paid more attention. To be detailed, technology creativity also be added to the revitalization of Fishery dominated village, and Fishing product processing dominated type village and cultural creativity were added to FTT village.

## 6.2.1 Key factors influencing village industrial transformation

### 6.2.1.1 Government acts as an important serving role

The government is the supporter, participant, and supervisor of rural revitalization. Under strict regulation, the government will support enterprises with policies and provide sufficient financial support and reward and punish them for substantial and spurious behavior, respectively. In China, the government can be divided into two tiers, the upper tier is the central government, and the down tier is the local government. The central government plays a steering role in guiding the industry towards desired directions, prompting the urban-rural balanced development in terms of infrastructure, public services, and social welfare; and the local government plays a serving role by directly managing industrial practices and coordinating with businesses and residents to provide services and solve problems, they take the responsibility of the down-to-earth implementation of the central government's policies and provisions of multitudes of services and solutions to possible issues in industrial transformation. The synergistic interaction of the central and local governments in China stimulates the rapid development of fishing villages, and make their residents' livelihood meet the living standard such as the development of public infrastructure, promoting quality of life, organizing their communities for orderliness and safety, developing local economies, managing natural resources and the environment in their jurisdictions as well as promoting education, sport, cultures, and local knowledge.

According to our investigation, governments' roles in the industrial transformation of different transformation models and different stages are different. Generally, governmental guidance plays an important role in the development and revitalization stages in all these four different transformation models, while in the renovation stage, it is the main driving force for the fishery dominated type (FT) Xiyangjiawa Village. According to the Outline of the Tenth Five-Year Plan for National Economic and Social Development adopted in March 2001 in the Fourth Session of the Ninth National People's Congress, the Ministry of Agriculture formulated The Opinions On Marine Fishing Vessel Control System for 2003-2010. Against this background, the local government in Xiyangjiawa Village and Taixitou Village proposed the transformation and upgrade of the traditional fishery by a combination of policy guidance and financial subsidy. The local government took measures to upgrade or renovate fishing vessels, improve their safety of facilities and equipment, and built 50 modernized, specialized, and functionally complete vessels. Besides this, the local government strengthened the training of professionals, and create a group of management and technical persons. For Dingshiwa Village, Wangjiataihou Village, and Taixitou Village, governmental guidance was much more obvious and important in the development and revitalization stages. After several years of development in the renovation stage, the key industry development models have been selected and fixed, the government made guidance on the future development directions and the overall plan for the whole regional development. In order to better complete the industrial transformation in the development and revitalization stages, local governments increase the investment in infrastructure construction and ecological environment improvement.

### **6.2.1.2 Elite acts as one of the main driving forces**

Village elites refer to the rural economic elites, who are the pioneer of achieving prosperity and always generate widespread repercussions. They always play a positive role in rural economic development. In traditional fishing societies, fishermen are highly homogeneous and easily form social rules of acquaintance, and much of the communal order in fishing villages is based on cultural consensus, blood ties, and a high degree of familiarity with each other. This presents difficulties for the government or other driving forces to implement new policies or take new actions in fishing villages. Village elites can therefore act as a link between fishermen and these development forces, becoming the core of the internal potential and infusing development dynamics for the fishing village system.

According to our research, Wangjiataihou Village (FVTT) developed by itself initially, and firstly invested by eight village elites, they used their houses as hotels and further relinquished fishery and threw themselves into fishing village tourism, the so-called “Yujiale” (Happy fishermen home). In Taixitou Village (DDT), the development of fishing village tourism in this village is also promoted by the village elite, who learn the “Yujiale” management experience from other successful villages, and established their own “Yujiale” combined with their own characteristics. These village elites play an important role in the process of industrial transformation, especially in the initial stage. They used their practice to raise villagers’ awareness of the need for transformation, and they have developed themselves as role models so that they continued to guide others. In traditional fishing societies, fishermen are highly homogeneous and easily form social rules of acquaintance, and much of the communal order in fishing villages is based on cultural consensus, blood ties, and a high degree of familiarity with each other. It is difficult for the government or other driving forces to implement new policies or take new actions in fishing villages. Village elites can therefore act as a link between fishermen and these development forces, becoming the core of the internal potential and development dynamics of the fishing village system.

### **6.2.1.3 High awareness of public participation**

Traditional village development planning involves experts, academics, commercial property companies, and government departments, and they are characterized by centralized discussions and decision-making. The lack of local community participation, planning, and vernacular design is hard to satisfy the current needs of residents. Thus, the traditional top-down development model cannot meet the requirements of residents. By contrast, public participation is a bottom-up approach, which can help establish equity and efficient development in village revitalization. In addition, once public participation became a consistent activity, the results became self-perpetuating, thus ensuring that major matters in village transformational development were addressed effectively.

Wangjiataihou Village is regarded as a pilot project for the new countryside construction in Qingdao New Area because of its prosperous fishing village tourism. During the process of industrial transformation, local villagers developed a local community and public awareness of self-organization and self-management was raised. For example, there is a street full of seafood

restaurants, which was planned and designed by the local villagers. In Dingshiwa Village, traditional fishermen transformed their original fishery work into fishery products processing work. On the one hand, it is a suitable way for transforming labor by following national policies. On the other hand, the income can be guaranteed, thus residents choose to stay in the village instead of working in cities, thus the common problem of the abandoned fishing village, left-behind children and elderly people, empty houses, and poor infrastructure situation were significantly improved in Dingshiwa Village. In Taixitou Village, led by the local government and village committee, villagers take part in the ceremony of sacrifice offering to the sea and recognize it as a village festival. All of these happened in the fishing village show that villagers taking part in the process of village industrial transformation will enhance their feeling of identification.

The scope and content of public participation own significant impacts on industrial transformation, and the attention of local villagers, particularly young generations, forms the main driven force for successful industrial transformation.

Table 6.1 Local participation during the process of industrial transformation in four villages

	Xiyangjia wa	Taixit ou	Dingshi wa	Wangjiataih ou
Villagers participate in the industrial transformation.	√	√	√	√
Villagers make the decision on how to develop village's industry	X	X	X	√
Villagers can utilize and control of relevant resources.	√	√	√	√
Villagers are able to share benefits of industrial transformation.	√	√	√	√
There is a long-term participation mechanism.	√	√	√	√
Villagers take responsibility for the implementation.	√	√	√	√
Villagers are willing to transform their work contents.	√	√	√	√
Villagers enjoy the democracy in industrial transformation.	√	√	√	√

Note: “√” means such kind of participation commonly existed in the villages' transformation; “X” means local participations are not common; The local participation dimensions shown in the table were generated by the field investigations.

From above Table 6.1, villagers usually just participate in the initial stage of industrial transformation, instead of decisions made by them, village elites, government, and enterprises are the main actors to made decisions. The main reason is that villagers usually cannot foresight the future development situation. Foresight is a set of innovative tools to ideate its shape and realizes

the future, it also refers to a strategic thinking capability about the future. Therefore, in future development, it is better to find ways to improve villagers' foresight ability, thus they can play a more important role during the decision-making process than just following the decision made by elites, government, or enterprises. The participation of local villagers can be further deepened and boarded.

#### **6.2.1.4 Enterprises speed up the industrial transformation**

Community-based social enterprises are understood as organizations that operate in a defined geographical location or community and giving a high priority to engaging residents. The development of Dingshiwa Village indicates that enterprises play a significant role in the initial stage of industrial transformation. For the other three different transformation models, enterprises, especially community-based social enterprises speed up their development process. For example, Qingdao Beibao Ocean Technology Co. in Taixitou Village, speed up the fishing products process industry and lead to the rapid development of the whole village. According to our field investigation, community-based enterprises can combine the enterprises and local villagers together, and focus on the needs of village development and the population living within it.

### **6.2.2 Common features of industrial transformation in four fishing villages**

#### **6.2.2.1 Improving the value-added industrial chain**

There is an industrial chain in almost all industries, only the length, and form of the chain are different. The longer the chain, the higher the added value and the more profitable it is. The industrial chain of fishery usually has two forms, on the one hand, it can enter the industrial chain as industrial raw materials for the food processing industry, and on the other hand, it can be directly used as final consumer goods, which leads to the fact that the industrial chain of the fishery can be long or short, and has different forms, and can be crossed between various chains. If the fishery products are not processed, just as the final product is directly into the market, the profitability becomes very low, and it is difficult to improve fishermen's income. Based on this, the fishing product processing industry and related tourism souvenirs driven by industrial transformation are two important strategies to increase the industrial chain value, diversify the industrial structure, and increase fishermen's income. In the case study villages, improving the value-added industrial chain comes to be the common feature of their industrial transformation. Typical examples are as follows: Dingshiwa Village developed its fishing products processing industry from an easy and short industrial chain, mainly relying on the lower cost of processing and fishing products into a much longer value-added industrial chain. Through the construction of cold storage units and establishing their own fishing products brands, the enterprises and village leader desire to improve and upgrade their fishing products' industrial chain and their values. The same activities happened in Taixitou Village's fishing products processing industry. For Wangjiataihou Village, through continuous practice and innovation, village tourism developed a higher value-added industrial chain following the demand of the market and local conditions, the village leaders encouraged villagers to unity together to build a new village with local characteristics and build their own tourism souvenir brand, thus to improve the value-added industrial chain and villagers gained considerable returns as a result.

### 6.2.2.2 Technological and culture-oriented development

In the process of industrial transformation in coastal fishing villages, in order to maximize short-term benefits, residents and enterprises may sacrifice their ecological environment and their special culture. However, the concept of “creative industry” was first put forward by British Prime Minister Tony Blair in 1997, which has become a prominent way to revitalize regional culture and economy.

Economy and culture are intertwined and inseparable from each other, and culture is the bridge and link between fishery and fishing village tourism. In order to make the fishing industry better integrated with the tourism industry, it is necessary to dig deeper into the fishing culture, which in turn stimulates economic revitalization. Traditional fishing culture covers almost all aspects of the daily life of fishermen in fishing villages, and a large number of unique fishing cultures, such as folklore programs and events, have laid a good foundation for the economic transformation and development of fishing villages. According to our investigation, cultural creativity has been a significant driving force for fishing village tourism development and come to be the accelerated driving force for the revitalization of Wangjiataihou Village (FVTT) and Taixitou Village (DDT). In 2013, Langya town was recognized as a national key cultural relic protection town in China and in 2014, the ceremony of sacrifice-offering to the sea was held in Taixitou Village for the first time. Currently, this ceremony comes to be an intangible cultural heritage in Qingdao, China and attracts thousands of tourists come to visit every year. In order to broaden the influence of this ceremony, the local government and village committee joined together to hold it every year since 2017, at the same year government planned to build Taixitou Village as one of the 20 municipal beautiful villages in Langya town. In 2018, this ceremony has been declared as an intangible cultural heritage in Shandong Province, China. Same as Taixitou Village, Wangjiatai Village, as a village dominated by tourism, many leisure fishing activities are conducted, such as leisure fishing, sea netting, ecological sightseeing, fishing customs experience, etc. have been added to the original local seafood supply, and local homestay supply.

Besides the cultural creativity for fishing village tourism development, continuous technology development and innovation are important factors for industrial development during the process of traditional fishery and fishing product processing transformation and upgrade. Since 2012, local enterprises developed regional demonstration projects for the innovative development of the marine economy, and a total of 22 projects have been approved for construction, effectively promoting the development of fishing products deep processing, mariculture, marine high-end equipment, and other industries.

Cultural and technological creativity would produce long-lasting impacts on the villages' development. The local festival activities raised by cultural creativity could be regarded as a performance to arouse the public memory and their identification. And technological creativity could promote the industrial transformation to a scientific and sustainable development direction. It should dig deep into the spiritual connotation and cultural heritage of traditional fishing culture, develop unique fishing village tourism in each fishing village, preserve the original characteristics

of fishing villages, develop fishing landscapes with unique charm, and repeat the role of fishing cultural innovation in the process of promoting economic transformation.

### **6.3 Development goals for coastal fishing villages in Qingdao West Coast New Area**

Combining different developing models in different fishing villages with the previous research on the evaluation of the impact of industrial transformation on fishing villages, the driving forces, and the mechanism, this chapter proposes fishing village revitalization planning from the “Three F”: fishery, fishing village, and fishermen. Aims to realize thriving businesses, pleasant living environments, social etiquette and civility, effective governance, and prosperity according to the requirements of Chinese rural revitalization, this chapter proposes specific planning on “Three F”.

#### **6.3.1 Fishery revitalization**

The village industry is the basis of village development, and the prosperity of industry is the primary position in the twenty-word strategy of rural revitalization, which highlights the decisive role of industrial development on rural development. A reasonable industrial structure and type can effectively drive overall development and thus improve the quality of life of villagers. In the specific planning of fishing villages, the existing development conditions of fishing villages should be the basis, through the excavation of the unique resources of fishing villages, clear industrial development direction of fishing villages, based on which the corresponding industrial development strategy is proposed to achieve the diversified development of fishing village industries.

#### **6.3.2 Fishing village revitalization**

The fishing village is the carrier for fishery revitalization and fishermen revitalization, reasonable planning and reconstruction are the essential factors for the sustainable development of the village. In order to realize the fishing village revitalization, the reasonable spatial layout, vernacular dwelling construction, infrastructure, and land usage, all should be planned by the wide participation of residents.

#### **6.3.3 Fishermen revitalization**

With the rapid development of China's modernization in recent years, people's living standard has also been greatly improved. However, problems such as urban-rural dualistic structure are still common, and villages in rural areas have slow development, low income, poor environment, and insufficient facilities, etc. In this context, the country has introduced a series of policies such as rural revitalization to promote the development and environmental enhancement of villages. Same to other rural areas, fishing villages are also experiencing rapid development. Therefore, the improvement of fishermen's living standards and enrichment are the starting point and ending point of the fishing villages' revitalization strategy, and the goal of fishing village development planning. Coastal fishing villages have good resources and are the direct beneficiaries of their resource. Based on precise poverty eradication and targeted poverty alleviation, the main interests and needs of villagers are taken as the premise to avoid new village industrial development becoming a profit-making tool for a few people. Through planning and implementation, improving the living

environment of villages, improving various infrastructure and public service facilities, promoting the optimization, and upgrading of village industries, and ultimately promoting the construction of ecological civilization and the improvement of fishermen's overall income level, so as to achieve the overall goal of fishing village revitalization.

#### **6.4 Planning principles for coastal fishing villages in Qingdao West Coast New Area**

##### **6.4.1 The principle of active and extensive transformation**

Qingdao West Coast New Area is one of the most rapid development areas in Qingdao, there are different kinds of fishing villages for different locations and transportation, economic conditions, and cultural customs, which leads to different industrial transformation modes. Therefore, the planning should be based on the premise of the village's own resource endowment and the village industrial development mode, so as to practically improve the relevance and operability of the village planning strategy, and then provide effective guidance for the village construction in line with the actual situation. The principle of planning is based on the orientation of the village industrial models, and the diversified needs of local fishermen. Based on the clear development mode of village tourism, the main tourism development strategy of the village is formulated accordingly. The resource conditions of Hainan coastal tourism-type villages mainly include fishery resources, agricultural resources, coastal natural resources, and human landscape resources. For the village different resource conditions and development modes, through in-depth research and analysis of the current situation of the local tourism market, find the problems and opportunities of the tourism market, while the target group for precise positioning and segmentation, research potential tourism demand and development trend, the development of differentiated characteristics of market positioning, and then determine the corresponding planning strategy, development timing and construction scale, to meet market demand, to achieve Hainan The coastal village tourism market value and revenue maximization [7].

##### **6.4.2 The principle of intensive and economical land use**

Due to ecological environmental protection, basic farmland protection and industrial development and construction of the situation coexist, the land of coastal fishing villages in Qingdao West Coast New Area is scarce, so the village planning must adhere to the principle of land conservation and intensive land use, thus to lay the foundation for the sustainable development of the village. On the one hand, all kinds of land in the village should be saved, to ensure the implementation of the ecological red line and the red line of basic farmland, and the total amount of arable land will not be reduced and the quality will not be lowered, and the construction land should be strictly controlled. With establishing corresponding scientific construction land standards for villages with different development modes and development conditions, the village planning process should combine the actual situation and objective needs of the village. At the same time, it should strengthen relevant management during the rapid development of the village industry development, strictly controls the scale of construction land, and thus ensures the intensive and efficient use of village land resources. On the other hand, the land should be intensively used, through the development of village land integration and land re-development. The elements of the village such



as mountains, water, forest, field, road, and sea should be planned and transformed in a unified manner to fully explore the existing construction land. At the same time, scientific land use policies should actively guide villagers and foreign enterprises to promote the improvement of village land to facilitate the rational development of the fishing village industry.

#### **6.4.3 The principle of multi-participation management**

Fishermen are the main builders of coastal fishing villages, the main producers of fishing village industries, and the inheritors of regional culture, so they should also be the direct beneficiaries of village development. For the fishing village development planning, the fishermen should have absolute participation and an appropriate voice in the village planning and must fully protect the local villagers' land rights and demands. Therefore, in the early stage of coastal fishing village planning and design, meticulous household research work should be carried out, the villagers' opinions and demands should listen to, thus mastering their needs and problems, and which can be used as the main reference basis for the village planning. In the process of planning and design, the villagers' opinions are given back in a timely manner and used as a guide to improving the planning, so that the villagers have certain planning decision-making power and can improve the relevance and feasibility of the planning results. At the end of the planning and design stage, the planning results should be published publicly and discussed with villagers, thus realizing the openness and transparency of the planning results, and guaranteeing the villagers' right to know about the village planning. Finally, at the stage of construction, villagers' opinions should also be adopted and they should be guided to participate in the implementation of planning, fully mobilize their enthusiasm through reasonable protection and incentive mechanisms, and enhance their sense of "ownership", thus improving the village environment, increasing sense of gain and happiness in the process of village industrial development, and promoting the maximization of village revenue, and finally realizing the benign development of village industry.

### **6.5 Village developing strategies**

#### **6.5.1 Fishery planning strategy**

- (1) Promote the restructuring of the fishery industry and improve the overall industrial development capacity

In order to promote the restructuring of the fishery and improve the overall industrial development capacity, the fishing village should expand the development field and enhance the added value of the fishery. The traditional fishery should be transformed into secondary and tertiary industries, especially to support the deep processing of aquatic products, the logistics industry, and fishing village tourism. The fishery industry chain can be expanded to pre-production and post-production, and improve the added value of fishery value and overall efficiency. For fishing village tourism, the focus should be paid to the development of urban recreational fishery with ornamental, fishing, and tourism functions, the cultivation of the ornamental fish industry for the international market, the creation of multifunctional, market-oriented, and high-quality fishery industry groups with the harmony of human and nature, the integration of urban and rural areas, and the comprehensive development of fishery.

(2) Accelerate the transformation of fishery growth, and constantly improve the quality of industrial development

For accelerating the transformation of fishery growth, and constantly improving the quality of industrial development, it should improve independent innovation ability, strengthen the research and development of key technologies, and the transformation of results. Reasonable planning and use of waters and beaches. The fishing industry should further strictly implement the national "double control" system, and continue to compress the intensity of fishing in offshore. For the transformation of the traditional fishery, the old fishing boats should be renewed and renovated, and energy-saving, environmentally friendly technologies, and equipment should be promoted, and eliminate outdated fishing gear and fishing methods. Continue to promote the development of aquatic product processing and recreational fishing.

(3) Accelerate the fishery technology innovation and its promotion system

For traditional fishery, technology innovation refers to the innovation of fishing gear and fishing methods, such as energy-saving technology for fishing vessels, new equipment for the fishery, and a modern comprehensive supporting technology system for the fishery. In order to accelerate the establishment of a fishery science and technology innovation system, the government should strengthen national aquatic scientific research institutions and fisheries universities, which are the leading roles in fishery science and technology innovation. Local government should support and encourage conditional enterprises to establish scientific and technological research and development centers, and establish infrastructure and science and technology projects for the formation of regional fisheries research centers and experimental stations.

(4) Pay more attention to fishery resources and ecological environmental protection

First, fishing vessel management should be at the core, the fishery should continue to implement various management systems that control the fishing intensity and strictly protect resources, steadily promoting the reduction of vessels. Secondly, to conserve the resources and environment, continue to increase the ecological construction of offshore fishing areas, and improve the ability of resources survey, and environmental monitoring. It should rely on the strength of the whole society and adopt a series of comprehensive measures and means through the joint efforts of all sectors to effectively protect fishery resources and the ecological environment of the waters, to lay a solid foundation for safeguarding and promoting the sustainable development of fisheries.

(5) Improve openness level and constantly enhance the international competitiveness of fishery

Through accelerating industrialization and regional layout, and actively developing foreign trade, the fishing villages can improve their openness and enhance the international competitiveness of fishery. The government should plan several high-level aquaculture export demonstration bases or processing export parks, support the development of leading fishing processing enterprises, cultivation of independent intellectual property rights and independent brands of processed products, and constantly improve the quality of foreign trade in fishing products. At the same time actively

develop fishing products to import processing, making full use of foreign resources to expand domestic employment. Implementation of the "go global" strategy, the fishing villages should continue to develop the offshore fishery. For offshore fishery, fishing villages should focus on using fishery resources with development potential, and strengthen bilateral and multilateral cooperation with relevant fishery organizations.

### 6.5.2 Fishing village planning strategy

#### (1) Village land use planning

Coastal fishing villages of Qingdao West Coast New Area have a complex spatial feature dominated by mountainous and hilly terrain. The land for villages' construction and industrial development is relatively tight and mainly located in the areas close to the coast. Therefore, in village planning, it is necessary to control the land use based on the total amount and quality of arable land, and strictly implement the control line of permanent basic farmland. In terms of agricultural space, it should promote the protection of basic farmland and the improvement of general arable land by combining the "Land Regulations" and "Three Adjustments"; in terms of construction space, it should control the total amount of construction land through population and construction land projections and the needs of village development, while promoting the demolition and reclamation of buildings that illegally occupy agricultural space.

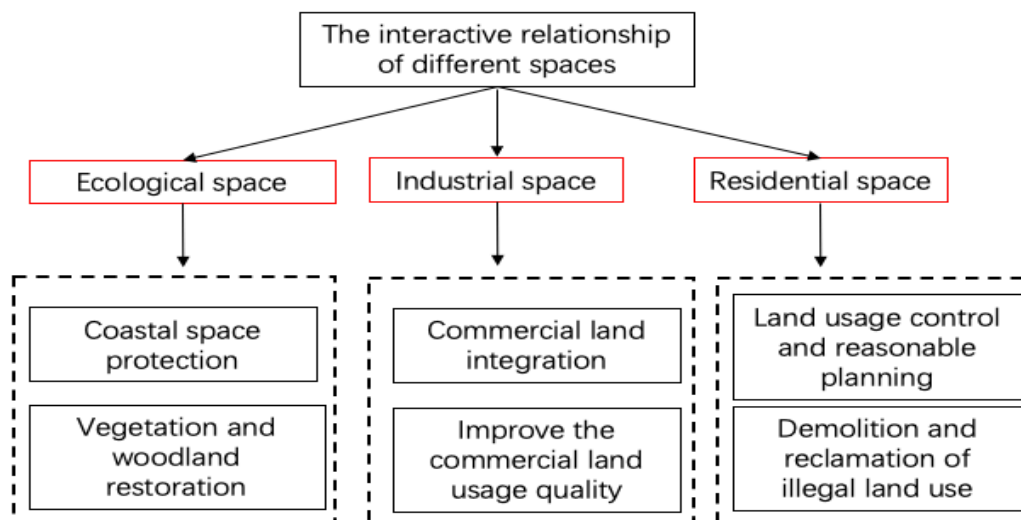


Figure 6.3 Land usage management in fishing villages

#### (2) Optimization of unused land and unused houses

The construction space is mainly used for villagers' living, which is generally concentrated in village settlements. Due to the complex land ownership and the lack of relevant management, the encroachment of village construction space on other agricultural spaces and ecological spaces is common in coastal fishing villages. Coastal fishing villages are now in the stage of industrial transformation and upgrading and have a greater demand for construction land for promoting deeper industrial development. Therefore, how to reasonably control the village construction space through planning is the core of construction space control. In the control of village construction land, on the

one hand, through the analysis of the growth rate of the village population in the past years and the scientific method of prediction, combined with the "Town Planning Standard (GB20188-2007)" and other normative requirements, the total amount of village construction land planning can be controlled. At the same time, in order to ensure the flexibility of planning, combined with the actual construction of villages to explore a certain "white" mechanism for the construction. "White" land use indicators are not allowed to occupy the permanent basic agricultural land, ecological protection red line. On the other hand, the central government and the local government should resolutely implement the requirements of not occupying permanent basic farmland for building houses and not violating the "one household, one house" rule, and orderly carry out the village's inefficient and idle construction land and optimize the layout structure of construction land.

### (3) Enhance coastal landscape, zoning, and grading control

The Coastal shore is the transition between the sea and land, showing the characteristics of both land and sea. As the main resource of coastal villages, the coastal shore is an important regional symbol and characteristic resource in village development, but in recent years tourism resort and high-end real estate development model has emerged. Through the excessive excavation and utilization of coastal shores, villages get economic returns, but this excessive development model has produced a certain threat to the coastal landscape ecology. Therefore, in village planning, it is necessary to pay attention to the overall protection of the coast shore. The coastal zone of coastal villages includes the shallow water area of the ocean, the beach area, and the near-sea area. The planning should be based on the current problems of the coastal shore and village industrial developing demand, and further divide the coastal shore landscape into the offshore area, beach landscape, coastal road landscape, and facilities. According to the distance between the village and the sea, the landscape planning strategy of different areas for zoning control and upgrading forms a "protection + control + upgrading" of the village coastal landscape utilization system Figure 6.4.

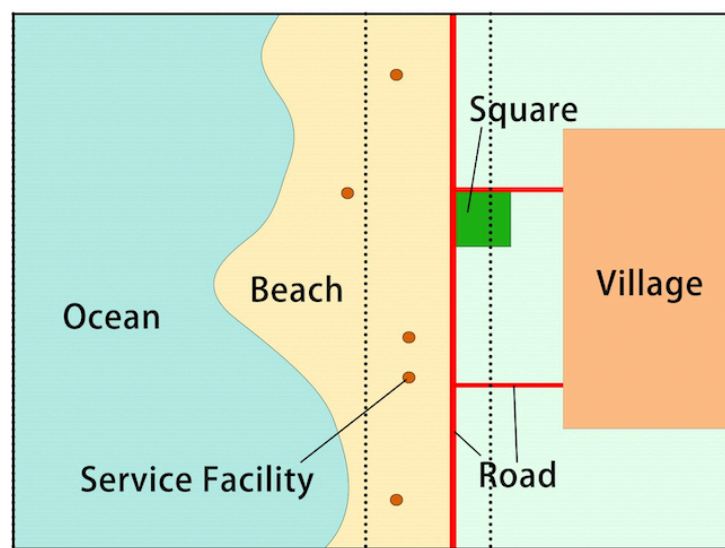


Figure 6.4 Planning for the enhancement of coastal landscape

In terms of coastal protection, the village should strictly follow the requirements of Shandong Coastal Zone Plan, strengthen the overall ecological protection of the coast, protect the shallow sea and beach areas, and strictly control the intensity of tourism development. Combined with the development requirements of fisheries and fishing village tourism, appropriate coastal resources are utilized. Based on protection, we will improve the rational construction of coastal landscape facilities, and on the basis of protecting the coastal ecological environment, we will build tourism infrastructure and provide facilities necessary for landscape viewing and rest. In terms of enhancing the coastal landscape, the overall landscape environment of the beach and fishing village is mainly renovated and constructed to improve the landscape integrity of the village and the coast. The landscape greening along the road can be upgraded and optimized mainly through landscape enhancement by different kinds of local landscape vegetation to provide a unique landscape experience for the tourism development of the fishing village, thus promoting the diversified use of coastal resources and enhancing the development of tourism in the fishing village.

### 6.5.3 Fishermen planning strategy

#### (1) Encourage of village participation

Village management is an important implementation guarantee to promote fishing village. Unlike urban management, villages are mostly a "solid rural community" and a "society of acquaintances who know their roots", so relying on the management of foreign enterprises is not practical and cannot receive good results. Therefore, it is reasonable to promote the co-management and co-construction of villagers and enterprises, mobilize the participation of villagers as the main body of the village, cultivate villagers' sense of "ownership", and allow villagers to participate in the development and operation of the village industrial transformation to achieve long-term stability of the village. Especially for the fishing tourism-dominated villages, village management should be based on the mobilization of villagers' enthusiasm for participation, through the development of the corresponding management incentive mechanism, so that villagers can taste the sweetness in the village tourism management and obtain certain benefits, while the enterprise and local government should play a good leading domain demonstration role to provide guidance and policy support, thus to realize the joint construction of rural tourism enterprises, villagers, and government.

#### (2) Strengthen training to effectively improve the quality of fishermen

In response to the needs of fishermen, they should carry out knowledge and skills training to improve the cultural and professional quality of fishermen and enhance their employment skills, cultivating a new type of fishermen. First, strengthen the training of fishery production safety knowledge, improve their safety production capacity at sea, and minimize the number of accidents at sea. Second, strengthen the training of vocational skills in fishery, popularize new technologies, and new models, and promote new species and methods. Third, improve pre-service training and follow-up education. In accordance with the needs of work transformation, pre-service knowledge and skills should be trained, before the work and post-job continuing education. The village cadres, fishing households, breeding households, and brokers are trained to become the leaders of the fishing villages to get rich, leading the masses of fishermen to work together to increase their income

and get rich. In addition, the overall quality training of managers and the leading role of talents should be paid more attention through training. It should constantly strengthen the level of grass-roots management and service talents in villages, enhance the modernization of village management level and management capacity, and finally inject sustainable development momentum for the realization of village development and industrial revitalization.

### (3) Improve the current public service facilities for improving the living environment

The situation of public service facilities in fishing villages is different from that of scenic spots or cities, often combining the requirements of industrial development and the daily needs of villagers, and sometimes multiple facility functions are combined in a single building. The main service facilities include a village committee, health room, commercial and sports place, etc. The construction of public service facilities can not only provide convenience for villagers' daily life and improve the living environment for local residents but also promote industrial development. Therefore, public service facilities in both ordinary villages and coastal fishing villages have an important role. However, due to the population and consumption characteristics of coastal fishing villages, some villages have inadequate public service facilities, and the villagers' basic living needs cannot be guaranteed.

In the planning of public service facilities for coastal fishing villages, the current situation should be used as the basis, the needs of fishermen as the main body and the needs of industrial development needs should also be considered. It should promote the linkage cooperation model between the higher government and the village government, to achieve the villagers' basic living needs to meet. Based on the content and requirements of the "Guidelines for Village Planning in Shandong Province", the planning concept of a 10-minute village living circle is used to lay out various village public service facilities, such as village management, education, culture and sports, medical care, commerce, and social welfare, etc., The location, quantity, construction situation, and scale of the facilities can be also fixed by this conception, in addition, the construction and planning timing of various facilities can also be clarified. Due to the shortage of land in coastal fishing villages, in the actual construction of public service facilities, functional integration, and combined arrangement should be explored to build diversified functional service facilities. According to the population scale and main needs of coastal fishing villages, different levels and facility types of service facility clusters can be determined, and the service facility clusters can not only provide the necessary needs for villagers but also realize the regional construction and sharing of village public service facilities according to the actual situation of neighboring village clusters.

## 6.5.4 Differentiation strategies for fishing villages with different development models

### (1) Strategies for the fishery-dominated fishing villages

Marine capture fishery is an important part of marine economic development in China. Since 1978, marine capture fishery in China have achieved unprecedented and sustained development due to liberating productive forces and the attachment of great importance to the application of advanced technology<sup>[17]</sup>. With the development of science and technology, the capacity of marine capture

fishery has continuously enhanced. However, problems such as overfishing and marine pollution have also emerged, and marine resources have begun to seriously decline. Currently, under the background of a severe decline in marine fishery resources, controlling the growth of the total production of marine capture fisheries has become a critical task for the government for the sustainable development of the marine fishery industry. And the technological promotion for modern fishery has become an important developing path. The cost of fishery technology promotion in China was 389 million yuan in 2002, 994 million yuan in 2009 and 3.72 billion yuan in 2019<sup>[17]</sup>. Thus for the fishing village still dominated by the fishery should transform their traditional fishery into modern fishery.

### (2) Strategies for the fishing products processing dominated fishing villages

The main users of such villages are not only the original inhabitants of the villages, but also a more complex multiple subjects, including core stakeholders such as the government, investment developers and villagers. Therefore, the planning should focus on the impact of village tourism development on different subjects, weighing the core demands of different core stakeholders for village tourism development, and then make corresponding planning responses. As the leader and core controller of village tourism development and development and construction, the government is directly responsible for guiding the sustainable development of villages. The government should give full play to its policy and functional advantages, actively respond to the national and other relevant policies to promote rural tourism in Hainan, coordinate the interests of the township and village government, villagers, developers and other entanglements, mobilize the enthusiasm of multiple subjects to participate in the construction of the village. At the same time through preferential policy development and project approval control, etc., to attract village tourism investment and specific projects signed to promote the village tourism development and implementation. Investment developers also play an important role in the development of village tourism, and they participate in the development of village tourism from the point of view of profit maximization. The planning should adhere to the principles of protection-oriented, reasonable development, resource integration, and localization, and realize the quality improvement of the village without destroying the characteristic resources of the village, and the government should also control the excessive development and resource destruction of developers, and guide them to reasonably carry out Tourism facilities construction and operation management activities. Villagers are the most direct recipients of the dividends of village tourism development, and the planning should meet the core demands of improving village facilities and economic income, ensuring the legitimate rights and interests of villagers, mobilizing villagers to participate in the construction and management of village tourism, enhancing the sense of belonging and cohesion, and thus realizing the real demand for income generation and prosperity. In general, should play the different subjects of their own advantages, in the planning strategy will be government guidance, developer investment and villagers participate in the combination, to promote the scenic area dependent development model of Hainan coastal tourism-type villages of synergistic development.

### (3) Strategies for the fishing village tourism dominated villages

At present, China's coastal fishing village tourism development mainly has the following types of models: one, government-led, relying on policy advantages to promote the development of tourism in the village, such as Zhejiang Dongji Island, Zhejiang Zhoushan Government to take advantage of the development of leisure fisheries policy east wind, and through financial allocations and corporate sponsorship, to solve the problem of construction funds for the island's tourist areas. Second, rely on the operating company to unified development, operation, management and promotion of the village, such as Shandong Hao Yu village villagers will be the tourism function area of their own land, farm caravans, restaurants, etc. through the operating company for shareholding, and the company's equity interests bound, so as to promote the joint efforts of the two parties, the formation of operational synergy, this model on the one hand to regulate the standard of tourism services, on the other hand, help the villagers to achieve common wealth. Third, for some fishing villages rich in historical and humanistic resources, foreign funds can be introduced to package and build, and unified operation, such as Zhejiang Wucun, invested by the local group, gradually become a comprehensive tourism resort integrating sightseeing, leisure, accommodation, catering, conference, vacation and entertainment functions, in the tourism planning, Wucun is also committed to explore local culture, creative cuisine, traditional folklore, etc., which greatly meet The cultural experience needs of tourists are greatly met. In summary, considering that Wang Fishing Village is currently taking advantage of the policy of the development of the Shenzhen-Shantou Special Cooperation Zone, and has gained the attention of the government of the cooperation zone because of the folklore of the boat-dwelling family, the author believes that Wang Fishing Village is suitable for the development mode of government-led, villagers' participation, the introduction of enterprise capital in the development process, and financial support for the construction and transformation of the tourist area and tourism projects. According to the location of natural resources and folklore resources in the village, the tourism function layout is carried out based on the principle of highlighting the characteristics and folklore of the village, and the tourism function area is reasonably divided, which is used as a blueprint for the later development and construction.

In the development of fishing village tourism, the unique culture of the fishing village should be protected and inherited, not blindly imitate other rural areas to develop rural tourism model, on the one hand, should rely on the existing resources of the fishing village, combined with the development of cultural tourism requirements, the fishing village culture to show tourists. Set up various forms of fishing culture experience activities. This skill stimulates the development of fishing culture inheritance, and promotes tourism development as the characteristics of fishing village tourism. On the other hand, the local fishing culture elements can be incorporated into the construction of facilities and village appearance of the fishing village by promoting the shaping of regional characteristic space and culture in public places, and thus the development and inheritance of the culture and history of the fishing village. The current cultural innovation in this area, the sea ceremony held every year attracts thousands of tourists to come and experience the local culture.



As shown in Figure 6.5, the development of the fishing village tourism moves to both ends of the U-shaped curve in order to obtain higher value and competitive priority. This gives a good inspiration to the planning and creation of the new industry of marine leisure fishery, focusing on the development of the industry with high added value at both ends of the smile curve. At the left end of the curve, that is, the upstream part of the industry chain, we should strengthen the planning of leisure fishery, cultural creativity, and other links. The development of these segments of the marine leisure fishery industry depends to a large extent on the development of service industries related to marine leisure fishery, such as the advertising industry and the cultural communication industry, and the development of these industries is conducive to the overall quality improvement of the industry presented by marine leisure fishery. In addition, the planning of marine leisure fishery is still in the mode of the government-led and market-supported regional master plan, which is conducive to the generation of the agglomeration effect of marine leisure fishery. This model is conducive to the generation of the agglomeration effect of marine recreational fishery and the characterization of the regional industry.

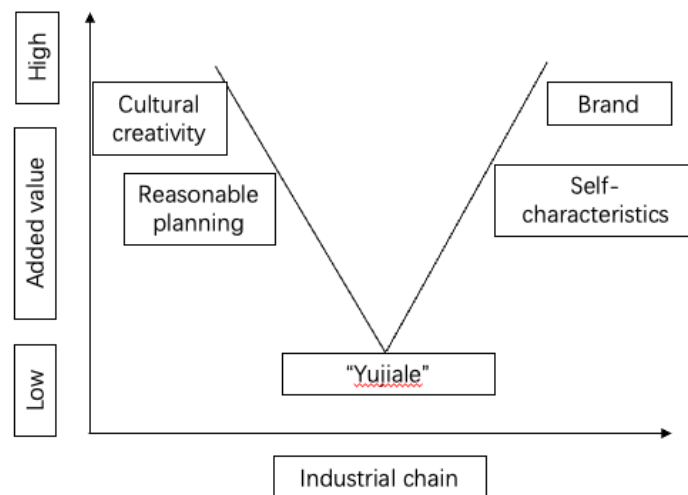


Figure 6.5 The smile curve of fishing village tourism development

## 6.6 Discussion and conclusion

The research on coastal fishing village revitalization, to understand how industrial transformation enhances local development is valuable to both the academic community and the practices of rural revitalization in coastal areas since fishing villages usually contain tangible and intangible heritage which need to be protected, and as a place to engage in livelihood activities, local villagers still need to live there. Industrial transformation-driven development is a valuable tool for promoting fishing village transformation and development, as well as increasing residents' income and living environment. This study research how industrial transformation affects coastal fishing village revitalization, by analyzing four typical industrial transformations that happened in coastal fishing villages, exploring the background driving forces of these industrial transformations, and discussing further developing suggestions. Attempting to reveal the process and mechanism of fishing villages' revitalization driven by industrial transformation, this paper makes the definitions of four typical

fishing village transformation types, i.e., fishery dominated type (FT), fishing products processing dominated type (FPPT), and fishing village tourism dominated type (FVTT), and Diversified development type (DDT), and takes four typical transformed coastal fishing villages in Qingdao New Area as our research objects.

In less than three decades, these traditional coastal fishing villages experienced an unprecedented transformation, especially in their industrial constructure. For the development process, we summarized the key driving forces in the basic three developing stages: the renovation stage, the development stage, and the revitalization stage, as shown in Figure 6.6.

There are mainly five dominant forces: government, village elites, public participation, enterprises, and creativity. Different transformation types have different driving forces from each other in the three stages, while the common features of successful industrial transformation in fishing villages could be concluded as improving the value-added industrial line, and technology and culture-oriented development. All these four transformation models aim to improve their value-added industrial line by different driving forces and creativity, especially technological and culture-orientated creativity come to be the most important driving force in the revitalization stage. For Fishery dominated village, the transformation and upgrade to a modern fishery were promoted by the local government at first, and then enterprises and technological innovation. For fishing products processing dominated type (FPPT), our case study village was initially transformed by enterprises, and then technological and cultural-oriental creativity. The core village enterprises were cultivated, and the industry chain was stretched and localized. For the fishing village tourism dominated type (FVTT), village elites play a significant role in motivating and integrating village participation, and culture-oriental creativity and government guidance come to be the main driving forces in the revitalization stage. Of course, the high awareness of public participation plays an important role in the whole process of these different transformation models.

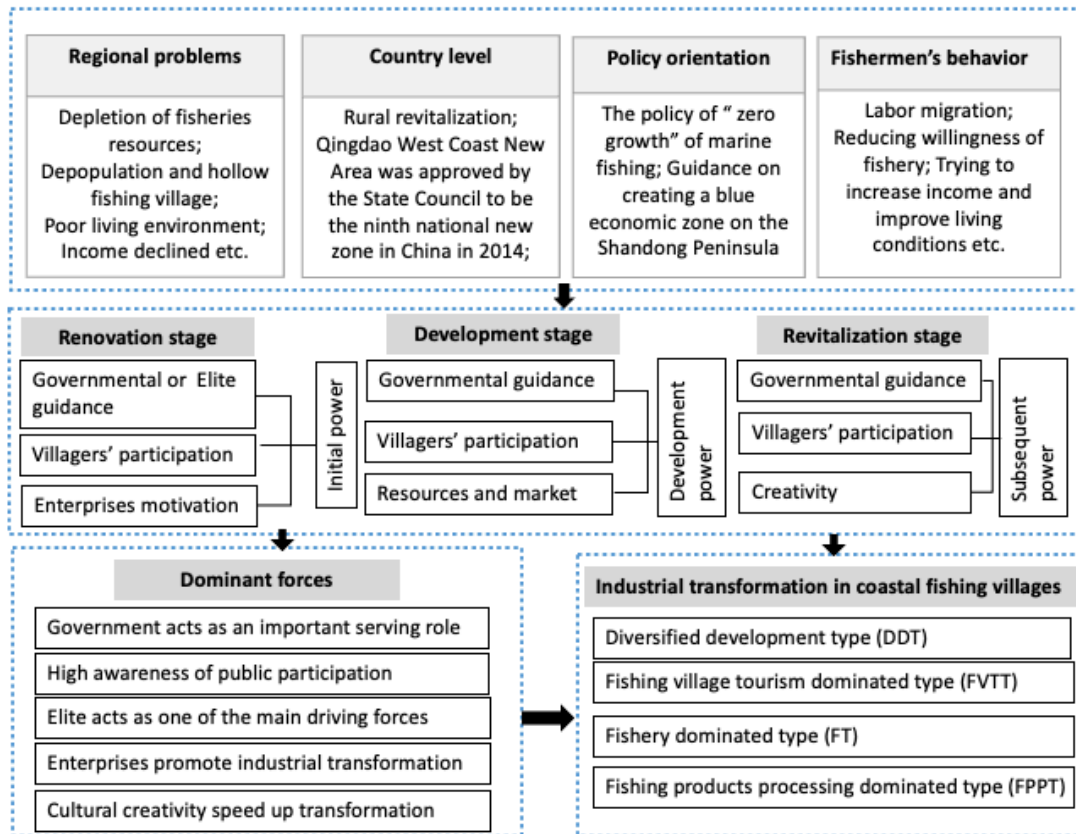


Figure 6.6 Main forces in the industrial transformation in coastal fishing villages

If we divided the transformation forces into internal and external driving forces as shown in Figure 6.7, we can summarize the internal forces as local government guidance, elite and public participation, and cultural creativity; and the external forces as national government policy and financial support, enterprise promotion, and market demand.

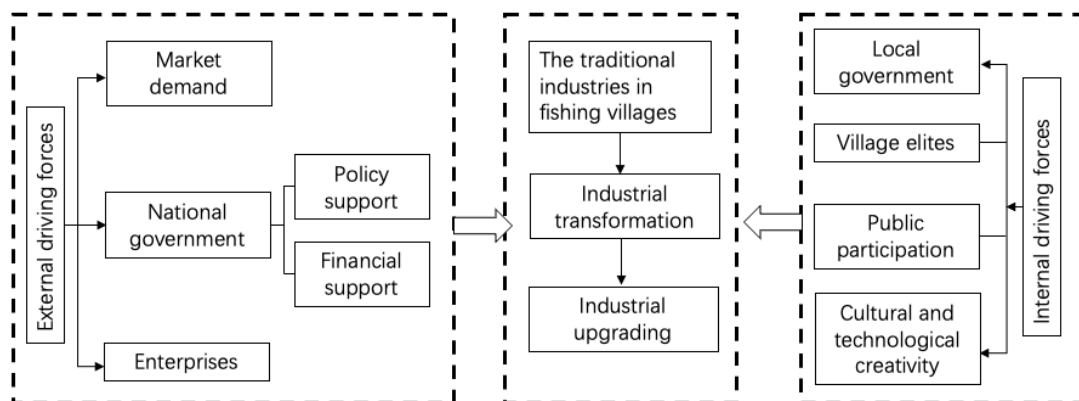


Figure 6.7 The external and internal driving forces for industrial transformation in fishing villages

Despite the above comprehensive depiction of the process, characteristics, and background driving forces of four different industrial transformations in typical fishing villages. According to the field investigation, we also found some problems, they can be concluded as: firstly, we found

that the quality testing standards for the fishing products are not enough, the products for exporting are less and mostly for local sales. In order to broaden the market, it is better to improve the quality testing standards and export. Secondly, compared with years ago, the current fishing products processing line is much longer, while the value-added industrial line still owns space to be improved. Thirdly, there are several problems that exist with fishery subsidies, one of the most important measures for industrial transformation. Subsidies are mainly supplemented by subsidized loans, and only a small part of such subsidies are really used directly for fishery production, and most of them are used as consumption subsidies for urban residents, fishermen are only indirect beneficiaries. Besides this, the misappropriation of fishery subsidies is quite common, and according to the investigation, the government subsidy funds are stripped at various levels, so the funds really used for fishery are very limited. Therefore, suitable improvements for fishery subsidies should be paid more attention.

Although our findings in this study have theoretical and practical implications, it also has several limitations that could be explored in future research. Firstly, the findings of this paper are based on the empirical study of four types of relatively successful fishing villages in Qingdao New Area, which may be limited by possible bias in sample selection. Therefore, these findings should be further verified and refined in future research. Secondly, the main findings are summarized by field investigation, while these investigations may not be precisely assigned due to the constraints of the survey respondents and conditions, which should be further researched by larger-scale survey data. In addition, due to the consequences of the pandemic COVID-19 in 2020, all walks of life have received great impacts, especially fishing village tourism and fishing products export. Therefore, the data in the year 2020 in this research is not as typical enough as the data in other years in showing the big change caused by industrial transformation. Thus, future studies on the industrial transformation in coastal fishing villages could include more detailed information from different years, especially data from the village level.

## Reference

- [1] Chen, Y., The history evaluation and transformation of fishing villages in China[J]. *Journal of Zhejiang Ocean University (Humanities Science)* 2016, 33(2): 20-28.
- [2] Sheng, F.M., Recreational Fishing Development and Discussion[J]. *Agriculture and Technology*, 2015,35(20): 180.
- [3] Liu Y, Li Y. Revitalize the world's countryside[J]. *Nature*, 2017, 548(7667): 275-277.
- [4] Qiu J.J., Zhang Ping, Jiang Huashuai, Liu Yu. The current situation and strategies for fishery transformation in Zhou Shan City[J]. *Anhui Agricultural Science*. 2014,42 (14):4521-4522.
- [5] Su M M, Wall G, Jin M. Island livelihoods: Tourism and fishing at long islands, Shandong Province, China[J]. *Ocean & Coastal Management*, 2016, 122: 20-29.
- [6] He, G.Y., Study on problems and countermeasures of new fishing village construction [D]. China Ocean University, Qingdao, 2008.
- [7] Chen, Y., The history evaluation and transformation of fishing villages in China[J]. *Journal of Zhejiang Ocean University (Humanities Science)* 2016, 33(2): 20-28
- [8] Liu Y, Li Y. Revitalize the world's countryside[J]. *Nature*, 2017, 548(7667): 275-277.
- [9] Liu, Y.S., Yang, Z., Challenges and countermeasures for beautiful countryside construction in China. *J. Agric. Resour. Environ.* 2015,32, 97–105.
- [10] Guo, Z., Sun, L., 2016. The planning, development and management of tourism: the case of Dangjia, an ancient village in China. *Tour. Manag.* 56, 52–62.
- [11] Su, M.M.; Geoffffrey, W.; Wang, Y.A.; Jin, M.J. Livelihood sustainability in a rural tourism destination—Hetu Town, Anhui Province, China. *Tour. Manag.* 2019, 71, 272–281.
- [12] Feng W, Liu Y, Qu L. Effect of land-centered urbanization on rural development: A regional analysis in China[J]. *Land Use Policy*, 2019, 87: 104072.
- [13] Yang J, Yang L, Ma H. Community Participation Strategy for Sustainable Urban Regeneration in Xiamen, China[J]. *Land*, 2022, 11(5): 600.
- [14] Smith, M. K. (2004). Seeing a new side to seashores: Culturally regenerating the English seaside town. *International Journal of Tourism Research*, 6(1), 17–28.
- [15] Qinian H, Tao Z, et al. SWOT Analysis the Development of Fishing Villages Tourism in Qingdao, China [J]. *Journal of Asian Urban Environment*, 2021, 105-110.
- [16] Zhao, W.J., The research about the transformation development of “Fishery, fishing village, and fishermen” under the Background of Rural Revitalization Strategy---the Ant Island of Zhoushan [D]. Zhejiang Ocean University, 2019
- [17] Hu F, Zhong H, Wu C, et al. Development of fisheries in China[J]. *Reproduction and Breeding*, 2021, 1(1): 64-79.

**CHAPTER 7**  
**INDUSTRIAL TRANSFORMATION AND SPATIAL RESTRUCTURE OF**  
**FISHING VILLAGES IN QINGDAO WEST COAST NEW AREA**

## 7 Industrial Transformation and Spatial Restructure of Fishing Villages in Qingdao West Coast New Area

### 7.1 Analysis of the influence of industrial transformation on the spatial evolution of coastal fishing villages

#### 7.1.1 Directly influence

7.1.1.1 The impact of the overall industrial transformation on the village space

7.1.1.2 The summary of the impact of different industry types on village space

7.1.1.3 The existing problems of current village space

#### 7.1.2 Indirectly influence

7.1.2.1 Industrial transformation changes the production and lifestyle of residents

7.1.2.2 Industrial transformation changes the population structure in fishing villages

### 7.2 Analysis of the interaction mechanism between industrial transformation and spatial evolution

#### 7.2.1 Directly influence

7.2.1.1 The space transformation provides the material basis for industrial transformation

7.2.1.2 Industrial space layout affects industrial development

#### 7.2.2 Indirectly influence

### 7.3 Analysis of the interaction mechanism between industrial transformation and spatial evolution

### 7.4 Spatial reconstruction strategy of coastal fishing villages under industrial transformation

7.4.1 Macro: restoration and protection of the overall the village space

7.4.1.1 The adjustment of the industrial land layout

7.4.1.2 Integration of the spatial functions

7.4.2 Meso: renewal and conservation within the living settlement space

7.4.3 Micro: Conservation and construction control of building units

### 7.5 Conclusions

## 7 Industrial Transformation and Spatial Restructure of Fishing Villages in Qingdao West Coast New Area

### 7.1 Analysis of the influence of industrial transformation on the spatial evolution of coastal fishing villages

The main objectives of this chapter are to investigate the interaction mechanism between industrial transformation and spatial evolution of fishing villages in Qingdao West Ocean New Area, and to explore the adaptive spatial reconstruction methods by analyzing the future industrial transformation and development trend of these villages. The related literature showed that industry plays a very important role in the evolution of village space, and there is an obvious interactive companion relationship between village industry and space Tianjin University, 2008 <sup>[1]</sup>. The theory of the human-land relationship emphasizes the mutual feeling and interaction between people engaged in various production and social activities and physical natural elements. In the study of village space, scholars have already focused on the mutual influence of people and elements of village space, arguing that village physical space has an influence on people's production and life, while human activities, such as production and life, also promote the formation and evolution of settlement space. There is a certain degree of interaction relationship among the industrial transformation, village space, and village residents. Among them, residents play as a space subject, as shown in Figure 7.1.

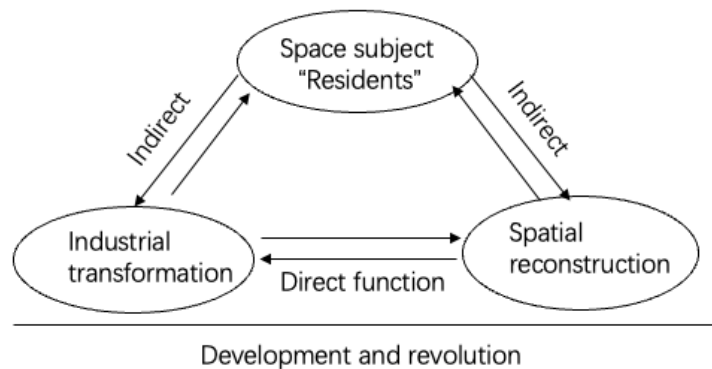


Figure 7.1 The logical relationship between industrial transformation and village spatial reconstruction

Industrial transformation and upgrading is a dynamic development process, and its impacts on the village space are continuous and dynamic processes, so the study of the interaction mechanism of industrial transformation and spatial evolution of fishing villages should focus on the overall development history of their industries and space.

Based on the above analysis, the specific analysis framework of this paper is as follows: firstly, a basic analysis of the industrial and spatial development history and current situation of fishing villages in Qingdao West Coast New Area is conducted with typicality and representativeness are selected for in-depth study. Secondly, in exploring the interaction mechanism between industrial development and transformation and spatial evolution of fishing villages, we analyze both directly and indirectly, among which, we focus on the importance of the spatial subject "people" in the



indirect role, and analyze it in terms of population composition and production and lifestyle. Finally, based on the above analysis, specific spatial reconstruction strategies are proposed for fishing villages in Qingdao West Coast New Area, Figure 7.2.

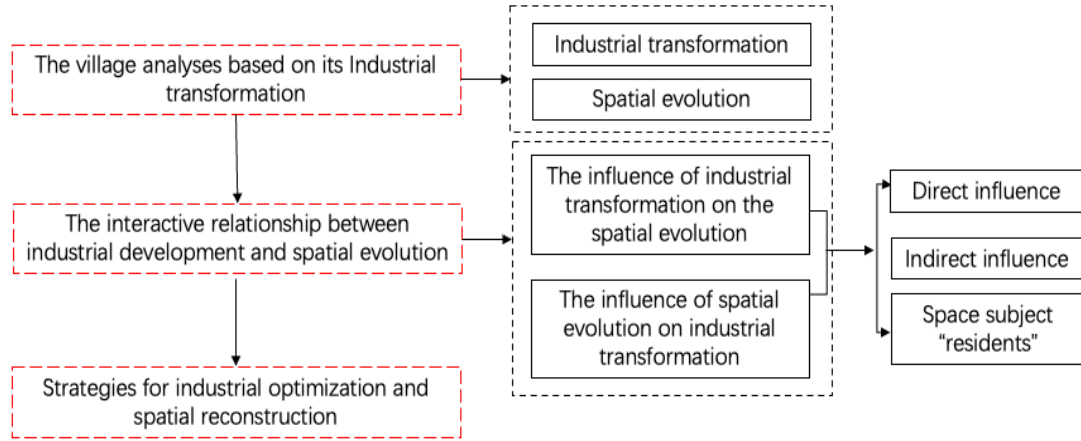


Figure 7.2 Analysis framework of Chapter 7

**7.1.1 Directly influence**

**7.1.1.1 The impact of the overall industrial transformation on the village space**

According to Chapter 2, the industrial transformation of coastal fishing villages can be divided into four typical types. In the process of industrial transformation, on the one hand, the leading industries of fishing villages are transforming, and on the other hand, the types of industries are gradually diversifying. The industrial transformation of fishing villages is realized by these two aspects and has impacts on the village space from the macro, meso, and micro levels Figure 7.3.

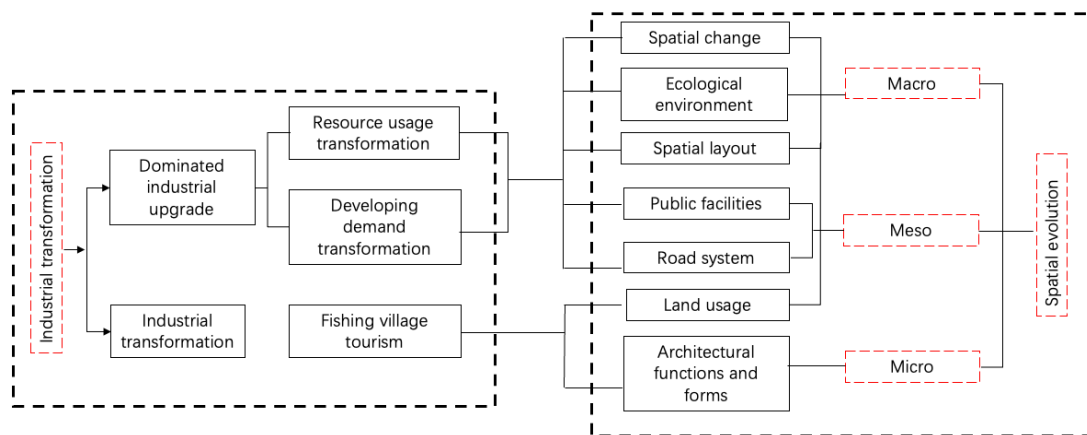


Figure 7.3 The influence mechanism between industrial transformation and village spatial evolution

**(1) Macro level: the overall spatial evolution**

In this paper, the transformation of the leading industries in fishing villages in Qingdao New West Area refers to the transformation from traditional fishery to modern fishery, fishing products

processing, and fishing village tourism. First, different leading industries rely on different spatial resources, so they also make the development of village space present different characteristics. The modern fishery and fishing products processing development relies on the development of coastal land resources, while the fishing village tourism development relies on cultural heritage. In the process of transformation from traditional fishery to processing industry, the overall spatial development mode of the villages is a kind of industry-led outward expansion, while the fishing village tourism transformation is a kind of endogenous renewal. In the process of processing industry-led outward expansion, the village space often shows large-scale encroachment of village ecological woodland, and other ecological space. The endogenous renewal of village space under the leadership of fishing village tourism is mainly the renewal of resources inside villages. In the process of tourism development, the local government usually proposes policy and financial support for renewing and optimizing the streets and roads, public space, and buildings. For example, Wangjiataihou Village and Taixitou Village have developed and constructed a series of infrastructures to promote village tourism.

① Transformed from traditional fishery to modern fishery

In terms of the functional layout, the change usually happened in coastal areas near villages for building new ports or relative fishery facilities, and the spatial form does not involve too much of the building. This part of the spatial transformation has less influence on living space in fishing villages.

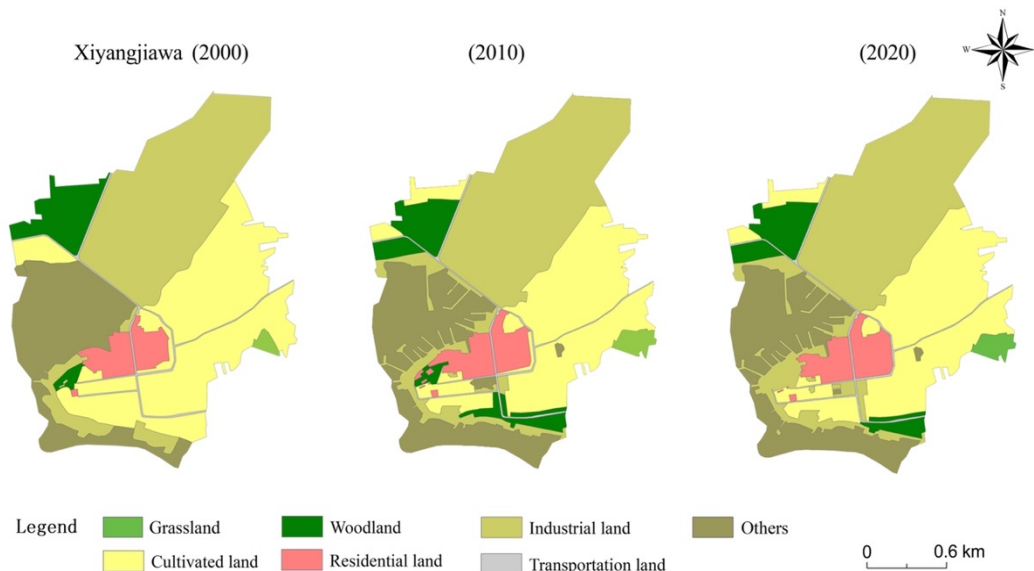


Figure 7.4 The spatial distribution change from 2000 to 2020 in Xiyangjiawa Village

② Transformed from traditional fishery to fishing products processing

Generally, the processing industry cannot coexist with the living space due to noise and environmental pollution, and in terms of spatial functional layout, it is usually distributed in blocks along both sides of the main external roads of the village. In terms of streets, the processing industry

usually has a certain aggregation in spatial distribution, and even forms industrial parks, unlike the traditional space, the internal road network of the industrial area is more regular. In Dingshiwa Village, its dominant industry is the fishing products process.

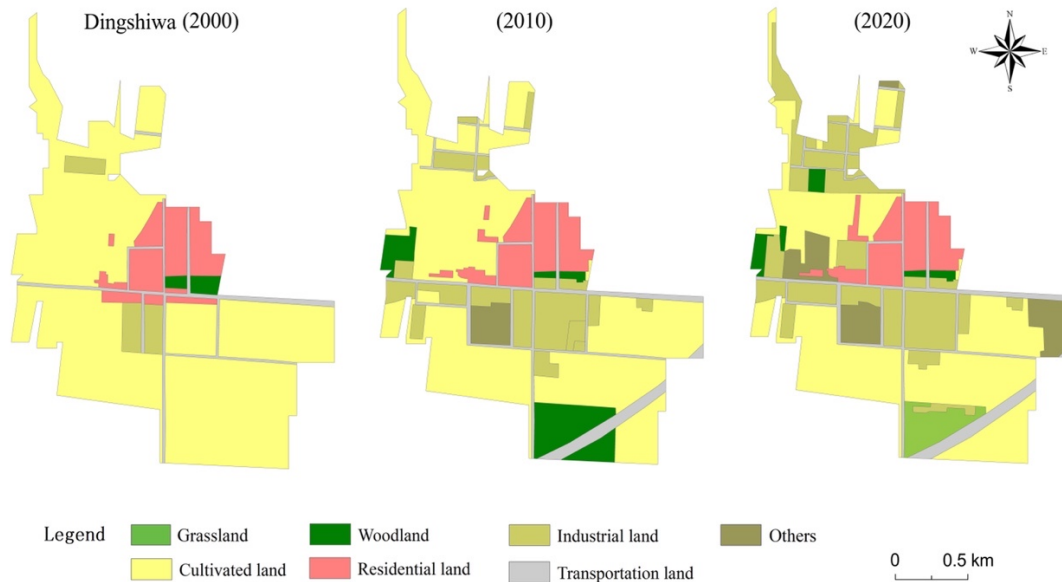


Figure 7.5 The spatial distribution change from 2000 to 2020 in Dingshiwa Village

### ③ Transformed from traditional fishery to fishing village tourism

According to the study of Wangjiataihou Village and Taixitou Village, where the fishing village tourism is more mature, the spatial layout of tourism service businesses is mainly dotted at tourist attractions and linearly distributed along both sides of the tourism route. Secondly, since tourism has a certain borderless, it can be better integrated with residential and living functions, so the development of fishing village tourism has changed the traditional space of the village from a single residential function to a combination of residential functions and commercial service functions, and the ecological space has also changed from a single ecological function to a combination of an ecological and tourism service function. As a result, many commercial+residential and ecological+tourism land uses have been developed. Finally, the development of fishing village tourism has a certain demand on environmental quality, and it will optimize the quality of fishing villages, especially the quality of public space and architectural style, which is good for the improvement of the internal quality of traditional spaces.

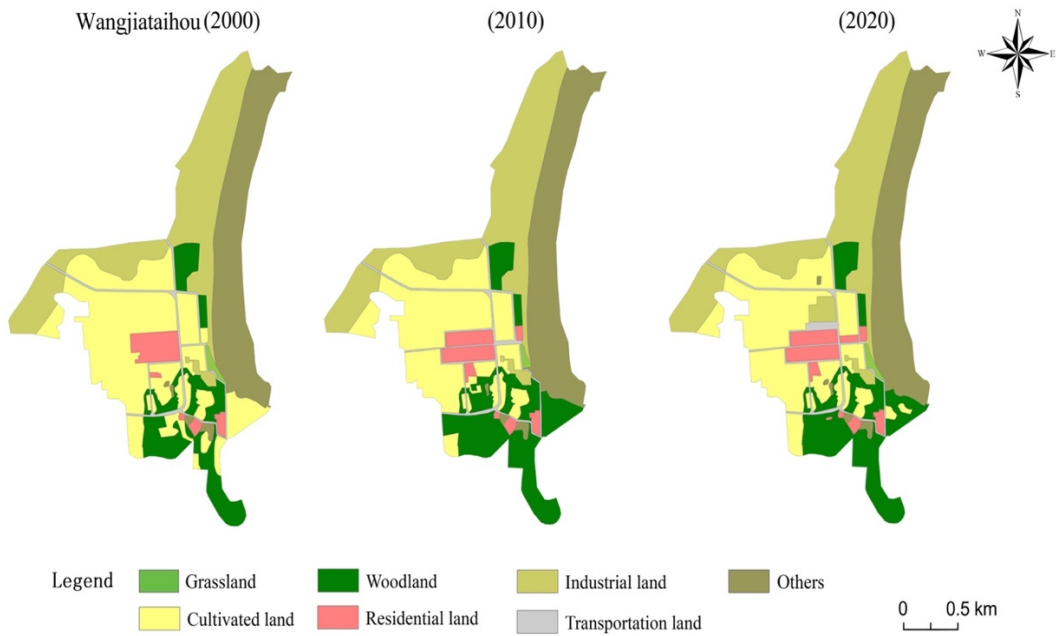


Figure 7.6 The spatial distribution change from 2000 to 2020 in Wangjiataihou Village

④ Transformed from traditional fishery to diversified industrial development

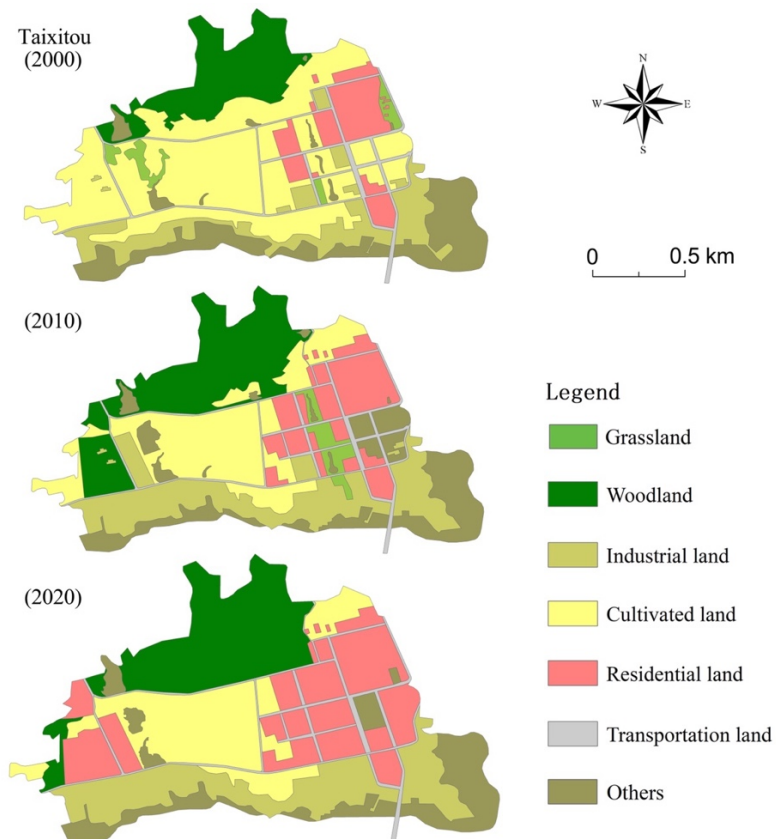


Figure 7.7 The spatial distribution change from 2000 to 2020 in Taixitou Village

Different from the other three villages, Taixitou Village is the only fishing village that realizes the diversified development of different industrial models. According to the land usage transformation analyzed by the GIS technology, the two obvious transformations of land usage in this village are residential land usage and industrial land usage. ① In 2000, the residential land is scattered. ② In 2010, the residential land and industrial land were both increased, but still in a scattered situation. ③ In 2020, industrial land and residential land have been combined to form a certain scale.

## (2) Meso level: the inner spatial evaluation of fishing village

As the leading industry of villages transformed, the fishing villages' development constantly put forward higher demands on the convenience of communication between villages and the outside world. During the traditional fishery-dominated period, the fishing villages had low demand for communication with the outside world, and just a small amount of commercial trade. Along with the rapid industrial transformation and development, these fishing villages have more and more frequent communication with the outside world. At the same time, the rapid development of villages also put forward higher requirements for road infrastructure. Therefore, the local governments make the unified planning and construction of the village's internal and external roads, Road system of traditional villages was thus changed, and external traffic roads and highways appeared in the villages, which together with the traditional streets and lanes within the villages formed a new street system. For tourism development, road service facilities such as parking lots were built beside the main roads in fishing villages.



Figure 7.8 Road service facility and the newly built village entrance road

## (3) Micro level: the evaluation of buildings

The diversification of industrial types in fishing villages has led to the gradual diversification of the functional types of land use in villages and the evolution of land use structures. At the same time, different industrial types have different demands on their production spaces, thus affecting the functions and forms of architectural units.

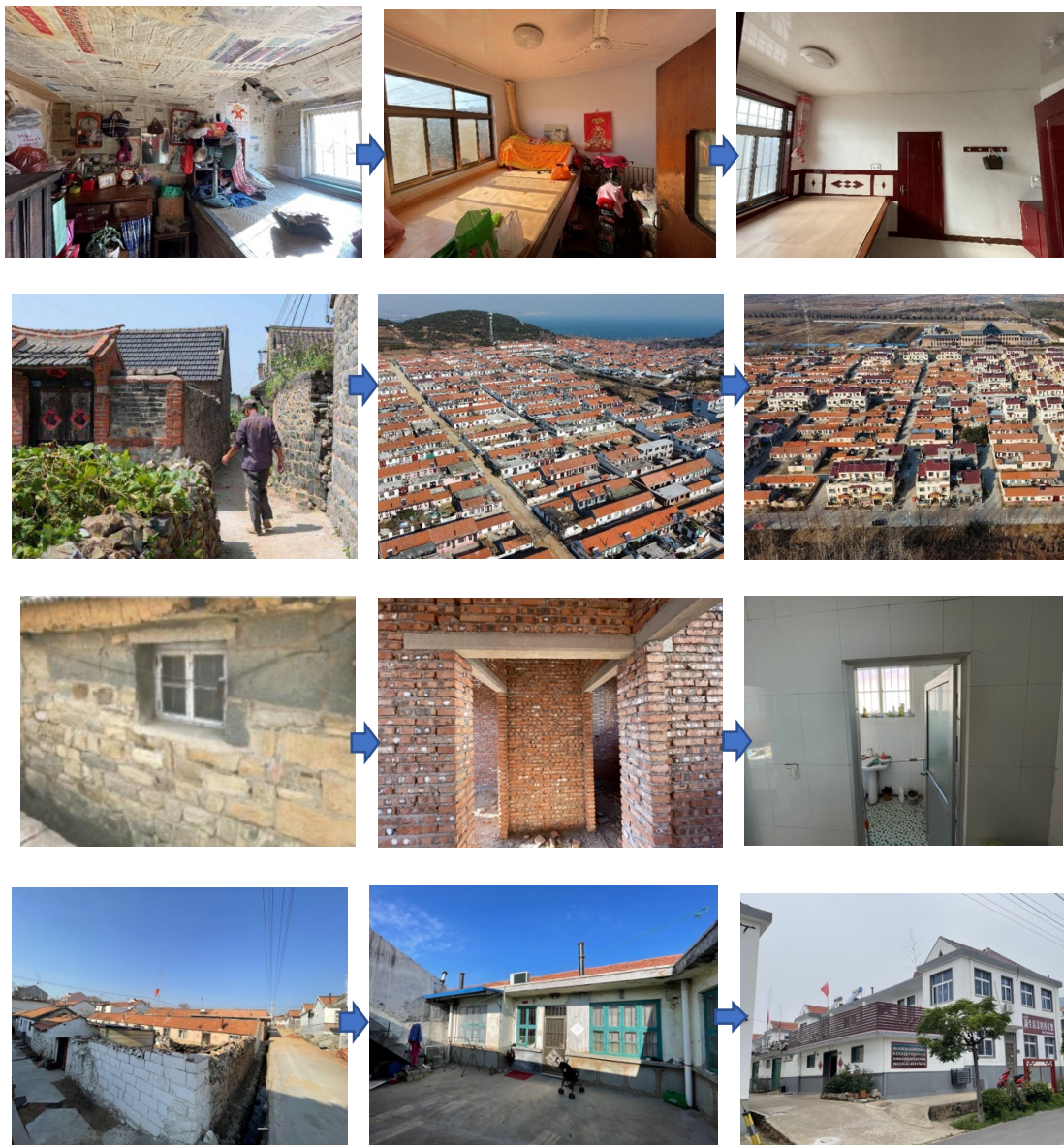


Figure 7.9 The evolution of the vernacular dwellings

Take the Wangjiataihou Village example, with the development of tourism, the form and function of a large number of residential buildings have changed. Along with the development of village tourism, more and more local villagers wish to join the process of tourism development and spontaneously renovate the residential houses and implant the function of tourism-based commercial services. At the same time, as the popularity of fishing village tourism, many people looking for second homes in the area come here and rent the dilapidated or collapsed buildings inside the traditional living space at low prices, and refurbish or rebuild them, which also promotes the renewal of the residential buildings. Most of the buildings that have been renovated or reconstructed by residents or outsiders shown as Figure 7.10.



Figure 7.10 The modern vernacular dwellings in Wangjiataihou Village

**7.1.1.2 The summary of the impact of different industry types on village space**

It can be seen that different types of industrial transformation have different needs for space for their different production characteristics. Different types of industries have a series of effects on space, mainly based on government planning guidance, and enterprises' development need. For example, in the development of tourism in Wangjiataihou Village, the Langya Town government organized the tourism plan, which planned the development direction of tourism in the village and the tourism route. Tourism-related commercial services will also drive the spatial transformation Figure 7.11.

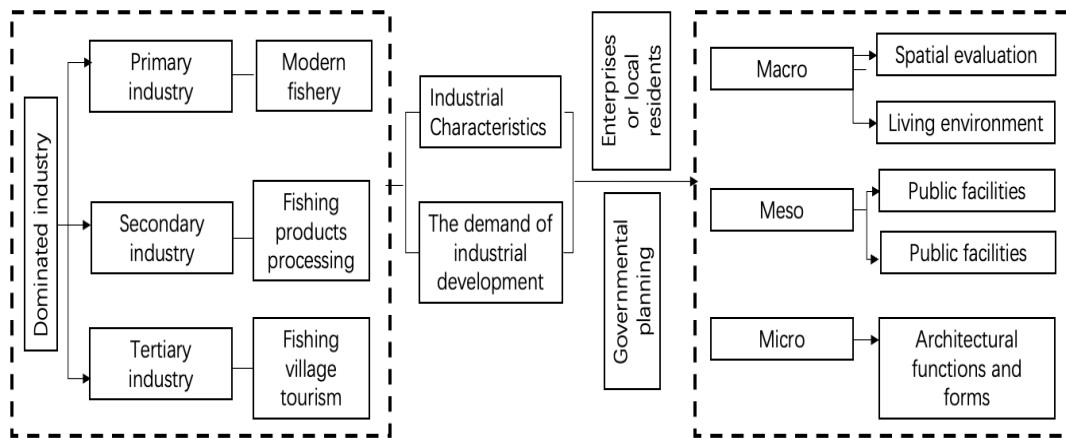


Figure 7.11 The inner relationship between the industrial transformation and its impacts on spatial evolution in fishing villages

Table 7.1 The impacts of industrial transformation on spatial evolution in fishing villages

Industrial structure	Before the industrial transformation, they are both traditional fishery-dominated villages	<u>Wangjiataihou Village</u>	<u>Dingshiwa Village</u>
		Fishing village tourism is the dominant industry.	Fishing products processing is the dominant industry.
Macro	Single land use	Tourism land use is increasing	Industrial land use is increasing
Meso	Typical coastal fishing village spatial layout	A large number of service facilities are established.	A large number of service facilities are established.
Micro	Typical dwellings with single function	The evolution of residential architecture to modernization and the gradual loss of traditional regional characteristics	

**7.1.1.3 The existing problems of current village space: Macro, Meso, and Micro**

**(1) Macro level: overall spatial situation and problems**

First, in terms of the overall spatial pattern, the original ecologically harmonious and livable spatial pattern of "mountain - farmland - settlement - water" in some fishing villages in Qingdao West New Area has been damaged or even completely disappeared. For example, in Dingshiwa Village, industrial land is developed along the external traffic road of the village at the periphery of the residential land, and a certain scale is formed, which separates the residential space and ecological space of the village, resulting in the disappearance of the original ecological and livable spatial pattern.



Figure 7.12 No buffer zone between the residential area and industrial area in Taixitou village



Secondly, the land use within fishing villages is generally limited, and there are few available land areas left. Many fishing villages, such as Xiyangjiawa Village, Dingshiwa Village and Taixitou Village, have no new residential bases for allocation. At the same time, the overall land usage layout of these fishing villages are lack rationality, with industrial land, agricultural land, and residential land mixed with each other, while industrial land is too compact with residential land and lacks buffer zones, which makes the residential space affected by noise and pollution generated by industry Figure 7.13.

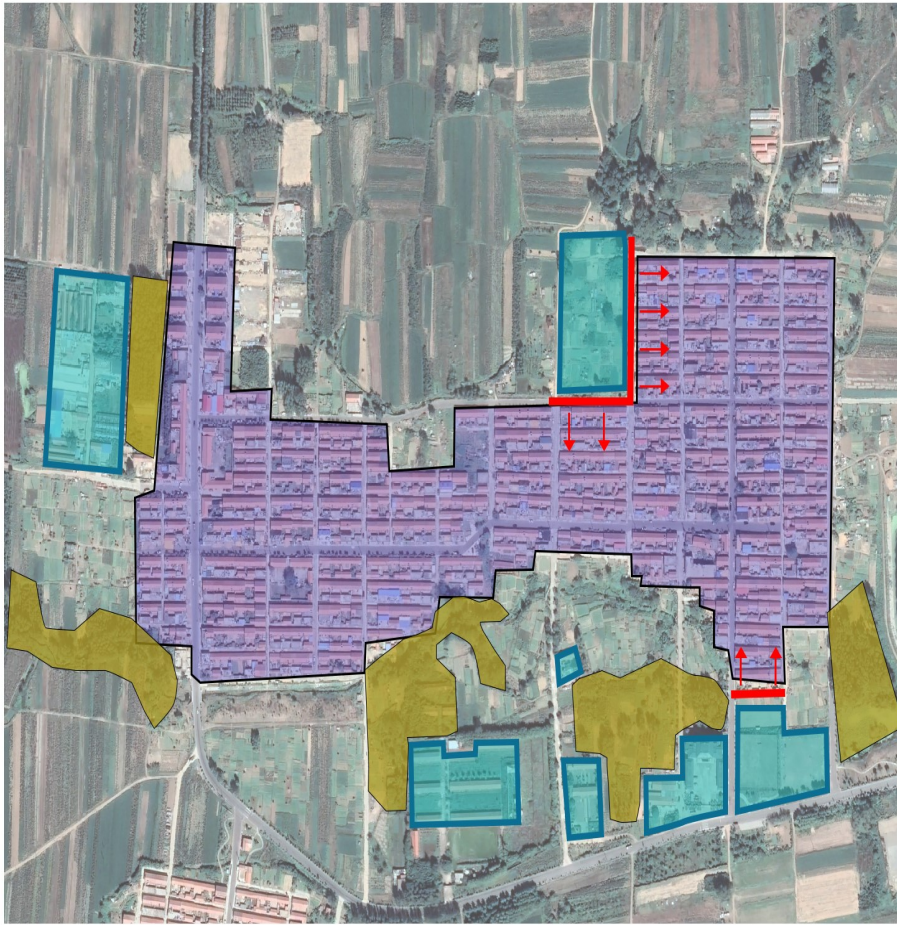


Figure 7.13 No buffer zone between residential area and industrial area in Dingshiwa village

Finally, the fishing villages in the Qingdao West Coast New Area generally have a superior natural ecological environment, and the settlements are usually backed by mountains, face to the sea, and have a complete ecological environment. However, according to the current situation, the sprawling expansion of construction land and the unreasonable layout of industrial land within the villages have destroyed the ecological network of the villages, and the integrity of the ecosystem has been damaged, showing a fragmented scene in Figure 7.14.

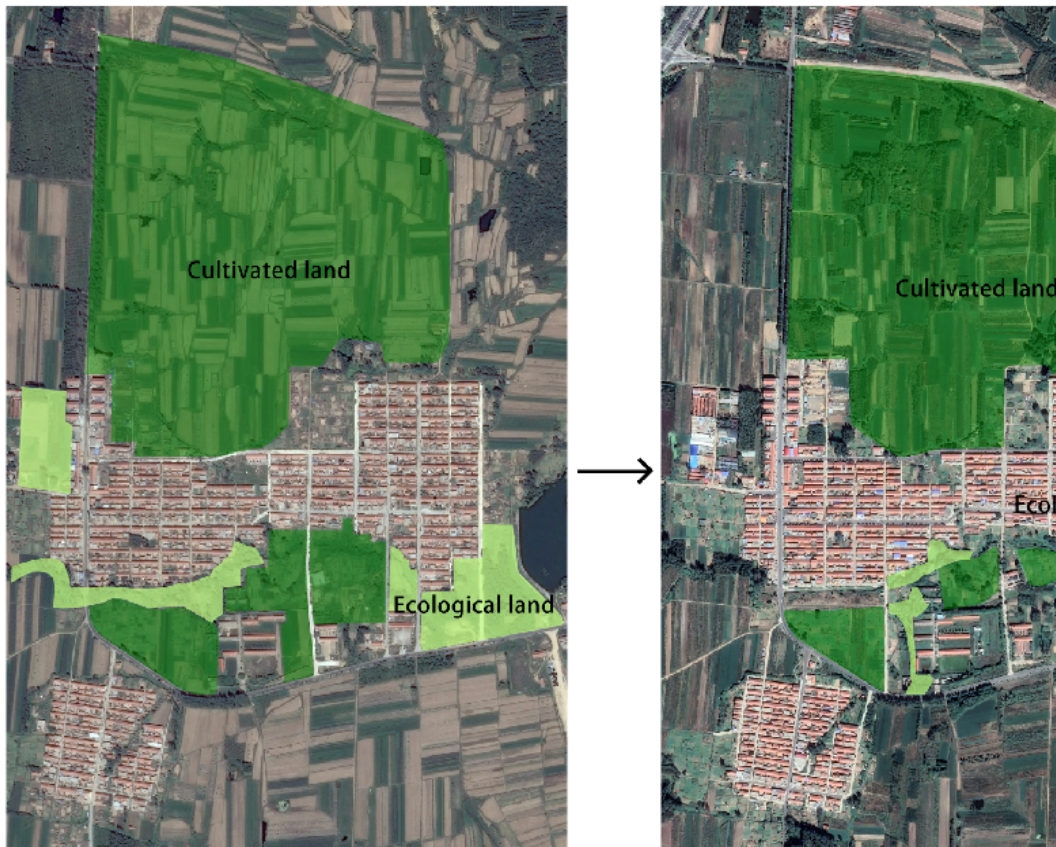


Figure 7.14 The evolution of ecological land usage in Dingshiwa village

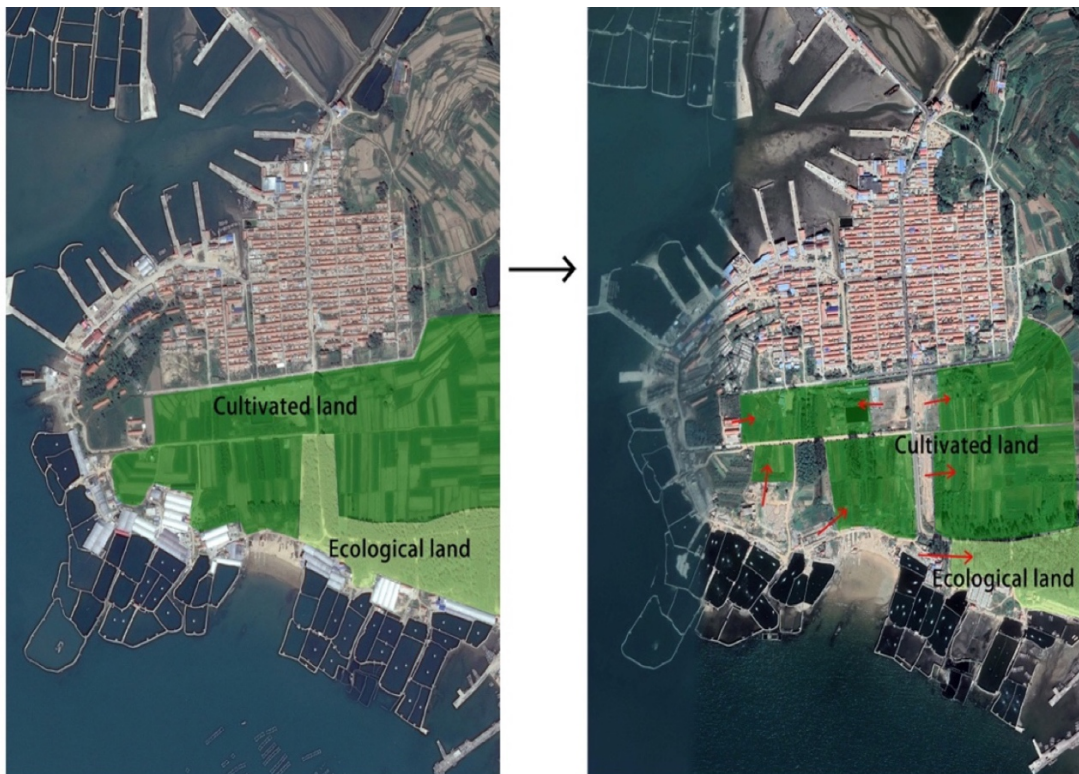


Figure 7.15 The evolution of ecological land usage in Xiyangjiawa village



Figure 7.16 The evolution of ecological land usage in Taixitou village

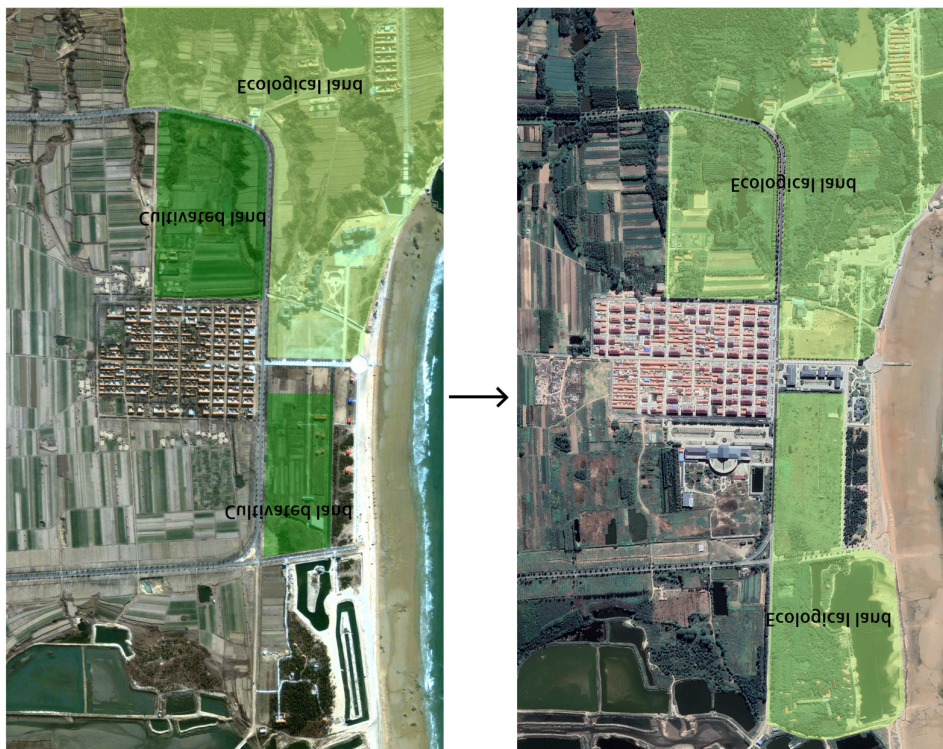


Figure 7.17 The evolution of ecological land usage in Wangjiataihou village

On the other hand, the industrial transformation has pushed some fishing villages to begin to develop the ecological land inside or around the settlements, but according to the actual research, it is found

that there is a certain blindness in the current development of the ecological space. For example, Taixitou Village and Xiyangjiawa Village both experienced a large reduction of natural scenery for industrial development. Wangjiataihou Village, as the FTT village, is the only village where the ecological land has been expanded for building ecological friendly fishing village for developing its tourism Figure 7.17.

## (2) Meso level: overall spatial situation and problems

In terms of streets and alleys, during the development of fishing villages, there is a certain scale of new housing construction around the original village space, and the street and alley of the new residential area are regular and loose, which is in obvious contrast to the compact street and alley inside the traditional space. At the same time, the newly built streets and alleys are always straight and the houses are planned as a military camp Figure 7.18, which is completely disconnected from the development of the traditional space of streets and alleys.

According to the research, the development of tourism in Wangjiataihou Village and Taixitou Village has increased the openness of public space and streets and roads within the traditional space of villages, especially in the middle and more mature stage of tourism development, traditional villages not only serve the transportation life of local villagers but also undertake commercial, sightseeing and entertainment functions to serve tourists. A large number of local residents say that the development of tourism has caused some disturbance to their daily life. At the same time, the public space distribution between the tourism development area and the general residential area within the fishing villages is unbalanced, and the spatial quality varies greatly, and there is an obvious dichotomy. In the traditional space, in addition to the function of living, the function of tourism service also appears. For Wangjiataihou Village and Taixitou Village, they have a higher degree of integration between tourism functions and residential functions within the traditional space, but the overall layout of commercial service land is loose, without obvious functional zoning, showing a certain disorderly type, which to a certain extent affects the daily life of residents.



Figure 7.18 Village planning

## (3) Micro: the current situation of architectural units and problems

① At present, the newly built buildings inside the fishing villages in Qingdao are mainly distributed in blocks outside the traditional space, as well as in points inside the traditional space, and the newly

built building forms have completely lost their traditional regional character and present modern characteristics. This has led to a mixture of old and new buildings inside the villages and a mixed and uncoordinated overall spatial appearance Figure 7.19.



Figure 7.19 The distribution of traditional residential areas and newly built residential areas

At the same time, in the process of research, it was found that the phenomenon of abandonment within the traditional living space of such traditional villages is widespread, and there are many abandoned houses within the traditional living area Figure 7.20. Along with the continuous development of villages' industries, the income of villagers is increasing, the living environment is gradually improving, and villagers are pursuing high living quality in different ways. Fishermen are no longer just satisfied with the traditional way of living but have started to turn to improved housing, and their demand for housing is no longer "live well" but "live well".



Figure 7.20 The abandoned traditional dwellings

② The overall quality of the building is poor and the traditional building is empty and wasteful. The current quality of the buildings in the fishing village is divided into three categories: good, average, and poor. The traditional dwellings are of poor quality because they are old and retain their traditional structures, while the brick-and-mortar dwellings renovated after the 1990s are more numerous and of average quality overall, and the new dwellings built after 2010 are few and of good quality overall. In general, the number of dwellings before the 21st century is high, and the overall quality is poor, so it is urgent to improve the living conditions of villagers and the village environment.

Most of the traditional buildings in the village have been abandoned because they were built long ago and have been subjected to serious natural erosion and dilapidation over the years. In recent

years, with the increasing demand for industrial development in the village, some villagers began to move outside the village to seek more space for bonsai planting and selling, and the vacancy rate of traditional houses has increased year by year. At the same time, families in the village who are better off have chosen to rebuild their own houses due to the increase in family size and the change in living needs, which has further aggravated the situation of abandoned houses, and many of the better-preserved houses in the village are facing the challenge of gradual deterioration without maintenance. Some of the traditional buildings have been left vacant for years and lack of maintenance, resulting in serious damage to the buildings and the collapse of the whole structure into a dangerous house, which is a great safety hazard. In the field research, it was found that most of the traditional buildings were partially collapsed, and most of the buildings had different degrees of damage to the roof and the enclosure bearing structure.

According to the president of the Langya town union, as early as the date when the Huangdao District Binhai Avenue was repaired to Langya town, Langya town has developed to the suburban area of the West Coast New Area. With the opening of Metro Line 13 in 2018, public transportation in Langya Town ushered in a leapfrog development, a large number of villagers in Langya Town choose to return to live in the village, especially in the research sample area of the town center area village-Xiajia Village, East Soap Household Village, Da Soap Household villagers mainly, with Langya characteristics of "Reverse urbanization" began to appear. Among them, according to Xiajia Village according to the village bookkeeper Wang Mou statistics, since the opening of the subway, due to the convenience of the subway Xiajia Village returned to live in 8 households, the village vacant homes also decreased from 15 to 7; age are 45-55 years old middle-aged couples, temporarily did not attract 18-45 years old villagers to return to live.

③ In the earliest days, building houses in fishing Villages, villagers mostly used a mixture of straw and clay to build roofs, and then added tiles Figure 7.21. The color of the tiles was mainly black (see Figure 3.16); with the abundance of building materials, prefabricated panels are now used to build the roofs. With the abundance of building materials, the roofs are now more often built with prefabricated panels, and are either covered with colored porcelain tiles or painted with waterproof paint. In the early days, due to the scarcity of materials, villagers mostly used sea stone and rough stone to build the walls; in the new houses, granite is used to build the walls. Meanwhile, In the 1970s and 1980s, the brick surface of houses was about 50 centimeters thick, while the thickness of walls of new multi-story buildings is about 40 centimeters.



Figure 7.21 The traditional architectural materials

The advantages of using traditional local construction materials are as follows:

(1) Economic and environmental

For thousands of years, people live on it and use it to build houses. These houses are rooted in the earth and seemed growing from the ground, blending with nature. Through long-term repeated practice by local people, it makes such local materials a kind of mature materials for dwellings.

(2) Good physical properties

Climatic conditions in coastal fishing villages decide that the housing constructions have to take thermal insulation and safety as the main targets. Generally, immature soil can adjust the indoor humidity. The rammed-earth wall can absorb the moisture in the air when it is too wet. On the contrary, when it is too dry, the wall can release excess moisture to the air. Therefore, adobe dwellings are likely to remain relatively pleasant indoor environments.

(3) Simple maintenance

During the process of use, some damage will come out, such as dry shrinkage cracks or cracks in the wall caused by uneven settlement of the foundation. As long as it does not seriously affect the safety of the structure of the overall housing, the process of repair is very simple.



Figure 7.22 The current modern architectural materials

Compared with the traditional dwellings in fishing villages, brick-concrete structure dwellings have the advantages of tense space layout, spacious indoors, sturdy structure, nice appearance and so on. The construction methods and materials are like urban houses' construction, concrete, and 240mm bricks are the mainly used materials, outside yards' walls are uncovered, the facade of architecture is generally white ceramic tiles, inside walls use cement mixed with sand, there are no insulation layers for the walls and roof Figure 7.22. The inside space also has great change, the room size is more suitable than before.

#### (4) The evolution of the vernacular dwellings

For the evolution of the courtyard in the fishing village, the house site is increased, but not increase greatly. There is a small increase in the length of east to west, while the north-south length of the residence remains the same.

Table 7.2 Evolution of homestead area and size

Time	Homestead area	The east-west width	The north-south width
Before 1978	160-165 m <sup>2</sup>	10-11 m	15.1 m
1978 to 2000	170-173 m <sup>2</sup>	11-12 m	15.1 m
Since 2000	170-175 m <sup>2</sup>	11-12 m	7.1 m

There are No Storage rooms in early. Along with the village development and the increase of residents' living requirements, the storage rooms were designed in the vernacular dwellings in the recent decades, show in Table 7.2. At the same time, it shows that the area of storage rooms are increased since 2000. The width of Storage room was less increased. The north-south length of storage room has always been about 3 meters





Figure 7.23 The storage room

Table 7.3 Evolution of storage room

Time	storage room area	The east-west width	The north-south width
Before 1978	No	No	No
1978 to 2000	5.5-7 m <sup>2</sup>	2-2.5 m	2.77 m
Since 2000	11.5-14.5 m <sup>2</sup>	4.5-5.2 m	2.77 m

Unlike the storage room, the main house has always existed in the vernacular dwellings. The main house is one of the most important parts of the coastal fishing village dwellings, which consists of bedroom, living room, second bedroom and kitchen, and main house is the main activity place of residents. The main house is mainly heated by heated Kang, so the bedroom where the fire bed is located is the most important meeting guests' space in the vernacular dwelling, Figure 7.24. With the development of the local economy and changes in people's lifestyles, the hospitality function of the bedroom has gradually shifted to the living room. This brought about a change in the size of the living room, which increased by 6m<sup>2</sup> compared to 30 years ago. With the change of people's lifestyle, the once ceremonial function of the living room is gradually disappearing Table 7.3.



Figure 7.24 The room situation in current vernacular dwellings

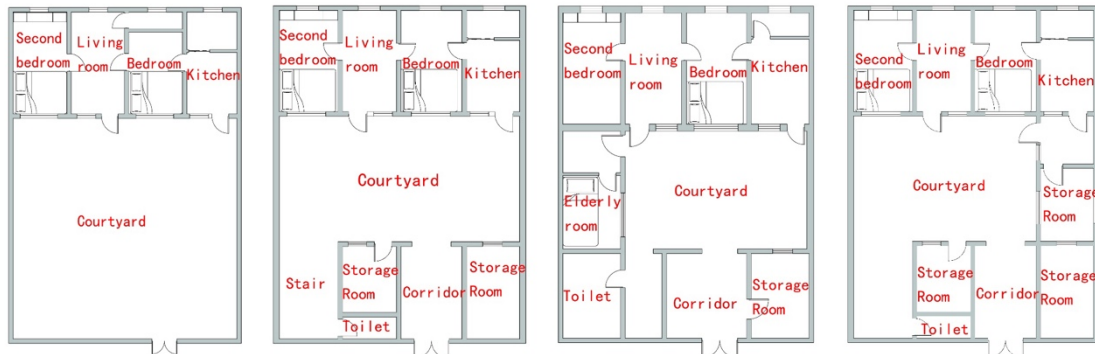


Figure 7.25 Layout of typical vernacular dwelling

With the development of the local economy and changes in people's lifestyles, the hospitality function of the bedroom has gradually shifted to the living room. This brought about a change in the size of the living room, which increased by 6m<sup>2</sup> compared to 30 years ago Table 7.4. With the change of people's lifestyle, the once ceremonial function of the living room is gradually disappearing.

Table 7.4 The size changes of living room

Time	Living room area	The east-west width	Function
Before 1978	10-12 m <sup>2</sup>	4.5-4.8 m	Ritual
1978 to 2000	5.5-7 m <sup>2</sup>	4.5-5.18 m	Ritual and hospitality
Since 2000	14-16 m <sup>2</sup>	5.0-6.3 m	Hospitality

According to the survey of rural residents in coastal areas, the comfort level of local residential thermal environment in winter is low. More than 50% of the households reported that they were dissatisfied with the indoor thermal comfort of the entire residence in winter. More than 70% of the households reported that the thermal environment of the second bedroom was unsatisfactory in winter, and 10% of the households expressed extreme dissatisfaction with the thermal comfort of the second bedroom. Over 45% of occupants rated the thermal environment in the master bedroom as accept reluctantly. More than 60% of the occupants reported that the thermal environment satisfaction of the living room was slightly dissatisfied and accept reluctantly. In addition, the residents' satisfaction with heating costs in winter is extremely low, and only 10% of the respondents believe that the satisfaction is within an acceptable range Figure 7.26.

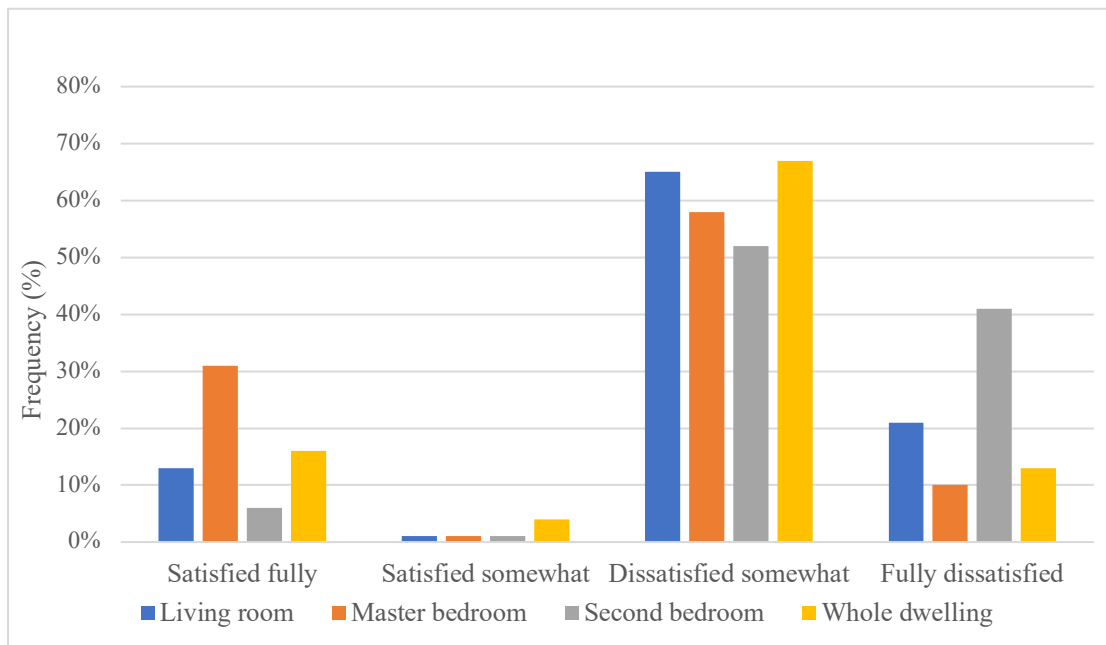


Figure 7.26 Frequency distribution of satisfaction on indoor thermal environment

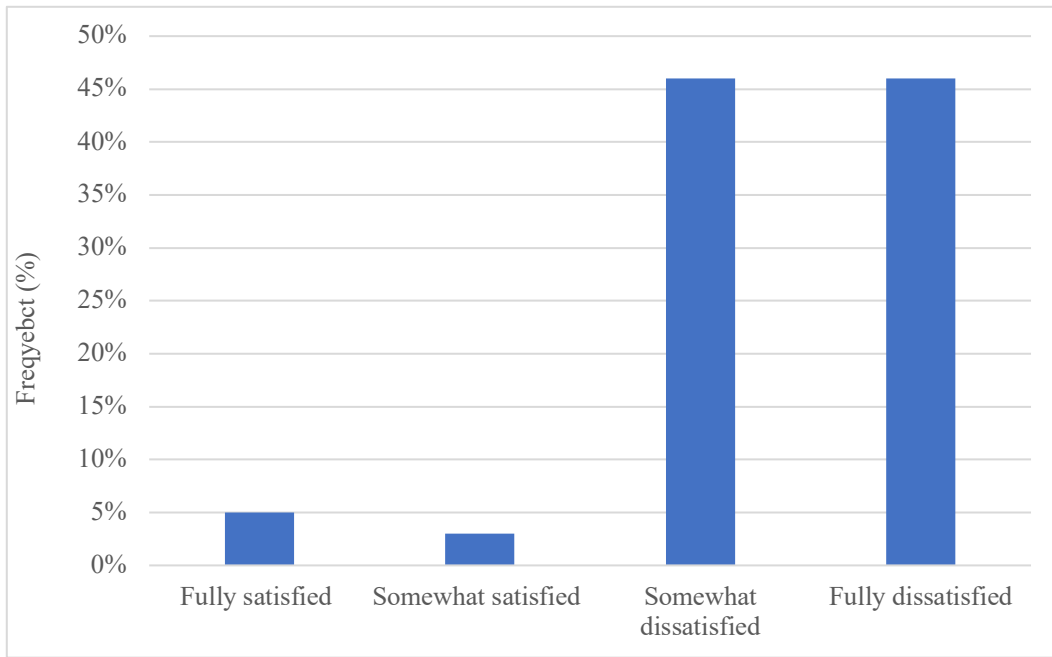
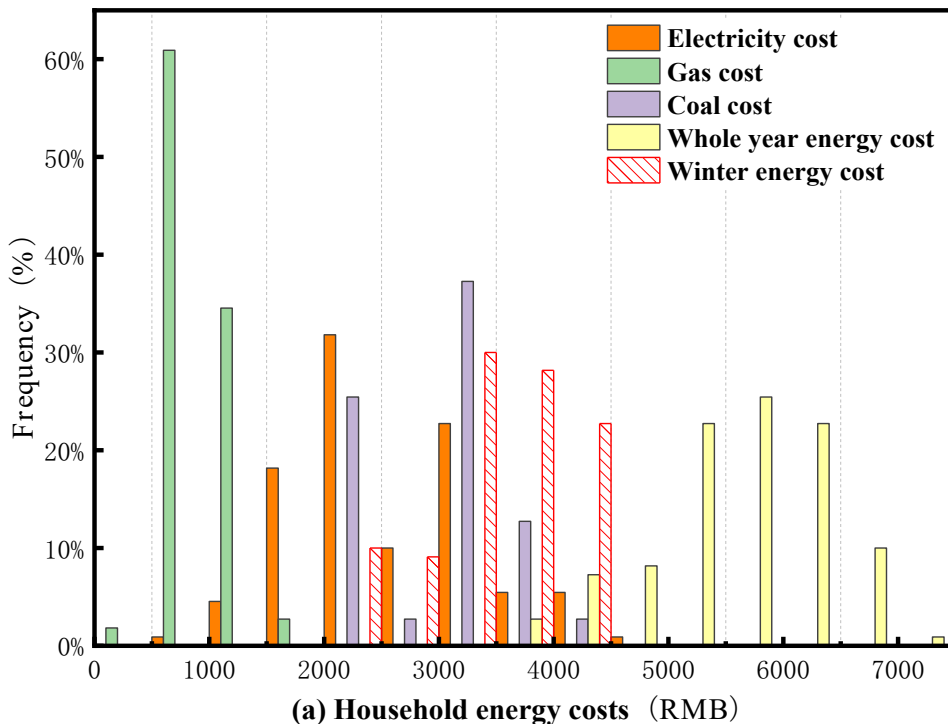


Figure 7.27 Frequency distribution of satisfaction on heating energy cost in winter

The average annual income of all surveyed dwellings was RMB 63,100 and the average annual energy cost was RMB 5,448.07, with the average annual energy cost accounting for 8.6% of the average annual income. The average winter energy cost is RMB 3,431.86, accounting for 5.6% of the average annual family incomes. More than 70% of the dwellings surveyed cost between 3,000-4,500 RMB for winter heating energy, accounting for 5.0%-6.7% of annual family incomes Figure 7.27.



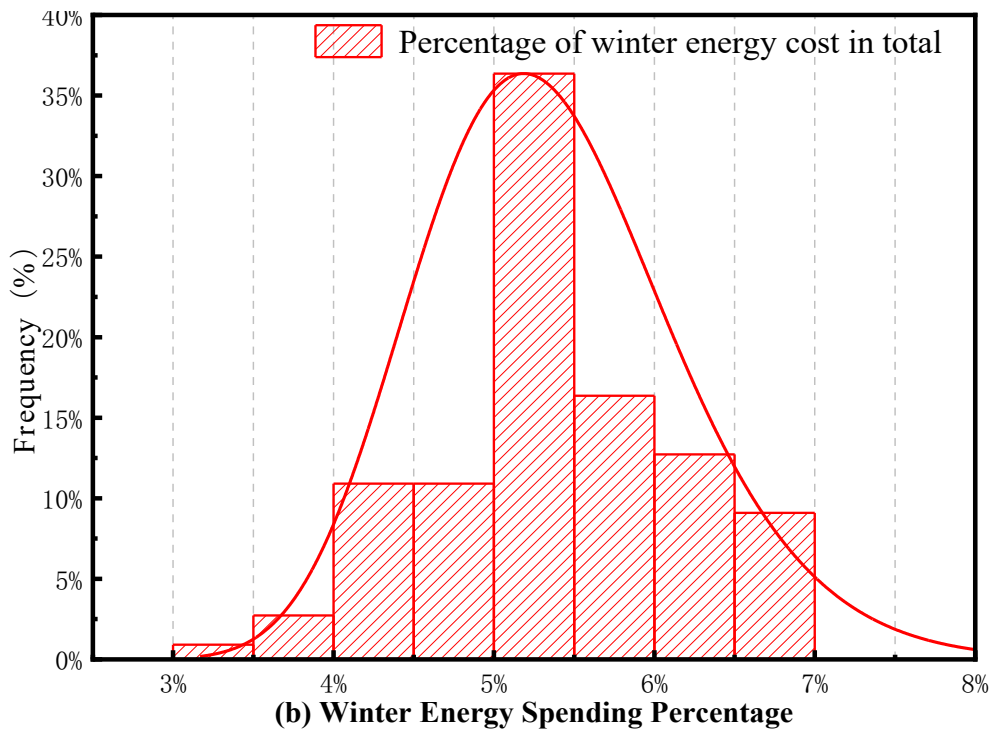


Figure 7.28 Energy cost and the proportion of heating cost during winter in dwellings

Table 7.5 Summarized the current problems

Fishing village	Macro	Meso	Micro
	Significant transformation of traditional spatial pattern and ecological environment	Uneven distribution of public space and dichotomy of living space	Chaotic architectural Style, large number of abandoned houses
Xiyangjiawa Village		The industrial land and residential area are mixed	Chaotic architectural Style, large number of abandoned houses
Dingshiwa Village	Land usage is unreasonable		Chaotic architectural Style, large number of abandoned houses
Wangjiataihou Village	Significant transformation of traditional spatial pattern and ecological environment	The tourism routine mixed with residential area	Chaotic architectural Style, large number of abandoned houses
Taixitou Village	Land usage is unreasonable	Street and alley are planned in chaotic	Chaotic architectural Style, large number of abandoned houses

Generally speaking, the contradiction between the poor satisfaction of the users of the existing heating mode in the indoor thermal environment and the excessive proportion of energy consumption is very prominent. Therefore, it is necessary to comprehensively analyze the specific

indoor thermal environment parameters under the typical local heating mode, and scientifically judge the relationship between the heating effect and energy consumption of different heating modes.

## 7.1.2 Indirectly influence

### 7.1.2.1 Industrial transformation changes the production and lifestyle of residents

The transformation of production and lifestyle of local villagers in fishing villages is the most basic driving force for the reconstruction of the living space. On the one hand, with the transformation and upgrading of the industrial structure of fishing villages, the production mode of fishermen has changed. During the period dominated by traditional fishery, fishermen mainly rely on the fishery. Along with the rapid urbanization and rural revitalization, the processing industry entered the fishing villages, attracting surplus labor to work in factories. With the development of fishing village tourism, more and more local fishermen are engaged in tourism. Along with the industrial transformation of villages, the social roles of residents in fishing villages gradually changed from traditional fishermen to various roles such as workers and businessmen. This transformation has effectively improved the income level and living standard of residents and created a higher level of demand for the internal living space of villages, mainly in the form of external expansion of residential land and internal renewal of traditional residential areas.

On the other hand, with industrial diversification, the number of employment options available to fishermen has increased. The differences in employment characteristics and welfare benefits, resulted in groups with different income levels, and lifestyles, thus creating different choices for living spaces. Some villagers choose a new site for new house construction, and some villagers choose to leave the fishing village to live in the town or urban areas, thus promoting the village abandoned phenomenon.

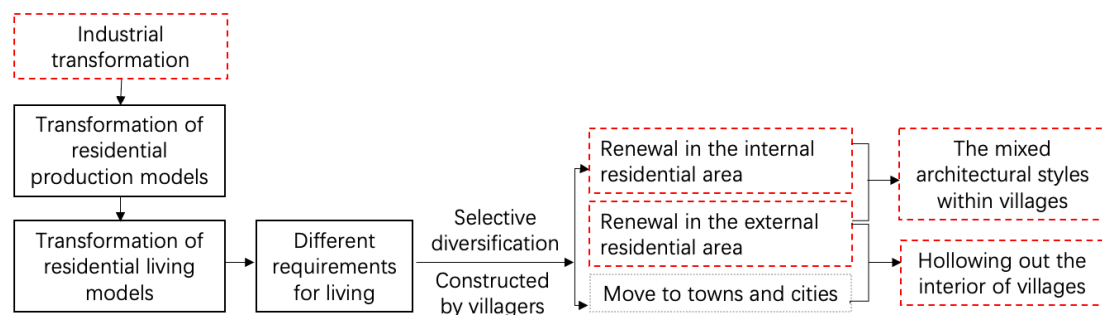


Figure 7.29 The production and lifestyle transformation of villages' spatial change

### 7.1.2.2 Industrial transformation changes the population structure in fishing villages

Besides the large number of residents working and living in towns or cities, the population structure also changed by industrial transformation. The first obvious change is population aging, as shown in Figure 7.30. Most of the residents living in villages are over 65, which take a great part of the village population. Another change in population structure is the migrant population increase, especially for the fishery-dominated village, whose living habits, leisure models, and social psychology are different from residents.

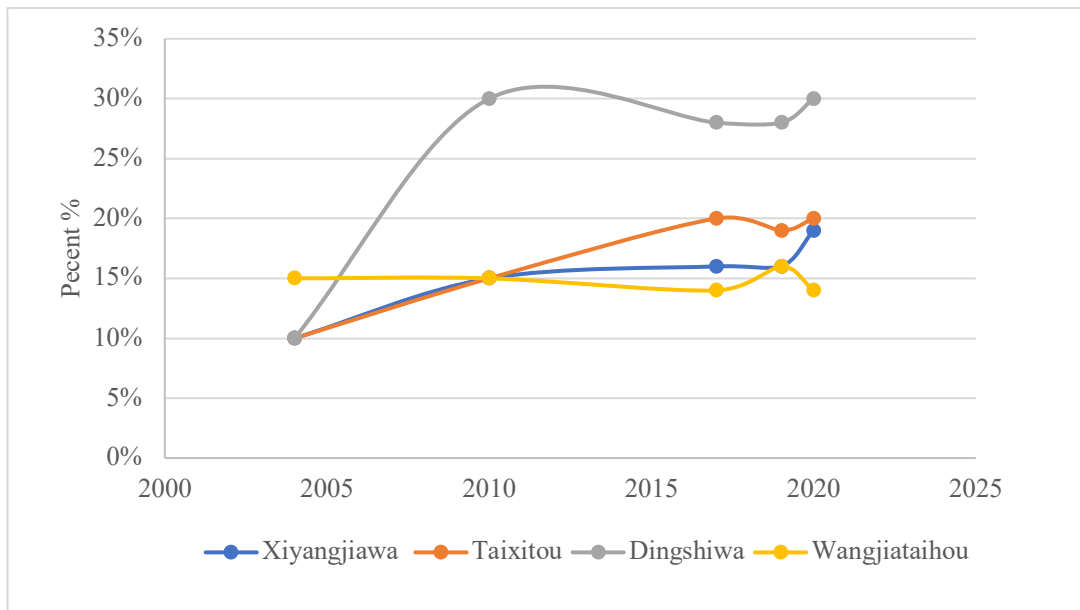


Figure 7.30 The proportion of 65 years old residents in the fishing villages

According to the age distribution Figure 7.31, it can also show that the aging population phenomenon in the current fishing villages. Among the respondents of the investigation, there are around 51% are among 50-60, takes half of the current village population. And around 26% are 60-70. The young villagers are still not the main production force in current villages. Therefore, in the future village industrial transformation, more and more new developed industries should attract more young villagers to stay and work in villages.

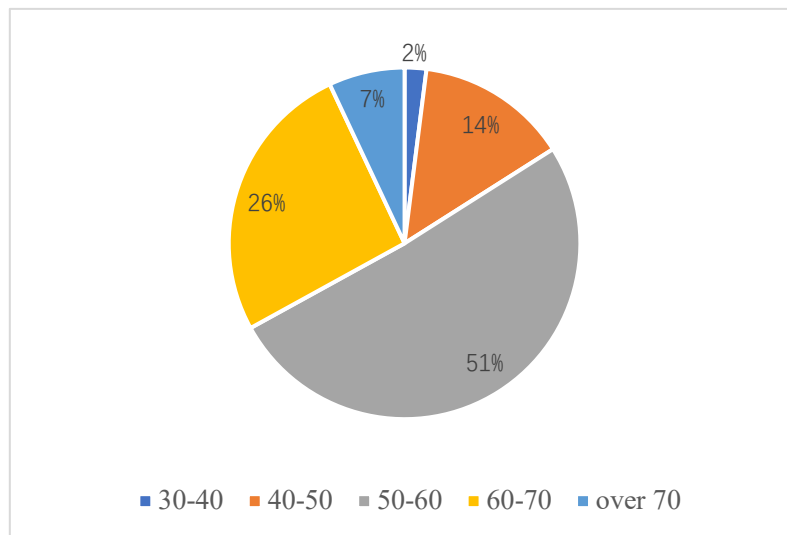


Figure 7.31 The percentage of different ages in the respondents

As industrial transformation and development, it attracts not only workers and businessmen, but also entrepreneurs, and freelancers, which gradually complicates the demographic composition of fishing villages and leads to micro-scale renewal within the residential areas. On the one hand, the space inside the fishing villages is obviously improved, mainly in the form of residential buildings

renewal, commercial space improvement for meeting market demand, and the optimization of public space by the government to promote industrial development and increase the attractiveness of the village. On the other hand, immigrant workers or enterprises have exacerbated the imbalance in the spatial allocation of public service facilities and other resources in fishing villages. Taking Wnagjiataihou Village and Taixitou Village, where show an obvious imbalance in the allocation of resources. The closer to the core tourism area, the more complete of public service facilities, landscape greening, and road facilities; while away from the core tourism area, the number of public service facilities is small and the number is not enough, and the road system and landscape environment have not yet undergone comprehensive improvement.

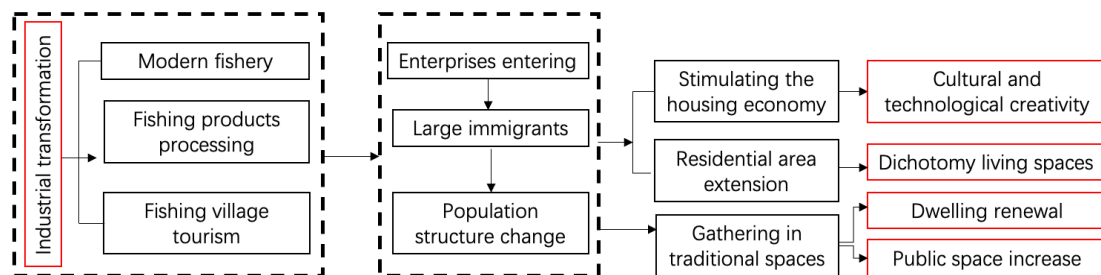


Figure 7.32 The change of population structure on spatial evaluation

## 7.2 Analysis of the influence of the spatial evolution of coastal fishing villages on industrial transformation

### 7.2.1 Directly influence

#### 7.2.1.1 The space transformation provides the material basis for industrial transformation

In the process of industrial transformation and development of fishing villages in Qingdao New West Area, space is the carrier for industrial transformation and development, and provides material conditions such as land resources and tourism resources for industrial transformation and development of fishing villages. First, the land is the material basis for the development of village industry. In the period of industrial transformation, village land resources provide support and with the increase of land for industrial production, the gross industrial product is also increasing. However, the land is very limited in the coastal fishing villages, which is one of the weaknesses for further expansion and industrial development. Thus, within the limited land, the industrial layout should be reasonably planned and designed. Secondly, the developing degree of industrial service facilities inside the fishing village also affects the development of village industries. For example, the industrial supporting facilities affect industrial production; the village tourism infrastructure affects the tourist reception capacity of fishing villages. Finally, the spatial pattern, street layout and architecture, and other material elements that carry the culture and historical development of the village are the advantageous resources for the development of fishing village tourism, and the basic development conditions for the further development of fishing village tourism.

#### 7.2.1.2 Industrial space layout affects industrial development

For rural industries, the industrial spatial layout is the basis and an important component of rural industrial development<sup>[2]</sup>. A reasonable industrial spatial layout can effectively promote industrial



clusters, improve the utilization rate of resources within the region, and obtain greater benefits in social, economic, ecological, and environmental aspects. The unreasonable industrial layout will not only hinder regional economic development but also deepen and intensify the various contradictory problems. According to the field investigation, the current space layout in the fishing products processing village Dingshiwa Village is insufficient, and the expansion of industrial development is hindered. The current layout of industrial land is chaotic, and industrial land is intertwined with residential land and ecological woodland, which affects the overall spatial quality.

### 7.2.2 Indirectly influence

Talent is an extremely important component in rural industrial revitalization <sup>[3]</sup>. Industrial transformation needs talent as a guarantee, and the denser the talents are, the better the quality of industrial transformation and upgrading <sup>[4]</sup>. Talent is also the guarantee for the continuous optimization and development of village industries and the core content of industrial transformation, the denser the talent is, the higher its production efficiency. The quality of the living environment inside fishing villages, including the ecological environment at the macro level, infrastructure construction and public space quality at the meso level, and living building conditions at the micro level, are important conditions, which directly affect the retention of internal talents and the willingness of external talents, thus affecting industrial transformation and development.

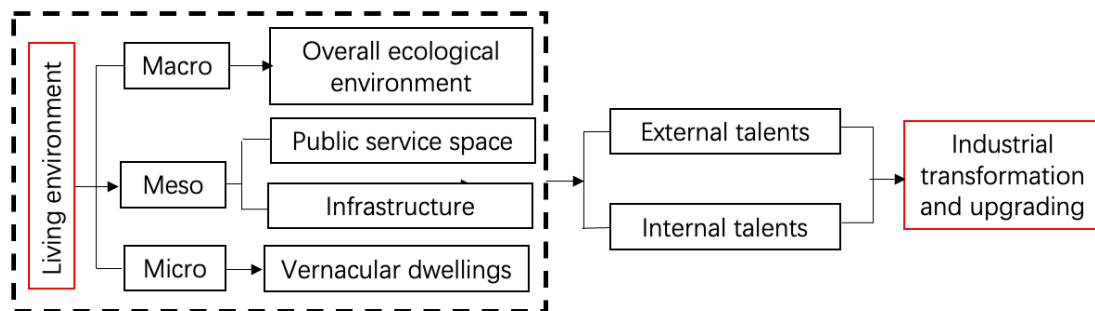


Figure 7.33 The indirect influence of spacial evolution on industrial transformation

## 7.3 Analysis of the interaction mechanism between industrial transformation and spatial evolution

The industrial transformation and development of coastal fishing villages in Qingdao New West Area affect the village space from both direct and indirect aspects, causing the village space to evolve and even reconfigure. The direct effect is the change of industrial structure, industrial type, and industrial scale have obvious impacts on the macro, meso, and micro levels of the village space. Indirectly, industrial development and transformation affect the space of fishing villages by promoting the transformation of the production and lifestyle of residents within the villages and the complication of population structure for the immigrant workers.

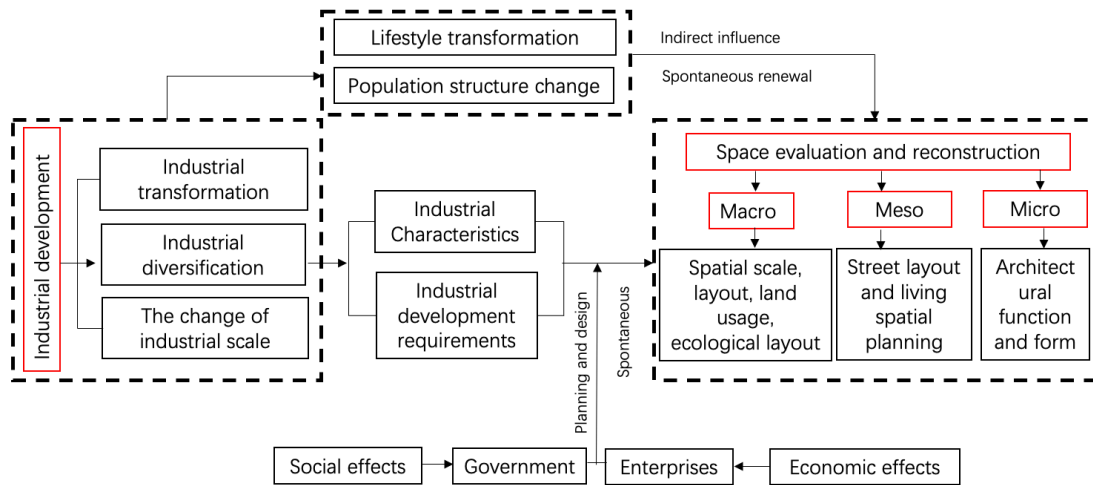


Figure 7.34 The impact of industrial development on spatial evolution

The space of fishing villages in Qingdao New West Area also has an impact on industrial transformation through both direct and indirect aspects. Firstly, the resource endowment of fishing villages provides the material basis for the transformation and development of village industries, and the functional layout of the land and the scale of space available also affect the efficiency of industrial development. Secondly, the quality of the living environment inside villages affects their attractiveness to talents, which in turn affects the quality of transformation or upgrading of village industries and the level of industrial development.

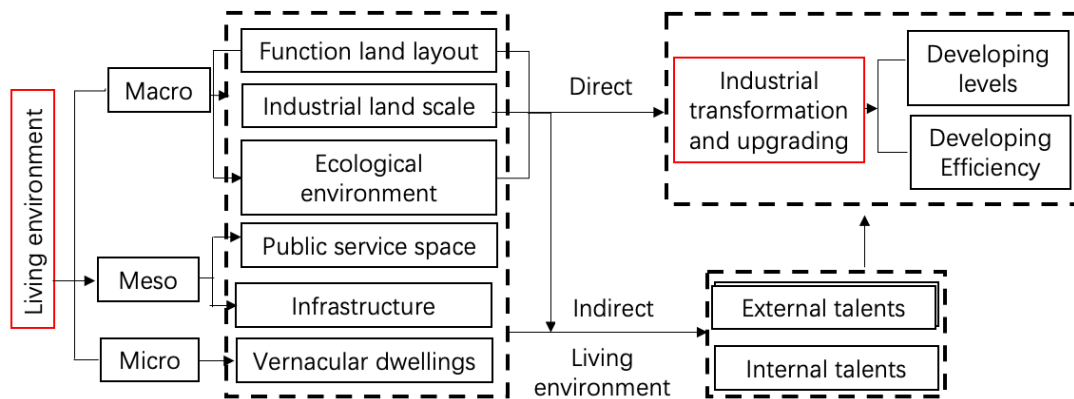


Figure 7.35 The impact of spatial evolution on industrial development

All in all, the industrial transformation and spatial evolution of the coastal fishing villages are complementary, and the spatial evolution reflects industrial development and the spatial basis for industrial development.

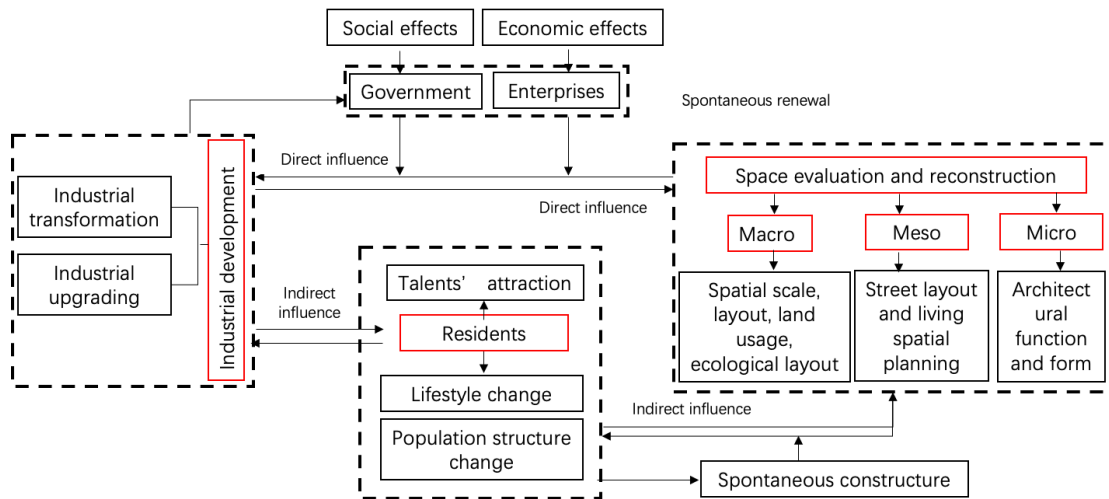


Figure 7.36 The interactive relationships between industrial development and spatial evolution

#### 7.4 Spatial reconstruction strategy of coastal fishing villages under industrial transformation

Regarding the reconstruction of the fishing village space in the Qingdao New West Area, there are mainly two aspects: the protection and development of the village space. First, in the process of reconstructing the fishing village space, the village space should be protected and renewed. On the other hand, the village space should be continuously protected and controlled so that it can retain its unique regional characteristics and maintain healthy and sustainable development. Through the spatial reconstruction in these two aspects, the industrial development and spatial evolution of fishing villages can form a good interactive relationship.

##### 7.4.1 Macro: restoration and protection of the overall the village space

###### (1) Restoration and protection of traditional spatial pattern

According to the field investigation, the main reason for the destruction of the spatial pattern of harmony between human beings and nature in fishing villages is the industrial transformation. Due to the demand for industrial development, large-scale agricultural land or ecological forest land at the periphery of settlement land is used for industrial development. First of all, the current land layout should gradually integrate the industrial land with the fishing villages, other than distributing it in a rude and fragmented way. By choosing a suitable location for a centralized layout, the impact of industrial development on the surrounding environment can be reduced, and the ecological pattern of the villages can be repaired Figure 7.37 Figure 7.28. Secondly, in the process of future industrial development, it is also necessary to pay attention to the reasonable control of the land scale, protect the overall spatial pattern of the village, and avoid the over-expansion of industrial land.

In Dingshiwa Village, for example, firstly, the industrial land used for construction fishing products processing factories should be integrated and located in an area close to the external traffic road, but with less disturbance to the village residential area and ecology, while controlling the scale of land use. Secondly, the original industrial land is reclaimed, so that the fragmented land within the village

can be integrated, restoring a harmonious connection between the village living space and the surrounding natural ecology.

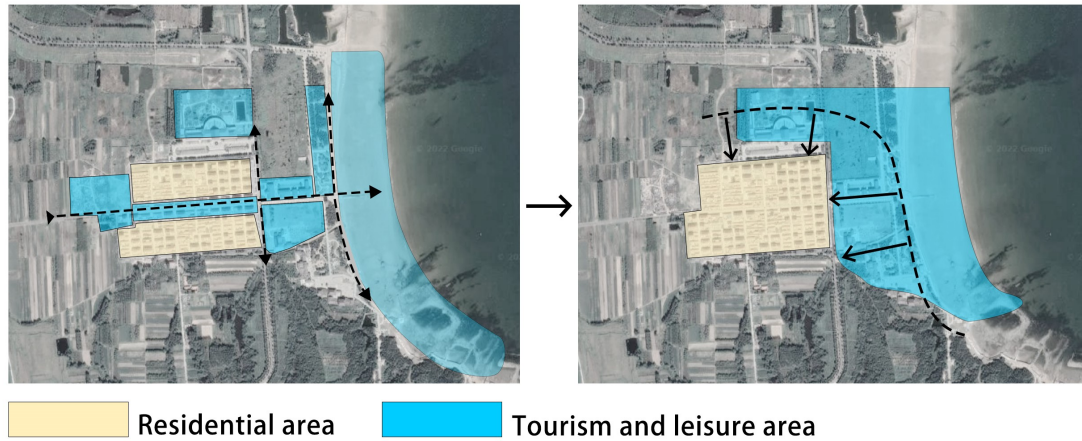


Figure 7.37 Diagram of spatial restoration and integration in Wangjiataihou village

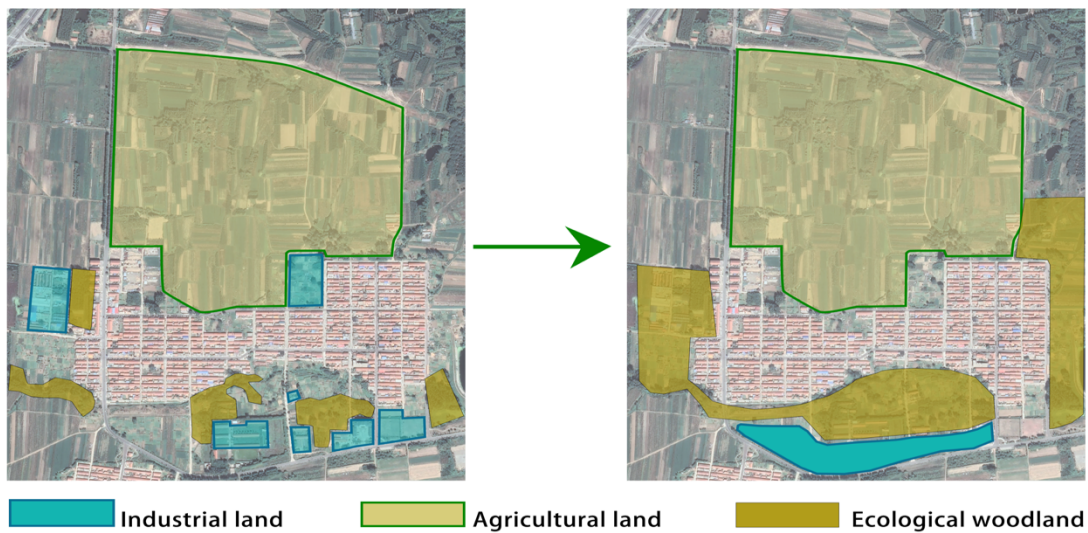


Figure 7.38 Diagram of spatial restoration and integration in Dingshiwa village

The scattered fishing products processing factories in Dingshiwa village is not good to form a large scale of processing in the future, thus the integration of these scattered industrial areas will be helpful for the future development. Same as Dingshiwa village, Wangjiataihou Village also have the same problem, the left picture shows that the tourism area scatter everywhere in this village, the mix of tourism area with the residential area, caused a kind of disturbs to residents.

(2) Restoration and protection of ecological land in villages

According to the current situation, the sprawling expansion of construction land and the unreasonable layout of industrial land within the villages have destroyed the ecological network of

the villages, and the integrity of the ecosystem has been damaged, especially for the Dingshiwa village and Xiyangjiawa Villages, whose dominated industrial have no relationship with tourism.

(3) Planning buffer zones between industrial area and residential area

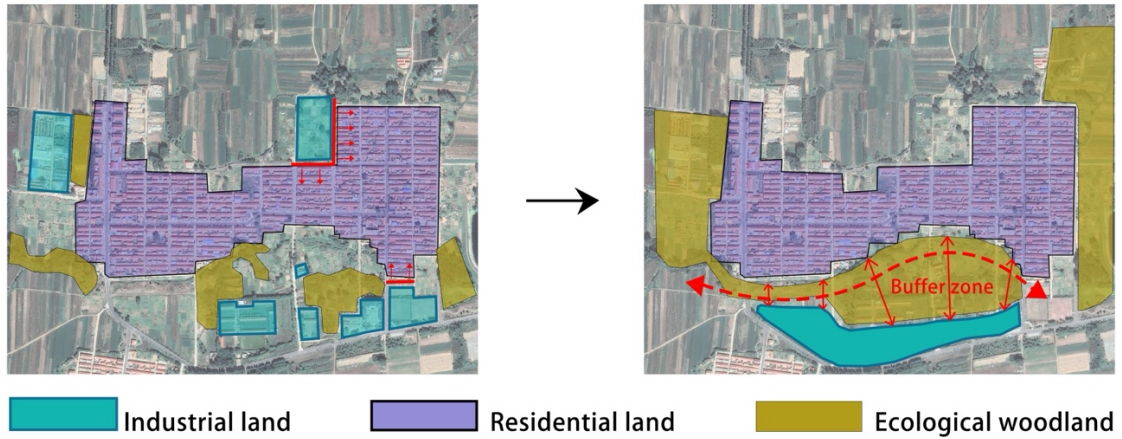


Figure 7.39 Buffer zone between the residential area and industrial area in Dingshiwa village

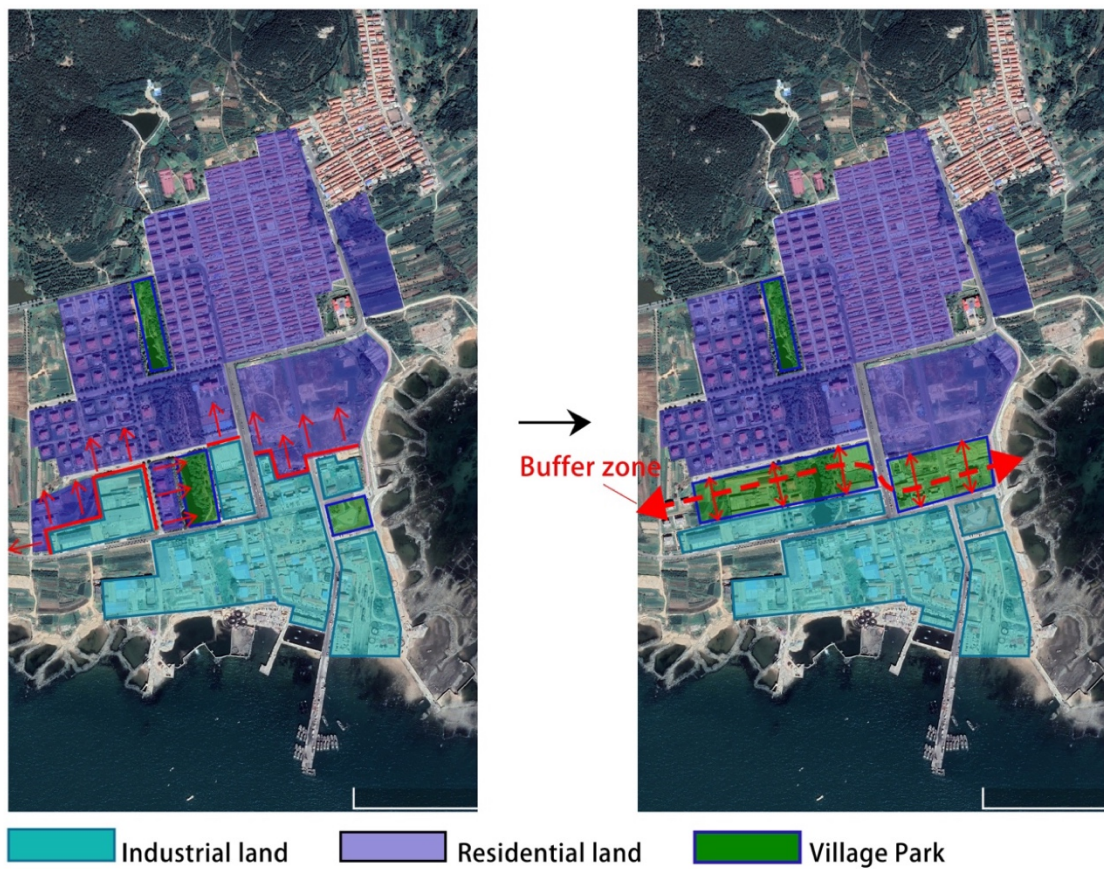


Figure 7.40 Buffer zone between the residential area and industrial area in Taixitou Village

#### 7.4.1.1 The adjustment of the industrial land layout

The goal of industrial land layout adjustment is to achieve the optimal spatial allocation of land resources, to effectively allocate land so that the spatial location can be in harmony with the environmental system, and maximizes the overall function of the industry<sup>[5]</sup>. In the current fishing villages, the land is fragmented, and the industrial layout is also fragmented. The disorganized and blind layout of industrial service land and the unreasonable layout of production land, make it difficult to support the further transformation and development of village industries, so it is necessary to make reasonable adjustments to the layout of industrial land according to the industrial characteristics so that the increasingly tight spatial resources can be maximized and the coordination between industrial development and space can be promoted. In terms of industrial land, the fishing villages in Langya town have been industrialized earlier, and the layout and construction of industrial land did not undergo unified planning, so the layout of the land is more arbitrary. According to the field investigation, it is an inevitable trend for fishing villages to transform their industries. On the one hand, the protection of the overall spatial pattern and ecological environment of the fishing village to avoid the industrial land from causing a big impact on it. On the other hand, considering the external transportation needs of industrial land, select a suitable location, and centralize the industrial land and reasonably control its land scale.

In terms of very limited agricultural land in fishing villages, with the adjustment of the layout of industrial land, agricultural land can be gradually restored to arable land, connecting the originally fragmented arable land, and providing the material space basis for the realization of large-scale characteristic production in the future.

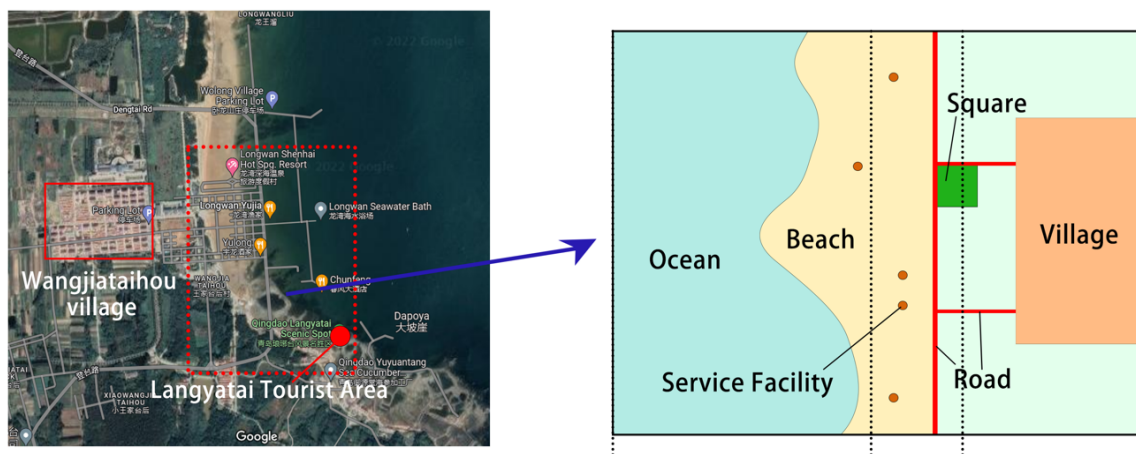


Figure 7.41 The division of residential area and coastal tourism area

In terms of land for commercial service in the tourism-dominated fishing villages, the commercial service land used for tourism is the main bases for tourism development in fishing villages. Among the fishing villages in the middle and more mature stage of tourism, taking Wangjiataihou Village as an example, for the problem of confusing functional layout of its internal tourism area, it is necessary to carry out reasonable re-planning of the commercial service space within the tourism area, integrate the existing functions of cultural experience, characteristic catering, leisure, and

entertainment, etc., carry out reasonable zoning arrangement within the area, and carry out differentiated business design, so that different functions in linkage development within the tourism area. At the same time, reasonable and flexible development space is reserved for the development of village tourism, the expansion of commercial service space, and the implantation of more tourism functions Figure 7.41 Figure 7.42. While for the fishing villages in the preparatory and early stages of tourism development should also make reasonable and flexible planning in advance for the future development and layout of the tourism-based commercial service industry and carry out moderate control to avoid the unnecessary expansion of commerce in the space.

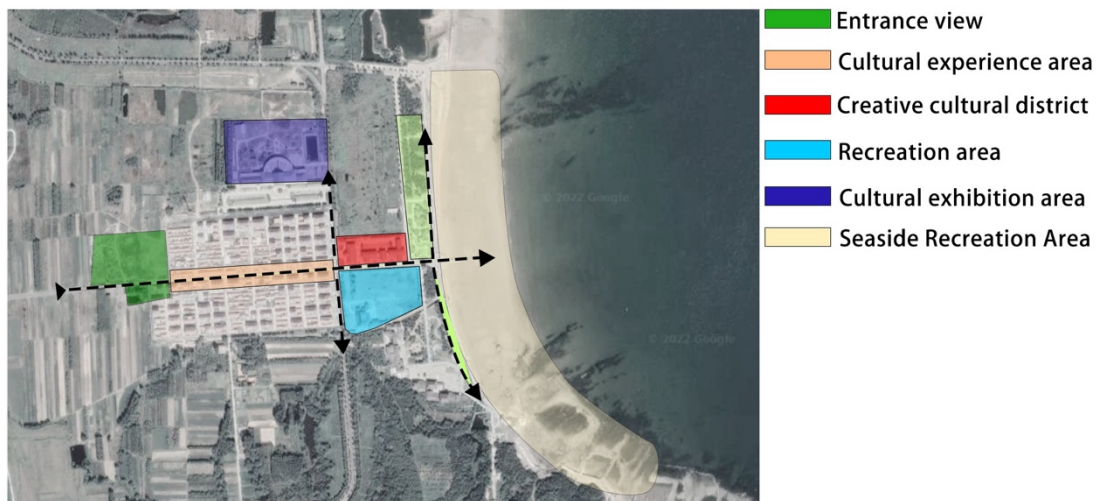


Figure 7.42 The functional area redivision for Wangjiataihou Village

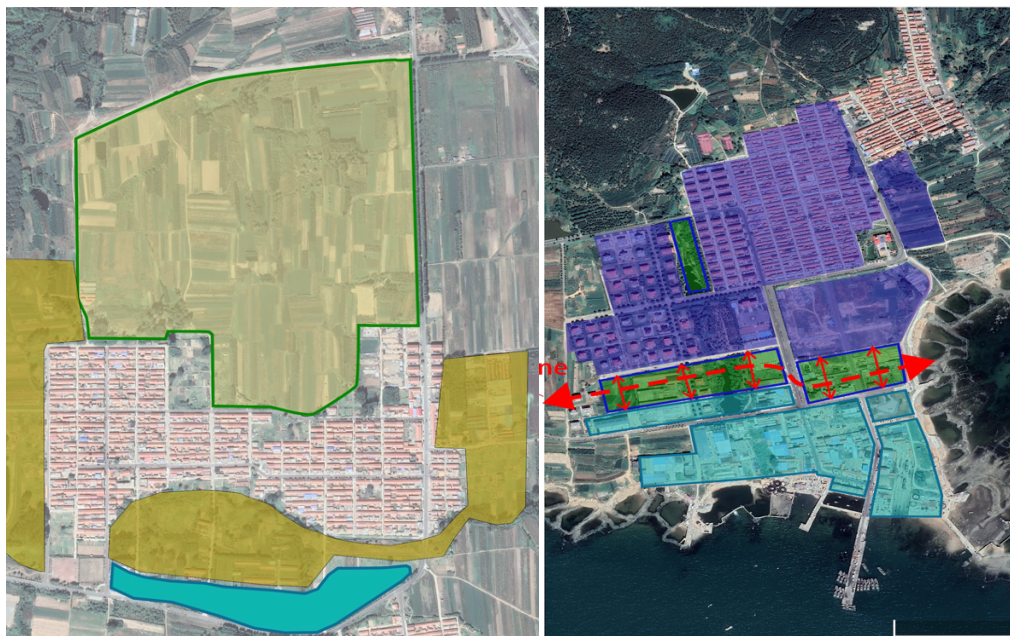


Figure 7.43 The functional area redivision for Dingshiwa Village

In the four transformed village, Dingshiwa Village and Taixitou Village are facing the same problems that the industrial areas are too scared and mixed with residential areas. It causes a lot of

disturbs to the daily life of local villagers. Therefore, it is better to integrate the scattered industrial land together, which will be easier to be managed and can be better development to be large scale of industrial zone. The integration of industrial land of these two villages are show as Figure 7.43.

#### **7.4.1.2 Integration of the spatial functions**

##### **(1) The internal spatial integration of industrial functions**

According to the field investigation, the industrial structure of fishing villages in Langya town is gradually transitioning. The borderless nature and high linkage of the tourism industry and fishing products processing make it closely related to agriculture, industry, commerce, construction, entertainment, and other industries <sup>[6]</sup>. The "extension of tourism to the primary and secondary industries" in rural areas has also become the development direction for traditional villages to respond to the diversified needs of the tourism market, and the development of the three industries in fishing villages. Therefore, while optimizing the spatial layout of industries, it is necessary to meet the demand for the integration of the functions of each industry, so that each industry can coordinate with each other and increase the spatial integration of the three industries.

Since there are certain differences among traditional fishing villages in various aspects such as natural conditions and economic bases, the specific spatial function integration should be planned and designed specifically according to the industrial development of each fishing village. Taking Taixitou village as an example. First, Taixitou village should reasonably plan the development of cultural tourism within the village. Then, the current fishery landscape inside the village and the fishing products processing factories can be used to develop the experience of tourism, so that the development of the fishery and processing industry can be driven by tourism. In terms of specific spatial strategies, the original functions of industrial and agricultural land in the villages can be replaced with tourism services.

##### **(2) The integration and development of industrial functions with others**

First, in the process of developing tourism in fishing villages, the landscape environment inside the villages is also an important resource for tourism development, which can be reasonably developed and utilized. The study of ecological environment capacity should be strengthened to ensure the sustainable development of the local tourism economy <sup>[7]</sup>, and tourism service functions should be appropriately implanted under the condition of ensuring ecological safety. Taking Wangjiataihou village as an example, firstly, the protection of the natural environment inside the village should be strengthened, the coastal landscape should be restored, and problems such as water pollution should be solved, and then, under the condition of ensuring a good ecological environment. Secondly, it is also necessary to pay attention to the relationship between traditional village living space and tourism industry space. Wangjiataihou Village currently has a certain scale of tourism development, although their tourism-related businesses are mainly expanded along the tourism route, there is still some blindness in spatial layout and disorganized distribution. In addition, the village lack signs, which makes the tourist often enter the private living areas of the residents, causing disturbance to



their lives. Therefore, when the tourism space penetrates the living space, it is necessary to clarify the scope of the tourism area to avoid the unorganized spread of related commercial services. At the same time, it is necessary to reasonably plan the tourism routes and increase the tourism signs to enhance the guidance, to minimize the disturbance and inconvenience caused by the invasion of tourists Figure 7.43.

In the industrial transformation and upgrading of fishing villages, the information network should be used to realize the diversified sharing of fishing village land resources, fishing resources and fishing village dwellings, thus forming the development model of shared farms, converting the idle resources and existing resources of fishing villages to maximize economic benefits. In the construction of shared fishing villages, the local government will take the lead in coordinating enterprises, society, and fishermen, and actively encourage fishermen to participate in the construction of shared fishing villages through land and housing leases or shareholdings. Thus, the goal of professional income increase in fishing villages can be achieved. At the same time, the social sharing of resources is realized. By coordinating the relationship between fishermen, enterprises and the government, resources are integrated and a shared trading platform is built to realize the sharing of resources between fishing villages and consumers.

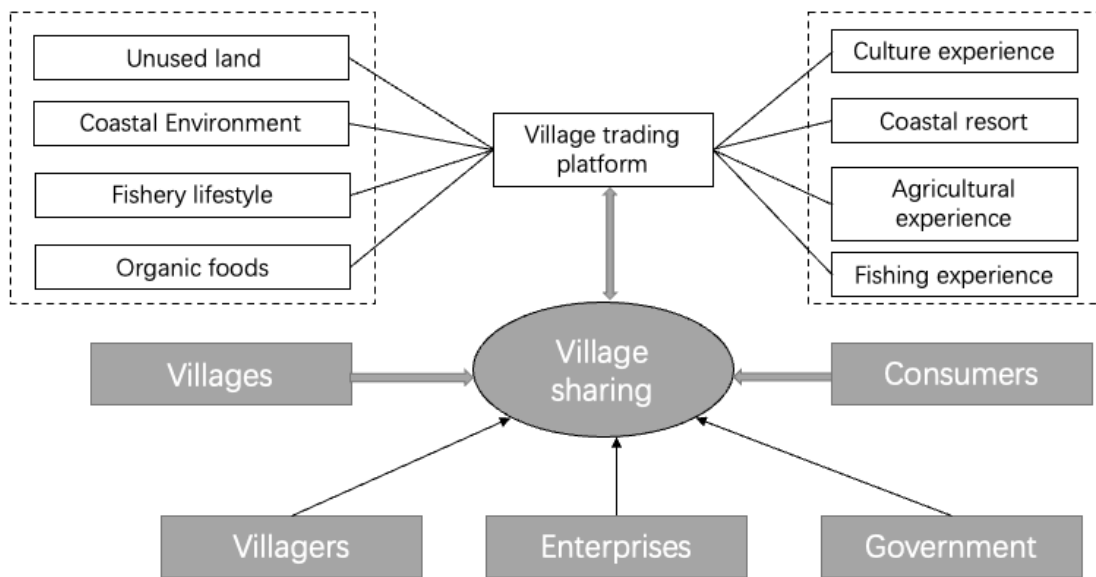


Figure 7.44 Village sharing mechanism

7.4.2 Meso: renewal and conservation within the living settlement space

(1) Protection and renewal of street and alley

The streets and lanes inside the residential area of fishing villages can be divided into two areas, traditional and new. In the process of repairing and renewing the streets and lanes, the original regional characteristics should be maintained from the selection of materials to the shape of the streets and lanes, so as to fully reflect the fishing cultural atmosphere of the fishing villages. The road landscape greening should be strengthened, while the sidewalk should be repaired with

materials with local regional characteristics to ensure the overall coordination of the street appearance.

(2) Increase and optimize the public open space.

According to the field investigation, with the fishing villages' development, the demand for public open space in fishing villages has increased, and the service objects are also gradually changing. The arrangement of public open space should be fairly distributed according to the needs of different groups of people, and the open space for residents and tourists is mainly concentrated in front of the public buildings in the village, such as in front of the village square. In the design of the open space, on the one hand, materials with local characteristics and native plants should be used as constituent elements, so as to take local materials, pay attention to local conditions, differ from the urban greening landscape, and focus on reflecting the village's own culture. On the other hand, the needs of the local residents should be put more attention. For the open space serving tourists in Wangjiataihou Village, the fishing village tourism-dominated village, resting facilities and guidance signs, and related introduction to show the historical stories and culture should be added and planned.

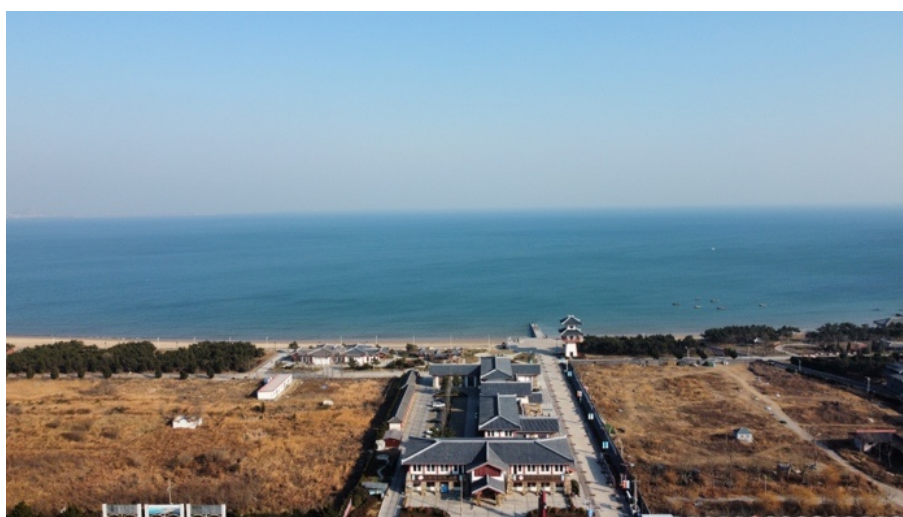


Figure 7.45 The newly built public space in Wangjiataihou Village

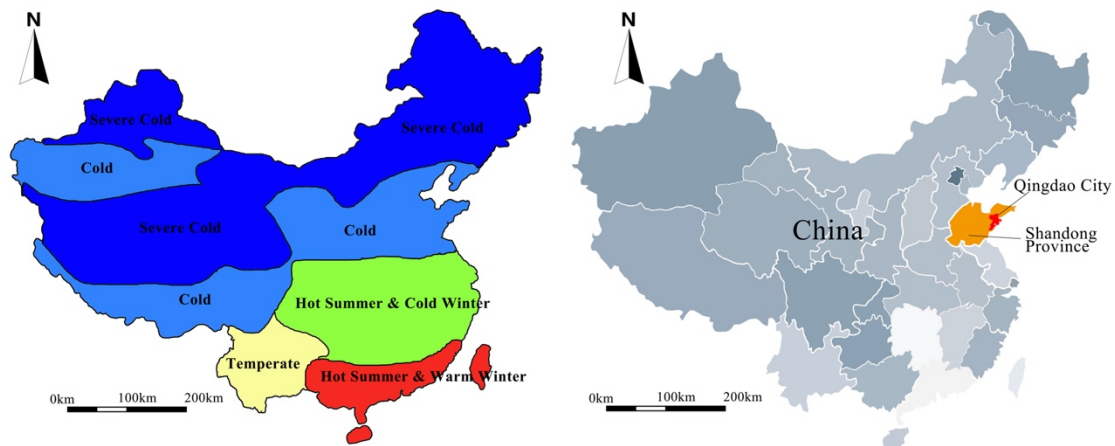
(3) Improvement of industrial space supporting facilities

In order to better develop the fishing village industry in Qingdao New West Area develop, it is necessary to strengthen the construction of industrial supporting facilities and form a complete industrial supporting facilities system according to the future industrial development trend of the village. In terms of modern fishery and fishing products processing, the industrial area first needs a complete infrastructure system of transportation, power supply, water supply, sewage, security, parking management, etc.; Secondly, the public space of greening, landscape, miniature, outdoor sports field, etc. need to be improved to serve the workers and increase the attractiveness of enterprises and talents; In terms of tourism supporting facilities, fishing villages should increase or reserve land for the construction of tourism supporting facilities according to the development of tourism, so as to provide strong basic support for the sustainable development of tourism in the future. First of all, in terms of road traffic facilities, the transportation system should be improved,

parking lots should be reasonably allocated to meet the transportation needs of tourists, and at the same time, tour signs should be added inside the tourist routes to guide tourists to choose the tourist routes they are interested in, so as to avoid tourists wandering blindly inside the village space and affecting the daily life of the residents; Secondly, focus on tourists' safety, optimize tourism service quality, reasonably allocate visitor service stations, public restrooms, first aid stations, and other service facilities according to the distribution of pedestrian flow, and at the same time, increase intelligent tourism facilities to make tourists have better tourism experience.

### 7.4.3 Micro: Conservation and construction control of building units

There are five climate zones in China Figure 7.46, and the unique climatic characteristics of each region affect the actual thermal environment of local buildings [8-10]. The geographical distribution of cold regions in China is extensive, with an area of about  $417.4 \times 10^4 \text{ km}^2$ , accounting for 43.5% of the total area of China [11]. Coastal rural areas in Cold regions of northern China face more severe environmental conditions in winter than inland rural areas, such as high outdoor wind speeds and high relative humidity [12]. However, the poor quality of rural dwellings in these areas and lack of formal heating systems can affect the comfort of the thermal environment in winter [13-15]. In addition, the northern coastal areas are facing serious aging problems, making the demand for comfortable thermal environment of the elderly more prominent.



a. Thermal climate zones

b. Location of Qingdao City

Figure 7.46 Thermal-climatic zones and geographical location of Qingdao city

This research area is located in Langya Town, West Coast New Area of Qingdao City Figure 7.46. The total regional GDP of Qingdao West Coast New Area in 2020 is 372.168 billion RMB, accounting for 30% of the city's GDP [16]. The total area of the West Coast New Area is 2,127  $\text{km}^2$ , with a rural land area of 1,090  $\text{km}^2$ , including 87.47  $\text{km}^2$  of land for rural dwellings [17]. The average annual temperature is 12.5°C (Figure 2b.). July is the hottest month, with an average temperature of 25°C; the coldest month is in January, with an average temperature of 1.3°C [18]. The average monthly relative humidity (RH) ranges from 70% to 90%, with typical maritime monsoon climate characteristics [18].

Table 7.6 Space composition of vernacular dwelling

Living space	Main space	Master bedroom, Living room, Second bedroom
	Auxiliary space	Kitchen, Shower and laundry room, Spare room
Productive space		Hall, Drying platform, Storage room (storage seafood), Storage room (storage tools)

The rural dwellings in the coastal area of Qingdao West Coast New Area are arranged in courtyards, and most of them are 2-section courtyard spaces, as well as 3-section courtyard spaces. According to the different habits and functions of dwelling space, local dwelling space is divided into living space and productive space. The different spaces contain functional rooms as shown in Table 7.6. The north side of the 2-section courtyard spaces is the main space and auxiliary space, and the south side is the product space and toilet. The north side of the 3-section courtyard spaces is the main space and auxiliary space, the south side is the product space and toilet, and the east or west side is a spare room (used as a storage room or as a room for the elderly) Figure 7.47.

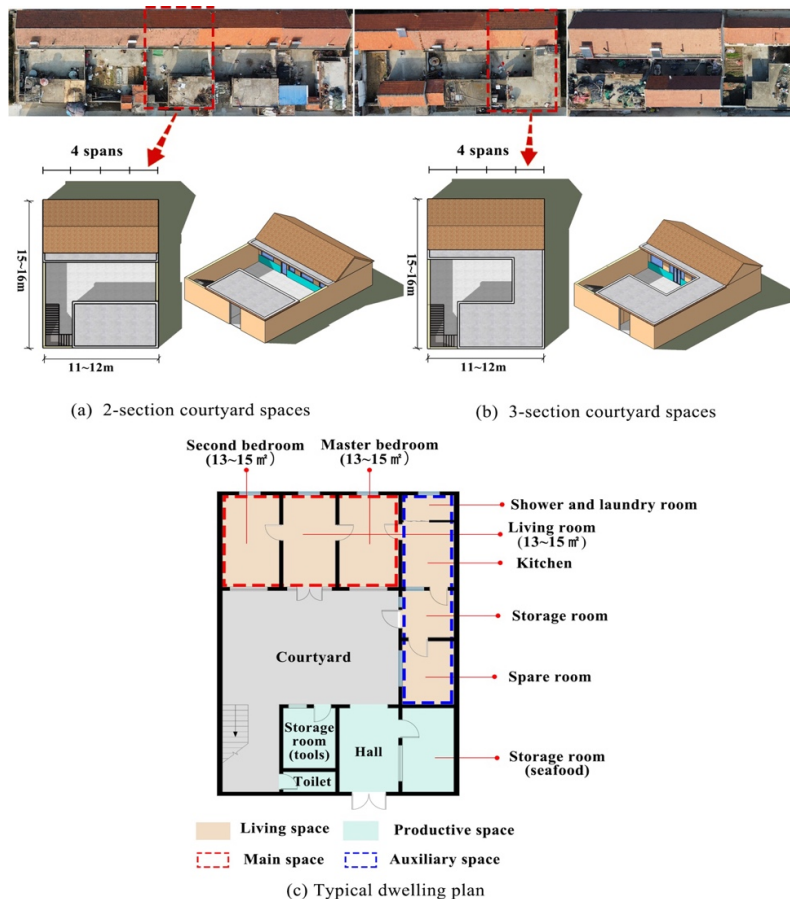


Figure 7.47 Current status and plans of the typical dwellings

The coastal rural dwellings homesteads are all rectangular (165 ~ 170 m<sup>2</sup>) and the horizontal width is four. The roof form of the dwellings mostly adopts the combination of sloping roof and flat roof, and the flat roof of the south side as a drying platform mostly is used to dry fishing tools. Hall as

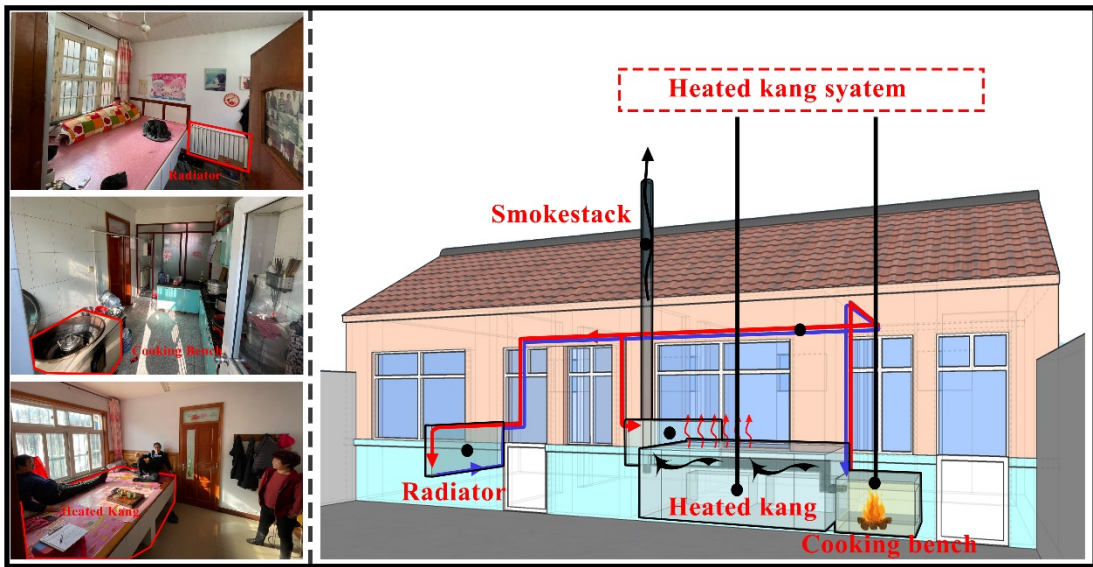
productive space can be used for parking agricultural vehicles. Storage rooms as productive spaces are divided into storage tools and storage seafood. There is no essential difference between 2-section courtyard spaces and 3-section courtyard spaces. Due to the difference in economy and family use demand, the 2-section courtyard spaces dwelling is a simplification of the 3-section courtyard spaces in the case of a similar general layout Figure 7.47.

The heating period in Qingdao is from November 16 to April 5 of each year <sup>[19]</sup>. The common heating equipment in the local coastal villages is a heated kang, indigenous water heating system (IWHS), air source heat pump (ASHP), and air conditioning (AC) Figure 4.48. The fire bed uses the waste heat generated by burning fuel in the hot chamber of the stove to heat the master bedroom through the flue and heat radiation. <sup>[20]</sup> IWHS heats water from the same source of heat as heated kang. IWHS are usually installed in the living room and second bedroom and connected to the heating water tank of the stove through a metal pipe, with a small pump to circulate the hot water. Both ASHP and HVAC heat the master bedroom by heating the outdoor air. In addition, ASHP is commonly used in local homes because of its better heating effect than HVAC in low-temperature conditions in winter. HVAC is mainly used for cooling in summer.

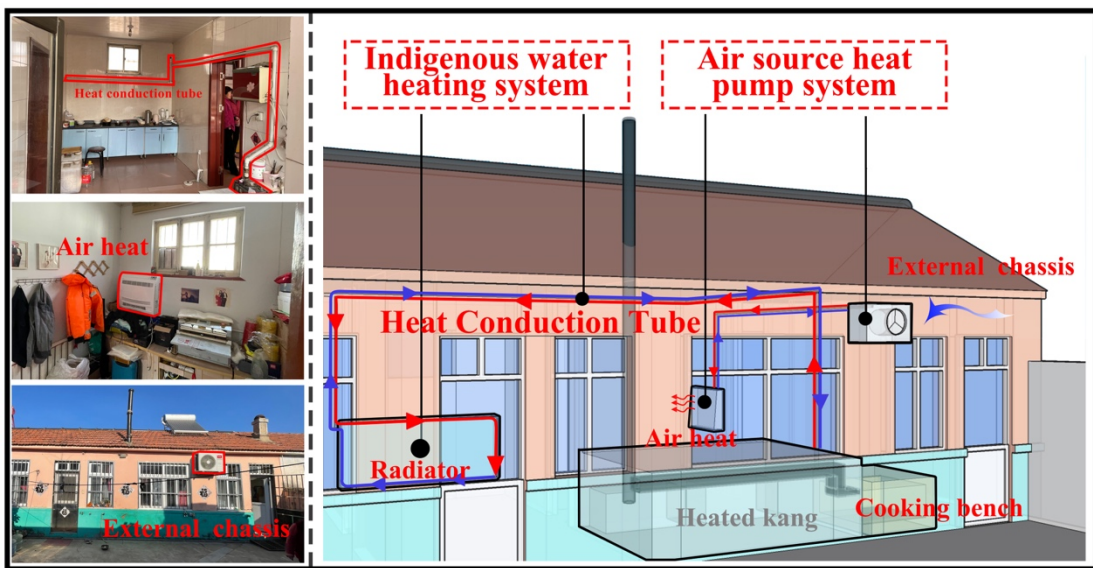
Therefore, the common heating methods for the master bedroom in winter of local dwellings are: (a) heated kang, (b) air source heat pump, (c) heated kang + air source heat pump. The common heating methods for living rooms are: (a) indigenous water heating system, (b) no heating. The common heating methods for the second bedroom are: (a) indigenous water heating system, (b) no heating Table 7.7.

Table 7.7 Mainly used room heating equipment and heating time

Use rooms	Heating methods	Use time(month)
Master Bedroom	Heated Kang	November – April
	ASHP	
	Heated Kang+ ASHP	
Living room	IWHS	November - April
	IWHS + ASHP	
	No heating	
Second bedroom	IWHS	November - April
	No heating	——



a. Heated kang system



b. Indigenous water heating system and Air source heat pump system

Figure 7.48 Photos of heating equipment and its construction

At present, the fishing village mainly suffers from the problems of mixed residential building style, abandoned and unused residential buildings, and incongruous industrial buildings with the overall architectural style of the fishing villages. Therefore, in the process of spatial reconstruction of fishing villages, attention should also be paid to the construction of architectural units, mainly involving two aspects: residential buildings and industrial buildings. For the current problem of mixed architectural styles in the fishing villages and a large number of abandoned and unused buildings within the villages, the three main solutions are protection, renewal, and demolition. The protection of architecture is mainly for the historical buildings that can reflect the traditional

architectural characteristics of the region and have high conservation value in the village. Such buildings should be restored according to the principle of restoring the old as the old. In the process of restoration, local architectural craftsmen should be used as the main staff for restoration, under the supervision of conservation experts. The use of local materials and local technology can minimize the cost of renovation. On the one hand, the restoration can help future development, and the government and developers should take the initiative to fund the restoration of buildings.

On the other hand, it is the renewal of the building in villages by residents. In China, residents, especially rural residents have the traditional habit of working hard and saving money to build houses, they tear down the old and build new ones. At present, the traditional residential buildings within the fishing villages usually can no longer meet the modern living needs of the residents, so there is an increasing demand for spontaneous renewal by the residents to improve their quality of life. At the same time, the industrial transformation will further promote the spontaneous renewal of residences within fishing villages. Such kind of renewal is very common in tourism-dominated fishing villages, residents renew their houses to serve tourism-based commercial service functions. In this regard, the local government should control the appearance of the buildings in the fishing villages. The spatial structure and architectural appearance of the traditional houses should be maintained, and the modernized functions of the buildings should be improved so that the buildings can be used conveniently without destroying the overall spatial appearance of the fishing villages. The demolition and reconstruction of buildings mainly focus on unclaimed ruins and dangerous houses in the fishing villages that seriously affect the spatial appearance of the villages. For the ruins or dangerous houses that have been unclaimed, they should be managed by the village, which can be rebuilt and rented by individuals or rebuilt by the village government to give them new functions.

Secondly, the current strong contrast between industrial buildings inside fishing villages and the overall village space can be weakened by adjusting the layout of industrial land and adding a transition zone between residential land and industrial sites. At the same time, the architectural style such as the color and form of the buildings in the industrial area should be controlled, such as using sloping roofs in the building and using green bricks and tiles in the building, thus being better integrated with the village environment.

Thirdly, Cultural protection is in crisis, and villagers' cultural awareness is not high Village culture shows the villagers' common social concepts, psychological perceptions and local customs and habits, and concentrates the villagers' values, which is an important link to maintain the inheritance and development of the village. However, the traditional culture of the village, except for the Hui School bonsai, has not been continued steadily. A series of spatial conflicts have caused the destruction of the village's material cultural heritage and the loss of the traditional landscape, and the lack of development and inheritance mechanisms for traditional performance skills and folk activities, and the intangible cultural protection is facing a crisis. On the one hand, tourism development has led to an increasing number of foreign tourists, and the traditional vernacular

landscape of villages has been affected and part of the material landscape has been destroyed; on the other hand, the government and capital have not effectively protected cultural heritage such as ancient buildings, and the lack of relevant protection systems and measures has caused rapid loss of cultural heritage.

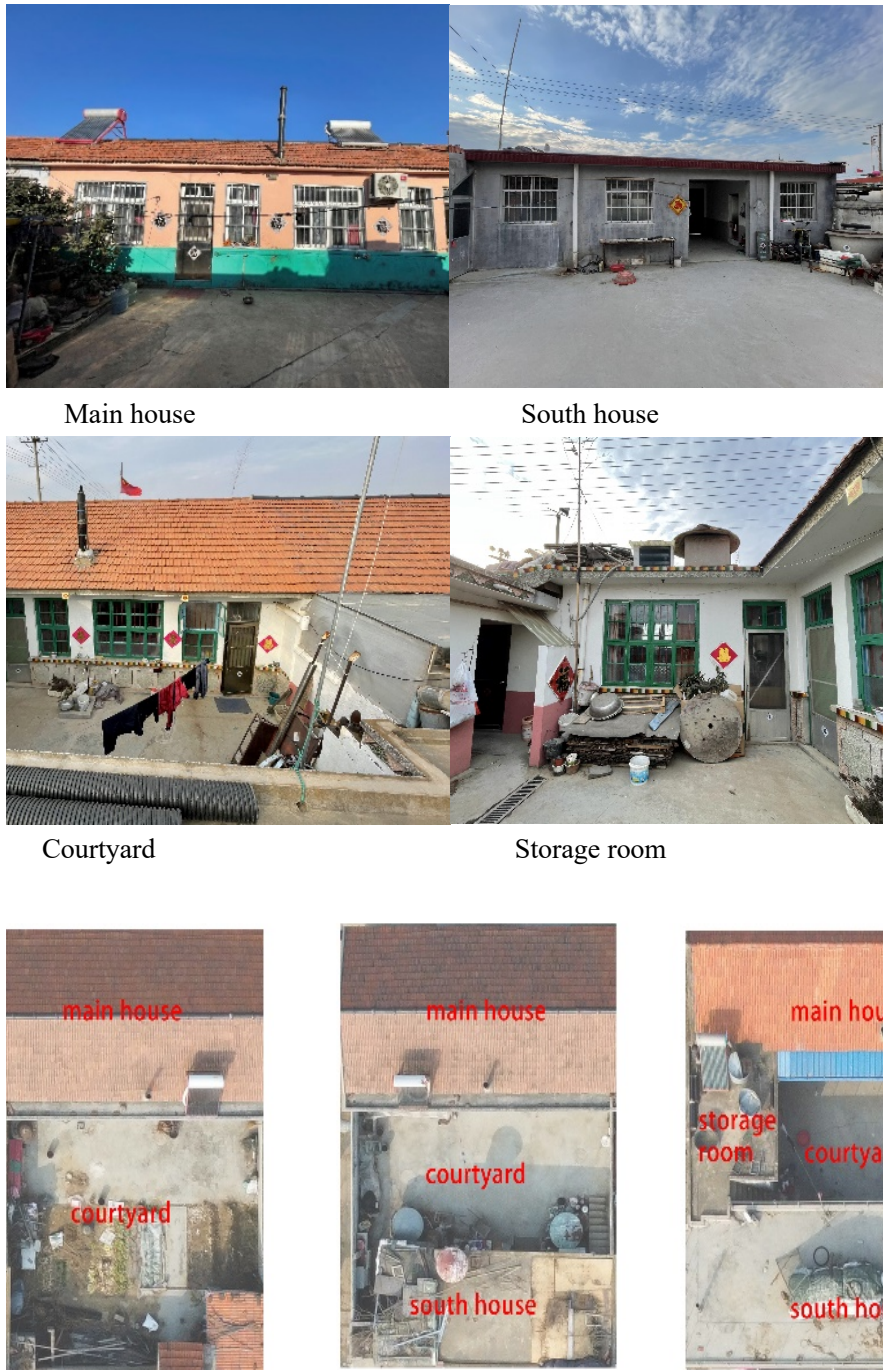


Figure 7.49 Traditional vernacular dwellings in Qingdao

In addition, the villagers' level of awareness of village culture determines the villagers' awareness of cultural protection, which affects the cultural protection and inheritance of villages. The local



villagers' awareness of village culture varies significantly, especially the younger generation has a low level of awareness of local culture, and most of the villagers lack the awareness and concept of cultural heritage protection. Through interviews and surveys, villagers feel proud and honored about their Fishing Village, but they think it is more conducive to the development of the village bonsai industry and tourism, most of them do not consider the protection of the village, do not understand why and how to protect, and think that protection is the responsibility of the government and has nothing to do with them ("How can we protect, what role can we ordinary people What role can we play? We have to rely on the government, the government has to pay for maintenance and so on, and our words are useless" - an old grandfather). The lack of cultural awareness among villagers, the low awareness of conservation and the lack of publicity and education have led to constructive destruction in villages.

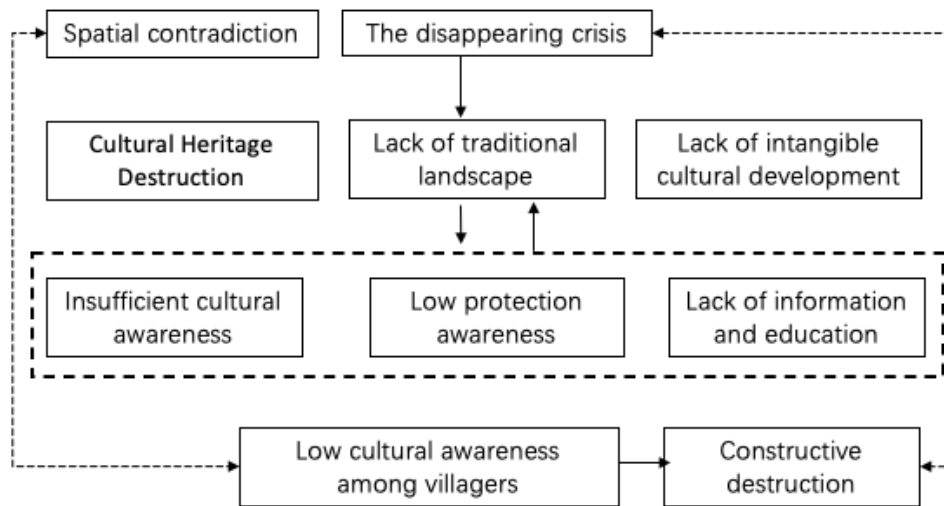


Figure 7.50 Inner logical relationship of traditional fishing village destruction

The development of special industries and the drive of market make the villagers' right to be the main body of the village gradually neglected, and power and capital continuously erode the village space and seize the villagers' interests to a certain extent. Under the spatial transformation and reconstruction of the village, different interests such as the government, capital, villagers, and tourists are occupying and competing for the space based on their own demands, and there are contradictions and conflicts among them, and they are constantly playing unbalanced interests. Among them, the government and the village committee hold the decision-making power to implement tourism development and guide the development of bonsai industry, while the government decides the development and construction direction of village space by introducing policies and making plans. The cooperative society, with its strong capital base, holds the right to speak and various resources, continuously invests capital to obtain economic benefits, and plays a leading role in the development of the industry. Compared with the government and capital, villagers belong to the disadvantaged party, the public participation mechanism is not perfect, and they passively participate in spatial practice activities, so villagers can only fight for their rights and interests through various acts of resistance, and the unequal status among spatial subjects leads to

many problems such as uneven distribution of benefits. Figure 7.51 shows the different participations in the reconstruction of fishing villages.

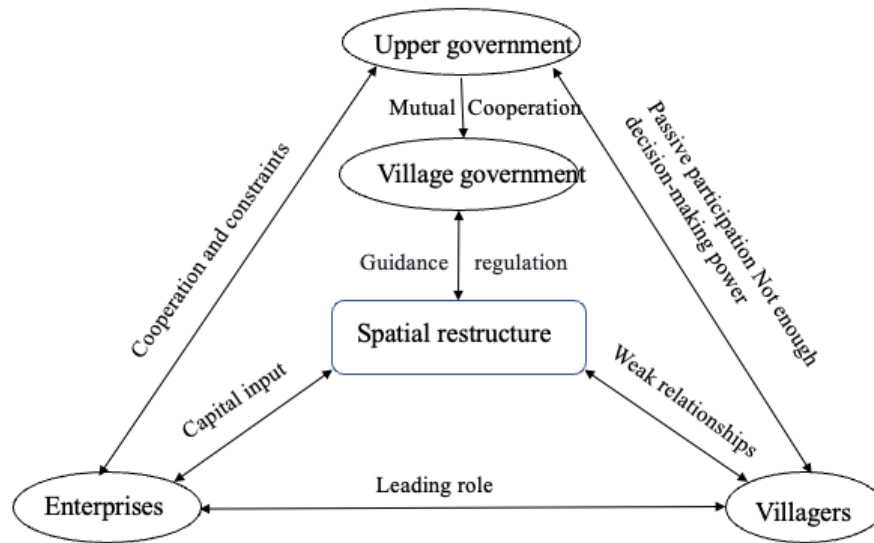


Figure 7.51 shows the different participations in the reconstruction of fishing villages

## 7.5 Conclusion

This chapter first analyzes the driving mechanism of industrial transformation and development of traditional villages in the fishing village of Langya Town, and summarizes the interactive mechanism of industrial transformation and spatial evolution of fishing villages in Qingdao New West Area, to provide a reference for the following strategies. (1) The driving mechanism of the industrial transformation of fishing villages in Langya Town is divided into internal and external factors. The external factors include institutional changes, government policies, market demand, and external capital entry, while the internal factors include grassroots government and residents' self-organization. The transformation and development of traditional village industries are the results of the interaction between endogenous dynamics and external variables. (2) The industrial transformation of fishing villages has an impact on the village space from both direct and indirect aspects. The direct effect is the direct impact of the change in industrial structure, industrial type, and industrial scale of the fishing villages on the macro, meso, and micro levels of the village space. Indirectly, industrial development and transformation have an impact on the space of traditional villages through the transformation of the production and lifestyle of residents and the complication of the composition of the immigrant population within the villages. (3) The role of fishing village space in the industry is still divided into two aspects: direct and indirect. Firstly, the village space provides the material basis for the transformation of village industry, and the industrial space layout impresses the efficiency of industrial development; secondly, the quality of the village living environment affects the attractiveness of fishing villages to talents, thus affecting the development level of village industry. (4) Through the analysis of each mechanism, the interaction mechanism of industrial transformation and spatial reconstruction of fishing villages in Qingdao New West Area is summarized.

## Reference

- [1] Li Jie. A Preliminary Study on Rural Settlement Formation under the Influence of Social Structure Factors [D].
- [2] Zhang Guoqin. Research on the spatial development of contemporary rural areas in southern Jiangsu under the dual dimension of "people-production"[D]. Southeast University, 2017.
- [3] Zou Yongshuai. Relying on talent introduction to promote rural industrial revitalization[J]. Human Resources, 2020(14): 24-25.
- [4] Guo Hongguang. Exploring industrial transformation and talent development in the era of new industrialization[J]. China's collective economy, 2020(33): 11-12.
- [5] Liu Feng, Liu Xianteng, Yu Zhong. A preliminary study on the spatial layout of synergistic regional industrial development: an example of the city cluster along Huaihuai[J]. Urban Planning, 2009, 33(06): 88-92.
- [6] Song Xin. Research on composite tourism in the context of industrial restructuring [D]. Shanghai Normal University Tourism Management, 2011.
- [7] Xie Mei. A study on the reconfiguration of tourism-based rural ecological space - a case study of Wolong Village in Chalin County [D]. Habitat Design, Hunan University of Technology, 2019.
- [8] Yang L, Fu R, He W, et al. Adaptive thermal comfort and climate responsive building design strategies in dry-hot and dry-cold areas: Case study in Turpan, China[J]. Energy and Buildings, 2020, 209: 109678.
- [9] Wang Z, Sheng X, Ren J, et al. Field study on thermal environment and thermal comfort at rural houses in severe cold areas[C]. Proceedings of the 8th International Symposium on Heating, Ventilation and Air Conditioning, 2014: 403-409.
- [10] Shao N, Ma L, Zhang J. Study on the rural residence heating temperature based on the residents behavior pattern in South Liaoning province[J]. Energy and Buildings, 2018, 174: 179-189.
- [11] Chen R-S, Kang E-S, Ji X-B, et al. Cold regions in China[J]. Cold regions science and technology, 2006, 45(2): 95-102.
- [12] Domrös M, Peng G. The climate of China[M]. Springer Science & Business Media, 2012.
- [13] Zhang Z, Zhang Y, Jin L. Thermal comfort of rural residents in a hot-humid area[J]. Building Research & Information, 2017, 45(1-2): 209-221.
- [14] Yan H, Yang L, Zheng W, et al. Analysis of behaviour patterns and thermal responses to a hot-arid climate in rural China[J]. Journal of thermal biology, 2016, 59: 92-102.
- [15] Xiong Y, Liu J, Kim J. Understanding differences in thermal comfort between urban and rural residents in hot summer and cold winter climate[J]. Building and environment, 2019, 165: 106393
- [16] The Year Statistic Book 2021.  
[http://www.xihaian.gov.cn/zwgk/bmgk/qtjj/gkml/zd gz/tjn j/202111/t20211115\\_3822946.shtml](http://www.xihaian.gov.cn/zwgk/bmgk/qtjj/gkml/zd gz/tjn j/202111/t20211115_3822946.shtml).
- [17] Qingdao West Coast New Area Rural Construction Planning [J],  
<http://qdhdzfwf.sd.gov.cn/hd/icity/resultQd>
- [18] Qingdao Climate. <http://www.weather.com.cn/cityintro/101120201.shtml>.
- [19] Qingdao City Heating Article

[http://csglj.qingdao.gov.cn/cg\\_ggqsydw/cg\\_ggqsydw1/202112/t20211213\\_3988433.shtml](http://csglj.qingdao.gov.cn/cg_ggqsydw/cg_ggqsydw1/202112/t20211213_3988433.shtml).

[20] Zhuang Z, Li Y, Chen B, et al. Chinese kang as a domestic heating system in rural northern China—A review[J]. *Energy and Buildings*, 2009, 41(1): 111-119.

**CHAPTER 8**  
**CONCLUSIONS AND PROSPECTS**

## **8 Conclusions and prospects**

8.1 Main research conclusions

8.2 Limitations

8.3 Prospect of the research

## 8 Conclusions and prospects

### 8.1 Main research conclusions

In China, rural settlements are experiencing dynamic changes in the process of rapid urbanization, globalization, and industrialization. Especially, in the coastal areas, the industrial transformation has brought huge changes to local fishing village development. Qingdao West Coast New Area is one of the most rapidly urbanization coastal areas in China, the fishing villages there are experiencing unprecedented transformation. In this paper, we focus on the relationship between industrial transformation and fishing village development.

The industrial transformation has been regarded as a significant measure for promoting fishery prosperity, fishing village revitalization, and fishermen's living conditions, and draws attention in coastal areas since the turn of the new millennium. Although this relationship is recognized, it is poorly studied in terms of the impact of industrial transformation on fishing village revitalization, especially at the level of fishing villages. In this study, a new composite indicator is proposed to evaluate the impact of industrial transformation on fishing village based on the "Three F" dimension, namely Fishery, Fishing Village and Fishermen, and their development process, internal logic, driving forces and mechanisms have also been explored. In addition, we make the definitions of four typical fishing village transformation types, i.e., fishery dominated type (FT), fishing products processing dominated type (FPPT), fishing village tourism dominated type (FVTT), and Diversified development type (DDT), and takes four typical transformed coastal fishing villages in Qingdao West Coast New Area as our research objects: Xiyangjiawa Village, Dingshiwa Village, Wangjiataihou Village, and Taixitou Village. They are all located in this most rapidly urbanized area and were selected as case studies to empirically investigate the industrial transformation in fishing villages through in-depth interviews and observations. The mainly research conclusions show as follows:

- (1) Based on field research of coastal fishing villages in Qingdao West Coast New Area of Shandong Province, China, the current development situation of coastal fishing villages in Qingdao is analyzed. In order to better describe the current development situation, the fishing villages are divided into four different types by their different industrial transformation models. Based on the classification, the developing history, their cultural characteristics, and main problems for industrial transformation have been analyzed. Furthermore, the factors that influence the fishing villages' development have been summarized. In addition, the future industrial transformation trend has been analyzed based on the SWOT analysis method.
- (2) While acknowledging industrial transformation is a significant measure for promoting fishery prosperity, fishing village revitalization and fishermen living conditions, little is known about the extent of the impact of industrial transformation on fishing village revitalization, especially at the level of fishing villages. For government, tourism company or local community, they all have their own evaluation focus, but the new composite indicator proposed in this paper can be used to evaluate the impact of industrial transformation on fishing village from the "Three F" dimension: Fishery, Fishing Village and Fishermen, which will be more comprehensive and objective. Under the rapid urbanization, villages with deep-rooted fishing traditions are

experiencing various industrial transformation, this indicator system can be used to do the industrial transformation evaluation, especially for those transforming from fishery to fishing village tourism, to determine whether the transformation is appropriate or not. In this paper, the newly proposed impact evaluation indicators are adopted to evaluate the different industrial transformations in the fishing village revitalization. The results show that these industrial transformations lead to an improvement in the economic level, the revitalization of the fishing village and fishermen, and a certain degree of overall revitalization level of four fishing Villages. Meanwhile, the main driving forces are the village elites and government guidance. In addition, we found several potential drawbacks in the current village development and proposed recommendations for future village revitalization.

- (3) This paper makes the definitions of four typical fishing village transformation types, i.e., fishery dominated type (FT), fishing products processing dominated type (FPPT), and fishing village tourism dominated type (FVTT), and Diversified development type (DDT), and takes four typical transformed coastal fishing villages in Qingdao New Area as our research objects. Based on field observation and comparison of typically transformed fishing villages, this paper explores how industrial transformation enhances the development of coastal fishing villages and what makes better industrial transformation in these villages. More importantly, the findings from these four different transformed cases illustrate how government, village elites, public participatory, enterprises, the cultural and technological creativity can promote village revitalization. In addition, the principle of future fishing villages' development and the related strategies are researched.
- (4) In less than three decades, these traditional coastal fishing villages experienced an unprecedented transformation, especially in their industrial constructure. For the development process, we summarized the key driving forces in the basic three developing stages: the renovation stage, the development stage, and the revitalization stage. There are mainly five dominant forces: government, village elites, public participation, enterprises, and creativity. Different transformation types have different driving forces from each other in the three stages, while the common features of successful industrial transformation in fishing villages could be concluded as improving the value-added industrial line, and technology and culture-oriented development.
- (5) This paper summarizes the interactive mechanism of industrial transformation and spatial evolution of fishing villages in Qingdao New West Area, so as to provide a reference for the following strategies. ① The driving mechanism of the industrial transformation of fishing villages in Langya Town is divided into internal and external factors. The external factors include institutional changes, government policies, market demand, and external capital entry, while the internal factors include grassroots government and residents' self-organization. The transformation and development of traditional village industries are the results of the interaction between endogenous dynamics and external variables. ② The industrial transformation of fishing villages has an impact on the village space from both direct and indirect aspects. The direct effect is the direct impact of the change in industrial structure, industrial type, and



industrial scale of the fishing villages on the macro, meso, and micro levels of the village space. Indirectly, industrial development and transformation have an impact on the space of traditional villages through the transformation of the production and lifestyle of local residents and the complication of the composition of the immigrant population within the villages. ③ The role of fishing village space in the industry is still divided into two aspects: direct and indirect. Firstly, the village space provides the material basis for the transformation of village industry, and the industrial space layout impresses the efficiency of industrial development; secondly, the quality of the village living environment affects the attractiveness of fishing villages to talents, thus affecting the development level of village industry. Through the analysis of each mechanism, the interaction mechanism of industrial transformation and spatial reconstruction of fishing villages in Qingdao New West Area is summarized

## 8.2 Limitations

Despite the above achievements of this study, there are still limitations: Firstly, the findings of this paper are based on the empirical study of four types of relatively successful fishing villages in Qingdao West Coast New Area, which may be limited by possible bias in sample selection. Therefore, these findings should be further verified and refined in future research. Secondly, in this study, the evaluation index system for village-level evaluation and proposal was mainly based on fishing villages in rapidly urbanized coastal areas. Therefore, the applicability of this evaluation system has limitations if it's used in other rural regions, especially non-fishing villages. Thirdly, all factors used in this study to construct the evaluation system were derived from field investigation, literature reviews, and discussion with experts, so there may be some discrepancies between the calculated results and the actual situation. Fourthly, the main findings are summarized by field investigation, while these investigations may not be precisely assigned due to the constraints of the survey respondents and conditions, which should be further researched by larger-scale survey data. Additionally, as a result of the COVID-19 pandemic in 2020, all walks of life have received great impacts, especially fishing village tourism and fishing products export. Therefore, the data in the year 2020 in this research is not as typical enough as the data in other years in showing the big change caused by industrial transformation. Thus, future studies on the industrial transformation in coastal fishing villages could include more detailed information from different years, especially data from the village level. Lastly, the field investigation did not provide more in-depth information about fishing village tourism, such as tourism products, activities, tourists' evaluations, and so on. To summarize, future research is needed to further explore the tourism developing situation and the possible mechanisms to better complete the industrial transformation, thus truly offering more assistance in the revitalization of fishing villages.

## 8.3 Prospect of the research

Under the background of Chinese Rural Revitalization, the research of fishing villages in coastal areas with rapid urbanization has both academic and practical implications since fishing villages usually contain tangible and intangible heritage which need to be protected, and as a place to engage in livelihood activities, local villagers still need to live there. The current rapid urbanization in

coastal areas of China is leading to many problems like the disappearance of fishing villages, depopulation, abandoned villages, and poor living conditions. The questions of how to preserve and revitalize these fishing villages, how to make local industry flourish, and how to improve fishermen's living environment and income, have become important practical and academic issues. We hope that the results will provide valuable information to local fishermen and decision-makers, and can also be used as a reference for the future revitalization of fishing villages. During the theoretical exploration and practice of spatial construction in fishing villages during the industrial transformation, there are still many problems to explore. However, due the limited time and energy, there are still many things to supplied and perfected. In addition, because of various reasons, the conclusions of this paper have not yet been applied in the design of the project. The paper hopes that by the results of this research, more researchers in the field of architectural design, planning, economy and ecology, and other related fields can be stimulated to do more research on the development of coastal rural areas, especially at the fishing village level.

## Appendix Questionnaire on the industrial transformation

### English version

### Questionnaire

Dear respondent,

This questionnaire is designed solely to carry out investigations on the topic of fishing village revitalization. We truly appreciate your cooperation in completing the questionnaire. All information provided is only for paper writing and will be treated with strict confidentiality.

#### Part A: Basic information

1. Gender             Male         Female
2. Age.....years
3. Local residents:     Yes     No
4. Family number: .....      Numbers live in fishing village: .....
5. Educational Background
  - Primary       Secondary     High School     Professional School
  - Undergraduate     Graduated
  - Other, please specify:.....
6. Career
  - Fishing fishermen                       Farming fishermen
  - Fishing products processing fishermen
  - Fishing village tourism fishermen
  - Retired/housewife                       Other.....
7. Average income of your family per year
  - Below 40,000RMB                       40,000-70,000RMB
  - 70,000-10,000RMB                       Above 100,000RMB
8. Dwelling structure:
  - Wooden structure                       Brick wall bearing structure
  - Stonewall bearing structure                       Concrete frame structure
  - Other, please specify:.....
9. Floor area ..... M<sup>2</sup>
10. Courtyard area .....M<sup>2</sup>
11. Infrastructure satisfaction: Please choose the number.

Road	Education facility	Medical facilities	Senior care facilities	Garbage disposal facilities	Sewage treatment facilities

(1.Satisfied fully    2.Satisfied somewhat    3.Dissatisfied somewhat    4.Fully Dissatisfied)

12. Main forms of summer cooling: Please check.

	Not used	Occasionally	Often
Air conditioning			
Fan			
Outdoor cooling			
Natural ventilation			
Do you satisfy the current summer cooling? ( ) 1.Yes ( ) 2. No Reasons for dissatisfaction: 1. Inconvenient operation 2.Unsanitary 3. Spend too much 4. Poor effects 5. Others _____			

13. Main forms of winter heating: Please check.

	Not used	Occasionally	Often
Air conditioning			
Ovens			
Floor heating			
Kang			
Do you satisfy the current summer cooling: ( ) 1.Yes ( ) 2. No Reasons for dissatisfaction: 1. Inconvenient operation 2.Unsanitary 3. Spend too much 4. Poor effects 5. Others _____			

14. Cost for different energy types

Energy types	Electricity	Gas	Coal
Cost			

15. Cost for different energy types in winter

Energy types	Electricity	Gas	Coal
Cost			

16. Satisfaction on heating energy costs: Please check.

- Satisfied fully                       Satisfied somewhat  
 Dissatisfied somewhat               Fully Dissatisfied

17. Indoor thermal environment satisfaction:

Master bedroom	Living room	Second bedroom	Whole dwelling

(1.Satisfied fully 2.Satisfied somewhat 3.Dissatisfied somewhat 4.Fully Dissatisfied)

18. To what extent do you satisfy the current life in the fishing village? \_\_\_\_\_

- Satisfied fully                       Satisfied somewhat  
 Dissatisfied somewhat               Fully Dissatisfied

19. To what extent do you satisfy the following public infrastructures in the village? Please write the number to indicate your opinion with the following statements:

Road, traffic conditions	Education facilities	Medical facilities
Senior care facilities	Garbage disposal facilities	Sewage treatment facilities

(1.Satisfied fully 2.Satisfied somewhat 3.Dissatisfied somewhat 4.Fully Dissatisfied)

20. What do you think will come to be the future development of your village?

- Fishery and farming fishery               Fishing products processing  
 Fishing village tourism                       Others, please specify:.....

21. What do you think should be the focus for the future fishing village revitalization?

- Increasing income                               Increasing employment  
 Improving living facilities                       Improving living environment  
 Increasing the residents' participation in village planning  
 Others, please specify:.....

**Part B: Open interview questions**

1. What is your main source of household income before the current work?
2. What drives you to change your original work?
3. Through what channel did you initially change your work?
4. Do you think the current income level of your family is significantly higher than you involved in the current work?

5. What do you think about the industrial transformation in your village?

6. What do you think are the most important factors for the realization of the village revitalization?

**Thank you very much!**

## Interview Contents

Dear interviewees,

This questionnaire is designed solely to carry out investigations on the topic of fishing village revitalization. We truly appreciate your cooperation in completing the questionnaire. All information provided is only for paper writing and will be treated with strict confidentiality.

### A: Industrial information (2005, 2010, 2015, 2020)

1. Total output value (Yuan/ per year) \_\_\_\_\_
2. Primary industry output per year (Yuan/ per year) \_\_\_\_\_  
Fishery output per year (Yuan/ per year) \_\_\_\_\_  
Total fishery products per year (Ton/ per year) \_\_\_\_\_  
Marine farming yield (Ton / per year) \_\_\_\_\_  
Mariculture area (Hectares) \_\_\_\_\_  
Fishing boats \_\_\_\_\_  
The population engaged in fishery \_\_\_\_\_
3. Secondary industry output per year (Yuan) \_\_\_\_\_  
The population engaged in the fishing products processing \_\_\_\_\_
4. Tertiary industry output per year (Yuan) \_\_\_\_\_  
Fishing village tourism management household \_\_\_\_\_  
Number of tourists per year \_\_\_\_\_
5. Dominated industry: \_\_\_\_\_

### B. Constructure situation in fishing villages (2005, 2010, 2015, 2020)

1. Centralized sewage treatment \_\_\_\_\_
2. Centralized garbage treatment \_\_\_\_\_
3. Road area ratio (Area of road/total area of the village) \_\_\_\_\_
4. Village road hardening rate (Road hardening length/total road length) \_\_\_\_\_
5. Per capita area of public service facilities (Area of public service facilities/total population) \_\_\_\_\_
6. Health facility ratio (Number of health facilities/village population ) \_\_\_\_\_
7. School ratio (Numbers of school/village population) \_\_\_\_\_
8. Abandoned houses rate \_\_\_\_\_

### C. Fishermen

1. Population \_\_\_\_\_
2. Total household \_\_\_\_\_
3. Aging index (Numbers of the population 65 years/village Population) \_\_\_\_\_
4. Per capita income Average income of villagers per year (Yuan) \_\_\_\_\_
5. Fishing population ratio (Numbers of fishing population/village population) \_\_\_\_\_

### D. Driving forces

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