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**From Double Livelihood Security to Multiple Crises,
Analysis of “Shi Hai” Fishermen based on Political
Ecology in Fengcheng Town, China**

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List of Acronyms

FAO	Food and Agriculture Organization
DFID	Department of International Development
EU	European Union
UN	United Nations
UNDP	United Nations Development Programme

Abstract

Fengcheng town is a small fishing town in Jiaodong Peninsula, China, Which is developed by marine fishery and marine-related industries. When the surrounding towns have rapid multi-industry development based on marine resources, Fengcheng town has become a relatively poor area that seems to be “ignored” by “development”. Through my previous field research and online interviews, I found that there are generally some marine-related industries and multiple industries in line with the performance of urbanization and modernization in several major fishing villages in Fengcheng town. And for the fishermen, they have experienced changes from the relatively stable livelihood structure of half fishery and half X industry to the livelihood structure of employment in various industries. However, under the impact of excessive capture fishing and environmental problems, the government began to implement a long-term “New Rural Construction” policy and a strict “Fishing Ban” policy. These policies and other related measures that seem to protect the livelihood of fishermen and promote the sustainable development of marine fisheries have made fishermen fallen into multiple crises dominated by “Shi Hai” (deprived of the ocean). Based on the theoretical framework of political ecology, I will analyse the reasons why fishermen changed into a more vulnerable and marginalized situation.

Relevance to Development Studies

This study provides an example of the development of marine fishery towns in eastern China and explores the reasons for the more complex livelihood problems faced by local fishermen after the implementation of the “Fishing Ban” policy and “New Rural Construction” policy from the perspective of political ecology. This also very useful for future policy revision.

Keywords

"Shi Hai", half fishery and half X, double livelihood security, multiple occupations, political ecology, “Fishing Ban” policy, “New Rural Construction” policy.

Chapter 1 Introduction

1.1 Background information and statement of the problem

1.1.1 Background information

Fishery activities have always been an important way for human beings to obtain food and maintain their livelihood. Before the 19th century, fishery resources have been regarded as an endless natural resources. Only by fishing, we can obtain great income. In traditional fishing, the requirements for fishing technology and fishing tools are not high. A large number of coastal residents choose to engage in marine fishing as the main source of family income. With the rapid development of society and the rapid growth of population, people's demand for aquatic products is increasing, which promotes the rapid improvement of the technical level of fishing. The prosperity of aquatic products market and the convenience of transportation also make people's consumption demand for aquatic products increase rapidly, and continuously strengthen the development and utilization of marine fishery resources. According to the assessment of the world's marine fishery resources by the world Food and Agriculture Organization (FAO) (FAO, 1999), more than 35% of the 200 main fishery resources have been overexploited, the resources have declined significantly, and 25% have been fully exploited. Among the 17 major fishing grounds in the world, four have begun to decline in resources, and nine are in a state of declining resources. Fishery resources have always been regarded as a kind of public resources, which also represents the “tragedy of the commons” of this kind of public resources.

In China, the fishery is a part of agriculture. Fishers can be regarded as a kind of farmers in their ownership, but in fact, there are great differences in livelihood choices. In most fishermen communities in China, the similarity between fishermen and farmers is that they are small-scale fishermen (farmers), with similar vulnerability to drastic changes and similar resilience to various shocks. At the same time, just after implementing the Reform

and Opening-up policy (1978) and before the 1990s, the family income of fishers was higher than that of farmers, which was an advantage of giving priority to the opening-up and economic development coastal areas. When there was no rigorous policy control over marine fishing, coastal fishermen gave priority to the fruits of Reform and Opening-up policy. Many fishermen generally give up on their own initiative, or they have no land planting security. However, after the 21st century, because of the excessive capture fishing and needs of market, the income of professional fishermen became lower and lower. Also, they need to pay an additional sum of money to buy food and vegetables. The fishery industry itself is highly dependent on fishery resources and the aquatic ecological environment. Due to its risk and competitive characteristics in resource utilization, professional marine fishermen are highly dependent on the utilization of fishery resources. The rapid development of the economy and society and the acceleration of urbanization, water pollution, water conservancy project construction and large-scale construction of offshore (shoal) aquaculture make the water pollution serious. Overfishing also leads to the lack of fishery resources, which makes the sustainable development of fishery suffer deeply. For fishermen themselves, marine fishing requires high physical quality and skills of participants, and it is also apparent in the gender distinction of work. Women are difficult to engage in the essential part of marine fishing and can only engage in supply work, such as sorting seafood, weaving fishing nets and other supplementary work. This natural division of labour is difficult to achieve gender equity. As the primary source of family income, men have driven away from marine fisheries, and the livelihood pressure is more tremendous.

In China's wide range of water areas, fishermen groups in water systems in different regions have encountered the harm of the "Shi Hai"(deprived of the sea) problem. In the Yangtze River Basin, the Yangtze River fishing ban has been promulgated and implemented for more than ten years. First, since 2002, the Ministry of Agriculture of China has stipulated that the Yangtze River Basin in some cities needs a fishing moratorium of up to three months a year (Spring fishing moratorium in Yangtze River). By January 2021, a comprehensive fishing ban will be implemented for up to ten years. In Zhoushan, Zhejiang Province, many traditional small-scale fishermen have reached the

middle-aged and elderly stage and their employment skills are relatively single. After being forced to leave fishing, they have difficulty in employment.

In Chang Le area of Fujian Province, due to the rapid development of industrialization and urbanization, construction land has increased, resulting in a large area of land reclamation from the sea. According to statistics, from 2006 to 2014 (Tencent News 2011), the state-approved 79 regional construction land reclamation plans, with a planned reclamation area of 1115 square kilometres. From 2005 to 2010, the average rate of land reclamation from the sea was as high as 17.5%, Land reclamation occupied tidal flat wetlands and some oceans, and fishermen were forced to "Shi Hai". Many large-scale projects for the construction of sea-crossing bridges have even catalyzed many serious mass incidents.

Environmental problems caused by the serious red tide in the Pearl River Basin of Guangdong Province, the construction of economic development zone and 300,000-ton wharf near the Beibu Gulf of the South China Sea, as well as a large number of fishing boats, returned after the demarcation of the Beibu Gulf, the loss of large fishing grounds, the construction of Yangshan deep water port, Shanghai international shipping centre, and the forced transfer of fishermen due to the construction of construction land in Weihai and Rongcheng areas of Shandong Province, Fishermen in these coastal areas are suffering from this "Shi Hai". In Fengcheng Town, a typical fishing village community that relies on the marine fishing industry as the primary source of income, although the fishing and fishery transformation is comparatively gentle, it is also experiencing the "Shi Hai" situation, the local fishermen have not fallen into extreme poverty but a marginalized situation. No matter among individual fishermen, between ordinary sailors and captains, between fishermen and fishery administration departments, or between fishermen and grass-roots governments, all power and capitals are transferred to the powerful side, and the livelihood environment of fishermen is more complex and their income is more unstable.

1.1.2 Profile of Fengcheng Town

The research site is named Fengcheng Town, located at the northernmost end of Qingdao, Shandong Province, and the easternmost end of Jimo district. There is a natural fishing port T-Bay to contact Qingdao, Haiyang, and Yantai. There are 42 administrative villages in Fengcheng town (China's rural areas are divided into administrative villages and natural villages. Administrative villages are villages with rural autonomy and managed by village committees composed of village secretaries and other leaders, and several natural villages form an administrative village). The town and all administrative villages have a total population of 53,000, 61.02 square kilometres of marine area, 51,000 mu (1 mu = 0.067 hectares, 3417 hectares) of cultivated land, 128 hills, and 23,000 mu of mountains (1541 hectares). It belongs to the typical hilly terrain of Shandong and the township of the Coastal Hilly Area. The coastline of Fengcheng town is 36.5km long, with 30000 mu (2010 hectares) of a shallow sea, 42,000 mu (2814 hectares) of beach suitable for aquaculture, 12,000 mu (804 hectares) of shellfish aquaculture, and 20,000 mu (1340 hectares) of shrimp ponds. These data reflect that Fengcheng town has excellent marine resources. At the same time, as a part of the hilly region of Shandong, the whole Fengcheng town has 128 hills, so the area of agricultural planting in the plain is far less than that of forestry, and agrarian planting is more limited.

The geographical location of Fengcheng town is extraordinary and important. Shandong Province, where it is located, is a province with an outstanding coastline and is good at developing agriculture and related industries. The GDP of the whole region ranks second in the country, and the urbanization rate is as high as 61.18%. Comparing cities in Shandong province, Qingdao has an immense contribution to GDP, with an urbanization rate of 75%. It is stated in the "14th Five-year plan" (Qingdao Marine Development Bureau 2021) that Qingdao city will reach an urbanization rate of 78% by 2025. It can be seen from the data that the development requirements and speed of Qingdao are different from the average data of the whole Shandong Province, which has a

tremendous causal relationship with the geographical location of Qingdao and the government policies supporting it.

The whole Qingdao City is in East China, Southeast of the Shandong Peninsula, adjacent to the Yellow Sea in the East, and adjacent to Japan and South Korea across the sea. It is not only a shipping hub in Northeast Asia but also a central economic city in Northeast Asia. Qingdao has an excellent port. Since 1984, it has been approved by the State Council as the first batch of coastal cities open to the outside world, which provides a foundation for the later development of Qingdao port into a free trade zone. Qingdao's primary marine industry is famous for its deep-sea aquaculture industry. In cooperation with other countries, Qingdao has gradually built and developed into an international aquatic product trading and cold chain logistics base. Qingdao's marine secondary industry mainly cooperates with scientific research universities. There are many domestic famous universities in the blue Silicon Valley area in the east of Qingdao to jointly develop the biomedical industry and accelerate the development of marine science and technology. Qingdao's marine-related tertiary industry is mainly tourism because Germany and Japan have occupied it in history, and there are many historical buildings and cultural relics, which enrich tourism resources. All these regional advantages and policy conditions are promoting the urbanization development of Qingdao and making more talents and labour force flock to the city (Jiang et al., 2008). Qingdao has mature experience and measures in the use of marine resources, the implementation of marine policies, the regulation of small-scale fishermen and the activities of large-scale marine industry companies.

1.1.3 Statement of the problem

In the face of the development situation of the overall affluent coastal areas, the residents in the coastal rural areas face the living dilemma of not being rich. When compared to rural areas in non-coastal regions, coastal rural communities' livelihood

strategies are primarily marine fisheries, which can provide a significant portion of income. This is part of the extra income, as the Chinese often say, "Mountaineers rely on the mountains, just as those by the waterside profit from water," which means taking advantage of local resources. Therefore, in the long-term economic development, it is generally believed that the financial situation of coastal villages and towns is better than that of inland communities. In fact, the risks faced by coastal rural communities come from both rural and coastal areas. In other words, the difficulties experienced by the transformation of inland rural areas and the problems arising from relying on the marine industry have occurred. The marine industry is no longer an advantageous condition for obtaining income. Still, it brings more risks and challenges to coastal rural areas, and the livelihood of rural coastal residents is also more impacted.

Fengcheng town has a long marine development history. After the establishment of villages and towns in the Qing Dynasty and the gradual settlement of immigrants, almost every village under its jurisdiction has a good port. Therefore, it has gradually developed into a famous commercial fleet to carry out the commercial transportation of ships throughout the country. This livelihood model dominated by commercial transportation and supplemented by marine fishing continued until the Second World War. Due to the long-term war and port congestion, the commercial advantage was lost, and the marine fishery in Fengcheng town was on the right track again. After the establishment of the people's Republic of China, from 1949 to 1978, According to the development model of the planned economic system, each villager forms a fishing team, and then the work points are calculated according to the variety, quantity and weight of seafood caught. Until 1978, after the implementation of the Reform and Opening-up policy, China began to formally implement the marine fishery under the market economy system. Then, by the end of the decade of the 21st century, the marine fishing policy began to strictly regulate the fishing area, season, fishing moratorium, quality, and service life of fishing vessels. At the same time, local industrial development policies tend to industrial upgrading and transformation.

As mentioned above, like other fishers living by the water, the primary source of livelihood of fishers is small-scale fishing and aquaculture and compared with different coastal or inland fishing zones, Fengcheng Town, as a typical fishing village, has no serious problems of poverty and transformation caused by "Shi Hai", but the grassroot government management. According to the geographical location, Fengcheng Town faces more transnational resources management requirements, but the coastal communities of Fengcheng Town present different livelihood options. After the implementation of the strict "fishing ban" policy and the "new rural construction" policy, the original stable livelihood structure has been broken, and the multiple industry employment has brought instability, not only is there a lack of labour support in fishing, which is the main source of income, but there are also problems in other livelihood strategies. I summarized six aspects and analyzed in Chapter 3.

1.2 Research questions and research objectives

1.2.1 Research questions

Main question

How political ecology works on the "Shi Hai" (deprived of the sea) fishermen in Fengcheng Town?

Sub-questions

- (1) What is "Shi Hai"? How did the "Shi Hai" in Fengcheng happen, and how the "Shi Hai" fishermen were forced to become a marginalized and vulnerable group in society?
- (2) Why did the fishermen's livelihood in Fengcheng town change from double security to multiple crises after the government implemented the "Fishing Ban" policy and the "New Rural Construction" policy?

1.2.2 Research objectives

- (1) To explore the occurrence and specific performance of political ecology in specific groups of “Shi Hai” fishermen in Fengcheng town in China, and to understand the relationship between different subjects, including individual small-scale fishermen, self-organization of fishermen, local fishery management department, grass-roots governments.
- (2) To understand the reasons for the “Shi Hai”, and how they became marginalized and vulnerable groups from the recipients of fishery resource-dependent industries.
- (3) To investigate the “Fishing Ban” and “New Rural Construction” policies implemented by Fengcheng Town under the rapid development of urbanization and industrialization in response to development problems, from mastering resource advantages to facing more serious livelihood impacts.

1.3 Research methodology, research design and limitation of the study

1.3.1 Research methodology and design

This research is both descriptive research for the impacts on the rural coastal communities with the marine fishery industry and exploratory study for the resilience and adaptation for the fishermen households in the research site---Fengcheng Town. My research mainly relies on primary and secondary data, and the primary data is collected by the qualitative method. For the COVID-19 situation this year, the data was collected from my preliminary research from December 2020 to February 2021 and formal study with the help of my research assistant in July and August 2021. The secondary data is collected from the local museum, county annals, ancient architecture, stone tablets, temples, ancient city walls.

During my preliminary survey (from December 2020 to February 2021), the zoning of the whole Fengcheng town has changed from the original town to a part of Tianheng community (Tianheng Town used to have the same administrative level as Fengcheng Town, for more convenient management, Tianheng community becomes the new name of the whole northeast rural region), which is a change in administration, but in fact, the level and scope of management of the town have not changed. The change of this administrative division has Chinese characteristics. This change in Fengcheng town is one of the reasons to help local fishermen not suffer serious "Shi Hai" impact. I selected seven administrative villages under the Fengcheng town for research. These selected villages are around the coastline and have excellent ports. Each small administrative village has a wide range of marine fishery industry traditions and practitioners. The chosen research objects also cover all industries related to marine fisheries and their new employment changes. Therefore, the research site can reflect the characteristics of the marine industry and the livelihood of residents in coastal rural communities (Long et al., 2012).

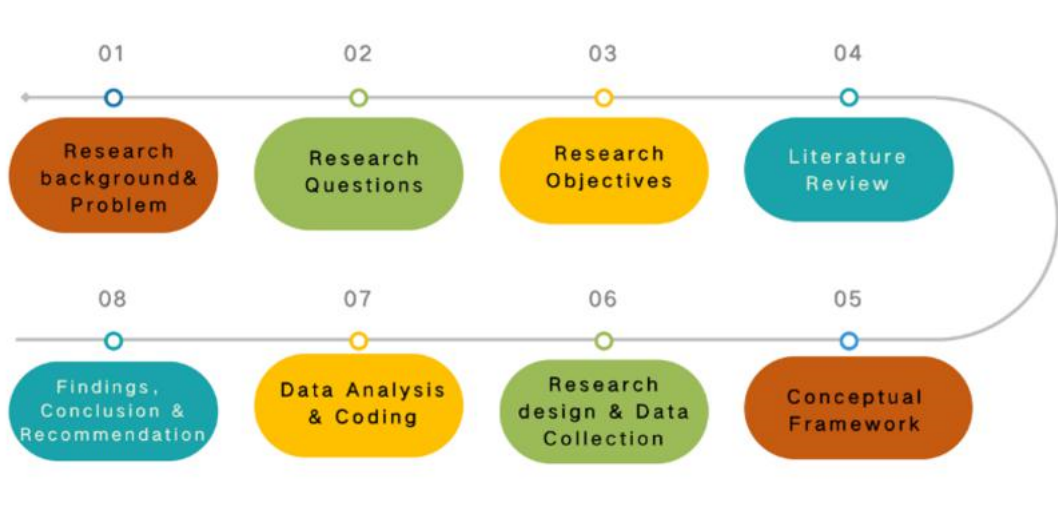


Figure 1.1 Research design process

The preliminary research is mainly based on qualitative data, all of the data is collected from the non-participant observation, participant observation, critical informants interview, and focus group discussion. The ethnographic method is (Creswell, 2007; Palmié and Stewart, 2016; Hammersley et al., 2019) And this preliminary research also covers the secondary data from the Fengcheng town museum, ancient city wall, ancient temple, stone tablets, individual diaries, newspapers, reports, certificates, and county

annals. The overall understanding of Fengcheng town primarily comes to compose this part of secondary data, and it also helps me create the research questions and research objectives.

The formal research period was in July and August 2021. With the restrictions of the COVID-19 situation, I hired a research assistant to help me collect data and organize the interview. The formal research was in the summertime, and it is a good time to do empirical research. It is because all the fishermen are in their off-season of marine fishing, they are going to choose other kinds of work to get income. My research assistant is the primary school teacher who works in Yingzi village primary school. She was on her summer vacation during July and August, so she had enough time to research. She is the local villager, and she knows almost all the villagers and the situation of the surrounding villages in Fengcheng town. In the beginning, I contacted her by WeChat, we kept talking online, and I elaborated on my research questions, my plan. She also gives her opinions to help me revise some misunderstandings, which allows the research to run reasonably. I prepared the outline of the research, the questions for each informant, she tried for the first informant with my guidance, and it was not successful, then I wanted to ask her to arrange every informant's online interview, and I will talk with the informants by myself. Due to the time difference (6 hours late in the Netherlands), I always talk with the informants after midnight and early morning, and my research assistant did the supplementary visiting and shooting tasks for me.

When interviewing key figures, some interviewees refuse to turn on the camera, which makes them feel comfortable and relaxed, but I have a low sense of interaction with the interviewees. Most of the time, because the network is unstable, I need to turn up the volume and explain the problems repeatedly. Many interviewees feel distrusted because they can't see real people in the online interview. The wife of some male interviewees will interrupt our conversation just because he is discussing family livelihood with a strange young woman. Online interviews may facilitate communication but exacerbate ethical issues. Online communication always ignores the ethical problem, sometimes I don't notice, and it happens (Glasius et al., 2017). Some informants delete my contact

address after my interview, some of them do not answer my questions anymore, but some informants still feel happy to keep contacting with me online.

I used participant observation and non-participant observation in the preliminary research period. Participant observation is the primary method in ethnographic research (Creswell, 2007; 2009; Punch, 2014). It is helpful to know the people's livelihood, activities and relationships among a group of persons. In the research site, I did the participant observation at the seaside to observe the tourism and experience the hot spring in the hotel around the shore. I also did the non-participant observation of offshore aquaculture, the rural handicraft industry, the sweet potato glass noodle processing industry, and mountain agricultural work. Whether I do participatory observation or non-participatory observation, I participate in the social activities of the research site as a researcher and integrate into their social atmosphere and try to become a member of it. In this way, my identity is both participatory and observational, which helps me understand the residents in this community. The non-participant observation gives me a chance to observe different households' real daily lives, and I watch as a bystander and try not to disturb the villagers.

I used the key informants' interviews both in the preliminary research and the formal online research (the details of the research question outlines are in the Appendixes). I collected the life story from different selected informants, the selected informants are from all kinds of industries in Fengcheng town. The life story method is an important way to carry out information in the in-depth interview (Atkinson, 1998). Through the respondents' narrative narration of their own life experiences, I will answer the questions I want to know in the guiding questions and often have some unexpected gains. Such a conversation is very much like rambling talk, and the respondents' answers constantly remind me to find new questions.

During the interview with key figures in the preliminary survey, I can observe the expressions and actions of different people, which is helpful to understand their narration; In the formal research, the emotional transmission of respondents will be

weakened because of the online form, but this is still the most important way for me to obtain data (see appendix 1 for more information).

1.3.2 Limitation of the study

(1) The research lacked primary data from government departments. Although I contacted and prepared the interview outline in advance and provided it to the interviewee, the informant refused my interview at the end. Therefore, the data and information about the government's policy support are from other respondents and second-hand data.

(2) Due to the impact of the time difference and the pandemic situation, there is a long response delay between me and all respondents, which is not conducive to my later analysis and makes it challenging to realize return visits and in-depth research.

(3) The majority of the critical person interviews, photographs, and video footage are sourced from my research assistant. Therefore, even though I completed all the discussions through online video talking, the information and pictures obtained are indirect and cannot form a complete picture like the empirical field research.

(4) Due to the limitation of time difference and distancing, many planned research methods cannot be fully implemented, such as focus group discussion, participant observation, and non-participant observation.

1.4 Theoretical Framework

Here I am trying to draw a figure of theoretical framework of this whole paper. I will draw all of the important key issues, the subjects, the implemented policies and the research questions, facing difficulties into one figure. And all of this happens under the same mechanism, that is political ecology, I will use this concept to analyze the reasons of the double crises that fishermen are facing with, and trying to come up with some measures for the local sustainable development.

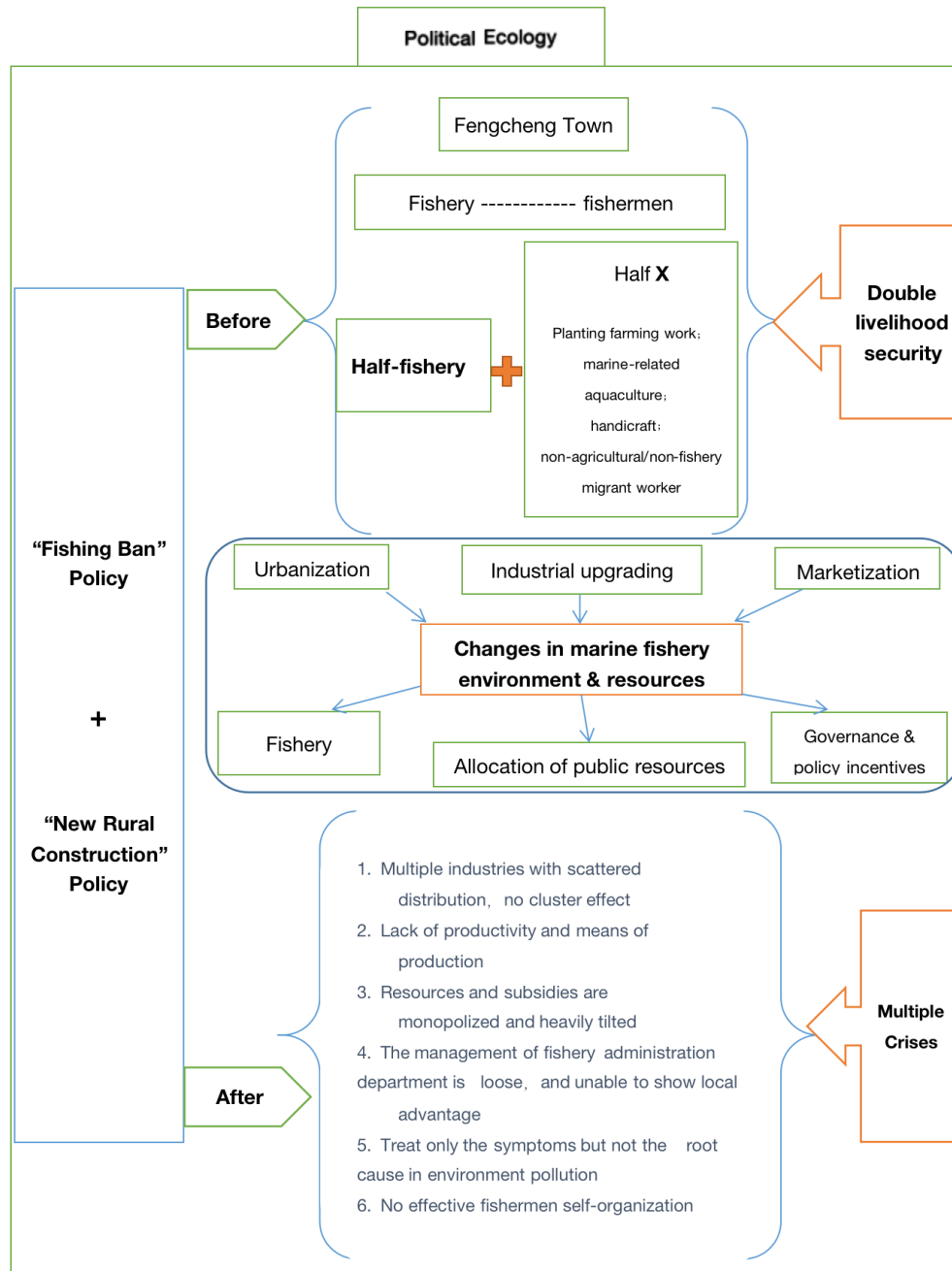


Figure 1.2 Theoretical framework

The given figure shows the theoretical framework of this paper. First, all of the issues, problems are happening under the political ecology framework, and this interdisciplinary perspective of politics and ecology is used to pay attention to the real needs of fishermen, emphasizing the governance and intervention of the state and the government in rural

areas, as well as the response to the social relations of the grassroots level. The society of political ecology provides an explanation for this complex development process to a certain extent (Paulson, Gezon and Watts, 2003; Walker, 2005; Neumann, 2009). This has helped me understand the current situation of the impact to the rights of fishermen in Fengcheng town and the infringement of fishery resources. At the same time, political ecology can focus on the relevance of local, international and international fields. I can combine the policies of governments at different levels with grass-roots governance to truly show the relationship across local geographical and political boundaries.

Second, the change of the livelihood structure of Fengcheng fishermen is based on the fact of social development. On the one hand, under the comprehensive effect of urbanization, marketization and industrial structure upgrading, people demand more and more marine resources, and even irrecoverable predatory fishing. On the other hand, in terms of ecological environment, the pollution from human activities is directly discharged into the ocean. The large-area breeding industry and the diesel leakage of fishing boats have directly affected the changes of marine resources and environment.

Therefore, this change has also exacerbated more and more serious fishery problems, leading to the tragedy of public goods of marine resources as public resources and corresponding policies. I regard the two most directly related policies "fishing ban" and "new rural construction" as the key to the changes affecting fishermen's livelihood. Under the influence of this series of factors, the original stable dual livelihood structure, half fishing and half x, has become the livelihood mode of employment in various industries, but correspondingly, it has also brought more complex multiple crises. I summarized the crisis in six aspects, including the lack of industrial cluster effect; Resources are monopolized by rural elites, and individual fishermen have become marginalized groups; The lack of means of production and productivity cannot promote the survival of traditional fishing fisheries; There is no unified self-organization of fishermen and trade unions; The management of the fishery administration department is not enough to help the fishing village give full play to its characteristics; The treatment of pollution is not

enough, and the root cause of pollution is not found. In Chapter 3, I will explore more on these multiple crises.

1.5 Structure of the research paper

In the first chapter, the research background, research problem, research methods, research design and theoretical framework are discussed in detail. The second chapter will conduct a literature review of the concepts to be used, including the definition of this special term "Shi Hai", the definition of "Shi Hai" fishermen, and the policy of "fishing ban" policy and "New rural construction" policy. The third chapter will classify and analyze the livelihood strategy data collected in Fengcheng town according to different standards. And I will explain the differences in livelihood strategies before and after the implementation of the two key policies. The fourth chapter discusses the framework of political ecology, and how does political ecology happen in China, in Fengcehng Town, with internal mechanism of Fengcheng town from the serious impact of "Shi Hai", as well as the relationship between the county industrial transformation and the livelihood strategy of rural fishermen. In chapter 5, I will figure out the particularity of fishery development in Fengcheng town and put forward some suggestions for future policy changes.

Chapter 2 “Shi Hai”, “Fishing Ban” Policy and “New Rural Construction” Policy

In this chapter, I will make a theoretical definition of the situation of "Shi Hai", "Shi Hai" fishermen, and give explanation and application of “Fishing Ban” policy and “New Rural Construction” policy in China, in Fengcheng town.

2.1 What is “Shi Hai”? Who are the “Shi Hai” fishermen?

"Shi Hai" is a term directly expressed in Chinese pinyin. It means losing the power and ability to use marine resources. In short, it means "predetermined of sea resources". Because the place I investigated is an example of China, I continue to use the expression "Shi Hai" in the full text. In some articles, they also used “Lost sea”, it is the directly translation of “Shi Hai” in Chinese.

The term "Shi Hai" has been widely mentioned in recent years. In short, it means deprivation of the sea, and it refers to the loss of the right to use marine resources and the way to obtain livelihood by relying on marine resources. Under the particular household registration system (Hukou system) in China, China's agricultural and non-agricultural residents are entirely separated. Under normal circumstances, residents born in rural areas naturally obtain agricultural registered residence and have the average land allocated according to the total cultivated land in the village. Similarly, fishers belong to agricultural citizens, and they will not only have land but there will also be the right to inherit and use the ship and the skills to do capture fishing. However, the fishermen who bear the brunt of "Shi Hai" will lose their fishing boat as a means of livelihood and their status as fishermen.

Since the "Reform and opening up" policy implemented in 1978, China's economy has been in a period of rapid development. Since the 1990s, China has highly developed and utilized marine resources, as well as the continuous occupation of coastal beaches and shallow waters, and gradually there has been a social phenomenon that fishermen lose

the use of marine resources. Therefore, from the perspective of the household registration system and the particularity of the implementation of “Reform and opening up”, “Shi Hai” is a phenomenon with Chinese characteristics. Therefore, in the study of fishermen's livelihood in other countries, there is little relevant literature.

When defining “Shi Hai” fishermen, different scholars have different understandings based on different contexts and different national conditions.

In Rao's article (2013: 2), he divided “Shi Hai” fishermen into three parts. The first part refers to the groups of fishermen who are unable to continue fishing because of the depletion of marine resources and other unnatural factors (excluding natural elements such as fishermen's old age, weakness and disease). Many research works literature calls these fishermen who have lost their sea as fishermen who have lost their sea; The second part refers to those fishermen who are still engaged in fishing operations in the ocean but are about to withdraw from the fishing industry due to the gradual reduction of fishing space; The third part refers to those groups that withdraw from the fishing and aquaculture industry because of environmental pollution or other policy construction. With the continuous deterioration of the marine environment, the continuous reduction of marine resources and the corresponding changing needs of policies, there may be mutual transformation among these three types of fishermen. Therefore, we can call all these fishermen who withdraw from marine fishing and aquaculture as sea lost fishermen.

According to the main reasons for sea loss, it can also be divided into policy sea loss and resource-based sea loss (Rao 2013: 15). The former refers to the reduction of sea area and fishing capacity available for fishermen due to the needs of national industrialization development or infrastructure construction and the adjustment of national fishery policies. Finally, some fishermen in these waters were forced to change their jobs. This “Shi Hai” situation caused by policy adjustment is more convenient for statistics. The local government and fishery administration department can determine the reduced number of fishers according to the reduction of the registered number of fishing vessels.

Resource-based loss of sea refers to the reduction of fishery resources available for fishermen in the sea area or even the absence of fish. The rapid reduction of resources reduces fishermen's income, and resource-based "Shi Hai" fishermen may be converted to policy "Shi Hai".

According to the specific target fishermen involved in "Shi Hai", they can be divided into individual "Shi Hai" fishermen and group "Shi Hai" fishermen (Rao 2013: 16). Individual means that the contradiction between some sea areas and other marine industries has not been reasonably solved, or fishers have lost their marine fishing capacity due to old age, disease, and other reasons. As a result, these fishermen can no longer engage in aquatic fishery industry activities. The group "Shi Hai" means that the fishery rights in some sea areas must be recovered due to the policy adjustment of national and local governments or the requirements of international conventions or agreements, resulting in the common face of "Shi Hai" by fishermen fishing in these sea areas.

In Yin et al. article (Yin, Chen and Li, 2008: 31), he divided fishermen into explicit "Shi Hai" and invisible "Shi Hai" from the degree of coping with the situation of "Shi Hai". Dominant refers to the group of traditional fishermen who are separated from marine fishing due to resource decline, policy requirements and other unnatural reasons (excluding old age or disease). The invisible refers to fishermen who are still engaged in marine fishing but face the pressure of reducing sea space and withdrawing from the fishing industry. Invisible fishermen may be converted to dominant.

There are such "Shi Hai" fishermen in other countries due to the requirements of national policies. For example, fishermen in the lagoon, Vietnam, must give up fishing and live entirely on land under the requirements of local ecological policies. The relocation and resettlement work of the government is not perfect, resulting in extreme poverty for fishermen. In the mangrove reserve in Indonesia, the ecological environment of mangroves has been damaged due to overfishing. The government policy requires the relocation of fishermen, which is also a policy "Shi Hai".

Under China's special urban-rural dual structure (there are obvious differences between cities and villages, the urban residents and rural residents are different because of different household accounts. Household accounts are divided into agricultural household accounts and nonagricultural household accounts. Generally, non-agricultural household accounts are urban born residents, and agricultural household accounts are obtained by rural residents). The vulnerability of fishermen is very obvious. There is no obvious retirement age for fishermen, but fishing in the sea requires high physical strength. After a certain age, fishermen will not be able to continue to engage in fishing and can only retire. Fishery practitioners will lose their original high-income advantage due to the decline of marine resources, government policy restrictions and the risks of other industries. In addition, the shortcomings of the fishery joint-stock system force some fishermen to withdraw from marine fisheries. The reason is that the first shareholder, generally the captain of a fishing boat, is the main beneficiary of the current national fishery subsidies, while other fishermen cannot benefit.

In short, there is no very standard definition of "Shi Hai" and "Shi Hai" fishermen in worldwide level. My application in this paper is under the specific Chinese context and national conditions.

2.2 “Fishing Ban” policy

In my opinion, the "fishing ban" policy is a mandatory policy of prohibiting fishing for part of the time or permanently for the fishing industry due to the excessive and uncontrolled human activities of seizing fishery resources, resulting in the decline of resources. In order to control human predatory fishing, control the increasingly serious decline of marine fishery resources and realize the sustainable development of marine fishery, the government and resource protection departments should carry out mandatory management on the use of resources.

China is not the first country to implement the fishing ban policy. Many international organizations and countries have relevant policies to ensure the sustainable

development of fishery resources. In the report of the United Nation (*Legislating for sustainable small-scale fisheries. A guide and considerations for implementing aspects of the Voluntary Guidelines for Securing Sustainable Small-Scale Fisheries in the Context of Food Security |Policy Support and Governance| Food and Agriculture Organization of the United Nations* , no date), it is proposed that the increase of fishery trade has plunged fishery resources into the tragedy of the Commons. However, after the establishment of the trade agenda for sustainable fisheries, the tragedy of the Commons has been reversed into the tragedy of the Commons(ibid., no date: 30). The key point of agenda is to prohibit predatory fishing, restore fishing resources, and establish a complete marine fishery ecosystem at the national level. In the report given by the Department for environment, food and rural affairs in the UK ("Department for Environment, Food and Rural Affairs, 2018: 25), in order to achieve the goal of providing sufficient fishery resources for the next generation, they have established a complete system for measuring and controlling individual catches. They strictly control the cross-sea fishing of foreign commercial fishing boats from legislation, and also manage the amount of fishing in the fishing zone by local fishermen. They have also fundamentally changed their original extensive understanding of fishery resources. They consider changing the concept of marine fishery as a public asset and hope to reach a consensus with other EU countries on cross regional cooperation (ibid. 2018: 26).

European Union has more explicit and strict restrictions on fishing opportunities. The "European Parliament and the Council on the common fisheries policy"(Sobrino and Sobrido, 2017) released in December 2013 stipulates many details, including the need for mixed species in one fishing, not only one kind of fish, and the prohibition of fishing for scarce and precious species, which will face punishment once caught. Within the scope of all EU regulations.

The fishing ban policy above emphasizes large-scale commercial fishing. In the example of small-scale fishing in Zambia, I found a similar policy with China, namely "annual fishing ban", which is the policy of protecting juvenile fish implemented by Zambia since 1974(Pamela L. Simalumba, 2013: 10). Similar to China, this "annual fishing ban" policy

also affects the livelihood security of the Fisher household. Some poor families who can only make a living by fishing have to travel long distances to work during the fishing moratorium, which is an impact on the livelihood of small-scale fishermen in the short term.

In China, fishery has developed rapidly since 1970s, and this development has continued until the 21st century. In China's annual fishery data in 2016, it is mentioned that about 20million Chinese people rely on fishery for a living, and 14 million workers are directly or indirectly engaged in fishery production. Among them, 69% of the fishing vessels with more than one million are small fishing vessels (Yuan, 2018; 4). Since the reform and opening up, the market has expanded, and the seafood caught in the fishery has been transported to many different cities and countries. The fishery is booming. This development stopped because of the scarcity and extinction of fish species. Since 1995, China first issued the seasonal fishing ban policy. By 2009, China's Ministry of agriculture (2017) extended the summer fishing moratorium. In 2017, the start time of the fishing ban period was determined as May 1 of each year, and the end time varied according to the geographical location of different sea areas(Yuan, 2018). In Zhang's(2015:2) work also mentioned that China's fishing industry has made great success but also great impact on environment and ecology.

The following picture comes from a letter from China to Japanese fishing boats on the Internet. The picture clearly indicates the summer fishing ban in different waters of China. The fishing ban in the Yellow Sea where Fengcheng town is located is from May 1 to September 1 every year.

It should be noted that the fishing ban policy in Fengcheng town sea area is different from that in China's Yangtze River Basin. The Yangtze River Basin implements a complete ban on fishing, and fishermen must completely change their jobs, with stricter requirements.



Figure 2.1 Period and Area of Fishing Ban in China in 2018

(Accessed from <https://www.piclub.or.jp/wp-content/uploads/2018/05/No.960-Chinese-Water-%E2%80%93-Adjustment-of-Annual-Summer-Fishing-Ban-Regime.pdf>)

2.3 “New Rural Construction” policy

The new rural construction policy is also called building new countryside, or new rural restructuring movement (Guo, 2015: 14). It can be called policy or movement. It was first proposed at the Fifth Plenary Session of the 16th CPC Central Committee in October 2005. The first notable achievement was the abolition of the agricultural tax policy, which began on January 1, 2006. Its initial purpose is to reduce the development gap between urban and rural areas and promote the development of rural areas, agriculture and farmers. The long-term problem of rural-urban dual system makes the farmers in China lagged behind the rural-urban dual system. To put it simply, it is to supply cities with rural resources and industries with agricultural resources. The countryside is in a state of

"being exploited"(Huang, Lang and Liu, 2021: 65). Therefore, many articles mentioned that the purpose of new rural construction is to integrate urban and rural areas, narrow the gap between urban and rural areas and change the current situation of rural backwardness.

The content of the policy involves all aspects of rural areas (Wong, 2013: 45). Economically, develop rural economy with characteristics and improve farmers' income; Develop multi industry employment, especially the power industry; Increase the added value of agricultural products and ensure the increase of agricultural income; Develop rural public utilities and rebuild rural houses; Supervise rural autonomous organizations and ensure the improvement of rural working mechanism.

These aspects seem to be very perfect, but there are many practical defects in the real implementation. This is the case in the implementation of Fengcheng town. In order to develop rural tourism and evaluate the "beautiful village" award(Wang and Tan, 2018: 393), the local village committee occupied a piece of construction land and built a large lotus pond. The pond was full of lotus and opened during the inspection of higher government departments, so it won the title of "beautiful village". However, this lotus pond is only for viewing. The lotus is not maintained by professional gardeners and soon withers. The publicity is not enough and can not attract foreign tourists. After traveling to the lotus pond, tourists find that there are no toilets, restaurants, parking lots and other supporting facilities, so the tourism value can not be brought into play at all. Local villagers began to put their fishing gear to dry on the bridge in the lotus pond.

The policy of new rural construction requires the integrated development of industries, so many places start with tourism. Rural tourism is conducive to promoting the development of rural economy, but it may not promote the construction of new countryside. As a rural area mainly engaged in fishing, fishing villages have sufficient development characteristics, but they may not be brought into play. In the fourth chapter, I will analyze the plight of Fengcheng town in combination with political ecology.

Chapter 3 The Double Livelihood Security and Multiple Crises

3.1 The literature review of livelihood strategies

Livelihood strategies are always used to analyse the farmers' households. In the case of my research, I am trying to use it to explore the livelihood of fishers and farmers. The fishery is also a kind of industry in primary industry. The residents who live in the coastal rural areas face the impacts of both agricultural and marine fishery. In the last few decades, some institutions like FAO, DFID created a framework to present livelihood. The adjustments and changes of the livelihoods are regarded as a new term--livelihood strategies.

As Conway (Goulden et al., 2013) said, livelihood means household, livelihood is an activity that allows people to secure the necessities of daily life, a livelihood can regard as a means of earning a living by individual or collective, and the individual or collective use their assets, such as the activities, resources, and access (Tang et al., 2013). Livelihood can be defined as a set of actions that use capitals by people to make a living, and the capitals cover different aspects, including financial, social, human, natural, and physical capitals (Scoones, 2009; McKay, Oliveira and Liu, 2020) Livelihood can be defined as a set of actions that use capitals by people to make a living, the capitals cover different aspects, including natural, physical, financial, human (Scoones, 2009; McKay, Oliveira and Liu, 2020) and social prosperity. The most important part of the livelihood strategy is that it provides the primary source of income for the household. Many heads of households have multiple occupations. Therefore, the occupation with the highest proportion of total income is regarded as the main occupation, and the occupation with the second-highest share of income is regarded as the secondary occupation.

However, the head of the household changes as the family's economic situation changes. So there is more and more households choose to have multiple occupations at the same

time. This kind of choice can reduce the risk and pressure for only relying on one occupation (Campbell et al., 2006), that is, alternative livelihood strategies. The livelihood strategies are implemented for achieving livelihood goals. From the 1980s, the livelihood strategies changed from the single strategy to the mixed practices or called multiple activities in the rural south. The government or the farmers themselves are aware that if they still do the single action on the on-farm scale, the income may decrease, and poverty may be more violent.

In China, according to the physical capital, some villages are removed for the urbanization process, and some villages follow the "New Countryside Construction" policy, the scattered houses are gathered. Some of the lands have also been consolidated into centrally planned planting land. For financial capital, most of the ageing farmers are small-holder farmers. The land they planted and the crops they harvested are limited, and they cannot get enough money from their plantation, they have weak competitive power with the large-scale plantation in the market. For social capital, the rural organizations like the elderly care and mutual aid group, cultural activities group, the women group always organize the activities to help the farmers. Those factors of livelihood capitals show the transformation of the ageing farmers' livelihood strategies and adaptation. Farmers' families depend not only on land for agricultural income but also on industry and Commerce for non-agricultural income. The single plantation cannot satisfy the family's lives. Some farmers choose to do small business, construction, and come join the factories or the cottage industry(Yuan, Dennis and Xiao, 2019), especially the ageing farmers who do not have enough power and energy.

The livelihood strategies of farmers have gradually revealed the characteristics of diversity and difference: on the one hand, in the process of promoting new urbanization, a large number of rural laborer have flooded into cities, and the way farmers earn a living has changed. The livelihood strategy began to change from traditional agriculture to non-agriculturalization. On the other hand, with the deep integration of rural industries, agricultural production, agricultural product processing and sales, catering, tourism, and other service industries are closely integrated, and the enthusiasm of farmers for

employment and entrepreneurship is constantly improving. Farmers' income-increasing channels have been continuously expanded, and the degree of concurrent employment has increased significantly. In conclusion, all kinds of changing livelihood strategies are from the absence of natural and human capital to achieving more and more social, physical, and financial capital. From rural areas to urban areas, from agriculture to industrial production, from off-farm to on-farm activities. The farmers, especially ageing farmers, experienced significant challenges in their lives. Farmers' households, as the most basic decision-making unit in rural society, farmers' livelihood problems affect the quality and direction of rural economic development. Under the background of the combination of new urbanization and rural industry, farmers' livelihood strategies gradually show the characteristics of diversity and difference. Strengthening the research on farmers' livelihood strategies is conducive to helping farmers to improve their development capabilities, promote the sustainable development of the rural economy, and achieve the strategic goal of rural revitalization and "New Countryside Construction".

The above explains the response of China's agricultural livelihood strategy to different livelihood capital, especially under China's "new rural construction" policy. In contrast, in addition to rural areas in plain areas, rural areas in mountainous areas and rural areas dominated by the fishery in coastal areas, they all have different sensitivities to different livelihood capital. In recent years, China has always been the largest fish catcher in the world, which is a manifestation of the highly developed marine fishery in China. This number one has not always brought development advantages. It may have made economic progress, but it has been negatively affected in terms of environmental protection and lack of resources. China's 13th five-year plan was released in March 2016, in which the policies on ecology, resources and fishery management were replanned and adjusted. In addition, due to the close cooperation with the international community, transnational and cross-regional agreements have also made many requirements and restrictions on China's policies, which directly impact the livelihood strategies of fishermen.

When analyzing fishermen's livelihood strategies to deal with "Shi Hai", I mainly rely on DFID's sustainable livelihood analysis framework. According to this framework, fishers can combine their livelihood capital and engage in different production activities to form a determined livelihood strategy. At the same time, the constraints of social factors, external trends and impact factors are also considered, resulting in livelihood outcomes. The livelihood strategy of fishermen covers the economic income of fishers, the protection of their rights and interests, the right fishery system and the transformation of coastal fishermen. Increasing the economic income of fishermen has always been the ultimate goal of all livelihood strategies. The protection of fishermen's rights and interests mainly includes the guarantee of the actual effect of fishery subsidy policy and the maintenance of damaged rights and interests. The right fishery system is more inclined to the legislative protection at the legal level. To increase income and protect rights and interests, a diversified livelihood strategy came into being. It is an active choice of fishermen based on certain economic conditions or a passive adaptation to a vulnerable environment. In the choice of diversification, non-agricultural activities are an important part of diversification. Compared with agricultural diversification and structural diversification, income diversification means that the capital of nonprofessional farmers is used in non-agricultural and non-fishery production activities unrelated to agriculture. This choice of diversified livelihood strategies has become the main guarantee to ensure income.

3.2 Livelihood strategies before the policies implemented

Before the implementation of the fishing ban policy and the new rural construction policy, the marine fishing industry in Fengcheng town was very prosperous, which was also related to the abundance of marine fishery resources. I use half fishery and half x to summarize the livelihood strategies in this period. This usage comes from the Hanshin Awaji Earthquake in Japan(Think the Earth, no date; Institute for Studies in Happiness, Economy and Society, no date). It is mainly used to describe the combination of agriculture and other industries to form a daily source of livelihood. The inventor is Mr Naoki

Shiomi(Japan for Sustainability, no date). This half farm refers to agricultural production, and half x refers to all unknown factors. It is not very strict. Half the time is used to engage in agriculture and half the time is used to work in other industries. It emphasizes a leisure and mild lifestyle based on agriculture and earning a living in different ways. This way of life provided a very good way of decompression for people at that time.

I use this expression here to summarize the livelihood of fishermen in Fengcheng town before the implementation of the policy as half fishery and half x, which focuses on their labor input to the industry and the choice of livelihood strategy.

In Fengcheng town with excellent resource conditions at that time, marine fishing was the most important industry and the pillar industry of the whole town. Every family had men engaged in fishing, while women and the elderly could choose to engage in other industries. Including land planting, aquaculture, textile processing, etc. X in Fengcheng town represents the arbitrariness of choice, but it exists as a supply industry for fishing.

3.3 Livelihood strategies after the policies implemented

3.3.1 The classification of the samples of rural households

The respondents in Fengcheng town are divided based on their relevance to the marine fishery industry. The results are as follows. According to the correlation with the fishery industry, professional fishing practitioners (fishermen), professional aquaculture practitioners (farmers), professional ship repair and construction workers, employees of aquaculture companies and employees of fishing net factories can be established. At the same time, according to the provisions of the fishing policy that fishing cannot be conducted during the fishing moratorium (May 1 to September 1 every year), fishermen naturally become seasonal fishermen and resulting in employment in a variety of

industries. In addition to seasonal reasons, another is the traditional livelihood model dominated by fishing and supplemented by planting agriculture. The last classification is based on the irrelevance with marine fisheries. It is divided into fully engaged respondents in non-fishery or non-agricultural industries, a single industry, and employees in multiple industries supplemented by agriculture.

The table below shows the data information of my 30 informants who are living in seven villages along the coastline of Fengcheng Town, I take each household as one unit. The items classified in the table include interview time, interview duration, age, gender, specific village name, first occupation, second occupation, third occupation, quantity comparison of income sources, and key reasons for the occupation.

Interview Report									
No.	Age	Gender	Village	First Occupation	Second Occupation	Third Occupation	Quantity Comparison of Income Sources	Key Reasons for the Occupation	Remarks
1	30	Male	Wangjiazui Village	Fishing	Fishing	Fishing	100%	Family tradition	Engaged in fishing
2	35	Male	Wangjiazui Village	Fishing	Fishing	Fishing	100%	Family tradition	Engaged in fishing
3	40	Male	Wangjiazui Village	Fishing	Fishing	Fishing	100%	Family tradition	Engaged in fishing
4	45	Male	Wangjiazui Village	Fishing	Fishing	Fishing	100%	Family tradition	Engaged in fishing
5	50	Male	Wangjiazui Village	Fishing	Fishing	Fishing	100%	Family tradition	Engaged in fishing
6	55	Male	Wangjiazui Village	Fishing	Fishing	Fishing	100%	Family tradition	Engaged in fishing
7	60	Male	Wangjiazui Village	Fishing	Fishing	Fishing	100%	Family tradition	Engaged in fishing
8	30	Female	Wangjiazui Village	Fishing	Fishing	Fishing	100%	Family tradition	Engaged in fishing
9	35	Female	Wangjiazui Village	Fishing	Fishing	Fishing	100%	Family tradition	Engaged in fishing
10	40	Female	Wangjiazui Village	Fishing	Fishing	Fishing	100%	Family tradition	Engaged in fishing
11	45	Female	Wangjiazui Village	Fishing	Fishing	Fishing	100%	Family tradition	Engaged in fishing
12	50	Female	Wangjiazui Village	Fishing	Fishing	Fishing	100%	Family tradition	Engaged in fishing
13	55	Female	Wangjiazui Village	Fishing	Fishing	Fishing	100%	Family tradition	Engaged in fishing
14	60	Female	Wangjiazui Village	Fishing	Fishing	Fishing	100%	Family tradition	Engaged in fishing
15	30	Male	Wangjiazui Village	Fishing	Fishing	Fishing	100%	Family tradition	Engaged in fishing
16	35	Male	Wangjiazui Village	Fishing	Fishing	Fishing	100%	Family tradition	Engaged in fishing
17	40	Male	Wangjiazui Village	Fishing	Fishing	Fishing	100%	Family tradition	Engaged in fishing
18	45	Male	Wangjiazui Village	Fishing	Fishing	Fishing	100%	Family tradition	Engaged in fishing
19	50	Male	Wangjiazui Village	Fishing	Fishing	Fishing	100%	Family tradition	Engaged in fishing
20	55	Male	Wangjiazui Village	Fishing	Fishing	Fishing	100%	Family tradition	Engaged in fishing
21	60	Male	Wangjiazui Village	Fishing	Fishing	Fishing	100%	Family tradition	Engaged in fishing
22	30	Female	Wangjiazui Village	Fishing	Fishing	Fishing	100%	Family tradition	Engaged in fishing
23	35	Female	Wangjiazui Village	Fishing	Fishing	Fishing	100%	Family tradition	Engaged in fishing
24	40	Female	Wangjiazui Village	Fishing	Fishing	Fishing	100%	Family tradition	Engaged in fishing
25	45	Female	Wangjiazui Village	Fishing	Fishing	Fishing	100%	Family tradition	Engaged in fishing
26	50	Female	Wangjiazui Village	Fishing	Fishing	Fishing	100%	Family tradition	Engaged in fishing
27	55	Female	Wangjiazui Village	Fishing	Fishing	Fishing	100%	Family tradition	Engaged in fishing
28	60	Female	Wangjiazui Village	Fishing	Fishing	Fishing	100%	Family tradition	Engaged in fishing
29	30	Male	Wangjiazui Village	Fishing	Fishing	Fishing	100%	Family tradition	Engaged in fishing
30	35	Male	Wangjiazui Village	Fishing	Fishing	Fishing	100%	Family tradition	Engaged in fishing

Table 3.1 Interview Report (Source: Field data, full details are given in appendix.)

Among them, there are 18 males and 12 females. The age range of all respondents is from 30 to 65 years old. People aged 30-39 account for 23%, 40-49 account for 51%, 50-59 account for 13%, and people over 60 charges for 13%. When selecting key informants, I did not specifically ask for differences in gender and age but specifically respondents engaged in fishing, basic agriculture, aquaculture, and multiple occupations. It is interesting that even though the respondents live in different villages, once other respondents are mentioned in the interview process, they have kinship, which is the characteristic of Chinese villages' societies. In terms of livelihood diversity, there will be a large family, which can form a complete assembly line in the industry. Through interviews in additional months (seasons), I found their work's diversity and seasonal characteristics and compared the income obtained by other jobs. Among the 30 people

interviewed, 19 are engaged in two or more jobs, including industries and agriculture-related to marine fisheries. Among the other 11 people, four are engaged in industries completely unrelated to marine fisheries. Their age range is between 30 and 50, and the remaining seven are engaged in jobs closely related to marine fisheries.

In this part, I first make a general classification of all the farmers' samples interviewed, which is a classification table based on the data of semi structured interviews. Among the 30 interviewees, ten are engaged in three or more jobs, accounting for one-third of the total. Most of these interviewees with multiple employment take the jobs with the highest income or the ones they are most familiar with and good at as their primary work (the main source of livelihood), because of seasonal influence, age and physical conditions, policy call and guidance, etc., they have higher and more urgent requirements for income, so they began to engage in other industries and multi-industry employment at the same time. Among the 30 people interviewed, ten are only involved in two sectors. Among these ten people, it can be clearly seen that if the choice of the primary industry is still an industry related to the marine fishery, the secondary industry must be agriculture. This part of the sample is like the traditional livelihood model of Fengcheng Town, which is dominated by fishery and supplemented by agriculture. If the primary industry is a non-agricultural industry, the secondary industry is also a non-agricultural industry. Among the 30 samples, there are ten people who are only engaged in one occupation. Among the ten people, two are fully engaged in nonagricultural industries. The others are still dominated by marine fishery related industries, including professional fishermen, ship repair, shipbuilding, aquaculture, etc. It should be noted that the interviews with 30 samples I conducted are not enough to make a complete and convincing prediction of the development of the proportion of different choices of local livelihood strategies. I can only include all livelihood strategies as far as possible with the help of my gatekeeper to make a more comprehensive exposition of the livelihood strategies of Fengcheng town.

3.3.2 Marine- related industries and capture fishing as the main livelihood

(1) Professional capture fishing

Among the 30 farmers interviewed, there are four fishermen who are specialized in fishing and are the primary industry. These four fishermen are concentrated in the age range of 30 to 50. Their fishing skills are learned from the experience handed down from generation to generation. The reason why they did not give up the fishing industry and continue to engage in fishing is that they have become the captain and their family has enough funds to support the business of the fishing fleets. Captain Sun, who spent most of his time in ocean fishing, led the fleet. During the sea ban period, he repaired ships in the shipyard. This year, because the maintenance life of one of the ships reached the upper limit, he invested 700000 yuan in building a new ship in the shipyard. Although he occasionally engages in agricultural planting, his wife is only responsible for it. The crops planted are sweet potatoes and vegetables, which supplement daily life. From the perspective of human capital, he has mastered very skilled ocean fishing technology and knowledge and has a strong ability to work and adapt to changes. That's why he has been engaged in the fishery for more than 40 years. In terms of social capital, in the long-term fishing business, he has a good and stable relationship with the local fishery administration department, other fishing fleets in the village, ship repair yards and shipyards, and the contact network. The crew he absorbs also includes his relatives and neighbours in the village, so his kinship is very similar. He has gradually formed excellent leadership in the long-term skilled use of fishing technology, the use and purchase of large ships, and the leadership of the fleet. In terms of natural capital, Captain sun has the right to use the land under his own name and his wife's name (his two daughters have moved their household registration due to their marriage and no longer own the land), the right to use two fishing boats and the right to offshore fishing. The other three people are between the ages of 30 and 40. They work on acquisition boats and small fishing boats. Moreover, these three people are also engaged in other jobs, such as being a courier and the owner of a small supermarket.

(2) Professional aquaculture

This is still a livelihood choice dominated by the marine fishery industry and supplemented by other non-fishery industries.



Figure 3.1 Harvesting of crabs

There are two professional aquaculture practitioners in my interviewed group. They call each other teammates because they often help each other during aquaculture and gradually develop into a business partnership or even a company established by kinship. For example, Mr. Lin, is 60 years old, he was born in Lv Dou Quan village. He has four brothers in total. After graduating from junior high school, he engaged in marine fishing with his father and two younger brothers, and the youngest brother is studying. Ten years later, the two brothers gave up fishing and began to do hourly jobs. After that, he started to fish in other fleets. After another five years, he began aquaculture, mainly raising shrimp and crabs. His two brothers, one engaged in the processing of feed and the other involved in the transportation of seafood, The industrial chain of their three brothers is relatively complete and does not involve too many interest disputes. It has always been a form of cooperation. Because the youngest brother has been studying, he finally took

part in the national civil service examination and worked in the government department in the city. Mr Lin is the only one who takes care of the breeding pond, and all the shrimp and crab feeding are completed by himself. He gets up at five o'clock every morning and goes to his brother's feed processing factory to get feed. The feed is mainly small fish and shrimp shredded. He will put nutrient solutions regularly according to the breeding situation. After arriving at his breeding pond, he will row his boat and sprinkle feed in the whole pond twice a day. Then, when there are too much excreta of shrimp and crab, he will open the inlet gate to let fresh seawater in, and the gate will also be opened to let the dirty draft out. As usual, he puts in the shrimps in April every year, but in recent years, because the amount of *Enteromorpha prolifera* (a kind of algae) is increasing, it almost covers the whole offshore sea, so he delayed the time of putting in the shrimps and became the time from the end of May to the beginning of June, which is staggered with the time when *Enteromorpha prolifera* pollution is the most serious.

In this story, I can know that Mr Lin's livelihood strategy has changed. The transformation from marine fishing to aquaculture is his personal choice. The biggest reason is the demand for high income. He and his brothers established a family farming industry chain. At the same time, because of the severe growth of algae, the pollution of offshore waters has a negative impact on the aquaculture industry.

(3) Professional ship repair and shipbuilding industry

Among the 30 respondents, there were two men aged 30 and 40. One was a professional ship repair shop worker, and the other was a ship construction shop worker. The two factories are in two different villages, but they are very close. The ship repair shop mainly repairs the ships that have been used for a few years, while the ship construction plant is to build new ships. According to the requirements of the local fishery policy department, large ships more than 20 meters long must be overhauled and reviewed every year, ships that have been used for more than 20 years must be scrapped, and all parts that can continue to be used can be used in the construction of new ships. There are not many other workers working in the factory where the two workers are located, which is also due to the significant reduction in the number of ships and employees

caused by "Shi Hai". But at the same time, the two factories can still operate smoothly is precisely because there are few practitioners and fleets in marine fishing, thus ensuring the stability of ship repair and construction.



Figure 3.2 A ship is waiting to be repaired in the factory



Figure 3.3 A ship is nearly finished building

(4) Aquatic products company workers

Among the 30 interviewees, a worker who is nearly 50 years old works in an aquatic product company. He used to be a fisherman and later engaged in sorting seafood in an aquatic product company. The aquatic product company was originally the company of

pond turbot in Norway in 2001 and was later acquired by a local aquatic product company. But he still works in this factory. He has completely stopped farming or fishing. From the interview with him, we know that there are many villagers like him. They can get a fixed salary every month, and the factory will help pay welfare and insurance benefits. This is more stable than fishing.

(5) Fishing net factory worker

In addition to the middle-aged and elderly retired fishermen and their families mentioned in the previous classification who are doing part-time fishing net weaving and repair work, there are also special workers working in large fishing net factories. There are two kinds of fishing net factories in Fengcheng Town, one is a South Korean invested factory, and the other is a local factory. The interviewee, Mr Yang, works in a fishing net factory in South Korea. His salary is higher than that provided by the local factory, but the work content will be more onerous.

3.3.3 Non- fishery industries

In this part, I classify the livelihood strategy choices of the respondents in Fengcheng town at the second level and classify all the employees who take the primary industry like the supply industry, including two occupations and three occupations. Their primary industry choice has been nonagricultural and non-fishery industries, but they have not given up the primary industry as a supply part of their livelihood. Therefore, there are two kinds of livelihood options. One is fishery as a supplement, another one is agriculture as the supplement, and no longer engaged in fishing.

Among the 30 samples investigated, the groups selected for this livelihood strategy are concentrated between the ages of 40 and 60 and over 60. This part of the samples can be considered as retired elderly farmers or retired elderly fishermen, who often engaged in agriculture or fishery industry when they were young because of the growth of age,

Due to the decline of physical fitness, they can no longer engage in fishing, fishery and related industries, but they still don't want to give up agricultural land, or they can still repair and weave fishing nets to participate in the fishery industry and obtain some income. In addition, it does not engage in any industry related to marine fisheries at all. As a supplement, agriculture is only to meet part of the family's food supply. They have enough savings or find non-agricultural temporary workers to earn their main income. Most of the non-agricultural temporary workers in this age group work in their own villages or towns and do not need to move to cities or commute between cities and villages.

Among the 30 people, several residents completely separated from the fishery industry. One is Mr Wu, who is 46 years old. He founded a tourism picking garden himself. This kind of rural tourism has been sought after by urban residents in recent years. His picking garden combines agriculture, leisure, and entertainment and has achieved a leap from primary to tertiary. There is also Mr Xie, who is in the mid 30s. After graduating from university, he began to engage in the decoration business and serve all customers in Fengcheng town and the nearest city. His business income has helped him buy two houses and raise two children. Another is a woman aged in her late 40s. She works as a babysitter in the city. Her monthly income exceeds 10,000 yuan (RMB), more than three times the previous agricultural income. These three respondents have been fully engaged in the non-fishery industry and have only a single occupation. Their single employment has completely lifted them out of poverty and completed their career transformation.

Uncle Han, a retired fisherman, is 65 years old. His current temporary job is as a security guard in the primary school in the village. In fact, his main task is to watch the door and observe the passing people and vehicles. His livelihood came from hand weaving and repairing fish nets with his wife. Another example comes from Mr. Du, a small-scale livestock farmer in the village. He was a fisherman before. Later, due to the reduction of the number of ships, he did not have enough funds to invest in buying new ships. Instead,

he switched to cattle and chicken farming. Gradually, livestock breeding became his main business, and agriculture became his side-line.

The above division is based on whether the primary industry is the supply part of household livelihood strategy choice. Focus on industrial characteristics, put fishery under the broad category of agriculture, and judge the importance of primary industries in all industries.

3.4 The correlation between different livelihood strategies and livelihood capitals

In the above livelihood classification of fishermen's households based on different conditions, I found that different family livelihood strategies have different sensitivity to different livelihood capital. I tried to analyze the correlation between this livelihood strategy and livelihood capital.

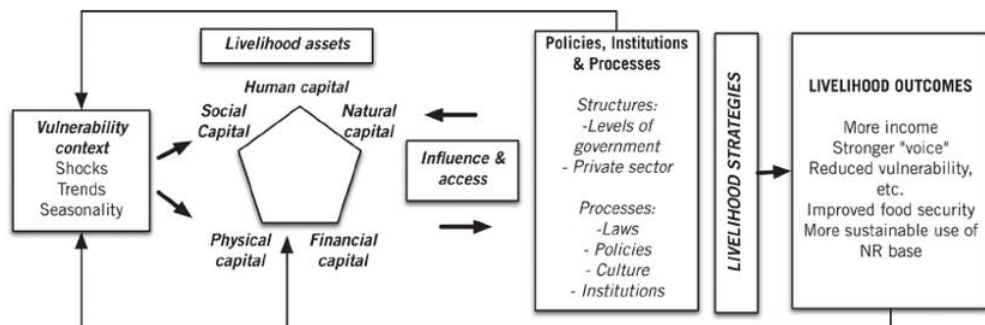


Figure 3.4 The sensitivity of rural households' livelihood strategy to livelihood capital, DFID (2002)

According to the most widely used sustainable development framework by DFID (the UK's Department for International Development), this framework emphasizes how different livelihood capital can be used to reduce poverty and risk (Xu, 2019; Xu et al., 2019a, 2019b), and finally promote the sustainable livelihood development of the whole family. Although this framework is mainly coming from agricultural households, it also works for fishery households. Different livelihood capital conditions determine farmers' choice of

livelihood strategies. Similarly, the ability to realize different livelihood strategies depends on Farmers' livelihood capital. A family is the smallest unit in rural society and the basic unit of rural poverty and development research in a country. It often has the characteristics of vulnerability. It can be understood that due to the impact of different other industries, the ability of owned capital to cope is insufficient.

After the above analysis of the 30 respondents, it can be found that the identity of fishermen in the fisherman community shows the characteristics of diversity, from the traditional livelihood mode dominated by fishery and supplemented by agriculture to more complex, more yuan, or even completely give up the livelihood options of the fishery. Non-agricultural and non-fishery employment opportunities are increasing, and they are also becoming the main source of family income. The livelihood and industrialization options of fishermen are gradually increasing and becoming mainstream.

So, the whole analysis framework is the sustainable rural livelihood analysis framework. There are five capitals: human capital, social capital, natural capital, financial capital, and physical capital. Connecting with the specific case study, I gave the details of each capital in the frame. In the social capital, there are social networks and connections within the village or between urban-rural, the kinship and neighbourhoods, official and informal groups, collective representation, mechanisms for participation in decision-making, and social leadership. In the natural capital, the Oceanary resources, including water and aquatic resources, the mountains and forest products, wildlife and wild foods, are mentioned in the village. In the human capital, education, knowledge and skills, capacity to work, capacity to adapt, and professional-skill worker are used in this village. In the physical means, the infrastructure construction work, including transportation, buildings, communications, have shown in this village, tools and technology including capturing fish, aquaculture skills, agricultural skills, seeds, fertilizer, pesticides also make the physical capital, what is more, the traditional and upgrading skills are also shown in the physical capital. In the financial capital, the capital is from the personal savings, multiple occupations, multiple income sources, credit/debit from the NGOs, or other informal organizations, the investments, pensions, subsidies from different levels of governments

Considering natural capital, firstly, according to different resource endowments and geographical locations, all fishing villages in Fengcheng town have the advantages of natural marine fishing and aquaculture, which is also the basis for the formation of the traditional livelihood of the residents of Fengcheng town. Secondly, the siltation of ports, the lack of marine aquatic resources, the pollution of marine water quality and the change of this natural capital all affect the traditional livelihood strategies. Third, because the planting and agricultural conditions of Fengcheng town are not good enough, the variety of crops is single, the salt content of the soil is too high, and there are many strong winds and cold weather in the marine climate, which is entirely unfavorable to the growth of general crops. These show that agriculture can only be used as the supply industry of Fengcheng Town and cannot be changed after the transformation of the marine fishery industry.

In terms of physical capital, the urban planning of Fengcheng town has been greatly improved under the implementation of China's "new rural construction" policy. The newly built roads distinguish the agricultural planting areas and construction areas of villages and towns, manage the abandoned land with high salt content, and rebuild terraces. These are the increase of material capital and contribute to the transformation of fishery industry in Fengcheng town.

At the financial capital level, in addition to the savings of each household, the government's subsidy policy has become the biggest driving force to promote the transformation of fishermen (Walker, Mitchell and Wismer, 2001; Lax and Krug, 2013). The government's policies include subsidies for the annual fuel cost of a small fleet, the trial of fishing licenses of vessels, the definition of fishing quotas, and subsidies for fishing vessels during the fishing moratorium, which have controlled the indiscriminate fishing to a certain extent and filtered and controlled some illegal fishing fleets to a certain extent.

As for social capital, social capital refers to the interpersonal trust and social network built by farmers to achieve the goal of livelihood ("The Sustainable Livelihoods Approach:

Toolkit for Wales," no date). It can be concluded from my research that the fleet in the village is composed of villagers who are familiar with each other and can help each other. Except for a few migrant workers, they are all related. In Mr Lin's story, he is a professional aquaculture farmer, but the cultivation, processing, and transportation network of the aquaculture industry relies on Mr Lin and his brothers. Therefore, kinship has become a necessary condition for the survival of the whole industrial chain. In addition, fishers are also closely connected with other sea areas because they stop at different docks. In addition to having their contact groups and organizations in each village, fleets and farmers in different villages will also organize regular training and meeting.

The most important of all capital is human capital, human capital including health, education, knowledge and skills, capacity to work, capacity to adapt (Majale, 2001: 5). It can be clearly found from my research that the age group of those who continue to engage in Marine Fisheries in Fengcheng town is concentrated in the middle-aged group, and they learn their fishing skills from a young age. However, with the growth of age and the decline of physical health, they cannot resist the high-risk characteristics of marine fishing. Their health limits their development. Many of these professional fishermen start fishing with their parents before they are 18 years old, so their educational level is limited, which has certain restrictions on their professional development. Groups of other ages are easy to find jobs in other non-fishery and non-agricultural fields because of their high level of education. The fishing skills acquired by professional fishermen, middle-aged and elderly fishermen cannot be applied to other fields, so marine fishery-related industries will still be the primary choice of their livelihood strategy. In the case of Fengcheng Town, it is precise because of the flow of young labour to cities and non-fishery industries that middle-aged and elderly fishermen are provided with job opportunities, their competition is much less, and the impact on the fishing resources of the whole sea area is reduced. This is a future task for the local government to promote the employment of marine fishing.

The promotion of different capital will lead to the transformation of fishermen's livelihood, especially from primary industry to secondary industry and tertiary industry

(From the forum on operationalizing sustainable livelihoods approaches, no date). In particular, the promotion of human capital and material capital will also lead to the transformation of part-time agriculture. From the perspective of livelihood diversification, the improvement of natural capital will promote the diversification of income sources of fishermen's families, while the improvement of material, human, social and natural capital will strengthen the occupational diversification of family members. In addition to industrial upgrading, increasing product added value is also a change method from primary industry to advanced industry. From household livelihood activities dominated by a single primary industry to livelihood strategies combined with multiple industries, these make households less vulnerable and more resilient to poverty.

3.5 Multiple crises

China is rich in water resources, including marine and inland rivers, lakes and seas. Therefore, residents who depend on water and draft will have relevant livelihood strategies. At the same time, due to the change of state-led policies on the use of water resources, the residents who live near the water (fishermen at the sea or riverside) face the situation of "Shi Hai" (deprived of the ocean). The endogenous mechanism of "Shi Hai" is the structural upgrading of the fishery industry, which is harmful and challenging to the traditional livelihood strategy of small-scale fishermen. Through the investigation of fishermen along the coastal region in China, it is found that fishermen in the Yangtze River Basin, the Zhu Jiang River Basin and Hainan Island have been seriously impacted by "Shi Hai".

On the contrary, although the fishermen in Fengcheng town have not encountered the very serious challenge of changing production, and have evolved a variety of ways of employment and integrated development of multiple industries, Fengcheng fishermen have not moved towards overall prosperity. They are facing more complex problems, so they are in the dilemma of marginalization. To judge the degree of wealth of fishermen, we need to compare their environment. Fengcheng town is located in a developed coastal area. When the surrounding fishing villages rely on the rapid development of tourism

industry, large-scale seafood processing industry and marine high-tech manufacturing industry, Fengcheng town seems to be a forgotten corner. Especially after the implementation of the fishing ban policy and the new rural construction policy, the original stable traditional fishermen's livelihood in Fengcheng town was forced to change. Under the new livelihood strategy, some fishermen realized the transformation and obtained more income, while most fishermen still continued their fragile livelihood in the whole rural community.

As I mentioned in the theoretical framework, I have summarized six livelihood crises, and I will analyze their specific connotation one by one.

3.5.1 Crisis in industries

First of all, multi industry development exists, but it lacks cluster effect. Obviously, Fengcheng town will still not abandon the advantages of marine fishery, but the traditional fishing fishery as a single source of livelihood is also undesirable. Because of the requirements of the fishing ban policy, predatory fishing has been strictly prohibited. Fishing can only be carried out in the non fishing moratorium, and the scope of operation of fishing vessels is limited due to the restrictions of international sea areas. There are no fish near the sea, so we can't go to the open sea. Only the middle zone can be fished by fishermen. According to the requirements of the "new rural construction" policy, "develop the fishery industry, increase employment and improve the income of fishermen", there are many marine aquaculture industries in Fengcheng Town, a small part of which are jointly farmed with the Institute of Oceanography, and most of them are farmed by families. Secondary industries related to marine fisheries include fishing net processing industry, ship repair and maintenance industry and seafood processing industry. In the tertiary industry, tourism has also become a new trend. The emerging farmhouse has attracted many tourists from the surrounding urban areas. In addition, Fengcheng town also has a certain development because it depends on the mountains, the fruit tree planting industry in the mountains and the mountain spring water processing industry. However, even if all

industrial forms exist, they are scattered and cannot form a cluster effect. So far, the disadvantages of each industry have been increased.

The mountain terrain of Fengcheng, some salinized soil and large temperature difference between day and night make the quality of sweet potato very high. However, the added value of sweet potato is very low. In the mature season of sweet potato, sweet potato can only be processed into sweet potato slices and sweet potato noodles. Other sweet potatoes can only be sold at a very cheap price, about 0.6 yuan 500g (0.08euro / 500g). However, the local single planting variety once again reduces the price and income of sweet potato.

Seafood obtained from fishing usually enters the market by direct sale and light processing. Direct sale depends on transportation and is generally sold in the local market, and the price will not be very high. The way of light processing is self-made dried fish, sauce, etc., with a single method. Only very precious varieties and stable production can make more money. Combined with the local aquaculture industry, fixed aquatic products will have high prices in specific seasons to increase income, but the labor cost in the early stage is high. The aquaculture industry I investigated is mostly family farming. Several brothers and sisters of a whole family form an industrial chain. This structure seems to be complete and stable, but it is very limited. Once a link goes wrong, the industrial chain will break and cannot be remedied, and the income of a family will be reduced.

In the maintenance industry of fishery tools, the repair of fishing nets can only obtain a very low income, which can be regarded as a part-time job for the middle-aged and elderly people in Fengcheng town. The manufacturing and repair of fishing boats have declined due to the decline in the number of workers engaged in fishing. There is only one shipyard and one shipyard in the town.

As for tourism and ecotourism, which has sprung up in recent years, there are few employees in farmhouse activities. There are only a few hotels in the town, and there is

no professional tourism training. Tourist resorts in surrounding villages and towns have attracted tourists. Public transportation is not convenient. Generally, only residents in nearby places will travel to Fengcheng town by themselves to experience farmhouse fun.

To sum up, various industries are scattered, unable to form a cluster effect, always face the risk of industrial chain rupture, and cannot unite with each other and produce higher added value. Fishermen can indeed be employed in different industries, but it is obvious that the income growth is slow and full of vulnerability.

3.5.2 Crisis in productivity and means of production

This part mainly involves two aspects: one is the lack of labor force, that is, the lack of fishermen engaged in fishing; The other is the lack and abandonment of fishing tools. After my research, I found that many fishermen who really continue to engage in professional fishing have already begun to engage in other industries because of their income requirements. In particular, most local fishermen choose to engage in non fish industries. It is the owners of ships and many outsiders who really continue to engage in professional fishing. These outsiders come from all parts of China, because modern fishing and fishing require low personal skills of fishermen. As long as they are healthy, they can join this industry. Fishermen from poorer areas will fish in Fengcheng town and send their income back to their hometown. At the same time, from the survey data, it can be seen that the fishermen who continue to engage in fishing are older, ranging from 30 to 70, basically concentrated in the range of 50 to 60. The quality of this labour force also limits the development of fishing. In terms of fishing gear of fishing vessels, in addition to the reduction in the number mentioned above, the registration and management of fishing vessels also lack perfect institutionalized requirements and evaluation system. In the review of the fishery administration department, there is only a requirement of one year. Whether it is necessary to repair or dismantle fishing vessels depends on the judgment of the owner of fishing vessels.

3.5.3 Crisis in redistribution of resources

This part of the crisis is reflected in the rural class differentiation caused by the difference in capital control. The elite class in the fishing village will get more resources and more subsidies, so as to become a stronger party and have enough power, while small fishermen will be more vulnerable and less helped. In Fengcheng Town, the owners of large fishing boats and fishing gear are the ship owners, that is, the captain. According to the subsidy requirements for fishery production in the "new rural construction" policy, the owners of fishing boats enjoy high diesel subsidies. The current diesel price ranges from 2200 yuan per ton to 2600 yuan per ton (1 euro=7 yuan) (Zhao and Jia, 2020). A large ship with 960 horsepower consumes 69 kg of diesel per hour. Each time the fishing boat goes to sea, it takes more than one day, which is calculated according to one day, It consumes 1 ton of oil a day. The monthly diesel subsidy is 7000 yuan. Fishermen who join the sea as working crew members can get a basic salary of 7000 yuan per month, and the rest will be distributed according to the profits from the sale. This kind of dividend income is very unstable, and this kind of income is out of proportion to the input of labor.

3.5.4 Crisis in lack of self- organization

The self-organization of small-scale fishermen is the international trend of fishery management. Under the background of Rural Revitalization Strategy, the government delegated the management power of small-scale fishery to fishermen's organizations in order to realize the autonomy of small-scale fishermen at the grass-roots level. In fact, there is no such self-organization of orderly management in the fishermen group in Fengcheng town. I found that they have a communication group established by social media. The content only discusses whether the weather and fishery administration are inspected or not, which does not reflect the operation of the organizational structure. They are passively regulated, and there is no fishery cooperative to establish connection. It is cannot be empowered to achieve an organization as trade unions.

3.5.5 Crisis in management of fishery administration

Fishery administration departments are specialized in fishery management. They divide management areas according to the county level and exercise jurisdiction according to the corresponding sea areas. In terms of practical management, the fishery administration committee cooperates with the grass-roots government, which can be the most grass-roots rural villagers' autonomous organization. There are many fishing villages under the jurisdiction of different numbers of fishermen, but it is not easy to implement the unified regulation according to the current situation of different fishing villages. The ports of some fishing villages in Fengcheng town have been silted up, which is an adverse condition for ships to dock, so the fishing industry will be transferred to other fishing villages; The coastline of some fishing villages is tortuous, which is suitable for fishing and not for aquaculture. In terms of management, the fishery administration department did not pay attention to the particularity of different fishing villages, and then the industrial advantages could not be brought into play.

3.5.6 Crisis in governance of environmental pollution

As a public resource, marine resources are prone to "tragedy of the commons" in pollution control. Most of the marine pollution comes from human activities, including the reduction or even extinction of fishery resources caused by fishing, seawater eutrophication caused by aquaculture, excessive algae covering the sea surface, the discharge of sewage and garbage from human life and production, as well as the pollution caused by oil exploitation and dumping of ships. In the sea area of Fengcheng Town, algae cover has appeared since 2007. The annual summer fishing moratorium will appear from May to September. This time period coincides with the golden time of aquaculture. The sewage discharge of aquaculture and the addition of growth liquid have exacerbated the eutrophication of sea water, and will once again affect the lives of shore residents. At this time, the whole fishing village stinks of algae decay. The fishery administration department

will invest a lot of money and manpower to clean up the algae every year, but if the pollution of aquaculture is not solved, the problem of eutrophic seawater cannot be solved.

In chapter 4, I will explain more about these multiple crises with the political ecology framework.

Chapter 4 Fengcheng Town Fishermen under the Framework of Political Ecology

4.1 Literature review of political ecology

Political ecology rose in the early 1970s. Similar to political economics, it is also an interdisciplinary subject, which came into being in the period of gradual global environmental crisis and continuous social and political turmoil. Especially in the problems of lack and degradation of various resources in developing countries, political ecology provides a "de politicization" explanation, which has cultivated the public's environmental awareness and global awareness to a very wide extent. The study of environmental crisis can find the reasons for the rapid growth of population and the consumption of limited resources. The research on social problems can be interpreted as inappropriate land management or cognitive defects. At the same time, political ecology also provides the tendency of "re politicization". Scholars in the 1960s and 1970s used Marxist principles and methods to analyze problems, especially the criticism of land, agriculture and farmers in developing countries (Perreault, Bridge and McCarthy, 2015: 4-6). Therefore, the concept of "dependency theory" came into being. Therefore, for the environmental and social problems at that time, this perspective of political ecology can not only explain "de politicization", but also study "re politicization". The names of eco politics and political ecology are very similar, but the former studies politics from the perspective of ecology, and the latter studies ecology from the perspective of politics(Perreault, Bridge and

McCarthy, 2015: 621). The research object is ecology. The theoretical framework I apply is political ecology to study the change of fishermen's livelihood.

As for the definition of political ecology, the diversity of political ecology itself makes it possible to summarize its definition domain and problem domain. Since its birth, political ecology has been widely used in multi-disciplinary and multi field research, including not only general research disciplines such as environmental anthropology, environmental sociology and ecological / environmental economics, but also specific research disciplines such as sustainability, disaster research, rural development research, climate change research, urban environmental planning and soil degradation research. Therefore, from the perspective of the application scope of political ecology, it obviously shows the characteristics of diversity. This broad application scope and interdisciplinary nature make it possible to have multiple definitions and understandings. From the traditional academic sense, political ecology is certainly not a discipline or branch discipline: its research object, analysis framework and methodology are very different (Perreault, Bridge and McCarthy, 2015: 621). In fact, its obvious interdisciplinary characteristics are its decisive characteristics and advantages.

Lamont Hempel (Hempel, 1996: 150) believes that the study of political ecology involves the interdependence of political units and their relationship with the environment, and focuses on the political consequences of environmental change. However, most political ecologists are committed to a theoretical commitment to criticize social theory and hold a post positivist understanding of nature and the production of natural knowledge, all of which are inseparable from the social relationship of power. Environmental change not only means bringing wealth to some people and poverty to others, but also means a change in the ability of one actor to control or resist other actors. Therefore, political ecology should reveal the beneficiaries and victims of environmental change, the potential costs of environmental change, and the differences of power that produce social and environmental consequences.

To answer the problems in development, political economics, which combines productivity and production relations, provides a method. Gavin bridge and others(Bridge, McCarthy and Perreault, 2015: 300) pointed out that the works of political ecology are rooted in Marxist political economics. Piers Blaikie and Harold Brookfield(Blaikie and Brookfield, 1987: 17) believe that political ecology is "the combination of ecology and the concerns of broad political economy, which includes the dialectics of continuous transformation of society and land resources, as well as the dialectics of class and group of society itself". Thomas Park(Greenberg and Park, 1994: 1) believes that it is necessary to combine the two visions of political and ecological production, which have a broader impact on the formation of the relationship between political and ecological production. Richard Peet and Michael watts(Watts and Peet, 2004:6) believe that political ecology is "the combination of social sciences with ecological roots and the principles of political economics". From the beginning, political ecology has emphasized the struggle, interests and plight of marginalized populations, such as farmers, indigenous peoples, ethnic minorities, religious minorities, women and the poor. Political ecologists not only seek the explanation of social and environmental processes, but also strive to build an alternative understanding of this explanation, and move towards social justice and radical politics.

Through the above discussion, we can roughly describe the definition domain of political ecology, that is, political ecology takes political economics and other specific methods as the method system, studies the relationship between ecological environment change and specific political and economic elements, investigates and reveals the complex domestic and international political and economic power relations and games behind environmental change in response to the "Depoliticization" interpretation of ecological environment, It aims to create an alternative vision(Robbins, 2012: 20) that not only highlights social justice, but also promotes environmental sustainable development.

In Paul Robbins's book "political ecology: a critical introduction"(Robbins, 2012: 21-23), he divides the specific basic theoretical problems of political ecology into five aspects. First, "degradation and marginalization thesis" with the enhancement of national economic intervention and gradual integration into regional and global markets, the original

environment-friendly production system has gradually shifted to the excessive exploitation and utilization of natural resources. This may lead to increasing poverty and periodic overexploitation. At the same time, it is assumed that the traditional system of corporate ownership is imposed by the government in advance or unsustainable. The government or enterprises claim to improve the production system of local population with modernist development, but it leads to the weakening of the sustainability of local practice and the aggravation of unequal distribution of resources. Second, "conservation and control thesis" forcibly seizes and controls the resources and scenery of producers or producer groups composed of a certain class, gender and nationality in the name of preserving "sustainability", "community" or "nature". In this process, the government and global interest groups destroy the local livelihood system, production system and socio political organization in the name of preserving "environment". In order to control resources, governments or other actors define those historically productive and relatively good local production practices as unsustainable. Third, "environmental conflict and exclusion thesis". The government, private enterprises or social elites create more and more scarcity by seizing or occupying resources, which leads to conflicts among groups. Due to the intervention of the government and its agents and private enterprises, some groups control collectively owned resources at the expense of the interests of others, making environmental problems "socialized"; Due to changes in conservation or resource development policies, the existing persistent conflicts between communities have made social problems "ecological". The fourth is "environmental subjects and identity thesis". The institutionalized environmental management system full of power relations has led to the emergence of "new people", who have their own self-definition, a new understanding of the world, and a new ecological consciousness and behavior. It is certain that people's beliefs and attitudes will not lead to new environmental actions or rule systems. On the contrary, new environmental actions or rules will be produced. Give birth to "new people". The new environmental system and conditions have provided opportunities and necessary conditions for local groups to obtain resources and represent themselves politically. Because the ecological thought of "new people" can connect different groups including different classes, nationalities and genders, they represent a new form of political action. The fifth is "political objects and actors thesis". The interaction between the natural world

and the human world makes the material characteristics of the natural world political. The interaction of different people, organizations, communities and countries has changed the power relationship between them and has an impact on the environment and society. This can be related to the emergence of hegemonism and individual empowerment.

Under the current crisis of excessive accumulation in capitalist society, French scholar Gorz (Gorz, 1980: 26) put the foothold of his political ecology thought on the planning of "ecological socialism", which eliminates the disadvantages of "economic rationality" and advocates taking "ecological rationality" as the core principle. In Gorz, economic rationality mainly corresponds to capitalist society (including Soviet model socialism), and ecological rationality corresponds to the new social form of ecological socialism. "Economic rationality" unilaterally pursues economic growth and profit maximization, and requires the ecological environment to obey the needs of economic development. Under the domination of economic rationality, it will inevitably lead to "human exploitation of human beings and human exploitation of nature". Ecological rationality "can better meet people's material needs with as few valuable and durable goods as possible and the least labor, capital and natural resources.

Blaikie (Blaikie, 1985) has used the same point of view to analyze the environmental damage caused by residents' opposition caused by resource utilization in developing countries, that is, the national development policy has affected the land as the living basis of small farmers and herdsmen, and changed the traditional management mode and life mode of making a living on land. Among them, the most profound impact of environmental change is soil erosion. The reason is that the traditional land use form has changed. The impact of land use change is generated around the political and economic conditions of producers.

Combined with the above literature review and the elaboration of multiple crises in Fengcheng town in Chapter 3, I will analyze it in the following 4.2.

4.2 Political ecology in Fengcheng Town

In Fengcheng Town, the first crisis is the combination of fishery industry and other multi industries. Due to the lack of industrial cluster effect, it is impossible to achieve extensive development. Here, I can analyze the control issues in political ecology. Although with the support of the government and the efforts of individual fishermen, multi industry employment has become possible. But this change has destroyed the original local livelihood system. Such forced changes may not necessarily achieve sustainable development goals.

The second crisis is the lack of productivity and mode of production. It can be understood here that fishermen, as a key productivity, can no longer contribute to the new environmental action or rule system. At the same time, the original means of production have been destroyed or eliminated, and the old mode of production has been replaced by the new mode of production. There has been a new set of ecological understanding and conditions for integrating into the environment.

The third crisis occurs in the redistribution of resources, which is reflected in the fact that small-scale fishermen can only work for the captain / boss on the fishing boat and can only become employees. These captains often have the most means of production. For example, the captain has two large ships with more than 900 horsepower and is also manufacturing new fishing boats in the shipyard. At the same time, because the captain is the owner of the ship, he also enjoys state subsidies for fisheries. In addition, the captain has a close relationship with the local fishery administration department and can know the information of the fishing administration inspection vessel in advance. This represents that the elite groups in the fishing village create more scarcity of resources through the occupation of resources, which can easily lead to group conflict.

The fourth crisis is about the lack of self-organization of fishermen. This is a reflection of the "Marginalization" trend of fishermen. When vulnerable groups are unable to express their views on issues related to themselves, they will be more vulnerable. Political rights

will be damaged, social status will be lower, and the awareness of cultural rights will be weaker.

The fifth crisis and the sixth crisis are all about governance. When the management of environmental problems and resource allocation, that is, the fishery department and grassroots government, cannot fully implement their own power, it also represents the destruction of the relationship between man and nature. Fishery administration departments and grassroots should not control individuals as hegemonic organizations, but should empower individuals to guide contact or change.

4.3 The internal mechanism of “Shi Hai” in Fengcheng Town

4.3.1 Utilization of sea by fishery industry

According to the changes of China's annual fishery sea use data collected from 2002 to 2010 in the bulletin on the administration of sea area use of the State Oceanic Administration, it is found that the fishery sea use area has decreased significantly and faster in these ten years. The sea for the fishery is mainly divided into marine fishing and aquaculture. The marine fishing industry uses the ocean from offshore to ocean and then returns to offshore fishing within a certain range. The sea for aquaculture includes enclosed aquaculture and open aquaculture. The open aquaculture sea is generally considered to be used for aquaculture production by means of net cage, artificial seeding and natural proliferation of marine benthos. It is generally used for shrimp and crab culture. Enclosed culture is also shoaled culture, which is mostly used to cultivate shellfish, such as oysters.

In addition to the reduction of the proportion of basic fishery sea use, the increase of sea use for other projects is an important reason for aggravating the "loss of sea" of fishermen. The main projects are as follows. The first is the sea area for transportation. The sea area is used to meet the needs of the port, shipping, road and bridge and other

transportation construction. Large port construction requires smooth navigation channels and wide enough berthing places, which will affect the smooth fishing operation of fishermen. Many large fishing grounds, such as Zhoushan fishing grounds in Zhejiang Province, cannot operate because of the operation of Yangshan port. For Fengcheng Town, after the founding of new China, it has no longer been the birthing place of large ports, and the ports with large throughput have been transferred to Qingdao port.

The second is construction sea use. Some submarine projects need to lay cables. According to the protective sea use requirements of optical cables, ships are not allowed to anchor and carry out fishery production activities within one n mile on both sides of each optical cable. In Fengcheng Town, there is no large submarine project to lay cables, but there is the construction of the small military airport, which will affect fishermen's participation in marine fishing to a certain extent. However, because the construction of a military airport led to more policy support, the government subsidized the occupied homestead and cultivated land to the villagers in the form of money. Some villagers were relocated, which ensured their housing safety and helped them carry out fishery transformation.

The third is the use of polluted sea resources, which refers to the occupation of the sea area caused by the discharge of sewage or industrial construction pollution. For Fengcheng Town, there will be serious algae breeding from the end of June to the end of August every year, covering the whole offshore sea area. Although there are professional treatment teams to clean up, this kind of algae pollution continues despite repeated prohibitions under the influence of large-scale aquaculture in other provinces adjacent to the sea. There are also many negative effects on marine fishing and aquaculture in Fengcheng town. In my interview with Mr Lin, I learned that his response is to postpone the cultured fish and shrimp seedlings to be put into the breeding pond, and store seawater in large water storage tanks in advance. In this way, there can be enough clean water to replace the seawater during the busiest period of fish and shrimp farming.

The fourth is to reclaim land from the sea, which refers to building dikes and dams along the coast to occupy the original beaches and harbours. This practice of reclaiming land from the sea is mainly reflected in the construction of coastal marine parks and colleges and universities in Fengcheng town. For local villagers, this public resource is a good condition for their life, driving the development of surrounding land prices and house prices.

The fifth is the sea for tourism and entertainment, which refers to the development and utilization of coastal and marine tourism resources, the construction of resorts, bathing beaches, coastal shopping centres, etc. Some coastlines of Fengcheng town have established resorts, hot spring bathing centres, Ferris wheel amusement facilities and coastal theatres. The construction of these tourism facilities has provided many employment opportunities for villagers and directly realized the transformation from basic industry to service industry.

The fisherman "Shi Hai" (deprived of the sea) can be compared with the land lost by farmers. When the marine industry develops vigorously, it is just like the urbanization construction needs to occupy a lot of agricultural farmland and turn it into factories. Farmers can get the corresponding compensation provided by the government after occupying the land, but fishermen are often in an embarrassing situation. Fishermen need to ensure a series of measures such as appropriate compensation mechanism, insurance system, employment guidance, education and training after facing the "Shi Hai" compensation policy (Cen 2012: 11). In Fengcheng Town, due to the long tradition of fishery development and the preference of Qingdao for marine utilization policies, the pressure of changing production and reemployment is not very serious, and the transition of transformation has been basically completed smoothly. Including the increase of aquaculture for high value-added fish, the weakening of the impact on foreign-funded enterprises, the construction of artificial aquaculture reefs and the reduction of the use area of land reclamation projects. These measures have enabled fishermen in Fengcheng town not to be seriously endangered by poverty in "Shi Hai". Next, I will explain a series of measures taken by the local government.

4.3.2 Practitioners in the fishery industry

The fishery industry is a part of agriculture, and fishery practitioners also have similar characteristics to agricultural practitioners. The first point is the ageing of fishermen. As among the 30 respondents I surveyed, those who continue to engage in a single professional fishery industry are middle-aged and elderly men, and there are no young people under the age of 30 in the fleet of the whole town. Therefore, This intergenerational difference is also very obvious. The technical professionalism of elderly fishermen cannot be inherited, and the number of employees has also decreased sharply, which has also increased the professional life of these middle-aged and elderly fishermen to a certain extent.

The second point is diversification, which is the result of livelihood diversification choices. Single fishing can not meet the livelihood needs of most families. Especially after the implementation of the strict "Fishing ban" policy, this four-month fishing moratorium is a good time for non-fishery work. At the same time, female villagers can also fully participate in non-agricultural and non-fishery industries. Among the respondents, women engaged in the mother and child industry in cities and women who build small textile processing workshops in villages. They are no longer engaged in supply activities but actively participate and become the main source of family income.

The third point is poor education. This characteristic of low education level widely appears in rural China. 92% of the illiterate in China are distributed in rural areas. Among the 497 million rural labour force, 40% are educated in primary school and below, and only 12% are educated in high school and above (Wang and Wang 2006:72). In fishing villages, the problem of low education also shows the difficulties in the upgrading of the fishery industry. The middle-aged and elderly fishermen cannot meet the needs of modern fishing vessels with their fishing skills learned through experience, and many large multinational ocean fishing companies will not hire middleaged and elderly fishermen. In Fengcheng Town, these middle-aged and elderly fishermen reduce a lot of

competitive pressure because most of their fishing sites are offshore waters. A small fleet of villagers' relatives will join a unified chat group for regular training and information notification.

4.3.3 Pension security policies and other subsidy policies for marine fishermen

Fishermen are more vulnerable than farmers. In the face of the current situation of "Shi Hai", there are few places they can take the initiative to change. To a large extent, they need the support of the government. This support is three policies, including legal security, social relief and rehabilitation development.

First of all, in terms of legal protection, it is necessary to protect the identity of fishermen, protect fishermen's fishing rights, and have clearer legal provisions on fishermen's right to use the sea area and fishing boats. In the face of the impact of other countries and other sea areas on fishermen's fishery rights, we can protect the rights and interests of smallscale fishermen in relevant international marine laws.

Secondly, in terms of social relief, it is necessary to resettle and compensate the fishermen who have "Shi Hai", establish compensation policies and establish the pension fund for "Shi Hai" fishermen according to different local conditions.

Third, in terms of job transfer and resettlement, the government or nonprofit organizations need to strengthen the training of fishermen and establish a perfect training mechanism to help fishermen realize industrial transformation when most fishermen have low education. Fourth, the government also needs to restrict the approval of sea-related projects and reduce and delay the harm of "Shi Hai".

The fishermen in Fengcheng Town did not fall into poverty because of "Shi Hai", but also because of the full implementation of the government subsidy policy. First, for fishermen who no longer fish, the ship is designated as a scrapped ship, and the corresponding funds are paid according to the horsepower of the fishing boat. The funds shall be paid to all participants (shareholders, all fleet members and captain) at the time of fishing vessel registration. Second, subsidies for projects of changing production and industry are used to attract fishermen who want to change production and guide fishermen to change production, including breeding, processing, transportation, leisure, entertainment and fishery. Third, fishermen training subsidies. Young people who want to participate in marine fisheries, especially those who want to participate in ocean fisheries, will receive free fishery technical training. After the training is completed, they will obtain a maritime certificate and be recommended to relevant posts for employment. The fourth is about the education of the next generation of children, which specifically provides local education subsidies at the stage of compulsory education for the children of fishermen to reduce the pressure on livelihood. The fifth is the subsidy for demolition and resettlement. Generally, the government will pay a one-time fund. Of course, for fishermen who are difficult to find a new residence, it will also arrange low rent houses for fishermen to live. These policies have helped fishermen in Fengcheng town reduce the livelihood pressure brought by "Shi Hai".

4.3.4 The relationship between county industrial transformation and fishermen's livelihood strategy

While emphasizing Fengcheng town as a case study, I must mention the particularity of China's administrative planning: the county's concept. As I said in my profile introduction to Fengcheng Town, its administrative division level is the county. It includes several natural villages and is under a larger village community. This is a very critical part. At the same time, government departments at this level have the most direct contact with villagers.

The well-planned development of the county is conducive to the industrial transformation and upgrading of the whole region. Weber (Weber 1909: 124; "A Dictionary of Geography," 2009;) clearly put forward the concept of agglomeration effect for the first time in 1909. He believes that agglomeration is the location adjustment of interrelated enterprises in order to save freight and transaction costs after the location of industrial enterprises is determined by local factors (1909: 130). Industrial agglomeration can be divided into two stages. One is the economies of scale produced by enterprises through the expansion of their own production, which is the primary stage of industrial agglomeration; However, large enterprises rely on perfect organizational methods to concentrate in a particular region, which leads to more similar enterprises gathering to it and finally complete industrial agglomeration. The secondary and tertiary industries such as industry, commerce and service industry are all important parts of the county industrial transformation.

Taking the underdeveloped areas (villages and towns) dominated by agricultural production as an example, the degree of industrial agglomeration and development is mainly based on the degree of agricultural development. The faster the development of rural economy, the higher the degree of industrialization and intensification, and the more complete the industrial chain, the faster the modern production of agriculture. In addition, relying on the advantages of convenient transportation can drive the agglomeration of goods and population. When analyzing the law of industrial displacement, Weber found that a place with convenient transportation, rich resources and technology will gather around the transportation hub or be attracted to resources.

Fengcheng town has a very rich and long history of marine fishery industry. All villagers are closely connected with the fishery industry. It is industrial upgrading still needs to rely on the fishery industry and integrate into the market. The demand for the labour force is increasing, and the quality of the labour force is required to be improved. Policies need to have more advantages in attracting talents. The advantages of coastline tourism resources need to further promote the development of the tourism industry.

At present, the industrial structure of most county economies is relatively single, the primary industry accounts for a large proportion, the industrial foundation is weak, and most industrial products are handicrafts. There are few large-scale enterprises, fewer high-tech enterprises, low market share, no characteristics of the industry and no publicity. The tertiary industry is also mostly a traditional service industry, and the modern service industry supporting agriculture and industry is very weak. This also occurs in fishing villages that are seriously and negatively affected by "Shi Hai". However, Fengcheng town has a good industrial background relying on the blue Silicon Valley Economic Zone in Qingdao. The development of the blue Silicon Valley Economic Zone has also attracted a lot of employment, and the more mature industrial industries have also helped to form a complete combination of the primary, secondary and tertiary industries in the region.

For fishermen in Fengcheng Town, the development of a multi-industrial structure represents that fishermen can choose diversified livelihoods and participate in a variety of jobs at the same time to help meet the requirements for family income. Only the diversity of industries can realize the diversified choice of fishermen's livelihood and the transformation of individual livelihood. At the same time, without the participation of fishermen and other labour forces in different industrial activities, there will be no prosperity and development of various industries.

As the Chinese saying goes, "relying on mountains to eat mountains, relying on water to drink water". People's way of livelihood is closely related to the living environment. The environment is the basis for human survival. The history of human reproduction for thousands of years is constantly adapting to and transforming the living environment. Whether it is the reasons of policy, the objective change of ecology, or the evolution of the environment, people must adjust their livelihood to survive. Compared with inland waters, the marine fishery industry has increased the consideration of international influence. The "Shi Hai" fishermen need to participate in the employment of different industries more flexibly, improve their resilience, realize the transformation of individuals and adapt to the transformation of the fishery industry.

Chapter 5 Conclusion

Compared with the implementation of the complete sea ban policy in the Yangtze River Basin, the marine fishery development crisis in Fengcheng town has not received much public attention, nor has it been publicized or reported by a large number of public opinion. However, its development examples can provide some comparison for other similar areas located in coastal areas without relocated fishermen. Because these fishing villages are areas with contradictions but not sharp contradictions, they are often ignored by policies. Residents living in these fishing villages choose to accept these difficulties or make changes passively, and these fishermen are also forced to become marginalized groups.

Compared with other coastal areas like the fishing moratorium, Fengcheng town has not encountered the phenomenon of large-scale demolition, which has reduced the production enthusiasm of local villagers. Demolition can help them stay away from poverty to a certain extent.

Compared with other rural areas dominated by agricultural development, Fengcheng town has the advantages of fishery resources, but it can not play its role under the implementation of the "fishing ban" and "new rural construction" policies.

In conclusion, although the multi industry format of Fengcheng town exists, it still can not achieve prosperity, and the advantages have become the disadvantages. Fishermen are also more marginalized. In the fourth chapter, I try to explain the causes of this multiple crisis with political economics, but the long-standing problems of power and unfair distribution are difficult to solve in a short time. Both the fishermen forced to be impacted and the local government implementing the policy are facing new challenges.

Appendices

Appendix 1 Research question outline

Unstructured interview questions and design considerations

1.Tool: the video recording, recording and photographing functions of the mobile phone (the mobile phone is enough, the memory is large, and it is convenient for transmission. Of course, others can also be.) note that the opinions of the respondents must be solicited in advance and their permission must be obtained. Recording is the content of all questions, and photography is the industry and environment of the respondents, or the group photo of you and the respondents.

2. Summary of personnel and questions interviewed by key personnel

(1) Aunt Lian's father and mother

You can get information through family communication or through communication with aunt Lian. You can tell me more about the stories that Aunt Lian communicated with you before, and I will record them.

Life story, historical interview

1. Name, age, occupation, several children in the family, their respective occupations, are they from the same village and know their experience?

2. What did you do when you were young, the development process of family small industry?What is the business scope of the village / town tool factory?What tools are available?How did you get the idea of running a factory?Father's main business?

3. owners main business?Agriculture?Repair fishing nets?

4. Do you have any fishing experience?Breeding experience?

5. If you repair the fishing net?How is it associated with a large fishing net factory? Is it odd job processing?Or your own fishing net factory?What is the connection with your own tool factory and linkage production?

6. Income? sensitive to the Chinese, but you can know the proportion, which means the proportion of income from different industries in the total household income?

(2) The hotel in the village, the East Village Hotel

The story about this restaurant can be sidetracked, such as a quick glance we had at that time, and the frequent collective patronage of your colleagues. How was a village hotel, and one of the few hotels with more formal and good dishes, established. I forgot the accent of the restaurant owner at that time. I seem to remember that it was from the northeast. So~

1. Is the boss's wife from this village? What are the sources of customers in the hotel? (transport vehicles? Businessmen? What business? Celebrations of the villagers? Dinners?)

2. Afternoon gambling, rural gambling, mahjong poker sideline?

3. Is there any land at home? Agriculture related?

4. The way of supply is close to the wharf, so there are many seafood, fish and shellfish? Is it a private purchase directly from the wharf, or is it related to the farm and pond?

(3) Steamed bread grain and oil grocery store

In the grain and oil store at the gate of the primary school, after my observation, the owner engaged in the production of steamed bread, the sale of rice flour, grain, oil, mutton rolls, sauces and non-staple food, and a new business, meituan distribution? (I forgot the exact name, remind me to modify) the pick-up point, which is a very interesting innovation. The combination of the most popular and advanced vegetable distribution business in the village.

1. Are you from this village? Married daughter-in-law? When did you start making steamed bread and selling grain and oil?

2. When did meituan start its distribution business? Do you have any authority or requirements to apply for qualification?

3. Is there any land at home? What are the main crops for agriculture?

4. Is there anyone engaged in marine fisheries? Men at home? Fishing? Small fishermen, medium fishermen? (distinguished by fishing boat horsepower)

(4) Nanny

As a sister-in-law in the city, the nanny takes other people's children, the situation at home, and the old man lives in the apartment in the village, which shows that he has accumulated some funds. What does the husband do? What about the field?

1. Since when did you become a sister-in-law?How did you start to be a sister-in-law?Join the organization?Trained?Textual research?How many households have been served?

2. Why do you want to be a sister-in-law?What is the opportunity?Introduced?

3. What was your job before you became a sister-in-law?

(5) Pangyu Qingdao aquatic products Co., Ltd., with the participation of foreign capital from Norway, is located in Tanyu village.(person in charge: Li Huajun, 13573238985)

It mainly breeds turbot, that is, turbot.It attracted investment in January 2001, with 200000 fry, which can produce 200 tons of fish in 7 ~ 8 months.This is the data at that time. What are the current breeding varieties, growth cycle, transportation and sales locations?

(6) Fengcheng Changling Ecological Park (ecological park of Senmiao Biotechnology Co., Ltd.)

1500More than mu of biological industry base, business scope of ecological park, planted tree varieties, fruits, agricultural products, tea, cultured livestock?Sheep?Is there a farmhouse banquet?

(7) Ecological restoration project, how to remove Enteromorpha prolifera in the ocean?

This is more professional. It should be the responsibility of the ecological restoration project of Blue Valley Authority.I will also continue to follow up the information on their official website.

(8) Hot spring landlady

Why can the hot spring shop be opened all the time despite the demolition?Did it come to their house?How many years has the hot spring been open?When did the whole town start the hot spring industry, tourism and farmhouse industry?Are there any other industries besides hot springs?Aquaculture?Agriculture?Non agricultural industry (urban work)?(sensitive question: demolition compensation, the number of people taking hot springs every day, how to ensure safety and health? Is it really "fishing for money with clean water"

(9) Wharf observation (are there any fishing, aquaculture and shellfish sold during the fishing moratorium?)

(10) Pork factories and pork shops

(11) A chicken farm in the village

(12) The scene of lotus pond in the ancient village of Kaolao village in this season

Be careful: The unstructured interview is relatively free and has a style of rambling, but the theme and framework are determined, that is, the problems are carried out according to their family livelihood. In addition, I also want to know the professional division of labor between men and women in the family, differences, changes and so on.

3、 Key group discussion

Information about fishery associations or local fishery collectives. One or two fishermen can understand the situation of this fishery group. Are there regular meetings to solve what kinds of problems together? Development?

If the key group discussion is too difficult to achieve, it needs to be achieved through non participatory observation. I wonder if you have a chance to go to sea by boat? So we need more experience related to real fishermen.

Appendix 2

Question outline for asking village secretary

1. For your identity, you are tackling numerous roles, do you have subsidy from the work of village secretary?

2. You are always living in Jimo District (urban area), what is your main job? How can you join/manage the village affairs?

3. Life experience, when you start to be a village secretary? How were you prepare for the village secretary election? Why you want to be a village secretary? What are the differences of becoming a village secretary (before and after)? How long for the tenure of office? Specific requirements?

4. As a village characterized by marine fishery and aquaculture, how to give full play to its advantages and disadvantages?

5. What kind of contribution you did for this village, as a village secretary? What did you do for you, for your family after being a village secretary?

6. What are the differences between as a village secretary, and as a village member? How do you look at the development of the village with different identities?

7.The development and changes of fishing in the whole village? What are the difficulties of engaging in a wider range of aquaculture and marine fishing? How to strive for government subsidies and how to advocate the survival of marine fisheries?

8.In addition to marine fishery related industries, what other industries are there, handicrafts, commercial canteens, supermarkets, farmhouse entertainment, tourism, livestock breeding, transportation, agricultural products processing industry generated by agriculture and its related added value.

9.The impact of the change of administrative division on small villages (from Fengcheng town to Tianheng town) is only different in name, or in management, what impact does it have on striving for fishery subsidies, welfare, arrangement of public servants and rural construction planning.

Appendix 3

Research Report

[illegible]

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