The Emergence of Commercial Marine Ranching in Eastern China: An Assessment of Institutional Frameworks

by

Guodong Wang
Bachelor of Arts, University of Victoria, 2017

A Thesis Submitted in Partial Fulfillment
of the Requirements for the Degree of

MASTER OF ARTS

in the Department of Pacific and Asian Studies

Supervisory Committee

The Emergence of Commercial Marine Ranching in Eastern China:
An Assessment of Institutional Frameworks

by

Guodong Wang
Bachelor of Arts, University of Victoria, 2017

Supervisory Committee

Dr. Andrew Marton, Department of Pacific and Asian Studies
Supervisor

Dr. Sujin Lee, Department of Pacific and Asian Studies
Member

Abstract

Supervisory Committee

Dr. Andrew Marton, Department of Pacific and Asian Studies
Supervisor

Dr. Sujin Lee, Department of Pacific and Asian Studies
Member

Based on research showing the serious environmental damage associated with conventional aquaculture, coastal marine ranching has been promoted by the Chinese government as an ecological and environmentally friendly way to produce aquatic products and simultaneously restore the marine environment. However, marine ranching is a general concept and there are significant differences among the three main types. This study initially focuses on commercial marine ranching to distinguish it from other types by identifying its unique features, functions and goals. Examining institutional frameworks of commercial marine ranching operations reveals the evolving interactions and interrelations between key actors in the network. The analysis adopts a modified social network theory approach that incorporates Chinese *guanxi* culture in a case study of the White Dragon Islet marine ranching project to research commercial marine ranching in China. Semi-structured interviews were conducted to collect details from each group of key actors, including the private sector, government, and local communities. Key outcomes of the research include developing a better understanding of the types of marine ranching in China and important insights into changing relationships developed from acquaintance to intimacy and then to trustworthiness within the institutional framework of a successful commercial marine ranching project. The thesis concludes by highlighting key practical implications for government policy and for commercial marine ranching practitioners to improve the implementation of such operations in China.

Table of Contents

List of Tables

List of Figures

List of Abbreviations

CMR	Commercial Marine Ranching project
PWMR	Public welfare Marine Ranching project
RMR	Recreational Marine Ranching project
WDI	The marine ranching project of White Dragon Islet

Acknowledgments

I would like to deeply thank my thesis supervisor, Dr. Andrew Marton of the Department of Pacific and Asian Studies at the University of Victoria for his inspiring feedback and generous support. The door to Dr. Marton's office was always open whenever I had any questions about the research. Even when we were not able to meet, he also made his best effort to guide me with the research remotely. Having Dr. Marton supervising me is the best luck on the path of my academic studying and having Dr. Marton in my life is the best feeling of a warm home for me in the foreign country of Canada. Hence, I also want to thank dear Wei Wang, Dr. Marton's wife, for treating me like a family. When I was studying abroad by myself, Dr. Marton and Wei invited me over for dinners in many festivals in the past years.

I wish to show my gratitude to my committee member, Dr. Sujin Lee of the Department of Pacific and Asian Studies at the University of Victoria. Her detailed suggestions and comments on the research inspired me to carefully review the full text with fresh thinking.

The research could not be possible without the participation of my research interviewees. Thank you all for patiently sharing with me your experiences and perspectives, and for allowing me to convert all of these into research ideas.

Finally, I must express my very profound gratitude to my parents and my dear Quinee for supporting me with help during the field study in China and continuous encouragement throughout the years of study and through the process of researching and thesis writing.

To all those who have given me generous support in the past years, thank you!

Dedication

To Mom, Dad, and Quinee,

who support me for the whole time with kindness and integrity.

Chapter 1

Introduction

A Trip towards the Research

On a Sunday afternoon in the summer of 2016 a university professor and his student were invited to visit the commercial marine ranching project of the White Dragon Islet (hereafter WDI) located in Luxi town on Luxi Island, Dongtou District, Wenzhou City, off coastal Zhejiang province, China. A luxury car picked up the two guests from the airport and sent them directly to the Zhuangyuan'ao ferry terminal. A commercial passenger ferry runs from the terminal to Luxi Island, where the project is located, six times a day all year around. Commercial ferries were the only way for people going back and forth to Luxi Island. Some other wharves also connect Luxi to the mainland, but this terminal is the biggest. On this line, the ferry transports about a hundred people at a time. After entering the ferry terminal, the two visitors observed that the waiting room was already crowded with passengers. It was a muggy room without air conditioning in the hot summer along the littoral area.

Meanwhile, an eighty-foot Chinese marine surveillance vessel slowly docked in the ferry terminal. The marvellous vessel looked new with no rust at all. But why was such an impressive marine surveillance vessel docking here? Perhaps they were coming to check workplace safety in the terminal or the sailing condition of ferries. The foreign guest was also curious about why Chinese government employees were working on a Sunday. While patiently waiting for the ferry with dozens of other passengers the visitors noticed a man suddenly disembarking from the vessel and he quickly approached waving his hand. "Please take the ship with me," the man said to them. But which ship? Hold on, the marine surveillance vessel? Without having time to appreciate the reasons they were ushered on board the government vessel and immediately

noticed a neatly organized and very well-equipped bridge and adjacent lounge area with air conditioning and refreshments. Their only thought was this is a lifesaver in the blistering summer heat. After a brief greeting from one of the owners of the WDI project, who was already on board to welcome the guests, the vessel departed for Luxi Island. After about thirty minutes the host and two guests disembarked waving thanks and goodbyes to the five uniformed crew having enjoyed a very pleasant scenic journey on an official government-operated vessel on a Sunday afternoon.

Wait! What an astonishing trip! How could it be that a Chinese State Oceanic Administration marine surveillance vessel came to assist two private visitors in taking a personal trip to the marine ranching project site of a private company on a Sunday afternoon? It began to sink in that something significant had just happened. After getting to the destination of the field trip, two guests have considered an overview of the WDI project on-site. The project is the only commercial marine ranching project in Dongtou area, is solely invested by private entrepreneurs and has the capability to produce over one million yellow croakers annually. By mid-2019 the project included an investment team of nine investors and employed over forty local workers with total gross revenues of one hundred million RMB for that same year.

It was clear that marine ranching, one of the marine aquaculture types, is not a new idea since Chinese scholars have started to talk about the concept of farming and ranching of the sea as early as the 1960s (Yang, 2016). However, after some pilot projects were halted in 1990 due to financial constraints, China moved its focus away from marine ranching for more than twenty years. Around 2013, the central government reintroduced the idea of marine ranching as a part of the future development direction of fisheries and gradually promoted its importance year by year (Chen et al., 2019). Therefore, under the broad policy guidance in China, it is believed that the

privately-owned WDI project on Luxi Island could be essential to regional development and its management team is closely connected to many stakeholders and external actors like government officials and local residents at the moment of such project being displayed before the eyes.

While absorbing the information about the WDI project and the marine ranching industry on-site, several questions gradually came to mind. Marine ranching is not a phrase often used or understood by the majority. It is worth to investigate what marine ranching, especially such commercial marine ranching operation, is in China and why they are getting more valued by the Chinese government at this stage? Why would an official ship help the leader of a local company with the reception of personal visitors? Is there any connection between these two parties? How was this CMR project implemented in this area and who are the stakeholders or involved actors in the CMR project? In addition to the private investors and government officials, how were local people involved in the construction of the CMR project? More deeply, how did the connections between these actors form and develop within its institutional framework? The seeds for doing this research were planted at that time as these and other questions were raised.

Combined with all the questions raised by visitors to the project described above, this study begins by exploring the background of the development of marine ranching to emphasize the need to promote marine ranching in China. Then it examines different types of marine ranching projects and investigate how the interrelations between actors were cultivated and transformed before and after the initial construction of the CMR project. The WDI project on Luxi Island was selected as a case study site for this research. A detailed analysis of the evolving relationships between stakeholders and key actors in such commercial projects in China will contribute to our understanding of the wider picture of changing institutional frameworks of the newly emerging commercial marine ranching industry.

After having the experiences of observing the working conditions and working procedures on-site and talking with several actors involved in different groups, this first-hand information will be used to reflect on the formation and evolution of institutional frameworks of the CMR industry. Moreover, in correspondence to marine ranching being promoted by the Chinese government, doing the research also provides scholars, officials and potential practitioners a clearer map of important elements including leadership restructuring, government support, processes of relationship building, and risks before or after starting the commercial marine ranching project. By focusing on commercial marine ranching among the family of marine ranching projects, the research begins by emphasizing the participation of private capital. It then examines the roles of external actors supporting the commercial marine ranching project. The ways and methods of building up connections within the institutional framework of such commercial marine ranching project in Wenzhou can be a systematic tool for both the private sector and the public sector to consider while planning the development of CMR projects, including public marine ranching operations with different functions in the east coast of China. By highlighting the detailed formation and evolution of relationships between all of the key actors, this study demonstrates how a very large CMR project successfully developed from scratch, and how consideration of connecting stakeholders and other actors are critically important in determining the success or otherwise of various CMR projects or other types of so-called ecological aquaculture in China.

A Brief History--The Need to Transform Fisheries in China

While this study places the CMR operation at the core of this research object, it is necessary to illustrate the background of how and why marine ranching, one of the marine aquaculture types, has become a critical part of the future development of fisheries in China. By

understanding this, the importance of promoting and analyzing marine ranching will be highlighted.

Fisheries are also known as “capture and aquaculture industries” (Zhao & Shen, 2016). The rapid development of the capture fisheries sector from the 1980s to the beginning of the 21st century caused overcapacity and overexploitation of resources. Because of the excess utilization of fishery resources in seas and the destruction of environment and ecosystem, marine fish began disappearing and the capture fishery has stagnated after around 1999 due to multiple measures made by China to restore marine fishery resources (Cao et al., 2017).

Several measures were undertaken to prevent the deteriorating conditions of the capture fishery in China. A summer fishing moratorium was imposed by the government in 1995 to help the protection and management of fishery resources. Until now, fishermen all over China are prohibited from capture fishing in four sea areas, including the Bohai Sea, the Yellow Sea, the East China Sea, and the South China Sea, for about three to four months in the summer every year (Yan et al., 2019). Moreover, the Chinese government proposed goals of “zero growth” and “minus growth” in coastal marine capture catch in 1999 and 2001, respectively, to deal with ecological and environmental issues. Furthermore, 8000 fishing vessels were scrapped, and over 40000 fishermen were relocated within two years after the start of a program of reducing vessel numbers and relocating fishermen away from marine capture fisheries in 2002 (Blomeyer et al., 2012).

On the other hand, aquaculture has become the crucial component of the fisheries sector in China over time as Zhang (2015) indicated that aquaculture only contributed 26 percent of China’s total fishery production in 1978 and it accounted for nearly 74 percent of the total fishery production by 2013. Meanwhile, China has also become the largest aquaculture producer

providing more than 60% of total world production (FAO, 2016) Aquaculture became to the core of the fisheries industry in China and even in the world. However, much of this activity was unregulated and resulted in numerous environmental, human health, and food safety problems (Zhang, 2015). According to Li et al. (2011), the primary ecological effects of aquaculture include organic pollution caused by discharges of fish wastes and feed, chemical pollution and water deterioration.

The fisheries industry in China contains both capture and aquaculture activities in inland freshwaters and marine seas as shown in Figure 1. This research leaves the freshwater part aside and focuses on the marine part by examining examples and statements on marine activities. Therefore, the research narrows down the range to marine catch and marine aquaculture – the latter also called mariculture (See Figure 1).

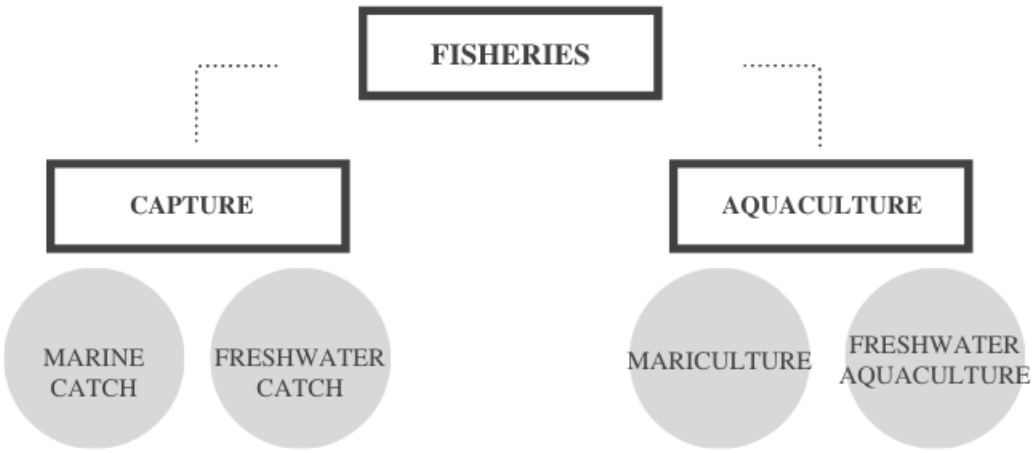

Figure 1 Subordinate Branches of Fisheries

Source: Compiled by the author

As background for the research undertaken in this study, it is useful to provide a brief historical comparison between marine capture fisheries and mariculture. As a result of the measures implemented since 1995 mentioned above, the marine capture fisheries in China began

to stagnate while mariculture made a rapid growth beginning in the early 2000s to continuously meet the demands for marine products, as illustrated in Figure 2.

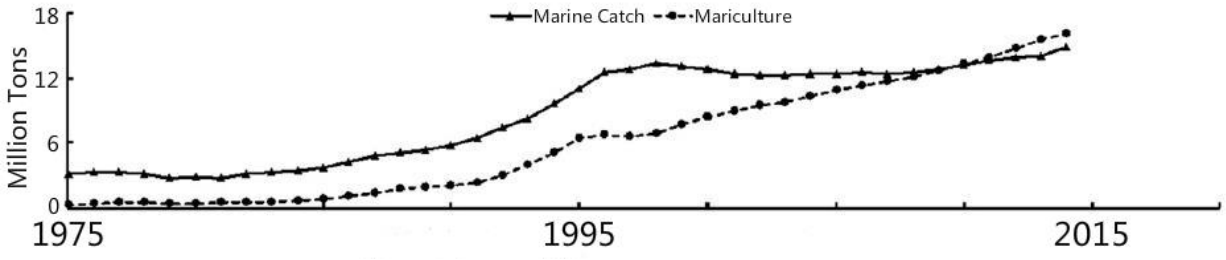

Figure 2 Total Quantity of Marine Catch and Mariculture in China by Year

Source: Cao et al., 2017, p.437

Figure 2 clearly shows a significant increased annual production in marine catch and mariculture from 3 million to 12 million tons and 0 to 6 million tons for the 20 year period to 1995, respectively. Marine catch productions were about the twice volume of mariculture production at the end of the 20th century. Since then, under the pressure of strict marine catch policies and measures, the total production of marine catch remained almost unchanged for the next two decades at around 13 million tons a year. Conversely, the development of mariculture almost tripled over the same period with production surpassing the total for marine catch for the first time in 2006 and approaching 16 million tons by 2014.

Although mariculture production has achieved significant growth in the total volumes of output, conventional mariculture techniques dominated by suspended net cages, ropes, or other structures positioned in open ocean waters have been criticized for causing severe problems, including food and excretory waste, into adjacent sea areas (Reece et al., 2017; Yan et al., 2017). Therefore, a more ecological and environmentally-friendly method of marine aquaculture production was seen as urgently needed even in the early 2000s. Marine ranching is considered one of the few alternative mariculture methods available for increasing productivity and for the

essential task of building sustainable marine fisheries and healthy coastal ecosystems in China (Ungson, 1993; Yang et al., 2016). Subsequently, China started to shift its development focus from mariculture using conventional methods and structures to a model that promotes marine ranching techniques to achieve both the restoration of the environment and ecosystems and to increase farmed ocean fishery products (Chen et al., 2017).

Building on this brief history and background of marine fisheries, a key overall aim of this study is to illustrate how China's fisheries have transformed, to describe what marine ranching is and to highlight details of a successful commercial marine ranching project which will be valuable for understanding the future development of mariculture and fisheries in China.

Purpose of the Research

The first goal of the research is to introduce the debates which exist in defining marine ranching and differentiate the features and circumstances of CMR from other types of marine aquaculture. Marine ranching (*haiyang muchang* 海洋牧场) is considered the necessary method for stock enhancement of fishery resources and restoration of the marine ecosystem in China. Governments at various levels have been promoting marine ranching since the early 2000s (Yang et al., 2016). Meanwhile, past reports have indicated that the future development of marine ranching requires more involvement of governments, the private sector and local communities in construction and operation (Yang, 2016; Zheng & Tang, 2017). However, under the broad idea of marine ranching, the roles of the private sector, the public sector and ordinary people seem ambiguous, and this appears to be part of the reason for the emergence of several types of marine ranching operations that need to be examined. In addition, gaps and ambiguities in defining each type of marine ranching in China and the lack of an official mechanism for approving such operations were observed while conducting the research. The subsequent

problems, such as arbitrarily using “marine ranching” in company and project names and disregarding the goal of restoring the environment, must be confronted for the sake of the further development of the industry.

Hence, the following chapter will categorize marine ranching types in the particular circumstances of China and indicate the key characteristics of commercial marine ranching projects (CMR) as the key objective. The discussion distinguishes CMR from other marine ranching types by highlighting its unique circumstances and elements and will introduce the phenomenon of the mixed-use of different marine ranching types at the current stage in China.

Next, another important objective of the research is to identify and examine the roles of key actors involved in the construction of the case study CMR project to reveal how their interactions and interrelationships at all levels were formed, how they shaped the direction of the project, and how they changed as the project developed. To assess the institutional framework of the case study CMR project in Zhejiang the research adopts a social network theory approach that incorporates Chinese *guanxi* culture to position key stakeholders and individual actors, and to examine each of their connections and interactions within the social network. Ferreira and Armagan (2011) assert that the social network serves as a structure composed of organizations or individuals that are interdependent and are connected in specific patterns. Applying a social network theory approach, this study divides these intricate relationships into three levels, including inter-employee, employee-society, and inter-organization levels (Yu 2008). While analyzing relationships in China, a theoretical framework largely based on Western circumstances might not be sufficient to observe the dynamic evolution of connections between actors. Adapting social network theory to by incorporating the Chinese form of social relationships, called *guanxi*, gives dynamic analysis as well as more angles to view various links

within a network, including blood relationships, direct and indirect friends, colleagues, and others with shared and/or mutual interests (Yau et al., 2000).

More will be said about social network theory and *guanxi* in the chapters which follow. For now, mainly at the level of employee-society relationships, it is important to emphasize how business *guanxi* develops from an "…initial arm's-length inflexible interpersonal relationship to a long-term close relationship…" which reflects the change from an outsider to a trusted and valued insider (Lo & Otis, 2003; Badi et al., 2016, p.206). After these two goals being achieved, this research has had provided government officials and CMR practitioners a remindful perspective of revisiting the difficulties and problems of promoting CMR these days, and of reviewing evolving interrelationships during implementations of CMR projects. Consequently, these contribute to the future development of CMR and marine ranching industry in China and then bring benefits to the ecological development of fisheries of China and even the whole world.

Research Questions

Prior to undertaking an analysis of the connections between and among actors in the institutional framework of the case study CMR, this thesis will address the following three questions:

- What is marine ranching and why is it necessary in China?
- What are the different definitions of marine ranching recognized by governments and academics in China?
- How are the key features of commercial marine ranching (CMR) different from other types of marine ranching in China?

These three questions are discussed as part of the literature review to illustrate the basics of marine ranching operations, especially CMR projects, in China. This study then addresses the following key research questions:

- How to identify a CMR project in China?
- Who are the key actors involved in constructing CMR operations?
- How does the private sector adapt to better prepare for the evolving relations in the network structure?
- How do the interactions and interrelations between and among key actors relate to challenges and opportunities in the development of commercial marine ranching in east coastal China?
- What are the advantages and disadvantages of the current institutional framework of CMR and are there any suggestions for overcoming potential problems?

By answering these questions, the study will provide an overview of the current institutional framework and reveal the evolving coordination of several key actors in commercial marine ranching in China based on a case study of one project. This study will also analyze the pros and cons of the existing institutional framework of CMR and provide suggestions for potential problems on the way to achieving sustainable development of marine ranching.

Organization of the Thesis

The thesis addresses the questions raised above in five chapters. This first chapter has introduced the inspiration for this study, provided a brief historical and conceptual background for understanding the importance of the research, and framed the analysis which follows around several key research questions. Chapter 2 begins by providing a comprehensive introduction to different marine ranching types in China, including their respective construction purpose,

features and elements, and highlights commercial marine ranching as the key object for this research. The second part of Chapter 2 introduces social network theory and Chinese *guanxi* culture to show how these two concepts complement each other to better explain the phenomena observed in the research. Chapter 3 discusses methodology, including why the research site was selected, how textual and interview materials were collected, and the way these materials will be analyzed. Chapter 3 concludes with a brief discussion of the ethical considerations and limitations of this study. Chapter 4 first examines the case study CMR project in comparison to the definitions of marine ranching in China by presenting its features and elements. This is followed by detailed social network analysis of the transforming leadership structure which highlights how key actors sought to achieve better relationship making to minimize risks and increase the success of the CMR project. The evolution of relationships between involved actors at the different stages of the development and construction of the case study CMR project is also discussed. The chapter concludes with an analysis of the consequences caused by actors' behaviours. Chapter 5 summarizes the key findings in relation to the review of CMR definitions and social network theory as adapted to Chinese circumstances. The current situation and suggestions for further development of CMR projects in China are also discussed. The thesis concludes by reviewing the importance and key contributions of the research on the development trends of CMR in China from both conceptual and practical perspectives.

Chapter 2

Literature Review

This chapter is divided into two sections: the first section introduces the definitions and features of different types of marine ranching and highlights the current shortage of direct research on CMR. Most research in the Chinese context analyzes marine ranching as a whole research object regardless of different entities of its subgroups. The second part draws on social network theory to reveal evolving connections between three main actors involved in the construction of commercial marine ranching projects.

Understanding Marine Ranching

It is important to address what marine ranching is, especially commercial-type marine ranching in this research, and how marine ranching is subdivided by different scholars and the Chinese government to highlight features of CMR as the research focus of this thesis.

The Pathway to the Consolidation of Definitions of Marine Ranching in China

Mokhtar and Awaluddin (2003) state that "marine ranching *per se* is not outlined especially in most international conventions" (p.216). It is challenging to have a uniform definition of marine ranching in academia in China as each scholar has their own perspective on defining marine ranching. According to Bell et al. (2008), sea ranching refers to "the release of cultured juveniles into unenclosed marine and estuarine environments for harvest at a large size in 'put, grow, and take' operations" (p.3). They emphasized on the breeding pattern, but the growing environment was not limited to the definition.

Chinese scholars tend to conclude different definitions of marine ranching into several essential recognizing elements. Du et al. (2015) argue that there cannot be and should not be uniform criteria for constructing marine ranching according to different space, purpose, and

investment. A marine ranching project is recognized as long as three essential features, including the manual intervention of the marine environment, little to no artificial feed, and unenclosed living environment, being observed. On the other hand, Yang (2016) lists six main elements of marine ranching: the purpose of increasing fishery resources, definite ownership and boundaries, artificial breeding, mostly natural feed, and scientific management. Based on these principles, he defines marine ranching as "the artificial fishing site where fishery resources are scientifically bred and managed by fully using natural productivity of certain sea areas, based on principles of marine ecology and modern marine engineering techniques" (p. 1133). Later, Yang's definition was used in the Shandong provincial standard called *Specification for marine ranching construction Part 1: Definition and classification* (Code number: DB37/T 2982.1-2017) published by the Shandong Bureau of Quality and Technical Supervision in 2017.

In the meantime, by consolidating different definitions for marine ranching presented in China, in 2017, the Ministry of Agriculture published *Classification of Marine Ranching* (Code number: SC/T 9111-2017) as the industrial standard to guide the development of marine ranching. In the document, marine ranching is defined as "the fishery modes of building or restoring the living environment for marine organisms, reproducing fishery resources, improving the marine ecological environment, and achieving sustainable use of fishery resources by using measures like artificial reefs and stock enhancement in specific waters based on principles of marine ecosystems" (p.1). However, such national and local standards still have ambiguous contents and have inconsistent ways of distinguishing among types of marine ranching operations. For example, the national standard introduces one general method to distinguish marine ranching operations in accordance with different settings. However, the document does not show any connections between the type of recreational marine ranching operations and its

overall definition mentioned above. Meanwhile, the local standard uses totally different ways of categorizing marine ranching operations, but nothing related to maintenance or commercial. These ambiguities make the government difficult in approving marine ranching operations.

This research uses the national standard to categorize marine ranching operations as it is the most official standard backed by the central government, and also borrows some academic definitions with more detailed contents. The national document classifies marine ranching operations into three categories: Maintenance-type, Mariculture-type, and Recreational-type. Maintenance-type marine ranching is the main type of marine ranching in China. However, since its institutional framework is relatively simple, which refers to the government itself, and does not extensively consist of the private sector, local people and other actors at the current stage, it will not be the main research object of the study. According to a governmental document from the Ministry of Agriculture and Rural Affairs (as a replacement for the predecessor, the Ministry of Agriculture on 19 March 2018) in late 2018, maintenance-type marine ranching operations, which can also be called non-profit public welfare marine ranching operations (hereafter PWMR), are mostly constructed by the government departments directly without private investors and others being involved. Its construction goal is ecological restoration and protection to regions. By using two measures of taking stock enhancement and deploying artificial reefs in coastal sea areas, PWMRs have gradually improved the damaged living environment for marine organisms and regained fishery resources for fishermen. Although PWMR is not the target of the research due to its generally single source of investment from governments, it is still necessary to explain its features in order to have a comprehensive comparison with other types of marine ranching project.

The construction goal of recreational-type marine ranching (hereafter RMR) is to promote recreational activities to regions, like fishing and sightseeing fishery. Although RMR is singled out in the governing document of marine ranching classification, it is not usually separately listed by some scholars or even in some local-level governmental classification standards of marine ranching (Hao et al., 2019; Yang et al., 2017; Ji & Zhang, 2019). They believe that RMR is classified under the CMR category since recreational activities belong to commercial behaviours. In the actual operation, recreational activities are usually mixed into the future planning of CMR based on completed breeding areas (Hao et al., 2019; Yang, 2018). Therefore, the thesis does not place RMR in the core position but will mention it when talking about the development trend of CMR projects.

The research focuses on Mariculture-type marine ranching operations for profits, also called commercial marine ranching (CMR) operations, that are mainly invested by the private sector ("Response to the number 4552 proposal"). Besides the private sector, there are also other actors impacting the completion of CMR, including the government and locals. These two main actors are supported by peripheral actors including research institutes, insurance companies, and banks. The relationships between these actors will be examined through the lens of social network theory in the next section.

The construction goal of CMR is to harvest more cultured marine products indefinite sea areas along the coast under the ecological and environment-friendly settings. CMR investors release juveniles in a fixed area and sell to the market after harvesting, just like what regular fish farms do (Hao et al., 2019). However, the differences between conventional fish farms and commercial marine ranching operations must be clarified. According to the Expert Consultation Committee of Constructing Marine Ranching of the Ministry of Agriculture and Rural Affairs

(2018), the different emphasis that CMR investors pay attention to during the operational process makes their project distinct. Fish farms prioritize and maximize profits by excessively using feeds and chemicals which result in pollution problems, but CMR projects are more concerned about the sustainability and capacity of the aquatic ecological environment while giving consideration to economic and social benefits. Meanwhile, natural measures are also employed to prevent potential problems caused by these minimal artificial supplies (Yang, 2019). These features of CMR are the key elements to distinguish it from conventional mariculture. On the other hand, the institutional framework of CMR is much more complicated than PWMR. The actors within the network of CMR consist of at least three main groups: the private sector, the government, and locals. The mutual collaboration between the private sector and government departments, reciprocity between the private sector and locals, and interactions between local government and local people are examples of interrelationships between these actors (Hao, et. al., 2019). Moreover, based on these observed connections, this research further argues that these different relationships have evolved or transformed along different periods of the construction of CMR in the findings chapter.

Gaps in Understanding of the Practices of Marine Ranching

This section mainly explains two types of marine ranching in different features and construction goals, which are basically PWMR and CMR. It provides an overview and explanation of the differences when examining marine ranching in China. However, Chinese scholars and government, at the current stage, tend to mix those features and elements of marine ranching with stock enhancement and artificial reefs. From 2015 to 2017, China has nominally constructed 64 national-level marine ranching districts, which are recognized by the Chinese Ministry of Agriculture. However, China is still in the initial stage of developing marine

ranching since areas of artificial releasing of juveniles and districts of artificial reefs have also been merely recognized as marine ranching by governments due to the lack of uniform criteria before 2017 (“The Construction Plan,” 2017; Hao et al., 2017). For example, a new project of constructing artificial reefs was launched and named “National-level Marine Ranching (Artificial Reefs) of Ma’anlie Island” in Zhejiang province (“The County Starts,” 2017).

It is worth pointing out that the confusion between maintenance-type marine ranching and artificial reefs or artificial release of juveniles must be clearly addressed in China. The fact that artificial reefs have been officially named marine ranching seems to contradict “…the principle… that marine ranching and artificial reefs cannot be considered identical” (Hao et al., 2017) causing confusion in the definitions of marine ranching. Yang (2016) argues that stock enhancement and artificial reefs are two technical methods to construct marine ranches, but it does not mean marine ranching equals to these two activities. There are many other necessary elements within the framework of marine ranching that can be observed in Figure 3.

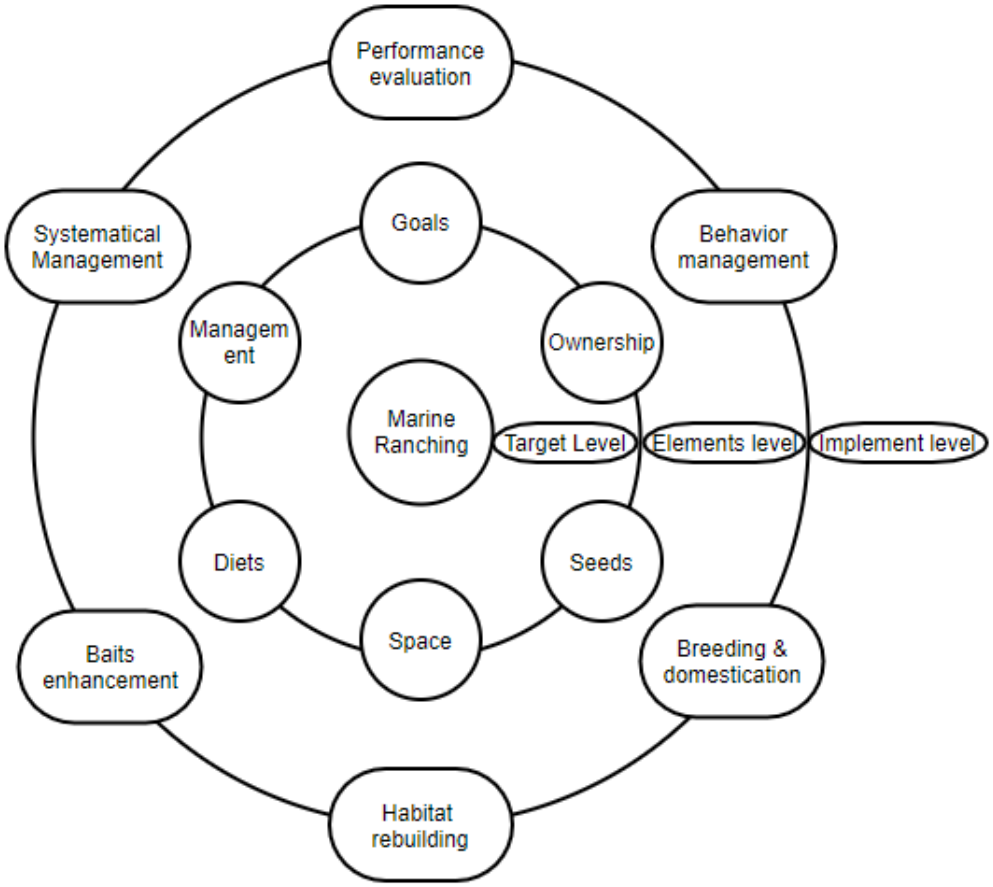

Figure 3 Systematic Framework of Marine Ranching

Source: Adapted from Yang, 2016

Although both Hao et al. (2017) and Yang (2016) illustrate different perspectives on defining marine ranching other than an ambiguous definition, the national standard mentioned above from the government, neither research distinguishes CMR from PWMR. It is important to differentiate them to examine different investment entities, construction goals, and measures employed. Thus, this thesis focuses on the CMR, which has not been broadly examined in the academic literature, by examining the mixed use of PWMR and CMR in the Chinese context and how these features and elements are not considered together in practice. Based on the clear understanding of these differences, a comprehensive analysis of actors within the institutional framework of CMR can be carried out.

Institutional Frameworks of CMR：Social network theory and *Guanxi* Culture

Cotton, Scott, and Venkataraman (2002) state that the lack of a sound institutional framework is the root cause of many failures in service delivery. Therefore, a sound institutional framework for the development of marine ranching, especially CMR as the key research object, will be crucial. The term "institutional framework" refers to the sets of regulations, agreements, informal norms, mechanisms, and organizational structures; moreover, it requires many organizations and actors to be in place, including authorities, the private sector, and community-based organizations (IEES, 2006). Clearly outlining the current institutional framework for CMR operations provides readers with a better understanding of how projects start and develop in the CMR industry under the circumstances of China. For the purposes of this study, the three main actors in CMR operations in China are governments, the private sector, and local communities. The research will specifically address how private sector investors in CMR operations relate to and interact with the government and community along with other minor actors.

Social network theory will be introduced to analyze the roles that actors are playing within the industry of commercial marine ranching. As Liu, Huang, Dou, and Zhao (2017) explains that the development of the social network approach was due to sociologists' attempts of understanding both formal and informal social relations, the theory contributes to a clear understanding of relationship development in marine ranching operations. In this study, social network theory will provide a general picture of all actors involved focusing on key concepts including *centrality*, *cohesion*, *weak and strong tie*, and *structural balance* (Liu, Huang, Dou, et al., 2017).

The concepts of *centrality* and *cohesion* are useful to examine the management structure of commercial marine ranching projects. The private sector is the initiating actor in CMR

operations, so how the private sector transforms itself to mobilize its social and institutional networks requires detailed analysis before being linked to other external actors. Meanwhile, the ideas of *weak ties* and *structural holes* will help to show methods of CMR operators forming and maintaining relations with external actors in the overall institutional framework. Finally, *structural balance* is employed to examine positive and negative relations between the operating company and other organizations, including the government, communities, and research institutions.

First, degree, betweenness, and closeness are three significant measures indicating the structural centrality of leaders in CMR operations (Liu, Huang, Dou, et al., 2017). High degree centrality grants individual leaders more social ties, greater opportunities for being decision-makers within the commercial marine ranching operations. High betweenness centrality turns head leaders of CMR operations into nodes connecting those unconnected network clusters outside of the current network. On the other hand, leaders reach other nodes with fewer steps and may spread information faster due to high closeness centrality. The example of connections between CMR project leaders can be shown in Figure 4.

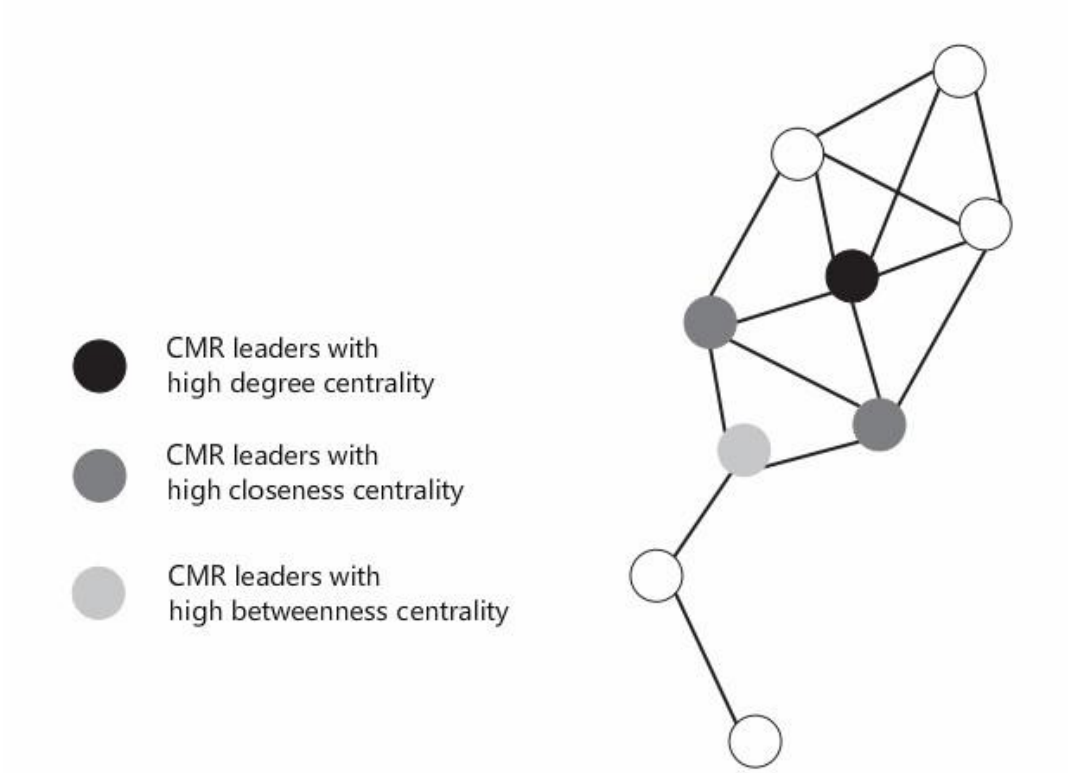

Figure 4 Network illustration of CMR leaders with high degree centrality, closeness centrality, and betweenness centrality.

Source: Adapted from Liu, Sidhu, Beacom, et al., 2017, p.4

Next, network cohesion is the structural feature measuring "the degree of interconnections among a group of nodes," and is used to detect grouplets in the larger network (Liu, Sidhu, Beacom, et al., 2017). This helps to separate groups of leaders within the same network of one CMR operation but have different executive thinking and decisions. It is a good way to reflect the evolution of personnel structure within the large group of the management team during the construction of CMR projects.

In addition, Granovetter (1973) suggests weak and strong ties to describe types of connections within a network or between networks. Granovetter's concepts are useful to analyze links between the network of one CMR project and the outside world. Weak tie network is a low-density network containing contacts that are less likely to be socially involved with each other;

meanwhile, contacts in a strong tie network are more likely to be highly connected, like close friends. It is worth noting that Granovetter's network theory reached a ground breaking conclusion that new job opportunities are more likely to be found through weak ties than strong ties since weak ties tend to bring more information that is not already known by strong ties. Therefore, strong and weak ties will be an effective tool to examine how CMR project operators gain more opportunities through social networking with weak ties.

Burt (2004) further develops Granovetter's theory of weak ties and introduced the concept of structural holes. He concludes that persons who bridge structural holes within the networks are more likely to succeed in terms of promotion and rewards, and having ideas accepted. The possibility of having good ideas for people who stand near and bridge structural holes in networks is higher since they are more exposed to different ways of thinking and are consequently more influential. In light of this, the gaps between CMR project leaders and their weak ties with external actors are equivalent to what Burt calls "structural holes" in social network theory. The investigation of how structural holes are bridged and how weak ties are reached is a key part of the research.

Finally, the concept of structural balance is an integral tool in examining relations between CMR projects and external organizations. There are not only positive and supportive relations in networks of CMR projects but also negative and hostile relations. It is suggested that "negative ties reduce performance, keep others from helping, reduce trust, and inspire individuals to hinder another's progress or harm the individual directly" (Labianca 2014, p.252). Moreover, there is a negative asymmetry, which means the negative tie has a more significant impact on outcomes than the positive tie. In the research, since the relations between main actors are multiple and complex in the overall network of CMR in China, it will be useful to employ the

structural balance to see how positive and negative ties impact the construction and operation of CMR projects in China.

The big picture and components of the theoretical framework of commercial marine ranching in China have been drawn. Another connecting element of expression within the networks of CMR is *social capital*. According to Lin (1999), "Social capital is captured from embedded resources in social networks," and it is the "investment in social relations with expected returns" (p.22). Orlowski and Wicker (2015) state that social capital improves the return on investment and include the connectedness of people and trust as core elements. In short, social capital is the connecting element that can be achieved from active interactions between actors within and between networks and is related to mutual trust and can be reflected in influence and power. Moreover, in addition to humans having private social capital, there is also corporate social capital for companies. It refers to the totality of network mechanisms, including network ties, network structure, and network resources (Bian and Zhang 2014). Yu (2008) provides a useful structure for elaborating on different levels of relationships between actors by dividing corporate social capital into three levels: inter-employee, employee-society, and inter-organization.

This research will be separated into three parts in accordance with the classification above. The first part is the analysis of the relation network of decision-makers within the CMR project itself at the inter-employee level. It illustrates how the private sector adjusts themselves to better approach other actors and operate commercial marine ranching projects under the section of centrality and cohesion.

Then under the section of weak ties and structural holes, the concept provides a way to understand how employees of the company getting in touch with the society can benefit the

development of commercial marine ranching operations in China at the employee-society level. The employee-society level in the research refers to personal relationships that employees of CMR projects have with external actors in society. These multiplex relationships will be indicated in the later findings chapter as developed friendship, leader-member relation, and even teacher-student relation.

Finally, the inter-organization level refers to the connections between main bodies of the actors, such as participating enterprises and competent units, or persons representing their respective organizations. Not all interested parties are on the same page with companies investing in CMR projects in China. The structural balance part helps to distinguish positive and negative relations between actors and analyze the mutual impact on these projects at the inter-organizational level.

However, under the circumstances of China, while a western theory of social network and social capital provides a solid framework to observe the existence of connecting actors, it is not enough to reveal the mobilization of developing relationships between these main actors in the network of CMR. Therefore, China's *guanxi* culture is introduced for a better understanding of social capital in China. Bian and Zhang (2014) define *guanxi* as "a dyadic, particular, and sentimental tie" that facilitates favour exchange (p.425). It combines acquaintance, intimacy, and trustworthiness for special favours based on special relationships, and it becomes particularly due to personalized sentiments that bring relational obligation and social-psychological pressure to favour granter and favour receiver. Their study dissects Chinese *guanxi* culture thoroughly and concludes the necessity and flexibility of *guanxi* ties at the early stage, but it does not fully explain the situations of social relations in operating commercial marine ranching projects in China nowadays. The expression of g*uanxi* culture within the network of project leaders of CMR

projects is not typical since all of them have invested and worked together to achieve the same goal of constructing and operating the projects. In contrast, the research blends *guanxi* culture into the application of social network theory to show the formation and development of different types of relationships between different actors in the sections of weak ties and structural holes and structural balance.

Chapter 3

Methodology

Approach and Rationale

This section aims to reveal active interrelations within the institutional framework of commercial marine ranching in China. The constructions of CMR operations influence the regional economy, land and sea area planning, and local people's livelihood. Correspondingly, governmental policies, geographical limits, communities' recognition are all elements fostering or restricting the construction of CMR operations to some extent. To investigate the mutual interactions and interrelations between related actors within the network of constructing CMR operations in coastal areas of China, the strategy of the research is to use a qualitative research approach to investigate both shared and conflicting interests among those who promote CMR projects and others who oppose to such developments.

In contrast to quantitative research methods providing factual data to solve research questions, qualitative research methods seek information about the experience, meaning, and perspective to explore and understand a new phenomenon that has little research been conducted on (Hammargerg et al., 2016; Creswell, 2013). The research uses the method of the qualitative case study. A case study approach is suitable for this research as it helps to identify key variables and new hypotheses (Starman, 2013). The existing literature provides little if any insights into the institutional networks which underlie the construction CRM projects, except that most studies have merely advocated the development of marine ranching in China. Furthermore, the case study undertaken for this research highlights key elements of the wider phenomenon of the rise of CMR in China. Thus, in order to fill the research gaps, the study aims to broaden the understanding of the complex layers of CRM through a detailed examination of a significant

project in East China involving the government, the community, and the commercial aspects of CMR during its construction and operation.

Research Site: Introduction to the White Dragon Islet Marine Ranching Project

The commercial marine ranching project chosen for the research is the White Dragon Islet project (hereafter WDI) on Luxi Island, located in Dongtou district, Wenzhou, Zhejiang province, China. Over two hundred marine ranching operations in total have been constructed in China according to statistics from the Ministry of Agriculture of China (Zhang & Kang, 2018). However, there is currently no official statistics or research showing specific classifications or sizes of these marine ranching operations. It is beyond the scope of this study to keep track of all the completed or ongoing CMR projects due to the lack of reliable data. Instead, this research focuses on the WDI project to identify the overarching nature of marine ranching operations in coastal China. WDI is an archetypal CMR project, considering the following three aspects: the investment source, location of the construction, and the distinct characteristics of the project.

The investment sources of WDI are transparent. A private company, funded by individual investors only, started and managed the CMR project. It is a typical private-invested CMR operation without the direct involvement or input from any other entity, such as government-backed state-owned enterprises, asset-backed listed companies, or angel investors. These details of the company and the individual investors can be accessed through the online National Enterprise Credit Information Publicity System. The project shares common characteristics with other mariculture activities and CMR projects. First, investors' capital and limited bank loans are the only two direct investment sources for CMR projects in most cases due to fishery and mariculture being deemed as high-risk industries. Typical risks include typhoon, flood, red tide, technical failure, and diseases (Yuan et al., 2017, p. 10). Although emerging insurance services

are promoted by the government and provided by mostly state-owned insurance companies, mariculture and CMR operations still suffer from an inability to attract a wider range of investment sources and the private sector is generally the initiator of most CMR operations. Thus, selecting WDI for the case study, as a typical CMR project that is funded by private investors only, will be more representative of China's wider commercial marine ranching industry.

Another common characteristic of the chosen project with others is the location of the construction. Li et al. (2011) stated many mariculture operations are conducted in rural areas of China. It can be concluded that many CMR operations are geographically settled in coastal rural areas of China, and the WDI project is one of them. The WDI project is located in Dongjiucun (Dongjiu village), the easternmost shore of Wenzhou. Two red areas in the following image indicate the location of the project on the island.

Figure 5 Location of the WDI project on Luxi Island

Source: Adapted from Google Maps, 2019

The red star section is the completed construction of the mariculture area of the WDI project, including two breakwaters, underwater nets, and sea area dividers, while the red circle area is not yet developed and under planning for subsidiary use of water purification. The necessity of the location of WDI must be addressed here first. This picture shows the location of the offshore WDI project being on the east side of the island.

From the broader perspective, the next picture shows the geographical location of the project at the district level, and it clearly shows that the project is also in the margin area of Dongtou district, where is also the edge of Wenzhou city.

Figure 6 Location of the WDI project in Wenzhou City

Adapted from Wenzhou Administrative Division Map, Wikipedia

The red triangle area on the right top corner of the picture is the location of the WDI project, and that area is geographically the farthest corner of the Wenzhou city that has residents and infrastructures. In terms of regional development, many obstacles must be overcome in this relatively outlying area, such as the lack of a young and well educated workforce, inconvenient transportation, and underdeveloped infrastructure, that will be analyzed later (He & Duchin, 2009; Long et al., 2016). Like the WDI project, most CMR operations are located in the margin areas of cities or districts along the coast and managers of these projects are facing similar impediments most of the time. Therefore, choosing the commercial marine ranching of White Dragon Islet as the case study will be a practical example helping to analyze the institutional framework of the CMR industry and draws its development track by examining the geographical and spatial characteristics.

Finally, the distinct characteristics of the WDI project itself must also be stated. The circumstances of the selected CMR project greatly relied on its relations with other actors like central officials, local officials, researchers, and local communities. It is worth noting that the main actors of WDI include a private company, investors and a management team, all of which are commonly considered to be external factors and relatively new to the commercial marine ranching industry and related network building in Dongtou region. Using the WDI project as an example provides a clear perspective on how new CMR leaders and investors did the construction and built a complex institutional network from scratch. Analyzing the construction of the WDI project and formation of its network of connections among actors provides a basis for understanding the evolution of relationships in the institutional framework across this emerging CMR industry.

By choosing the WDI project as a case study, focusing both on its general and particular characteristics, this research will have a close look at overall patterns of CMR operations in China including main actors in CMR constructions and proceed to examine the evolution of industrial networks using an institutional framework.

Data Collection

According to Baxter and Jack (2008), a qualitative case study allows for the exploration of a phenomenon by using a variety of data sources. The research undertaken for this study utilizes three primary types of information: textual materials, semi-structured interviews, and the researcher's first-hand observations and experiences on activities related to the WDI project.

Textual Materials

Analyzing textual materials is the first primary method used in the case study. Various documents, such as government reports, public records, media articles, and websites or diaries, express the basics of marine ranching in China and indicate a basis for understanding the contribution of actors involved in the case study, like policy and financial support sources for WDI.

In the following chapter, the research uses national and local government reports on China's mariculture to review the background for the CMR and emphasize the importance of the WDI project to the region. These reports include Chinese featured "red header documents" from different levels of government, government annual performance reports, and news. A thorough institutional restructuring of China's State Council in 2018 must be explained in the research to avoid confusion of different names of new departments in China.

It also employs published national and local marine ranching standards and common definitions to distinguish if the chosen CMR conforms to the characteristics and its differences

with other marine activities, like fish farms. The macroscopic texts, such as government reports and public records, were accessed through online sources and the university library system. Others related to the WDI project were collected during fieldwork. Field notes were taken and observations on the daily operation of the WDI project were conducted on-site. For instance, the research uses the WDI project brochure from its holding company to review the entire construction process and all basics about the facilities. Two internal confirmation letters of different subsidies from Dongtou district government were also consulted during the fieldwork.

These various textual materials provide readers with a solid foundation for understanding the overview of the arising industry before getting into semi-structured interviews. The collection of more materials during the fieldwork on the island brought the investigator inspiration to raise deeper questions about details. Documentary analysis was also used to helps cross-check and compare the data based on the responses from interviewees. Semi-structured interviews integrated with comprehensive documentary analysis resulted in increased accuracy and reliability for the research.

Semi-Structured Interviews

Most textual materials can be accessed online, but detailed information is usually not included in the texts. Thus, another method is adopted to have a deeper understanding of the interrelations between actors behind those online materials. The semi-structured interview is indispensable in the research. Robson (2002) indicated:

> The type of interview has predetermined questions, but the order can be modified based upon the interviewer's perception of what seems most appropriate. Question wording can be changed and explanations are given; particular questions which seem inappropriate with a particular interviewee can be omitted, or additional ones included. (p. 270)

Based on the document analysis before interviews, some interview questions can be raised beforehand, but responses can be unexpected. The direction of questions is changeable. Questions on the list may be changed or deleted while extra questions can be added during interviews. Therefore, a semi-structured interview is the most suitable way in the research. Details of the questions asked, and the array of responses are discussed in more detail in the findings chapter.

Selecting Participants

Interview respondents for this research came from different categories, including WDI project leaders, government employees, staff working for the project and local residents living in nearby villages. Respondents in different groups were asked different questions in relation to their own roles in the WDI project. Thus, the ways to approach these groups were not identical.

To conduct the semi-structured interviews, the investigator (hereafter PI) took a field trip to the research site and spent one month living in the nearby village in the summer of 2018. Before going to the field, the president of the WDI project was first contacted through phone. The phone number is available on the company website. The scope of the study and the voluntary nature of the process was discussed during the phone call. The president, JX, agreed to meet then share the information of the WDI project, including other actors taking part in the construction. Snowball sampling was used to fulfill the first two groups of respondents. Under JX's arrangement, another WDI leader, XP, also became an interviewee. A consent form was separately presented before the interviews with two WDI project leaders. Fieldwork included site visits to the newly built office on-site, two breakwaters, and the fish breeding areas.

Two government officials were introduced by JX, including the director of the district Ocean and Fisheries Administration (OFA), HH, and the director of the district Radio and

Television Station (RTS), RG. Both are using government power to impact the WDI project: The former is directly responsible for administering marine and fishery activities, while the latter controlled the image-building of projects and products in the region. Both were informed of the scope of the study and formal consent was obtained prior to the interviews.

With prior permission in hand visits to the office, facilities and breeding areas were undertaken and all work procedures were observed on site. In addition, it was possible to contact field staff in person and three of them formally consented to be interviewed separately. Different staff were randomly chosen from different subgroups. One interviewee was the project technician and the others were general labourers.

Lastly, locals living in nearby villages were randomly chosen to talk about their reflections about the establishment of the WDI project in their region. The PI randomly asked local people sitting in front of their places if they were available to have an interview, without the limitation on their age, gender, or academic standing. Three individual interviews were conducted, and the scope of the study and the consent form was been explained beforehand.

Thus, it was possible to collect responses from members of all potential actors and stakeholders in the construction of the WDI project. Through searching for and finding research respondents across an array of different categories, it was also possible to being to answer the research question about the identity of key actors and stakeholders in CMR.

Participant Summary

A total of ten participants related to the WDI project were interviewed in the research. The following Table 1 summarizes the basic information of each.

Table 1 Participant Summary

Participants	Category	Occupation
JX	Project Leader	President
XP	Project Leader	General Manager
HH	Government Employee	Director of the District OFA
RG	Government Employee	Director of the District RTS
XW	Company Employee	Company Technician
YY	Company Employee	Fishing Operator
AF	Company Employee	Fishing Operator
YL	Local Villager	N/A
YP	Local Villager	N/A
YW	Local Villager	N/A

Source: Compiled by the author from interview notes.

The research focuses on everyone's relations to the WDI project. Therefore, participants in the first three groups of project leaders, government employees, and company employees need to state their occupations to show how they are related to each other and to the project. Questions were asked based on their detailed jobs. Differently, participants in the group of local villagers were not asked questions about their jobs, but their reflection on WDI only. Their questions were based on their same identity as a local villager.

Interview Procedures and Questions

Semi-structured and face to face interviews were conducted. Interview questions are different, and the length of the interviews varies according to different groups. After some pre-determined questions put to each participant, the interviews turned into conversations since the further questions were all modified based on prior answers (Robson, 2002).

WDI project leaders were the first to be interviewed. Since the research targets the WDI project, interviews with the group of project leaders were over an hour. The first several questions are predetermined and about the brief introduction of the project and the company. After that, the direction of interview questions moves to the aspects of the significant staff transfers, company structural evolution, the building of relations with officials, and conflict of interests with local villagers. The list of interview questions to a group of project leaders is presented in Appendix B.

Document analysis may not be enough to show the concrete implementation of policy support or financial support. Thus, the objective of talking to local officials was to fill gaps in information and seek further clarification and elaboration of other details from the analysis of documentation. Two interviewees were introduced by the WDI project leader. One is the township leader of RTS focuses on the advertising impacts of the WDI project to the region, while the other one is the district head of OFA that pays attention to how various support from the local government was progressed and implemented. The time for the meeting with officials was limited. Interviews were about twenty minutes each at their office. In the meantime, it is unexpected but also makes sense that the government does not always play a positive role in the project. The list of questions, presented in Appendix C,

includes aspects of governmental support, information sources, applying procedures, and relation evolvement with the private sector.

The working staff is the essential node within the institutional framework of CMR projects. Three workers answered questions and each of them took forty minutes. A reciprocity relation exists between staff and CMR operations. Thus, the questions to working staffs consist of the working environment and economic conditions, as listed in Appendix D.

Local villagers' opinions on the construction of the marine ranching, impacts on their life, and potential conflicts are also crucial to the research. The emphasis of the interview with regular local villagers is related to what changes the settlement of WDI project brings to the region and local communities, the broader impact on the regional lifestyle, and local economic pattern, as shown in Appendix E. Three villagers took interviews and thirty minutes were spent on each.

Additional Connections

This section shows the PI's additional connection to the WDI project. Luxi Island is the hometown of the PI, and the PI went back to the place every year in the past over twenty years. Therefore, the PI has experienced the positive and negative changes in the place over time, as well as the periods before and after the construction of the WDI project. Thus, the PI can look closer at the pros and cons of the WDI project and think deeper about its correlations behind it. Meanwhile, the PI has had information about the construction of the WDI project to some extent during visiting hometown for many years. The PI can more comprehensively consider the research on the WDI project.

Although the interviews were conducted in China, mandarin does not always work. Luxi Island, located in the margin area of Wenzhou city, is a relatively enclosed place to the society

that speaking Wenzhou dialect is the only prevalent way to achieve the maximum efficiency of communicating. Especially, some senior villagers do not understand mandarin at all. Therefore, with the ability to speak fluent Wenzhou dialect, the PI was able to conduct interviews with local workers and villagers without any obstacle.

In addition, the principal investigator also participated in The Second International Symposium on Modern Marine (Freshwater) Ranching held in Dalian in October 2018. Through the analysis of materials from the conference, the PI tries to reveal differences and illegibility of understanding marine ranching domestically and internationally in the research.

Ethical Considerations

The research received approval from the Human Research Ethics Board (HREB) at the University of Victoria on May 23rd,2018 (protocol number: 18-160, see Appendix A). Although a researcher-family member relation exists in the research, there was no conflict of interests and the research remained objective. The research follows ethical research guidelines and every participant has had a chance to understand the consent form. Verbal consent was provided to participants who do not read many Chinese characters. The consent also helped participants to understand the voluntary nature of participation, free withdrawal, and protocols to protect privacy. Participants' names would not appear in the thesis. Instead, every respondent has been granted an alias. All materials that contain interviewees' information, privacy, and answers to questions have been securely stored and no one can access them.

Chapter 4

Findings

While most of the existing literature focuses on the general attributes of marine ranching, few have studied the social relations of marine ranching projects in China. Chapters 1 and 2 have partially illustrated how the Chinese government and contemporary scholarship are defining, categorizing, and theoretically considering marine ranching in China. The case study of the marine ranching project of White Dragon Islet (WDI) is introduced and analyzed in this chapter to examine the institutional framework of running commercial marine ranching operations. This chapter is structured around the research questions introduced in Chapter 1 as follows:

The first part of this chapter provides an introduction and overview of the WDI project to uncover its features and then considers the first core question: Why is it crucial to reach consensus on the definition of CMR in China and what is an efficient way to define a CMR project? The remainder of the chapter then focuses on revealing the institutional frameworks of the WDI project and the evolving connecting relationships behind the structure. In the known three major actors of the private sector, the government, and local communities, and some minor actors being involved in constructing CMR operations in China, this chapter discusses how the private sector transforms itself for better forming and maintaining relations in the network structure. Then it moves onto the next core part: how do interactions and interrelationships between and among key actors relate to challenges and opportunities in the development of marine ranching in east China? Governments, the private sector, and local communities play essential roles in this type of marine ranching operations. This chapter regards these three actors as the core and extends to other relevant actors, like banks, research institutes, and insurance providers that can also be influential to the comprehensive development of CMR. To observe

and analyze the evolution of relationships between actors from strangers to mutual relations, the chapter uses social network theory as the general structure of the analysis and borrows Chinese *guanxi* culture to explain specific issues under the circumstances of China.

The final section of this chapter engages with the third research question which aims to assess the current institutional framework of marine ranching operations by highlighting the successes, challenges, and problems of the circumstances of commercial marine ranching in coastal China. This section will also raise questions and considerations for further research.

Origin and Establishment of the WDI project

Starting from 2012, Zhejiang provincial government launched a project called "Zhejiang businessmen returning to hometowns for investments" to boost its economy and development and local governments started to provide preferential policies to these returning businessmen and their companies. Several Wenzhou-born private investors built up a private company called Zhejiang Donee Corporation and took this opportunity to go back to Wenzhou to build a commercial marine ranching operation. It is a private invested mariculture-type marine ranching project located in Dongtou district, Wenzhou, Zhejiang province that merges marine aquaculture with recreational fishery and ecological protection. The main business would be the large-scale farming of yellow croakers and based on this, breeding of other kinds of fish and the development of recreational activities like angling and sightseeing. The marine ranching project of White Dragon Islet is named after its geographical location. The company started to build two parallel breakwaters at both ends of White Dragon Islet, an uninhabited island, to connect it to Luxi Island in 2013 and over 5 years constructed a 108-acre rectangular marine ranching area. Based on the breeding mode of fencing breakwaters, this example of marine ranching features

strong water permeability, a large-scale water body, low breeding density, unenclosed bottom, and abundant natural feeding for raising fish (Chen, 2019). See Figure 7.

Figure 7 Aerial View of the WDI project

Source: Image taken by the author

As illustrated in Figure 7, the bigger island of Luxi is mostly covered by vegetation while White Dragon Islet is barren rock and uninhabited. Clearly observed breakwaters connect these two pieces and the area in the middle is the breeding area.

The marine ranching operation was the first project in the region using breakwaters as two fences to build a nearly natural habitat for ranching fish in open seas (Xia & Lin, 2018). Underneath the 332-meter long east dam and the 491-meter long west dam, strong-strength fibre mesh was set up from the breakwaters to the seabed to perform water permeability while prohibiting fish from escaping.

Academic and Official Identification of China's CMR Projects

When the research positions commercial marine ranching in China as its research object and selected a case study, it examined the qualification of the selected project to appeal to government officials and marine ranching practitioners for the necessity and the idea of recognizing CMR projects. This part first indicates that China is not able to guarantee so-called CMR projects implementing their responsibilities due to the lack of official regulation on defining marine ranching at the current stage. Then, based on Yang's six elements (2016) of defining marine ranching mentioned in Chapter 2, a more comprehensive way of seeing CMR projects in China is raised by identifying the typical features of the WDI project itself. It compares the features of the WDI project to the existing official and academic definitions of CMR in China to examine its qualification. Meanwhile, this section also identifies the differences between the WDI project, as a CMR operation, compared to conventional aquaculture activities.

First, the local and national versions of the classification of marine ranching in China mentioned in Chapter 2 defined and categorized marine ranching projects only in vague terms. For CMR projects funded by private investors for example, there were no national regulations nor legal provisions to recognize such projects. In other words, the process of constructing CMR projects was not explicitly differentiated from the process of constructing and operating conventional fish farms, even as China entered a period of providing various policy and especially massive financial supports to marine ranching projects that were supposed to incorporate environmentally friendly construction and operating practices. This resulted in the haphazard emergence of projects labelled as marine ranching which did not appear to comply

with any consistent aims and criteria. As Dr. Hongsheng Yang, the Vice Director of the Institute of Oceanology of the Chinese Academy of Sciences, declared in a news report:

> Deploying artificial reefs, doing stock enhancement, and even using cage culture mode is usually and easily considered as marine ranching projects. The concept of coastal aquaculture is mixed with the concept of marine ranching construction and this resulted in the naming of marine ranching projects everywhere in China. (Zhang & Kang, 2018)

By searching on the National Enterprise Credit Information Publicity System of China, hundreds of enterprises directly include "marine ranching (*haiyang muchang* 海洋牧场)" in their registered company names. Nevertheless, most companies are all officially assigned to different industry categories, including agriculture, wholesale and retail, scientific research and technical services, hotel and catering services, manufacturing, etc. Meanwhile, more companies do not use marine ranching in the company names but in the names of their affiliated projects.

Zhang and Kang (2018) raise the question in a more polite way in their title: "How do marine ranching projects guarantee 'Ecology First'?" The research expresses the question in a more explicit way: Are these registered marine ranching companies or self-called marine ranching projects all working on the ecological development of marine ranching? The answer is still a mystery now as Chinese authorities have not had an official way to approve yet.

The WDI project was one of the self-designated CMR projects at the beginning. In fact, there is no requirement by the government to inspect and identify at that time or now. Later in 2015, as if the government tacitly approves the WDI project of being a CMR project, the State Oceanic Administration (2015), which merged into the Ministry of Natural Resources of the PRC after the government reshuffle in 2018, at an online introductory event introduced the WDI project as a key ecological marine ranching construction of carrying out the ecological enhancement of fishes, protection, and management of nearby shellfishes and algae and

promoting of marine environmental protection in the specific water between the Luxi Island and White Dragon Islet. However, the critical question is: Based on the absence of officially valid measures to examine and verify, is such an indirect introduction from the Chinese government a reliable guarantee that CMR projects are moving towards the goal of ecological development of fisheries? The simple answer is most likely no.

As the WDI project has been selected as the case study to explore CMR projects in China, and although it has been described as a model CMR project by the government in an online introduction, it is important for the purposes of this study to confirm that it is a genuine "CMR project" and not merely another veiled aquaculture activity self-labelled as marine ranching. Moreover, a detailed exploration of the case study project will highlight the key elements and objectives of marine ranching within the fisheries industry. The research for this study applies Yang's six major elements to defining marine ranching projects mentioned in Chapter 2, which include the purpose of increasing fishery resources, clearly defined ownership and boundaries, unenclosed space, artificial breeding, mostly natural feeds, and scientific management (Yang, 2016).

The WDI project is the first "fence type breeding style commercial marine ranching operation" in Wenzhou and it sets the increasing production of the fishery for financial returns as one of its goals. Defined ownership and boundaries are the legal basis for the construction of CMR projects. The certificate of sea area use for the WDI area was issued on February 27, 2013, by Dongtou government and its boundaries and its usage are clearly stated in the following Table 2. It must be clearly noticed that the certificate of sea area use does not refer to the CMR project being recognized as a marine ranching project by the government. The applicant decides on their

project names. For any type of sea area use, like conventional cage culture and mudflat culture, a certificate of sea area use is one of the necessities of the operation.

Table 2 The Public Notice of The Sea Area Use of The WDI Project

Applicant	Project Name	Location	Area	Method	Duration
Dongtou Luxi Donee Corporation	The marine ranching project of White Dragon Islet	The sea area between Dongjiu Village and the White Dragon Islet	42.9198 hectares	Unenclosed Mariculture, Structures with water permeability	15 years

Source: Adapted from http://ocean.china.com.cn/2013-02/16/content_27964968.htm, Nov. 19. 2019

The table above clearly states the company name and its authorized area with total size and time length. Meanwhile, the certificate also addresses the WDI project as the unenclosed mariculture mode, which is another crucial element of marine ranching. Two breakwaters with a net under the water surface assure water permeability while keeping all fish within the breeding area. The design of not using any net on the bottom of the construction provides the fish more activity space and the ability to hide in the bottom mud while extreme weather conditions occur.

According to Yang (2016), fish seeds must be mainly artificial or domesticated to distinguish from the marine capture fishery that harvests wild fishery resources only; meanwhile, feeds must be mostly natural to be different from those marine aquaculture activities that rely on non-ecological artificial feeds only. The fish-seeds of the WDI project are artificially bred and delivered from Fujian province (Liu, 2015). In addition, compared to massive artificial feedings in conventional fish farms, due to the abundant natural baits in the large-scale sea area, there is little to no artificial feeds needed for juvenile fish in the marine ranching area (An & Zhou, 2006). The management team of the WDI project indicated that juveniles in their breeding area

are fed with artificial feeds once every five to seven days to ensure that all feeds are consumed every time and the most of their fish hunt for natural foods in the sea area. According to the management team, the whole group of fish is fed about 500kg of artificial feeds at each feeding time and only half of them can have a full meal, which means many of them still have to hunt for natural food most of the time. In comparison, conventional marine aquaculture owners feed their fish twice a day to make the fish grow much faster, which causes severe excessive feeding and subsequent water deterioration. Although the specific data of consumed feeds is not clear, the idea is clear that the feeding mode of limited artificial feeds mixed with natural food is more ecological than severe excessive artificial feeds being wasted in the water body.

The last element is the scientific management. The WDI project and its mother company are under scientific management by connecting with research institutes and universities, setting up its own laboratory and research institute, and inventing its own technical patents. Since the connections between the project and other institutes will also be included in the following interrelationship part, the scientific measures that the WDI project has been working on are listed here and will be introduced in detail later.

Although Yang did not mention breeding density and include the usage of drugs and nutrient to the usage of fish feeds in the six elements, it is worth mentioning that these two issues have a great impact on determining whether an aquaculture activity, a CMR project, in this case, is on the track of ecological development or not. Meanwhile, these two issues are the most important aspects to tell the differences between a CMR project and a conventional marine aquaculture activity.

The sea area of the WDI project is about 43 hectares (equals 107 acres) and the volume reaches 2.42 million cubic meters. It is estimated to produce two million yellow croakers, which

is around 1 million kilograms of fish per year. By dividing the total product weight of the year, 1 million kg, by the total volume of the water body, 2.42 million m^3, the culture density is 0.41 kg/m^3. According to An and Zhou (2006), higher culture density causes a higher possibility of diseases and death; Manuel et al. (2014) also states that lower culture density of 0.5 kg/m^3 resulted in higher overall growth performance after comparing culture density of 0.5 kg/m^3 and 1 kg/ m^3. Hence, the 0.41 kg/m^3 of the WDI project is the low culture density that does not bring heavy pressure to the marine environment and the WDI project is on the track of ecological development of fisheries. In comparison, the China Fisheries Association (2017) claims that the culture density of marine cage breeding, which is the main branch of the conventional marine aquaculture in China, has reached 20 kg/m^3 in average in 2014 and the outsize culture density accompanied with excessive use of fish feeds has caused severe water deterioration and diseases and deaths of aquatic animals (Lin, 2010). In short, although there hasn't been a clearly defined number of culture density being harmful or harmless to the marine environment, the idea is that the lower culture density of CMR project, as 0.41 kg/m^3 of the WDI project being the example in the research, must be on the track of ecological development while the conventional marine aquaculture, having 20 kg/m^3 of cage culture as the main example, is sometimes characterized as gravely threatening the marine environment of China.

On the other hand, the advantageous combination of the large-scale water body, abundant natural baits, and low culture density of the WDI project results in the lower possibility of diseases and subsequently the nutrient resources and chemicals being unnecessary while abuse of drugs and nutrients in fish farms is significantly polluting water bodies (Lv et al., 2019). In addition, the leader of the WDI project also states that their further methods of restoring ecology and environment in the area include planting seaweed and shellfish on the seabed to purify the

water body and improve the living environment for other nearby species; this makes the WDI project one more step closer to the achievement goal of ecological marine culture. In other words, compared to conventional fish farmers using excessive feeds, nutrition supplements, and chemicals, CMR operators like the WDI project management team, maintain the dual objectives of making profits and achieving ecological and environmental protection. Hence, in addition to the natural feeds covered before, the two different attitudes of CMR projects and conventional fish farms towards the use of nutrients and chemicals can be another necessary measure to distinguish CMR projects from other aquaculture activities.

In conclusion, the core of this part is to reveal the fact that when all CMR projects in different categories position themselves to benefit from various supporting policies, the Chinese government only has a prototype of defining these CMR projects and does not currently have any dedicated legal provision to examine and verify the characteristics and ecological objectives of such endeavours. A more comprehensive way of examining CMR projects combining Yang's six elements: the purpose of increasing fishery resources, definite ownership and boundaries, unenclosed space, artificial breeding, mostly natural feeds, and scientific management, with another two important aspects: culture density and the usage of nutrients and chemicals, is proposed. This detailed measure brings readers a better ability to distinguish authentic CMR projects from nominal ones in China and potentially provides CMR-related policymakers with a general structure to find a way of eliminating the false and retaining the truth.

Social network theory and Chinese *Guanxi* Culture

The second part of this chapter applies the modified theory of social networks by incorporating Chinese *guanxi* culture to undertake an analysis of the interactions and interrelationships among key actors. The chapter examines questions pertaining to how the

connections and interrelationships between or among the involved actors of the institutional framework have been formed and evolved throughout the implementation of the CMR construction.

As mentioned in Chapter 2 that the private sector is the main investor to CMR projects and the government and local communities get involved afterwards, so enterprises, government, and local communities are listed three main stakeholders involved in the construction of CMR projects in China while several subsidiary actors also being listed as targets of the analysis, including banks, research institutes and universities, and insurance companies.

The research uses a social network theory approach to examine the interrelations between main actors and external roles behind the White Dragon Islet project. The following theoretical analysis is divided into three parts. The first part is the transformation of the leadership structure of the one CMR operation to reveal how the private sector prepares itself to mobilize its social and institutional networks. Utilizing the concepts of centrality and cohesion, the first part will examine connections at the inter-employee level within the mother company that invested in the WDI project. Then the second part is an analysis of methods of CMR operation leaders being engaged in interactions with other important actors. By using weak ties and structural holes, the research addresses how the mother company connects to external actors through personal relationships at the employee-society level. Given the very fluid circumstances in China, the connections between different actors develop and transform throughout the development of the WDI project. Chinese *guanxi* culture is also introduced and incorporated into the concepts of weak ties and structural holes to trace the evolution of relationships. The last part introduces the positive and negative effect on the CMR operation brought by interactions between the private sector and external actors during the construction and operation of the CMR operation. An

analysis of structural balance will reveal the official relationships between the company and external organizations – referred to as the inter-organization level.

De Nooy (2010) analyzes social networks from two perspectives, that is, overall and local network structure. The private sector, the government, local communities, and all other subsidiary actors constitute an overall network structure of its participating members as shown in Figure 8.

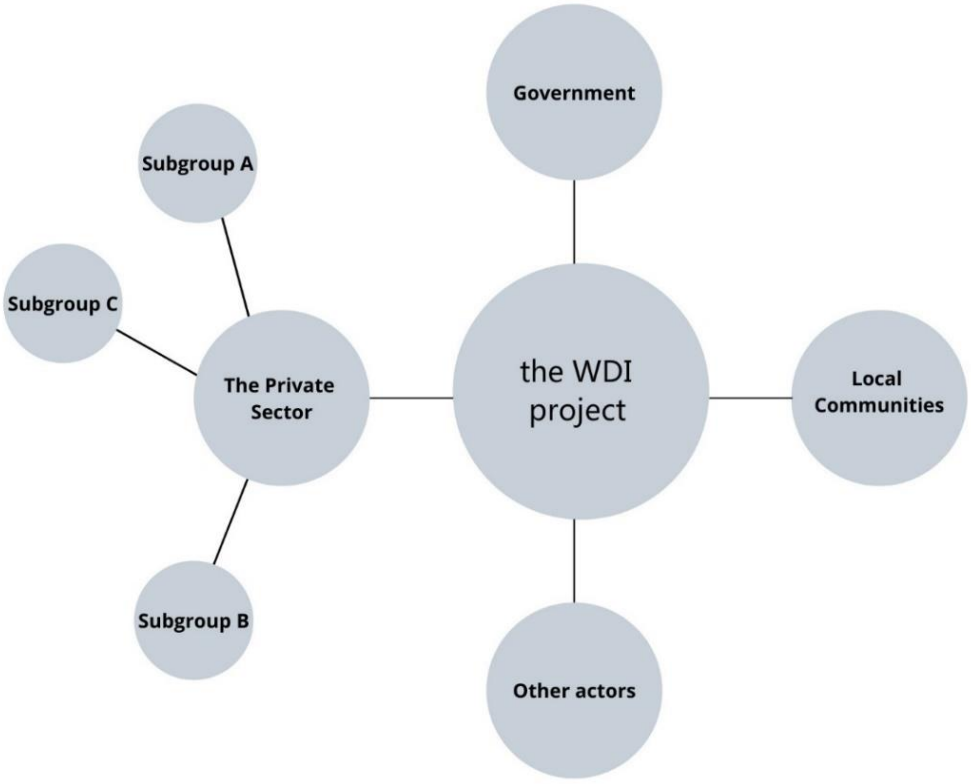

Figure 8 The Overall Structure of the WDI Project

Source: Compiled by the author

Since the private sector is the initiator of the WDI project, the local structure of the WDI project is the structure of the private sector that has several subgroups and the overall structure is the whole institutional framework that includes all involved actors in CMR operations. Sub-

groups A and C associated with the private sector illustrated in Figure 8 are placed closer together to reflect the evolution of centrality and cohesion between participating members.

Before linking the WDI project to all external factors, it is important to analyze the private sector as key personnel in the company significantly affects the subsequent institutional development of the project. In other words, the detailed transformation of the company leadership structure is integral to understanding how different actors mobilize their social and institutional networks to overcome challenges and risks while gradually achieving community and business support. Thus, the analysis here starts with personnel changes within the company in relation to the evolution of the local structure of the company.

To respond to the call of "Businessmen returning to hometowns for investments" from provincial and municipal governments, after completing an investigation of water conditions near the White Dragon Islet, JX and his business partners, including XP and SS, who are all originally from Wenzhou, Zhejiang, decided to unite to return to their hometown and make an investment on a CMR project, namely, the WDI project. As all levels of government have consecutively announced the slogan of developing ecological marine aquaculture and the increasing weight of marine ranching in recent White Papers, the industry of marine ranching has become closely related to newly announced governmental policies ("The Construction Planning of National," 2017; "The Thirteenth Five-year Planning of," 2017). While the government quickly started to provide substantial support for the construction of marine ranching projects, the capacity of project managers to respond by establishing relations with external actors and more quickly, getting the information about promulgation of new government policies and support mechanisms from key government actors greatly benefited the WDI project. It was clear

that the leadership structure of the WDI operation had developed its ability to make interactions and interrelationships with external actors more efficiently and more quickly.

The parent company of the WDI project has nine private shareholders and three larger private investors, JX, XP and SS, managing the company while the rest six investors are non-executive directors. Interviewed for this research, the president of the company, JX, is relatively new to the position. He became the president and legal representative of the company in mid-2018. Before overseeing the whole company, he was the principal initiator and the vice general manager of external relations. XP remains as the general manager assisting the president with logistics and production. SS, the largest investor, was the former president and the legal representative of the company before JX. It is worth mentioning that SS has a brother, JC, who is another major non-executive director on the board. In short, the local leadership structure of the WDI project shifted from share-based, which means the person having the most share take the top position, to capability-based, which refers to the persons with the most efficient capability of receiving information from the external actors.

Centrality

The concept of centrality frames the discussion of individual nodes and the idea of cohesion frames the discussion of subgroups. It must be clearly stated that the inter-employee level structure includes investors, as well as other regular workers and consultants. However, during the analysis of the changing leadership structure, since investors were the initiators of the WDI project, only project investors are considered at this stage and regular staff are not specifically mentioned.

First, the number of links between individuals within the network structure of the private sector reflects the degree of centrality. As the initiators, JX, XP, and SS were all connected with

potential investors and formed the company with nine private investors in total, which turns into the formation of the network of all investors. Since they all have connections with all of the other co-investors within the local structure, this consequently grants each of them the same highest degree centrality. This suggests that in the leadership transformation of this CMR operation, degree centrality is not the key factor in achieving an improved ability to interact with external actors.

Next, betweenness centrality reflects the level of the leaders connecting those unconnected clusters outside of the local structure of the CMR operation. In the case of the WDI project, JX was the vice general manager of external relations, which means that he has the advantage of dealing with all issues with individuals or clusters outside of the network of investors. This makes JX become the critical bridge representing the company receiving and sending out information between the local structure and the overall structure. Being the gatekeeper, new information from the outside stops flowing to the inside area of the network if the node with high betweenness centrality opposes the dissemination (Liu, Sidhu, Beacom, et al., 2017). This evidence suggests that JX is the individual with the highest betweenness centrality in the local network structure relative to XP, SS, and other investors. The differences of betweenness centrality that JX and SS have is observed during the transformation of the leadership structure of the WDI project and this suggests betweenness centrality is a variable factor of the local structural transformation of the WDI project.

Finally, the higher closeness centrality means leaders of the CMR operation reach other individuals with fewer steps and spread information faster in the local and overall structure. Because of being on the essential bridge position of the local WDI network structure, JX is the immediate medium directly receiving information from the overall structure and sending out

information to the local network. Being as the gatekeeper of all incoming and outgoing information within the local structure, JX becomes the person who needs the fewest steps to reach all other individuals no matter in the local structure or the overall structure, and this consequently grants JX the highest closeness centrality in the local structure of the WDI project. Hence, closeness centrality is also a variable factor in the personnel changes of the WDI project.

Figure 9 illustrates the network of the head leaders with high degree centrality, closeness centrality, and betweenness centrality in the local structure of the WDI project.

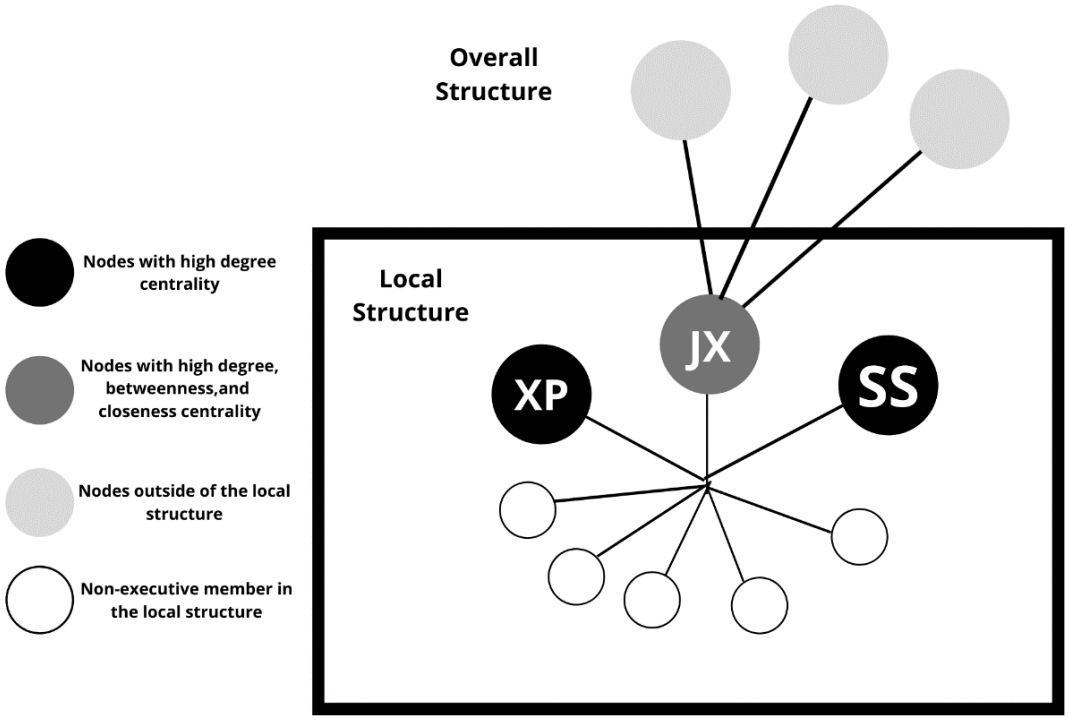

Figure 9 Network illustration of CMR leaders with high degree, betweenness, and closeness centrality in the structure of the WDI project

Source: Compiled by the author

The above figure shows that JX, XP, and SS have the same high degree centrality in the local structure since they all know every shareholder well. Then being on the most important

position of connecting the local structure to the whole institutional structure brings JX much more extensive betweenness and closeness centrality than XP and SS and makes JX the only node in the local structure of the WDI project with high degree, betweenness, and closeness centrality. Occupying the right network position in the network contributes to the person being the decision-maker, which is the top leader of the WDI project in the case study, and centrality measures are the valid ways to identify them by looking at their network positions (Liu, Sidhu, Beacom, et al., 2017).

Based on observations of the structural modification in the leadership of the WDI project by using centrality measures, the following issues became apparent. All investors agreed on the most prominent investor with the most shares, SS, being the president of the company with no doubt at first. They soon realized that a CMR project requires the immediate exchange of information to and from the outer network during the period of massive supporting resources from external actors occurring. The involved individual of the WDI project, with a high degree, betweenness, and closeness centrality is most likely the better candidate for the decision-maker. JX became the next president of the company later in 2018 keeping his critical responsibilities of internal and external information transmission. The centrality measures reflect how the leadership changes of the WDI project take shape and this can be an example for multi-investor involved CMR projects to modify and improve the leadership structure. Afterwards, the modification and improvement of the leadership structure impact the effectiveness of developing external actors on the CMR project. Landherr (2010) raises a comprehensive math model to make a detailed calculation of the amount of each type of centrality measures. Although the specific quantification of the centrality that each node has is not accountable in this research, the idea is to suggest that the high combined centrality contributes to the advantage of being the

better candidate for the decision-maker during the modification of leadership structure of CMR projects. An example here is a bridging person that connects JX with important external actors that may only provide helps to JX while being the decision-maker or the president of the company in this case. Once JX leaves the position, the bridging person cuts connections with the WDI project. More details of the example about the bridging person called YL will be explained in the following part of weak ties and structural holes. It shows the importance of the decision-maker with the highest centrality to a CMR operation in relation to the interactions and interrelationships with external actors.

Cohesion

Although all shareholders are investing in the same company and share the same goal of gaining returns, the strategies of operating the company by different leaders may be widely divergent. For example, as JX told during the interview, SS, when he was still on the position of the president of the company, refused to accept the bank loan after JX, as the vice general manager of external relations, being granted the approval from the bank with efforts. The agreement and signatures of all shareholders of the company are the prerequisites to any finance-related issues of the business. Although the reasons behind the conflict remain mysterious, it is clear that the main leaders of the WDI project with antithetical ideas could bring ambiguous developmental direction to the project and this subsequently impacts the direction of making interactions with external actors. The transformation of the leadership structure observed can be an effective measure to eliminate such problems. In this example, when SS was the president, the interactions with banks were frozen as the decision-maker stopped capital from banks; afterwards, after JX becoming the decision leader, he reactivated the connection with banks and achieved an abundant supply of funding from banks. The details of connections and interactions

between JX and banks will be introduced in the structural balance part. Here, it suggests that a leadership structure transformation of a CMR project is the starting point of the developmental direction of mutual relationships with external actors. Hence, next is how the concept of cohesion is applied to understand such structural changes.

Network cohesion detects grouplets in the structure. Figure 8 has shown the appearance of subgroups. To provide a more detailed local structure of subgroups in the WDI project, Figure 10 is displayed as follows.

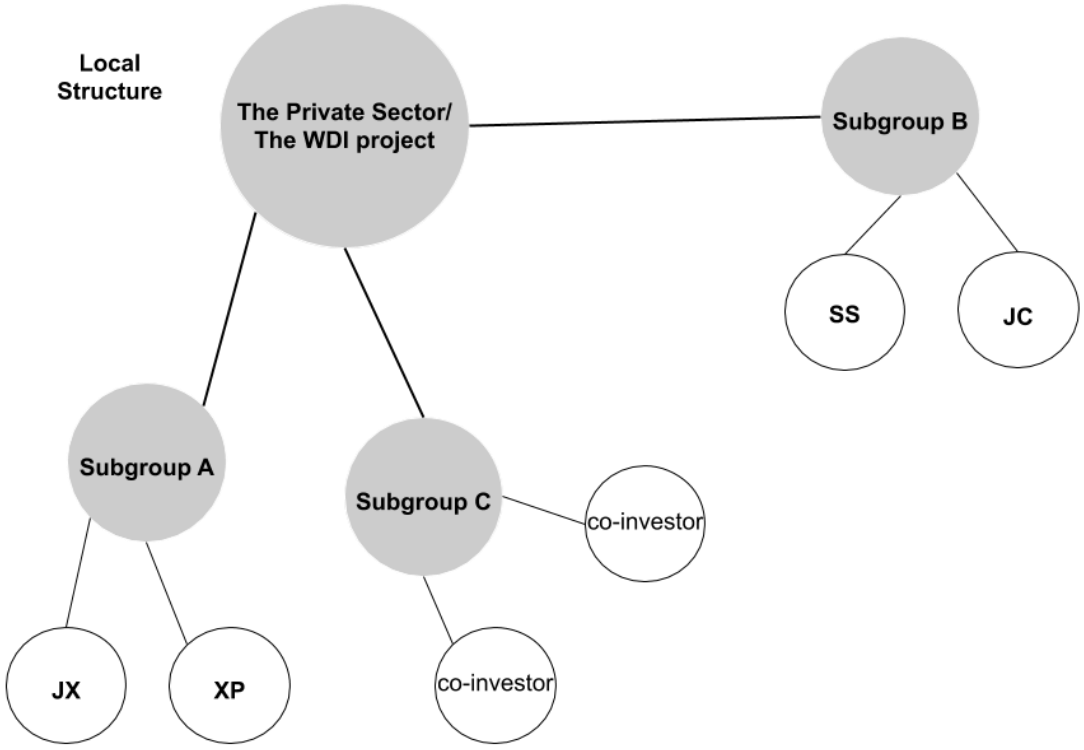

Figure 10 Distribution of subgroups in the WDI project

Source: Compiled by the author

As shown in Figure 10, there are subgroups observed in the local structure of the private sector, which is the mother company of the WDI project in this case. JX and XP are in the subgroup A while SS and his brother JC is in the subgroup B. Several other investors, not limited

to two only, are in the subgroup C. The process of how these subgroups are formed will be uncovered in the following. Moreover, the subgroup being closer to another one reflects the closer connection between them and being far from others means distant relations in the network. It must be indicated first that subgroup C of non-executive investors is a floating subgroup, which means its distance with the other two subgroups may change in accordance with certain situations. Currently, it is observed being aside by subgroup A of JX and XP and will also be explained next.

During the evolution of the leadership structure of the WDI project, all investors are the nodes and they are all falling into different subgroups. Subsequently, there are different subgroups formed between individuals if we consider the company as the local network, which means that nodes in a subgroup may have more or stronger connections than other nodes in the network. When JX was the vice general manager of external relations, the general manager, XP, took charge of production and the president at the time, SS, was only responsible for employee management. Thus, JX and XP directly worked as a partner to each other and regulated the production and marketing chain without president SS being necessarily involved for the last years. Consequently, the connections between two managers rapidly increased, and the cohesion based on collaboration between them was developed. The most frequent contacts between these JX and XP, who oversee the two most critical parts of the WDI project, made the strongest link between these two nodes. De Nooy (2009) defines such nodes that are directly and strongly linked to each other, or called adjacent, fall into a cohesive subgroup. In the structure of the private sector in Figure 10, the subgroup of JX and XP is shown as subgroup A. The group A consisting of leaders of two most important sections of the WDI project is considered as capability-based.

In the meantime of JX and XP forming their clique and directly sharing first-hand information with each other after their long-term close cooperation, president SS also united with his blood-related brother, JC, who was a non-executive investor of the WDI project, to make up another little group based on consanguinity to hold their opinions while facing the company's major decisions in the board of directors. The subgroup of SS and his brother JC is illustrated as subgroup B in Figure 10. As mentioned that SS has the most shares in the structure, the subgroup B is a share-based grouplet.

So far, two major subgroups in the network came on the stage. The group of JX and XP could reach from the producing unit to the outside world and gather two-way information more directly with fewer steps; in the meantime, SS was the president of the company and held more shares with his brother than JX and XP. At this moment, the leadership structure of the WDI project remaining share-based or moving towards capability-based depends on which group the subgroup C chooses to stand with. According to JX, during the rapid development of the marine ranching industry and fast implementation of related new policies in China, only the fastest reaction to the external can help the WDI project to keep up the pace. Members of the board of directors are inclined to agree on opinions from the management with the latest information and more external relations than those having higher shares. In the example of SS refusing to accept the approval from banks, SS united with JC were the only two investors rejected to keep the financial connections with banks while other investors led by JX and XP were trying to convince them to take the loan support from banks. As a result, to achieve higher efficiency of dealing with external information and maintain high cohesion among all shareholders, the subgroup C decided to stand closer to the subgroup A and the board of directors appointed JX as the president of the company with his high centrality and strong cohesion and put the subgroup of JX

and XP on the management table. However, the key of subgroup C is that it is a floating subgroup. Group C chose to be with group A under the current circumstances of China's marine ranching industrial development, which means there is possibility that these investors move back to the side of group B under certain changing situations over time.

The full picture of the local leadership structure of the WDI project transforming from share-based to capability-based has been uncovered so far. It is a revolution that the company tries to get itself prepared for better approaching other actors and running the WDI project by adjusting its leadership network and optimizing its structure. At the current stage of China, although the impact of degree centrality is not significant, a capability-based node with higher betweenness and closeness centrality more likely forms its cohesive subgroup surrounded with other nodes than share-based nodes and then becomes the top leader of CMR projects in China.

Weak Ties and Structural Holes and Chinese *Guanxi* Culture

An overview of the evolution of the local structure brings us to the next topic, that is, the overall structure and emerging connections between the WDI project and external actors at the employee-society level. Special attention should be paid to the interrelationships between individuals, more specifically, the decision-maker of the WDI project and external actors.

Weak ties and strong ties are two types of connections within networks (Granovetter, 1973). Weak ties are usually composed of acquaintances or loosely connected actors outside of the current local structure, while strong ties are generally greatly connected within the network. However, there are structural holes between the local private structural and its outer network indicating the missing connections between actors. See Figure 11.

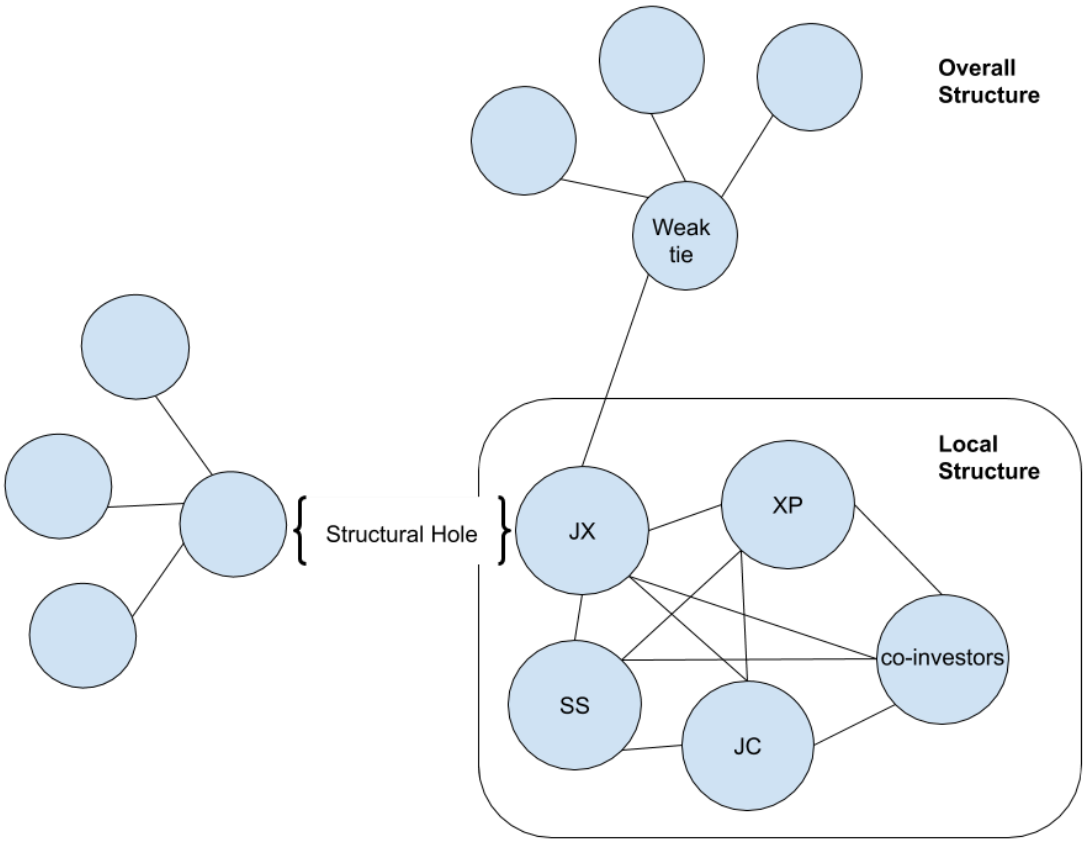

Figure 11 Network illustration of strong ties, weak ties, and structural holes in the structure of the WDI project

Source: Compiled by the author

In the above figure, the local structure of the WDI project is a strong tie network as all of the shareholders know each other well and are highly connected. JX, as the external relations manager, has weak tie relations to the outer structure. Meanwhile, there are persons in the overall structure that JX cannot bridge with and the missing connections between them are structural holes.

Without weak ties being involved, these private investors may still be able to run the company and the WDI project, but potential obstacles are various, for example, the inefficiency of getting information about policy changes, inadequate support from the government due to the shortage of information sources, and the lack of inclining policy due to the lack of actively

approaching to officials. In short, strong ties in the local structure are the prerequisite of the WDI project; moreover, the value of weak ties must be also realized since weak ties in the overall structure greatly help the subsequent development. As Granovetter (1973) suggests that opportunities are more likely to be touched through weak ties than strong ties, it is important for the private company to form relationships with weak ties to seek for more opportunities. The opportunities here refer to the factors mentioned above: faster transmitting of information, policy inclination, and various governmental support. Therefore, at the employee-society level, there must be someone bridging weak ties outside the network of the company, cover the structural holes, and connect the company or the person himself at least with the outer society.

Although social network theory provides a comprehensive perspective on identifying the status of nodes within the network, it does not include a way to monitor the quick change of relations between nodes in the Chinese context. In the case study of the WDI project, social network theory is helpful when locating nodes and weak ties in local structure and in the institutional framework, but it fails to grasp the dynamics of changing relationships between actors. An additional tool is needed to examine the core section: the formation of connections between involved actors, or in other words, the process of structural holes being bridged, and the evolution of these connections, which refers to the changing weak tie network outside the local structure. *Guanxi* in Chinese refers to relationships and it develops from acquaintance to intimacy and then trustworthiness (Bian & Zhang, 2014). It becomes useful to this research as it consists of the process of relationship evolution. Hence, the research incorporates Chinese *guanxi* culture with social network theory to reflect changing statuses of connections and interrelationships between involved actors of the WDI project.

Big Rewards for Connections and Interrelationships

JX, as the president of external relations focused, is the person in the network covering structural holes and bridging weak ties and has gradually and successfully formed relationships with various actors including central government officials, local officials, and other experts. In this part, his personal experience reflects most of the formations and evolutions of connections and interrelationships between the private sector and the government at the employee-society level.

To achieve the faster development of the WDI project, it is impossible to leave the government aside. Both central and local government provides various support to the construction of the WDI project and this mainly includes policy support and financial support. As JX being on the decision-making position of external relation focused, connecting with weak ties, which are central and local government officials here, enhances his efficiency of receiving information from these weak ties. The benefits of financial and policy support are massive.

First, financial rewards are considerable. According to JX, after the WDI project getting approved by the administrative department of the government, the private company received a 20 million RMB subsidy called “Charge for Sea Area Utilization” from the central government for restoration of the environment. The management team of the WDI project is required to submit proposals to administrative departments when they desire to use the fund, and after the completion of proposed projects using government funds, the municipal-level marine department would review all parts to ensure quality and accurate financial records.

In the meantime, there are also respectable funds from the local government. While JX’s company pay for constructing the main body of the WDI project, the local government helps with building supporting facilities through reimbursement, direct financial support, and indirect

financial support. According to several documents from the government that JX showed during the interview, building a sizeable refrigerated warehouse costs the company more than 2 million RMB, and the Dongtou District government reimburses about 1 million RMB for the company. Moreover, in 2017, the district government provides 700 thousand RMB construction subsidy to the private research institute affiliated to the WDI project and its mother company to buy office appliances and set up research topics (Cai & Su, 2017). Although all the funding is supervised and recorded by the district government and limited to a special fund for special use, it can still be observed that the local Dongtou government is supportive of the development of the WDI project. Another remarkable financial support is that the district government spends over 18 million RMB to specially construct two roads for the operational convenience of the WDI project.

On the other hand, a more efficient way of receiving information from the overall structure is beneficial to gain various policy support from central and local governments, which brings the WDI project a good reputation and benefits within a short time. The construction of the WHI project was eventually completed in 2019. However, within years before the completion of the construction, the WDI project had already been included in the national-level marine ranching demonstration area of Dongtou and granted titles of healthy aquaculture demonstration ranch and pollution-free agriculture product by the Ministry of Agriculture. Locally, different levels of local government had recognized the WDI project as the key construction project of Zhejiang, Zhejiang technological and innovative enterprise, Wenzhou agriculture leading enterprise, Wenzhou famous product, etc. See Figure 12.

Figure 12 Display of received honour (partial)

Source: Image taken by the author

In China, there is always a plaque to prove each title or official honour being granted by the government. Figure 12 is the evidence on-site that partially shows the massive policy support gained from the efficient information reception. As JX said during one interview,

> Because of the connections with local officials, I have received the information of free offices for technological and innovative enterprises in downtown Wenzhou from officials and have started to prepare for the application before the new policy being officially published online. (Interview notes)

This clearly shows how the benefit of forming and maintaining connections and interrelationships with government actors are worth making great efforts. Therefore, as the marine ranching industry is getting more closely related to policy and the government, the person in the company whose job is to establish and maintain relations with the government and officials is vital to the CMR project and the means of establishing and maintaining relations is becoming more significant. Theoretically, this also illustrates how social network theory, especially the concept of weak ties here, must be contextualized by taking into account *guanxi* culture exemplifying the distinctive characteristics of CMR networks in the Chinese context.

Three Types of Relationships Building

JX has established countless connections with others over the years. Three typical examples indicate three main types of observed connections and interrelations handling: active-type, passive-type, and medium-type.

Active-type refers to the person on the bridge position actively connects with the specific target person in the overall structure. While reporting the WDI project proposal to the central government unit, or more specifically, to the State Oceanic Administration (hereafter SOA), JX had a chance to meet with the deputy chief of the SOA, FW, and at that time JX seized the chance of becoming from a stranger to an acquaintance to the central government official. The weak tie has been found, and how to further develop the relationship later is essential. JX introduced that his method of bridging weak ties with central officials was paying attention to FW's family life during the meeting. While their conversation was mentioning the WDI project, FW also randomly talked about his family and his worries about food security in China, especially milk powder for his granddaughter that might be substandard. Because during that period, most people still did not trust in domestic milk power in China due to the 2008 Chinese milk scandal (Yang, 2011). By caring about his worries and ordering milk powder online and sending from abroad to FW's place directly, JX moved forward building *guanxi* with FW. As a result of the active development of the relation, FW appreciated JX's concern, and JX quickly became an intimacy and the trust between them was formed to some degree. In this context, JX successfully created *guanxi* with the central government official who is directly supervising the WDI project by tactfully caring about the latter's concerns about family life which are not related to the project at all. The active-type of relationship-building requires the bridge node to be enthusiastic about not CMR project-related issues only but any matter that may help.

Bian and Zhang (2014) state that *guanxi* facilitates favour exchange. In return to JX's being warmhearted, FW could more directly deliver information about various support or programs from the government that might benefits the WDI project to JX rather than abusing his powers directly helping with the WDI project. So far, a benign relationship between the government and commerce has been observed. However, it must be noticed that the weak tie here, FW, is only attached with JX himself but not the company or the project itself because their relationship is based on privately benign favour exchange. Although JX represents the WDI project and the company while dealing with issues with FW, the development of their relationship starts from non-work personal interaction. Take the 20 million RMB "Charge for Sea Area Utilization" subsidy from the central government for restoration of the environment as an example, after the *guanxi* between JX and FW being established and developed, FW delivered the information about the subsidy program to JX once the government had confirmed the implementation of the program so that JX could prepare for the application in advance. The SOA department still supervises the application and the subsequent funding proposals, and every step follows a standard procedure. Without FW's information, JX and his company may or may not have the prompt access to the information which may lead to subsidy being missed. In this relationship, FW remains a weak tie to JX while their *guanxi* develops from stranger to acquaintance and then to intimacy. JX mentioned in the interview that his "big brother" FW is willing to provide research funding if JX has any marine-related research topic after FW has retired from the leadership position of SOA and became the president of China Association of Marine Affairs in 2016.

The second type is the passive-type, which means the bridge node has been connected by weak ties before being active. The WDI project is the higher-level (provincial-level key

construction project), and the construction of the WDI project would significantly affect regional development. The scheduled investment of the single WDI project reached 230 million RMB while the GDP of Luxi township of 2013 is about 390 million RMB (Qian, 2014). The local government department of Dongtou district takes it seriously by listing its construction in the local development plans over a number of years ("The Two-year Action Plan of the Integrative Development", 2019).

The Ocean and Fisheries Administration and the Radio and Television Station of Dongtou district are used as examples. While JX, representing the company, was dealing with the local oceanic government department that directly supervises marine ranching project issues, JX had chances of building relationships with these local officials. Unlike the relationship between JX and FW that JX is the active node bridging FW, the relationship between JX and the director of the district Ocean and Fisheries Administration, HH, is based on flattery. According to the local development plan, the circumstances of the WDI project in Dongtou district is essential to the regional development. Hence, HH understands all details of the project well and is the side that actively and closely deals issues with JX. To push the development of the WDI project, these related local officials would forwardly transmit information about applicable local governmental support to JX and the company. When the company applies to build a refrigerated warehouse, the local fisheries department delivers the information about applying for the governmental support that covers half of the cost for constructing the facility. Similarly, RG, the director of the local Radio and Television Station, actively offers to advertise the WDI project and its parent company on official platforms including periodically introducing the WDI project on the television and promoting the WDI project-related social events on its official accounts.

Some officials forward JX the information of applying for free offices and supplies in local business incubators in downtown Wenzhou once they received the notice from their higher units. With all these interpersonal help, while local officials remain weak ties to JX, their *guanxi* has gradually transformed from acquaintance to intimacy to JX and changed their interrelations from business-to-business to enhanced personal relations. The marine surveillance vessel arranged by HH to pick up two private visitors of JX is the expression of the transformation of their relationship from the public to private.

In short, local government officials are more likely to be a closer weak tie to JX since they all clearly know the importance of the WDI project after them all working together with JX to support the development of the project. One thing must be noticed that local officials have relationships with JX at the inter-organizational level at first. They consider JX, the project, and the company, and all information will be shared or transmitted as long as the WDI project is settled there. After dealing with JX for a period, the relationships later become private to some extent.

The last type of forming connections and interrelations is medium-type. Sometimes, although the person can find weak ties and bridge structural holes by himself, he may still need a specific medium node to make several relationships in a short time. Thus, the person may need one or more persons becoming the bridging nodes for him, so as JX. YL, the former party secretary of the Faculty of Fisheries and the Faculty of Marine Environment at the Ocean University of China, is the person that JX needs. YL has worked in positions since 1998 and currently has been retired. JX employed him as the consultant with the firm and put him on the position of bridge node due to his connections with many officials and experts in oceanic fields in China. It must be mentioned here that the research divides the relationships into three levels:

inter-employee level, employee-society level, and inter-organization level. Since JX has hired YL as the company consultant, YL has been included in the inter-employee level and hence, YL becomes a strong tie to JX rather than a weak tie at first. Therefore, to JX, YL is an essential medium for him to reach an increasing number of potential weak ties. The Ocean University of China (hereafter OUC) is the only leading university in various oceanic aspects in China for the past decades, so many heads and leaders of governmental departments and academia graduate from OUC, for example, most current and past chiefs and deputy chiefs of SOA, heads in subdivisions of SOA, experts, and leaders of the Marine Research Institute of the Chinese Academy of Sciences. YL, as the important figure in OUC history, has many persons in positions who used to be his students.

Therefore, by building *guanxi* with the medium, YL, JX acquires the ability to reach many weak ties at the same time. Although these budding relationships with these persons are acquaintances at the first, it gave JX and the WDI project more chances for future development through bonding with their old teacher at OUC. Therefore, after the relationship of cooperation and employment being formed, the trustworthiness brought by reciprocity was observed between JX and YL. As JX mentioned when YL and he get in touch with YL's former students, these persons have particular and personalized sentiments with YL, with close ones having personal attachments and not closely related ones showing personal faces to the old teacher (Interview notes).

The last type ties for the CMR project has some limits that must be noted. YL was in a key role at OUC, and this university was the only leading university in oceanic fields in China when these actors first met. Building *guanxi* with YL and picking him as the medium node provided important help for the development of the WDI project, but this node may not be

reproducible in other fields. Also, interestingly, according to JX, the relationship between him and YL relies on JX himself and not the WDI project or the parent company (Interview notes). In other words, after entering the local structure of the WDI project, YL would was prepared to maintain strong ties to JX, but not for any other member of the management team although they are all in the same company. Confusingly, although to be sure that YL is a weak tie to JX at the beginning, social network theory does not provide a way of thinking if YL can turn into a strong tie from a weak tie after working closely together on the project even though this appears to be the case. YL literally shifts from being part of the overall institutional structure of the WDI project to being a key actor in the local structure of the private sector. Only by accommodating the notion of *guanxi* culture is it possible to explain this important ship in the relationship between JX and YL from acquaintance to intimacy, and finally trustworthiness. YL thus emerges as the medium node between the local structure and the overall institutional framework.

In brief, JX, as the person running the WDI project and is responsible for its external connections, has been found using three ways to build relationships with potential weak ties: active type, passive-type, and medium-type. These bring forward that the outward node of the local structure of CMR operations actively bridging structural holes with weak ties by grabbing every opportunity to develop the relationship from acquaintance to intimacy. Secondly, the nodes on the side of the local government actively reach the local structure of CMR projects with the relationships change from public to personal to some extent after interacting for a period. The last one is to employ and cooperate with a medium node that many other weak ties can be reached through. Coincidentally, relationships between JX and FW, JX and YL both exclude the role of the CMR project and the company and are based on the existence of the person, JX himself. To put it bluntly, it may be possible to say that if JX left the project, these relationships

would be gone with potentially profound implications for the viability of the project. These observations also enrich the importance of the aspects of centrality and cohesion parts in CMR operations.

Structural Balance

Structural balance refers to the inter-organizational relation part introducing both positive and negative relations between the WDI project and other related actors. Several central bodies related to the WDI project will be addressed in this part, including research institutes, insurances, banks, the local government, and local communities.

Research institutes, insurance companies, and banks incorporated as weak ties to the WDI project. The relationships between the project and research institutes and insurance companies remain inactive; differently, the relationship between the WDI project and banks develops from acquaintance to intimacy throughout the progress of the project. On the other hand, although the previous parts have shown that the decision-maker of the WDI project made good relationships with the government and officials at the employee-society level, the local government also plays as a double-edged sword to the WDI project, as well as local communities. The local government actively supports the development of the WDI project as mentioned above, but some departments bring in a negative impact. In the meantime, local communities also bring a negative impact to the WDI project at the inter-organizational level and some enter the local structure of the project and become strong ties to the project at the inter-employee level afterwards.

Research and advanced technologies are important to the successful development of CMR projects in China. This study does not focus on what technologies would be necessary for fish breeding, so it will only be considered as a part of the structural balance that supports the

development of the project. At the beginning of the WDI project, JX's strategy was to set up a private research institute to collaborate with the best oceanic universities and research institutes in China by directly providing funds and giving research topics to university professors and researchers. Institutes, including the Ocean University of China, the East China Sea Fishery Research Institute of Chinese Academy of Fishery Sciences, Zhejiang Ocean University, Zhejiang Mariculture Research Institute, and Ningbo Ocean and Fisheries Research Institute, signed cooperation agreements with the WDI project to support overcoming technological obstacles. As mentioned in the financial support part that Dongtou district government provided 700 thousand subsidies to the private research institute of the WDI project, this funding support can also cover part of the research fees for related issues and topics (Cai & Su, 2017). However, the interactions between the WDI project and research institutes were observed only when the WDI project was looking for specific technical help. This also shows the relations of reciprocity and mutual benefits between them but anything above that was hardly found. Although the *guanxi* between the WDI project and these institutes are roughly acquaintance and remain inactive, these institutes can still back up the WDI project in the technical aspect to some degree in exchange for research funds.

The insurance for CMR projects is a new product designed and promoted by the government. CMR project is still a high-risk marine aquaculture measure that is fast developing recently. Due to its novelty and high-risk, aquaculture or more specifically, CMR projects have never been covered by the fishery's mutual insurance in China before (Jiang, 2013). Until 2017, with the policy support to the construction of marine ranching projects from the Ministry of Agriculture, the China Fishery Mutual Insurance Association, regulated by the Ministry of Agriculture, started to consider setting up insurance programs for marine ranching projects.

Working together with the local government, the insurance provider investigated the WDI project in 2017 (Li, 2017). The specially designed insurance program for the CMR projects in the region requires the company of paying half of the premium, no matter the higher or lower amount that the company wants to be underwritten, with the local government paying the remaining half. The insurance providers are not proactive in insurance programs for marine ranching projects since high-risk underwriting activities bring them more risks than other regular activities. Companies running CMR projects may actively reach insurance brokers to get their projects insured or insurance providers do not actively encourage them to apply for the insurance services. In the case of the WDI project, it was covered by the breeding insurance in 2017 at first. However, in 2018, typhoon Maria attacked the WDI project and resulted in facilities on site being destroyed on a large scale and the direct financial loss of fisheries products reaching twenty-three million RMB (Xu, 2019) Although the insurance agreement had been signed before the incident, the insurance company did not actively close the deal. The typhoon hit right before the premium was paid off and the agreement went in effect. As a result, the WDI project bore the loss and did not receive any insurance compensation. Therefore, although the government has started to make up the lack of insurance program for emerging CMR projects, insurance providers do not eagerly make deals with CMR projects because of its high risk and keep their acquaintance and weak tie positions to marine ranching projects at the inter-organization level (Xia, 2018).

Unlike with insurance providers, the relationships between the WDI project and banks develop. Although banks also consider CMR activities as high-risk, there are several items that marine ranching companies can pledge to banks to get bank loans. The essential thing is the license of sea area use. It can be considered as a government-issued certificate that gives the

right of exploiting a sea area, and banks regard it as a valued property right. Other items include existing valuable products, real estates like office buildings and warehouses, and even company credit. When the parent company running the WDI project borrowed money from the bank through pledging their license, the company received a huge mortgage loan from the Dongtou Rural Commercial Bank (Interview notes). That was the company's first contact with the bank, and at that time, the bank was just business acquaintance to the company since the WDI project was just one of the large loan customers of the bank. However, its unique feature is that when diseases or death happened to the high-risk industry, the company may suffer difficulty in fund flow. In 2018, typhoon Maria attacked the WDI project and resulted in facilities on site being destroyed on a large scale and the direct financial loss of fisheries products reaching twenty-three million RMB (Xu, 2019). To help restore production and keep paying for loans, JX was introduced to the governor of Zhejiang (Provincial) Rural Commercial Bank by the president of Dongtou Rural Commercial Bank. The governor and the president were willing to support the WDI project in the region and help to resume production by using the method of "borrowing new to return old" and waiving the interests for years (Interview notes). Another factor facilitating such a case is that it can be a method for banks to avoid bad loans after the company resumes and repays the loan. Therefore, the WDI project was a regular customer to the bank at first and then works much closer with the bank under the special arrangement based on reciprocity. However, the action of the governor of the bank is unpredictable. It is not guaranteed that the special arrangement would be applied to all cases. In this case, the bank is acting supportive of the WDI project, but it remains uncertain in other cases.

The local government usually has a positive attitude towards CMR projects like mentioned in the previous section, but there are some exceptions due to different authority

systems. In the case of the WDI project, the most significant conflict is between the WDI project and the Land and Resources Bureau of Dongtou district. JX, as the president managing the WDI project, has received the agreement to use land areas near the construction of the WDI project from the Dongtou district governor. However, the Land and Resources Bureau of Dongtou district, which is not directly supervised by the district government but the Land and Resources Bureau of Wenzhou City, decided to keep the bureaucratic way of authorizing the land use certificate to the company of the WDI project. According to JX, as he told the district governor that "I have been to the bureau 14 times so far and the certificate is still not available," the occurrence of the delay eventually slowed down the use of the land by about two months. Although such a negative impact from the local government might vary depending on the regions and local authority systems, it is worth to keep in mind while investigating the interrelationships of CMR projects with other actors in regions.

Local communities can be both supportive and hostile to CMR projects in their vicinity. In the case of the WDI project, the impact of local communities is negative at first and becomes positive later. During the construction of the WDI project, the problem of expropriating local villagers' lands and sea areas emerges. While constructing and negotiating with local villagers about requisition amount at the same time, due to reparation was not in place in time, about a hundred local villagers got assembled to the construction site to march against the project in 2015. The local government sent over three hundred police forces to the construction site to maintain social order when the crowd was gathered. A team of ten police officers was stationed at the village to manage the situation for the subsequent six months after that. The gather directly hindering the construction progress caused an eleven-month delay for the completion of the construction, and the trust in the marine ranching project was reduced. Finally, the district

government advanced the reparation for the company to appease local villagers and dealt with the marine ranching company thereafter.

Although the local community delays the construction of the WDI project at the early stage, its importance is noticed when putting into production. The essential part is the local labour force. Since the WDI project is in the rural area by the coastline, there are no new labour resources floating into nearby areas. Therefore, local villagers are turned into labourers with rich fishing experiences and skills working in the marine ranching area. Heavy labour work on-site includes ailing, casting nets, fishing, and delivering. Without hiring over forty local villagers to work on-site, there would be enormous pressure for the company to find enough labour force to keep the business running. These employees are transformed from weak ties to strong tie workers within the local structure since they are starting the career with the WDI project.

For the villagers, the return is considerable as they can earn more than doing conventional marine fishing, and it is less dangerous to work in a well-constructed workplace. The average salary of a site employee reaches fifty thousand RMB a year while the annual average income for rural workers is about thirty-five thousand in 2017 (China Statistical Yearbook, 2018). Local community support for the operation of the marine ranching project is through the provision of an affordable labour force. In another way of thinking about this, fewer fishery resources and decreasing numbers of fishing vessels result in lower-income and drag down fishermen's living standards. The settlement of the WDI project has already created over forty jobs for local communities with stable working conditions being provided.

In short, local communities play both positive and negative roles in the marine ranching project. The project may be hindered while facing reparation problems that are closely related to personal interests at the beginning. After the construction is finished, local communities become

supportive of the marine ranching project and crucial as many necessary labour forces are provided.

In conclusion, for interrelations between the private sector and other actors at the inter-organization level, the evolving conditions of these connections vary depending on the individual subjects and their particular characteristics. Although all these actors mentioned above, excluding local communities, are weak ties in the whole institutional framework, social network theory does not fully express the evolution of their roles in the WDI project. This shift in roles is summarized in Table 3. Incorporating the idea of *guanxi* helps to better understand incongruences and inconsistencies of human relationships in emerging in the Chinese CMR industry which social network theory alone may miss due to its indifference to local cultural particularities.

Table 3 Evolution of Actors' Relations to the WDI Project

Subject	Early involvement	Later involvement
Research institutes	Weak tie	Weak tie
Insurance providers	Weak tie	Weak tie
Banks	Acquaintance	Intimacy
Local communities	Negative weak tie	Strong tie in the local structure

Source: Compiled by the author from field notes

Among these actors involved in the institutional framework of the WDI project, research institutes and insurance companies remain as the weak ties to the WDI project. Research institutes keep reciprocity relation by passively providing scientific researches in exchange for research funds while Insurance service providers are passively accepting the application for the insurance service from the WDI project under the setting of being state promoted. Banks are the

acquaintance to the WDI project since they check through everything about the project before making a massive loan to the company, and along with the deeper cooperation, the relationship develops to the intimacy in order to gain a win-win situation. Finally, local communities play opposed roles to the WDI project over time. It is the negative weak tie to the WDI project first because of the interest-related problems about the expropriation of land and sea areas during the construction of the WDI project. After the competition of the construction, it transforms from a negative weak tie to a strong tie in the local structure of the WDI project since these local villagers have become employees of the project. This table does not include the local government. Local governmental units may bring positive and negative impacts on the WDI project simultaneously and because it really depends on local authority systems in regions.

The case study of the WDI project highlights two main findings. The first revolves around issues of defining the key characteristics and objectives of marine ranching. In the absence of clarity from the Chinese government about valid measures to examine and verify the genuine attributes of CMR projects, research for this study proposes defining marine ranching to include the objective of increasing fishery resources, clearly defined project ownership and boundaries, an un-enclosed fish raising space, artificial breeding, mostly natural feeds and scientific management. To these characteristics should be added a relatively lower breeding density and the very limited use of feed nutrients and chemical additives. The analysis suggests that, taken together, these key attributes provide the minimum prerequisites for defining a genuine marine ranching project.

The second key finding emerging from the case study highlights the key connections and interrelationships between actors in the institutional framework of the CMR project in the Chinese context. These connections and interrelationships co-exist across three levels: inter-

employee, employee-society, and inter-organizational levels. Under the current circumstances of the rapid development of the marine ranching industry in China, a critical node with higher centrality and cohesive subgroups reflects the transformation of the local leadership structure of the CMR project shifting from share-based to capability-based. Such leadership structure improvements prepare the private sector itself better to mobilize its social and institutional networks later. Secondly, three typical types of a relationship forming and maintaining are raised. Active-type is observed in bridging specific targets of central government officials based on personal relationships. Passive-type appears in long-term cooperation with the local government starting with public relationships towards private relationships. The last type that turns weak ties into strong ties through employment to reach more weak ties within a short period is considered as medium-type. Finally, inter-organizational relationships with research institutes and insurance providers tend to be inactive while banks getting intimate with CMR projects due to common risks and interests. Different local authority systems delaying the development of a certain CMR project was observed but these occurrences are subject to regions and local governmental arrangements. The most changing relationships with local communities develop from negative weak ties at the inter-organizational level to crucial strong ties at the inter-employee level to CMR projects at different time stages.

Chapter 5

Discussion and Conclusion

This study initially revealed the phenomena of blindly pursuing naming marine ranching projects under the emerging national development trend due to the lack of uniform definitions and recognition of marine ranching projects in China at the early stage. Then the thesis examines the positions and interrelations between the private sector, the government, and local communities as the three major actors while minor actors, such as insurance companies and research institutes, are also involved.

The first section of this chapter undertakes a detailed review of the features of two types of marine ranching operations in China and highlights the differences between the two and with other conventional fish farms. After that, it focuses on commercial mariculture marine ranching operations by discussing the evolving structure of the private sector itself and using the private sector as the initial point to analyze its relations with other major and minor actors. This is followed by an overview and assessment of the institutional structure of commercial marine ranching operations. The second section of the chapter raises difficulties and problems of doing commercial marine ranching operations in China with feedback and suggestions on resolutions. The last section of the chapter will discuss the significance of the research.

Marine Ranching Operations in China Nowadays

Capture fishery and aquaculture constitute the fishery industry. In China, along with the declining capture fishery, China relies more on the energetic development of aquaculture. To overcome the long-term negative effects of the conventional mariculture methods introduced in Chapter 1, China started to find an alternative way to keep the development of its mariculture industry on track which is also beneficial to the ecological environment. The construction of

marine ranching was gradually brought on to the stage as the future development direction for the fishery in China.

Although the idea of marine ranching was raised in China in the late 20th century, China did not officially recognize the construction of marine ranching operations in national development, such as the five-year plan for national fishery development made by the central government, until 2006. Even so, academics may demonstrate their individual opinions on the definition of marine ranching operations, but Yang (2016) has concluded that the academic definition of marine ranching in academia has remained non-uniform. As mentioned in Chapter 2, China's national and local standards of classifying marine ranching operations were formally published in succession in 2017, which finally brought an official definition to marine ranching operations to some extent. However, some parts of the contents remain ambiguous and need more explanation.

It must be noticed before digging into details of marine ranching that three different grand divisions of marine ranching operations, including public welfare marine ranching project (PWMR), commercial marine ranching project (CMR), and recreational marine ranching (RMR), share similar names but have different features and purposes. Under similar names, PWMRs prioritize the gradual restoration of the natural environment and ecological system in the offshore sea body. Local government provides funding for two construction measures – the implementation of artificial reefs and the release of juvenile fish, and ongoing maintenance. The cooperation between local governments, who construct PWMR districts, and private companies, who provide maintenance service for these projects, began to increase. The analysis of PWMR and the emergence of Public-Private Partnerships, which the public sector and the private sector jointly develop marine ranching operations, need further in-depth research. In the meantime, the

position of RMR is another research topic on the diverse development of Chinese fisheries. RMR is not a regular type of marine ranching recognized internationally. Fujiya (1999) raised two types of marine ranching, recruit-type and harvest-type, but the RMR is not included in the literature. The research on ocean ranching operations in Japan, the United States, and Iceland shows no relation to the recreational fishery (Arnason, 2001). China's national standards published by the Ministry of Agriculture (2017) puts RMR in the category list with no details or explanation being included in the official document, and the purpose of developing recreational activities does not accurately accommodate the recognized definition of marine ranching in the same document. Although the national government has initiated efforts to normalize the definition of marine ranching, more time and detailed guidelines are still needed to resolve the lack of clarity.

On the other hand, besides the preservation of the ecological environment is a goal, privately invested CMR operations also pursue financial returns. They follow the cycle raised by Fujiya (1999), which is release-feed-reproduction, under measures that are beneficial to the environment. In contrast to PWMR being led by the local government, CMR operations are initialled by the private sector. This study has focused on commercial marine ranching as the research object to analyze and assess the institutional structure of constructing CMR operations in Eastern China. The inter-employee level, employee-society level, and inter-organization level are the three levels from social network theory that are used to examine CMR operations.

Definitions of Marine Ranching in China – Seeing through the surface

An important outcome of this research is the development of a comprehensive way of identifying and examining the key elements of marine ranching objectives and activities based on a combination of Yang’s six elements and two additional characteristics – a lower culture or

breeding density and the limited use of chemicals and feed nutrients. The necessity of having this kind of examining mechanism for marine ranching is revealed in the following discussion.

In October 2018, the investigator participated in The Second International Symposium on Modern Marine (Freshwater) Ranching held in Dalian, China. It was organized by the China Society of Fisheries (CSF), China's largest academic organization on fisheries affiliated with the Ministry of Agriculture of China. However, even the title of the conference hosted by the official organization has already been unclear. Marine is related to the sea while freshwater is supposed to be not of the sea. Two contrary terms put together in one topic raised questions about whether marine ranching in China included freshwater aquaculture even though freshwater ranching does not currently exist. A review of the conference abstracts revealed that aquaculture activities in rivers, inner lakes, and reservoirs were also included. However, these activities are contrary to the core goals and developmental direction of marine ranching operations as much of the freshwater fishery is associated with significant damage to the environment (Zhang, 2015; Li et al., 2011; Reece et al., 2017; Yan et al., 2017).

On the other hand, of the 126 research abstracts reviewed from the conference, 7 were international research on regions and areas outside of China, while the remaining 119 studies focused on China. None of the 7 international studies referred to marine ranching. Instead, they used specific phrases such as artificial reefs, stock enhancement, and marine release. In contrast, excluding the 88 studies that were either technical reports or research on freshwater activities, 16 of the remaining 31 used similar terms to the international studies, and the rest 15 directly used marine ranching in their titles. Most research on marine ranching or marine ranching-related topics equated public welfare marine ranches with marine ranching operations. Unfortunately, none of the research papers published in China elaborated on the differences between various

types of marine ranching operations despite the Chinese government having published its official document describing different types of marine ranching. This academic conference organized by the official organization responsible for all fisheries does not differentiate these types according to different goals, settings, and structures, even after the publication of the Chinese national classification of marine ranching in 2017. This lack of clarity in the official and academic definitions and characteristics of marine ranching means there has been some lingering confusion about the classification of specific projects and unevenness in the labelling of marine ranching locally and globally.

Furthermore, the lack of regulations on marine ranching has sometimes resulted in what appears to be misleading naming of projects and activities. A brochure from a private company in the conference exhibition called Cathay Marine Ranching Development CO., LTD. mentions the construction of a national marine ranching demonstration district without naming the project and without providing any structural details. A search for the list of all national marine ranching demonstration districts recognized by the Ministry of Agriculture (2017) does not include the name of this company. Indeed, the brochure claims the company plans to provide recreational activities for the public in the area but did not have a business related to marine ranching operations despite the impressive company name.

These circumstances seem to indicate that in practical terms it may still be too early for the Chinese authorities to directly manage and influence the development of marine ranching without first paying more attention to establishing specific criteria and regulations for approving different types of marine ranching operations. This study also highlights how methods of comparing CMR operations with other types of marine ranching must take into account the ambiguous and sometimes inconsistent objectives of academic researchers, government attempts

to regulate, promote and manage marine ranching, and the interests of stakeholders, including investors, local communities, financial institutions and the scientific community among others.

The Evolving Management Structure Within the Private Sector

Coinciding with the emerging CMR operations in China since the early 2000s, the case study has shown how projects initiated by private companies and individual investors have improved their management structure. Based on the concepts of centrality and cohesion and observations of the leadership restructuring in the WDI project, the analysis has revealed how key actors prepare to better mobilize their social and institutional networks to benefit the operation. The ability to collect information within the fewest steps brings the decision-maker higher combined centrality, including degree, betweenness, and closeness, as well as cohesion with other employees and investors regardless of shareholding proportions. The structural evolution is reflected in the key decision-maker being promoted to the top position and the capability of connecting actors in the overall network is essential to the rapid development of the CMR operation. After the network within the private sector unit was optimized and decision-makers adjusted, it became better prepared to approach other external actors for the continuing smooth development of the CMR project. Examples from the case study indicated that the centrality and cohesion created by the key decision-maker greatly impacted the developmental direction of his interactions and interrelationships with important external actors and these reflect the movement of the private sector adapting itself to prepare for building connections with others in the network structure.

Weak Ties and Structural Holes: the ways of building mutual relationships

Strong ties are like the hardware components of a computer, and weak ties are the software that makes it run. Strong ties are members within the private sector network that started the CMR, and their relations with weak ties external to the network directly impacted the future of the project. Structural holes are usually observed when the private sector does not have relations with many potential weak ties. In the meantime, in the Chinese way of building relations with others, *guanxi* is formed and developed. The concept of *Guanxi* culture helps with understanding the connections with weak ties in the study of CMR.

Hence, three types of forming and maintaining relationships in CMR projects have been explained, including active-type, passive-type, and medium-type. Active-type of forming relationships occurs when *guanxi* with leading government officials that successfully grow from acquaintance to intimacy brings one or more opportunities to the CMR, like information transmission and policy inclination. It must be noted that the development of *guanxi* tended to revolve around the personal relationships between the key decision-maker of the CMR project and central government nodes and not within the private sector unit itself. This special personal *guanxi* is represented when central officials provide efficient information delivery to the decision-maker of the CMR project only but not to any other in the same network. Passive-type of relationship formation was also observed when local officials are engaged in supporting CMR projects in the regions. Since China has been promoting the development of marine ranching operations, local authorities tended to develop their *guanxi* with leaders of CMR projects from acquaintance to intimacy to better boost the development of these projects and subsequent regional development. This was the sort of significant relationship so strikingly revealed when the 80-foot Chinese national marine surveillance vessel collected its civilian passengers.

The last medium-type of relationship formation in CMR projects requires an essential bridging node. The features of the fishery in China are that the circle of Chinese marine officials is limited and relatively closed. This meant it was relatively easy to identify and target the relevant bridging node. Successfully finding a bridging node for the CMR project provided more opportunities for expanding *guanxi* to more weak ties within a short time. However, the limitation of the method is also apparent. Although the *guanxi* between the decision-makers of CMR projects and the bridging node may develop from stranger to trustworthiness, the relations with these new weak ties are more likely to remain acquaintance due to the indirect connections. Interestingly, the relation with the bridging hole, like above, is also limited to the related decision-maker himself but not the private sector unit. It is hard to tell if this part of the observed phenomena of medium-type is unique to the WDI project only or is probably general to the whole CMR industry. This more complicated formation of relations may be worthy of further study to figure out why and how this happens.

Structural Balance: double-edged sword actors

Some external actors play positive and negative roles in CMR operations. The research examined scientific research institutes, insurance companies, banks, the local government, and local communities.

Research institutes and insurance companies generally brought positive impacts to CMR projects, but the relationships remained acquaintances. Research institutes provided technical support in exchange for scientific funding from CMR operations. However, this was only on an ad hoc and short-term basis generally focussing on specific technical issues or problems which required resolution. Similarly, based on the case study of the WDI project, insurance companies were not proactive in cultivating business with CMR projects. Although the central government

has started to promote insurance programs to support CMR projects, providers would only sell insurance over when actively approached by CMR operations because these projects are still considered as very high-risk. The research also revealed that insurance risk was also heavily underwritten by the local government since the local government helps CMR projects with 50% of premiums under the guidance of the central government.

Banks overall have a positive impact on CMR operations after the nation started to encourage and guide banks to support the development of CMR operations. However, as high-risk mariculture projects are still not regular customers to banks, they still make their own decisions about capital loans while dealing with CMR operations like requiring properties and complete documents from CMR investors as guarantees. However, once banks started to share the risks with CMR operations by successfully providing loans to CMR operations under the new policy, the relations between the private sector and banks became intimacy as observed in the case study because CMR projects may need continued help from banks and banks use measures to help CMR projects to get rid of bad loans once the connections were built.

Local governments used to positively impact the development of CMR projects by providing various subsidies and policy support. However, observations from the case study also show that different authority systems may bring negative impacts to CMR projects by slowing down the construction. The best example in the research is the Land and Resources Bureau of Dongtu district, which is directly under the Wenzhou city council but not the district government, delayed the application of extended sea area use for unknown reasons when the Dongtou district government urged to make the application approved and resume the expansion of the CMR project. The observed example may be limited to the specific region or time period,

but the idea is that while analyzing institutional relationships of a CMR project, it is important to also investigate the negative impacts from the government.

Local communities are another sharp double-edged sword for CMR operations. Evidence from the case study of the WDI project suggests that the carelessness of dealing with issues like land and compensation for displaced residents can play a significant role in the development and implementation of CMR projects. During construction, strong reactions among local villagers were observed, which resulted in the temporary suspension of the project, as well as some kinds of minor troubles to marine ranching constructors. However, they are also essential to CMR operations, as they are important local labour force and consumers for the CMR project after the construction is completed. Although not the main focus of this study, the changeable positive and negative interactions and relations between the private sector and local communities are worthy of further research in relation to understanding mutual benefit and regional development.

The main body of the research lists the private sector, the government, research institutes, insurance companies, banks, and local communities as actors involved in the constructions of CMR projects. It also uses social network theory incorporated with guanxi culture to examine the evolution of the interactions and interrelations between the private sector and each other actor.

Situations and Suggestions

This section alerts government officials to the necessity of developing examining and oversight mechanisms to overcome the problems of three types of marine ranching being indistinguishable in China. It also seeks to highlight for the private sector matters that need attention while dealing with key actors in the institutional structure during the development and implementation of commercial marine ranching projects.

Although China has announced its official classification of marine ranching operations (Ministry of Agriculture, 2017), there are still many details missing in the document. The government has adopted many scholarly definitions and combined these with its own understanding of the marine ranching situation in China. Three categories of maintenance-type, mariculture-type and recreational-type are outlined in the official definitions. Meanwhile, two types, recruit-type and harvest-type, are recognized internationally, which correspond to the first two types in the Chinese context. These two types can be found in other countries, such as Japan and the United States (Arnason, 2001). However, the last one, recreational type, has never been individually listed in international definitions. Some existing marine ranching operations globally may also carry recreational activities, but they do not appear to be the core reason for constructing marine ranching projects. As the Chinese official definition of marine ranching indicates that "building and restoring the living environment for marine organisms, reproducing fishery resources, improving the marine ecological environment, and achieving sustainable use of fishery resources…," the link between environmentally sustainable fisheries and recreational activities is not clearly defined (Ministry of Agriculture, 2017). Therefore, China may have its own intention to separate recreational-type marine ranching projects, but the government must explain in greater detail the differences of RMR with the other two types of marine ranching and its connections with fishery resources and ecological restoration. While the scale of RMRs in China is not yet significant, this may need more study in the future.

For existing PWMR and CMR operations, because of their names being similar, it is sometimes difficult to distinguish what marine ranching refers to precisely. In addition, due to the lack of a uniform definition of marine ranching for such a long time, many projects that are predominantly artificial reefs or cage mariculture are also registered as marine ranching projects.

This sometimes leads to confusion about the differences and purposes of marine ranching operations. At the same time, since the government has already announced three types of marine ranching, it is suggested to clearly explain all types through media or news reports, to shift conventional thinking of conventional mariculture methods as being destructive towards the goals of three types of marine ranching operations having a positive environmental impact. Hence, relevant government officials are suggested to consider an explicit measure, as a project recognition mechanism, to single out and approve qualified and genuine CMR operations that achieve the goals of increasing aquatic productions and watery environment conservation at the same time. Meanwhile, nominal CMR projects that only benefit from generous support from external actors can be eliminated.

For the institutional framework of the CMR project itself, China has made efforts on tax policies, bank loans, and mariculture insurance, and has been laying a solid foundation for the construction of CMR operations. The problems here are specific. CMR practitioners must pay more attention to dealing with issues about the discordance between different government units and government bridge-burning behaviours. These were not fatal to the CMR project but restrained the efficient expansion of the project. Meanwhile, local communities started to meaningfully engage in CMR operations only after the completion of their construction. However, before that, the private sector must be more careful about the reactions from local communities. It is necessary to work with local government to get through the period of dealing with local communities. Besides direct financial factors like compensation, the private sector and the local government are suggested to work more closely together to have close consultation with local villagers about the CMR project like introducing local and regional impact and benefits

from the project. This may acquire recognition from village collectives beforehand and prevent negative reactions in the process of construction.

The private sector is in the centre of the current institutional framework of CMR projects while generous support from the government and relevant units like banks and insurance companies is observed. The emphasis on helping to construct marine ranching operations from the leadership of China is an advantage for the industry. However, disadvantages in the current framework like the lack of clarifying marine ranching essence and bureaucrat system problem raised above may become obstacles to the further development of CMR operations. The research brought up some suggestions but further observations and practical measures for resolving these problems require more research.

Significance of the Research

The research illustrates the lack of clarity in the defining and approving marine ranching operations, especially CMR operations, and focuses on the institutional framework of constructing CMR operations through a three-level inspection based on social network theory adapted to incorporate Chinese *guanxi* culture. Its significance can be academic and practical.

The study reveals the phenomena that so-called marine ranching operations may or may not meet its definition and primary goals of ecological restoration and protection. Then it provides an overview of primarily academic and governmental expressions on the definitions, which are considered ambiguous at best in China. Based on these, the research contributes to a reconsideration of an essential method of examining and approving especially CMR operations in China, especially for policymakers and marine ranching practitioners. While changes to scholarly and government definitions or classifications are not proposed, the research highlights how a review of the current CMR operations with Chinese characteristics and providing more

detailed explanations would help to bring a better understanding of the benefits of this industry in China.

Moreover, the study fulfills a void in the structural analysis of commercial marine ranching in China in English language literature. It uses social network theory to look closely at the evolving interactions and interrelationships between the private sector, who have been the primary initiators of CMR operations in China, with external actors within the wider institutional frameworks. The concepts of weak ties and structural holes help to distinguish external actors, but they are insufficient for an analysis of the whole process of forming and maintaining relationships in a Chinese setting. Thus, the research also employs the idea of Chinese *guanxi* culture to reflect relational changes between key actors. The experience of private guests taking the Chinese marine surveillance vessel is a striking expression of the hidden personal relationships between the private entrepreneurs and government officials that were examined and explained through a combination of social network theory and Chinese *guanxi* culture. Hence, while building on a theoretical framework largely based on Western circumstances, this study further suggests the importance of the local contextualization of social network theory by incorporating culturally embedded networking practices into the analysis of the dynamics of marine ranching operations in China.

In practice, the research gives government officials an overview of issues and problems during the interactions that concern practitioners and emphasizes the need to review government interrelations with the private sector. The study also illustrates a complete example of the institutional dimensions of constructing and operating CMR operations for governments, investors and other commercial marine ranching practitioners. Key points about how a private CMR project can modify its own leadership structure to better form and maintain relationships

with other key actors and stakeholders have been highlighted. The research has also identified all potential actors within the overall network along with some detailed connections to help practitioners reinforce their current networks or start new CMR operations. Finally, it reveals difficulties and problems for those who want to engage in the marine ranching industry to help minimize possible risks.

Limitations of this Study

While the research employs the comprehensive conceptual framework of social network theory to investigate the evolving relationships between involved actors in the institutional structure of a commercial marine ranching project in China, it is important to recognize and acknowledge the limitations of this study. Although the phenomena of rising CMR projects are partially examined through a case study approach, there may also be other factors potentially affecting CMR projects in China which may not be fully revealed in just one detailed case study.

For example, the private company that invests in the WDI project has a typical joint-equity enterprise that shareholders own roughly even shares. It makes major decisions depending on its executive board. This is unlike many other aquaculture enterprises which are under sole proprietorship as corporate entities with leading investors holding a majority of shares (Li et al., 2011). Such enterprises usually make decisions relying on head shareholders' personal opinions and decisions. Thus, the structure of the investment reflects the structure of the CMR management team, and this results in the different strategies to approach external actors and cultivate relationships. The analysis of the capital structure of the WDI project and the company may only provide one perspective on understanding the formation of companies in the commercial marine ranching industry in China.

Other variations may also lead other CMR projects in different directions. As mentioned, CMR is also considered a high-risk industry. Risks such as typhoon, flood, red tide, technical failure, and disease all bring potential financial loss to operating CMR projects to some extent. Consideration of such risks is essential when overseeing other CMR projects. Even being lucky on social networking can be an attribute, as Smith and Worth (2019) state that people are more likely to notice and be open to opportunities just because of their luck. Therefore, some project leaders may be lucky enough to bridge with essential key actors to mitigate certain risks while some may not be so lucky. The potentially significant impact of managing risk is worthy of more attention in further research. This study has emphasized an examination of the WDI project and analyzed interrelationships within its institutional framework to look into the broader CMR industry in China at this stage. However, when inspecting other CMR projects in China, a fully comprehensive investigation must be carried out, which includes funding structures, construction goals, consistency of project features, and interrelationships between and among involved actors.

The group of local villagers that were interviewed in this study is relatively small and this may also be a limitation of the study. Interviews with villagers indicated a perception that there was limited direct community participation in the WDI project during construction and that more attention was given to interactions between the private sector and the government. There might be other patterns of connection between the WDI project and local communities which may have been overlooked in this study and which may require further contacts with local villagers and in-depth talks. Some other CMR activities in China appear to have greater and more direct community participation in project construction and management. More weight on the analysis of detailed interactions with local communities, including interviews with a more local villagers, are suggested when investigating such CMR projects in future research.

Bibliography

An, X., & Zhou, Q. (2006). Shuichan yangzhi zishen wuran jiqi shengwu xiufu jishu [Progress in study of bioremediation for aquaculture self-polluted water bodies]. *Techniques and Equipment for Environmental Pollution Control, 7(9).*

Arnason, R. (2001). *The economics of ocean ranching: experiences, outlook and theory*. FAO Fisheries Technical Paper 413. Rome: Food and Agriculture Organization of the United Nations.

Badi, S., Wang, L., & Pryke, S. (2017). Relationship marketing in Guanxi networks: A social network analysis study of Chinese construction small and medium-sized enterprises. *Industrial Marketing Management, 60,* 204–218. doi: 10.1016/j.indmarman.2016.03.014

Baxter, P., & Jack, S. (2008) Qualitative case study methodology: Study design and implementation for novice researchers. *The Qualitative Report, 13*(4), 544-559.

Bell, J. D., Leber, K. M., Blankenship, H. L., Loneragan, N. R., & Masuda, R. (2008). A new era for restocking, stock enhancement and sea ranching of coastal fisheries resources. *Reviews in Fisheries Science, 16*(1-3), 1-9. doi:10.1080/10641260701776951

Bian, Y., & Zhang, L. (2014). Corporate social capital in Chinese guanxi culture. *Research in the Sociology of Organizations*, *40*, 421–443.

Blomeyer, R., Goulding, I., Pauly, D., Sanz, A., & Stobberup, K. (2012). *The role of China in world fisheries*. Luxembourge: Publications Office.

Burt, R. S. (2004). Structural holes and good ideas. *American Journal of Sociology*, *110*(2), 349–399. doi: 10.1086/421787

Cai, Y., & Su, Y. (2017, December 21). Dongtouqu zhaokai rencai fazhan dahui [Dongtou district holds the convention of talent development]. *Sina Zhejiang*. Retrieved from http://zj.sina.com.cn/news/zhuazhan/2017-12-21/detail-ifypwzxq4774718.shtml

Cao, L., Chen, Y., Dong, S., Hanson, A., Huang, B., Leadbitter, D., & Naylor, R. L. (2017). Opportunity for marine fisheries reform in China. In S. A. Levin (Ed.), *Proceedings of the National Academy of Sciences* (Vol. 114, pp. 435–442). doi: 10.1073

Chen, L. (Ed.). (2019, November 25). Bailongyu shengtai haiyang muchang dahuangyu zhuyangqu quanmian touchan [The main breeding area of the ecological marine ranching of the White Dragon Islet is in full production]. *Dongtou News*. Retrieved from http://www.dtxw.cn/system/2019/11/25/013645573.shtml

Chen, P., Shu, L., Yuan, H., Feng, X., Tong, F., Chen, Q., & Li, X. (2019). Guoneiwai haiyang muchang fazhan lichen yu dingyi fenlei gaishu [Review on development, definition and classification of marine ranching in domestic and overseas]. *Journal of Fisheries of China*, *43*(9), 1851–1869.

China Fisheries Association. (2017). Shenyuanhai yangzhi—yuye zuiju fazhan qianli de chanye [Deep offshore mariculture--The brightest industry in fisheries. Retrieved from https://www.wxwenku.com/d/101097016

Cotton, A., Scott, R., & Venkataraman, V. (2002, November 4-5). Sanitation – a problem of scale. Paper presented at 'Making Services Work for Poor People' World Development Report (WDR) 2003/04 Workshop in Eymsham Hall, Oxford.

Creswell, J. W. (2013). *Qualitative Inquiry & Research Design: Choosing among Five Approaches* (3rd ed.). Thousand Oaks, CA: SAGE.

De Nooy, W. (2010). Social network analysis. In C. Crothers (Ed.) *Historical Developments and Theoretical Approaches in Sociology* (Vol. 1, pp. 377-401). Oxford: Eolss.

De Nooy, W. (2009) Social network analysis, graph theoretical approaches to. In R.A. Meyers R. (Eds.) *Encyclopedia of Complexity and Systems Science* (pp. 8231-8245). New York, NY: Springer.

Du, X., Wu, X., Gao, M., & Wang, D. (2015). Woguo haiyang muchang kaifa de xiangguan wenti tantao [The discussion on related issues of the development of China's marine ranching]. *Hebei Fisheries, 2*, 53-57.

Expert Consultation Committee of Constructing Marine Ranching of the Ministry of Agriculture and Rural Affairs. (2018, April 16). Haiyang muchang yu haishui zengyangzhi [Marine ranching and mariculture]. *China Fishery News*. Retrieved from http://gb.oversea.cnki.net/KCMS/detail/detail.aspx?filename=CYEB20180416A021&dbcode=CCND&dbname=CCND2018

Food and Agriculture Organization of the United Nations (FAO). (2016). *The State of World Fisheries and Aquaculture 2016. Contributing to Food Security and Nutrition for All*. http://www.fao.org/3/a-i5555e.pdf

Ferreira, M. P., & Armagan, S. (2011). Using social networks theory as a complementary perspective to the study of organizational change. *BAR - Brazilian Administration Review*, *8*(2), 168–184. doi: 10.1590/s1807-76922011000200004

Fujiya, M. (1999). Marine ranching: present situation and perspective. In *Marine Ranching: Global Perspectives with Emphasis on the Japanese Experience* (pp. 1–27). Rome: Food and Agriculture of the United Nations.

Granovetter, M. S. (1973). The strength of weak ties. *The American Journal of Sociology*, *78*, 1360–1380.

Hammarberg, K., Kirkman, M., & Lacey, S. D. (2016). Qualitative research methods: when to use them and how to judge them. *Human Reproduction*, *31*(3), 498–501. doi: 10.1093/humrep/dev334

Hao, Y., Tian, T., Yang, J., Wu, Z., Chen, Y., & Shi, H. (2019). Woguo jingyingxing haiyang muchang chanyelian yanshen yanjiu [The extension of the industrial chain of for-profit marine ranching in China]. *Ocean Development and Management*, *5*, 84–89.

He, L., & Duchin, F. (2009). Regional development in China: Interregional transportation infrastructure and regional comparative advantage. *Economic Systems Research*, *21*(1), 3–22. doi: 10.1080/09535310802703395

International Ecological Engineering Society (IEES). (2006). *Challenges in developing an institutional framework*. https://sswm.info/sites/default/files/reference_attachments/IEES%202006%20Challenges%20in%20Developing%20an%20Institutional%20Framework.pdf

Ji, S., & Zhang, Q. (2019). Haikou: Guli shenbao chuangjian guojiaji haiyang muchang shifanqu [Haikou: Encourage qualified marine ranching to apply for national-level demonstration sites]. *Hainan Daily*. Retrieved from http://www.mnr.gov.cn/dt/mtsy/201902/t20190213_2395138.html

Jiang, L. (2013, March 21). Zhejiangsheng shuichan yangzhi huzhu baoxian gongzuo yantaohui zai Hangzhou zhaokai [The seminar of the mutual insurance for Zhejiang aquaculture is held in Hangzhou]. *China Fishery Mutual Insurance Association News*. Retrieved from http://www.cfmi.org.cn/index.php?m=content&c=index&a=show&catid=20&id=321

Labianca, G. (J. (2014). Negative ties in organizational networks. *Contemporary Perspectives on Organizational Social Networks Research in the Sociology of Organizations*, 239–259. doi: 10.1108/s0733-558x(2014)0000040012

Landherr, A. (2010). A Critical Review of Centrality Measures in Social Networks. *Business & Information Systems Engineering*, 6, 371–385.

Li, P. (2017, February 27). Zhongguo yuye hubao xiehui yu Zhejiangsheng xiehui gongfu Wenzhou jiu dahuangyu yangzhi xiangmu kaizhan diaoyan [China Fishery Mutual Insurance Association and ZheJiang Association went to Wenzhou to investigate yellow croaker breeding project]. *China Fishery Mutual Insurance Association*. Retrieved from http://www.cfmi.org.cn/index.php?m=content&c=index&a=show&catid=18&id=2263

Li, X., Li, J., Wang, Y., Fu, L., Fu, Y., Li, B., & Jiao, B. (2011). Aquaculture industry in China: Current state, challenges, and outlook. *Reviews in Fisheries Science*, *19*(3), 187-200.

Lin, H. (Ed.). (2010). *Shuichanpin anquanxing* [Seafoods security] (2nd ed.). Beijing: China Light Industry Press.

Lin, N. (1999). Building a network theory of social capital. *Connections*, *22*(1), 28–51.

Liu, N. (2015, June 18). Dongtou wenshang huigui fazhan haiyang jingji [Dongtou Wenzhou businessmen returned to develop marine economy]. *Zhejiang Daily*. Retrieved from http://tzcjj.wenzhou.gov.cn/art/2015/6/18/art_1220532_1638348.html

Liu, W., Sidhu, A., Beacom, A. M., & Valente, T. (2017). Social network theory. In *The International Encyclopedia of Media Effects* (pp. 1–12). Wiley-Blackwell.

Liu, X., Huang, Q., Dou, J., & Zhao, X. (2017). The impact of informal social interaction on innovation capability in the context of buyer-supplier dyads. *Journal of Business Research*, *78*, 314–322. doi: 10.1016/j.jbusres.2016.12.027

Lo, M. C. M., & Otis, E. M. (2003). Guanxi civility: Process, potentials, and contingencies. *Policing and Society, 31*(1), 131–162.

Long, H., Tu, S., Ge, D., Li, T., & Liu, Y. (2016). The allocation and management of critical resources in rural China under restructuring: Problems and prospects. *Journal of Rural Studies*, 47, 392–412. doi: 10.1016/j.jrurstud.2016.03.011

Lv, D., Cheng, J., Mo, W., Tan, Y., Sun, L., & Liao, Y. (2019). Haishui yangzhi wuran yu shengtai xiufu duice [Pollution and Ecological Restoration of Mariculture]. *Ocean Development and Management*, 11, 43–48. Retrieved from http://www.haiyangkaifayuguanli.com/ch/reader/create_pdf.aspx?file_no=20191107&year_id=2019&quarter_id=11&falg=1

Manuel, S., Luís, C., Sofia, E., Jorge, D., Claudia, A., Teresa, D. M., & Paulo, G. (2014). Strategies to enhance the competitiveness of semi-intensive aquaculture systems in costal earth ponds: the organic aquaculture approach. *Frontiers in Marine Science*, 1. doi: 10.3389/conf.fmars.2014.02.00116

Mokhtar, M. & Awaluddin, A. (2003). Framework for sea ranching. *Reviews in Fish Biology and Fisheries, 13*, 213-217.

Ministry of Agriculture (2017), *Haiyang muchang fenlei* [Classification of Marine Ranching]. Retrieved from https://www.sdtdata.com/fx/fmoa/tsLibCard.doView

Ministry of Agriculture (2017), *Guojiaji haiyang muchang shifanqu jianshe guihua (2017-2025)* [The Construction Plan of National-level Marine Ranching Demonstration Districts (2017-2025)]. Retrieved from http://www.gov.cn/gongbao/content/2018/content_5277757.htm

Ministry of Agriculture (2017), *Quanguo yuye fazhan di shisange wunian guihua (2016-2020)* [The Thirteenth Five-year Planning of National Fishery Development (2016-2020)]. Retrieved from http://www.gov.cn/xinwen/2017-01/08/content_5157624.htm

Ministry of Agriculture and Rural Affairs (2018). *Guanyu zhengxie shisanjie quanguo weiyuanhui diyici huiyi di 4552 hao (nongye shuili lei 362 hao) tian dafu de han* [Response to the number 4552 proposal (number 362 category of agriculture and water conservancy) from the first meeting of the 13th national committee of the CPPCC]. Retrieved from http://www.moa.gov.cn/gk/tzgg_1/tz/201812/t20181204_6164300.htm

National Statistical Bureau (2018). *Zhongguo tongji nianjian 2018* [China Statistical Yearbook 2018]. Retrieved from http://www.stats.gov.cn/tjsj/ndsj/2018/indexch.htm

Orlowski, J., & Wicker, P. (2015). The monetary value of social capital. *Journal of Behavioral and Experimental Economics*, *57*, 26–36.

Qian, F. (Ed.). (2014, January 17). 2013 nian Luxixiang dangjian shuzhi he zhongdian gongzuo [The Report on Party Building and Key Work of Luxi Township in 2013]. *Dongtou News*. Retrieved from http://www.dtxw.cn/system/2014/01/17/011555717.shtml

Robson, C. (2002). *Real World Research: A Resource for Social Scientists and Practitioner-Researchers*. Oxford: Blackwell Publishers Ltd.

Shandong Quality and Technology Supervision Bureau (2017). *Haiyang muchang jianshe guifan di 1 bufen: Shuyu he fenlei* [Specification for marine ranching construction Part 1: Definition and classification]. Retrieved from http://dbba.sacinfo.org.cn/attachment/downloadStdFile?pk=f95239636357967001d1e3f415ec98fd5cc5c59cffdb27d0c3268084d1260e83

Smith, M. D., & Worth, P. (2019). Positive psychology and luck experiences. In Church I. M. & Hartman R. J. (Eds.) *Routledge Handbook of Philosophy and Psychology of Luck* (pp. 377-387). London: Routledge.

Starman, A. B. (2013). The case study as a type of qualitative research. *Journal of Contemporary Educational Studies*, 28–43.

The People's Government of Shengsi County (2017). *Woxian qidong maanliedao guojiaji haiyang muchang (rengong yujiao) jianshe xiangmu* [The County Starts the Construction of National-level Marine Ranching Project (Artificial Reefs) of Ma'anlie Island]. Retrieved from http://www.shengsi.gov.cn/art/2017/5/26/art_1354784_11016574.html

The People's Government of Dongtou District (2019). *Dongtouqu wentilv chanye ronghe fazhan liangnian xingdong jihua (2019-2020)* [The Two-year Action Plan of the Integrative Development of Culture, Sport, and Tourist Industries in Dongtou District (2019-2020)]. Retrieved from http://www.dongtou.gov.cn/art/2019/12/6/art_1254247_40807777.html

The State Oceanic Administration (2015). *Dongtou Bailongyu shengtai haiyang muchang gongcheng* [The Ecological Marine Ranching Construction of Dongtou White Dragon Islet]. Retrieved from http://www.mnr.gov.cn/zt/hy/2015hjwlx/2015hjwlx_dt/2015hjwlx_dt_tj/201504/t20150420_2107624.html

Ungson, J. (1993). Implications of sea ranching in developing countries. *NAGA, The ICLARM Quartly*, *16*(1), 11-13.

Wartenberg, R., Feng, L., Wu, J. J., Mak, Y. L., Chan, L. L., Telfer, T. C., & Lam, P. K. S. (2017). The impacts of suspended mariculture on coastal zones in China and the scope for Integrated Multi-Trophic Aquaculture. *Ecosystem Health and Sustainability*, *3*(6). doi: 10.1080/20964129.2017.1340268

Xia, J., & Lin, J. (2017, November 20). *Wenzhou shouge weilanshi haiyang muchang—"Dongtou Bailongyu" tongguo yanshou* [The first fence type marine ranching project in Wenzhou—'Dongtou White Dragon Islet' passed the acceptance]. Zhejiang News. Retrieved from https://zj.zjol.com.cn/news/807199.html

Xia, Y. (2018). Yuye huzhu baoxian zai tuijin haiyang muchang jianshe zhong de zuoyong fenxi [The analysis of the functions of mutual insurances of fisheries in promoting the construction of marine ranching]. *China Fisheries*, 6, 29–30.

Xu, Y. (2019, August 8). Wenzhou tiqian zhunbei luoshi fangtai cuoshi! Yuye shengchan fanghu, haidao renyuan cheli [Wenzhou prepared measures against typhoon in advance! Protection of fishery production, evacuation of island personnel]. *Zhejiang News*. Retrieved from http://news.dhtv.cn/201908/00092593.html

Yan, L., Liu, Z., Jin, Y., &Cheng, J. (2019). Donghaiqu yanchang fuji xiuyuqi yuye ziyuan zengzhi xiaoguo fenxi [The assessment on stock enhancement effect of fishery resources by extending the summer fishing moratorium in East China Sea area]. *Marine Fisheries, 41*(5), 513-519.

Yan, Y., Kang, M., & Zhang, X. (2017). Development and Transformation of Marine Fishery in China. In *2017 International Conference on Economics, Management Engineering and Marketing*. Retrieved from http://dpi-proceedings.com/index.php/dtem/article/download/17099/16605

Yang, C. (2011, March 1). Mei xinxin, qicheng lumin bumai guochannai [Lack of confidence, 70% of people in mainland China do not purchase domestic milk powder]. *China Times*. Retrieved from https://web.archive.org/web/20110302065016/http://news.chinatimes.com/mainland/505064 21/112011030100473.html

Yang, H. (2016). Woguo haiyang muchang jianshe huigu he zhanwang [The review and outlook for the construction of marine ranching in China]. *Journal of Fisheries of China*, 7, 1133–1140.

Yang, H., Huo, D., & Xu, Q. (2016). Views on Modern Marine Ranching. *Oceanologia Rt Limnologia Sinica, 47*(6), 1069-1074.

Yang, H. (2019, March 26). Goujian Zhongguo tese haiyang muchang de lanse mengxiang [Construct the blue dream of marine ranching with Chinese characteristics]. *China Scientific News*, pp. A5. Retrieved from http://news.sciencenet.cn/dz/dznews_photo.aspx?t=&id=32134

Yang, Y. (2018). *Woguo haiyang muchang shifanqu jianshe guanli bijiao yanjiu* [The comparison of construction and management of marine ranching demonstration districts in China] [Master's thesis, Dalian Ocean University]. Retrieved from http://cdmd.cnki.com.cn/Article/CDMD-10158-1018890377.htm

Yau, O. H. M., Lee, L. S. Y., Chow, R. P. M., Sin, L. Y. M., & Tse, A. C. B. (2000). Relationship marketing: the Chinese way. *Business Horizons*, *43*(1), 16–24.

Yu, Y. (2008). *Qiye neibu de shehui ziben* [Social Capital inside Enterprises]. Dalian, Liaoning: Dalian Maritime University Press.

Yuan, X., Pongthanapanich, T., Zhang, Z., Jing, X., & Ming, J. (2017). *Fishery and aquaculture insurance in China*. Rome: Food and Agriculture Organization of the United Nations.

Zhang, H. (2015). China's Fishing Industry: Current Status, Government Policies, and Future Prospects. In *China as a "Maritime Power"* (pp.1-33). Arlington, Virginia.

Zhang, Y., & Kang, N. (2018). Haiyang muchang ruhe quebao "Shengtai youxian"? [How do marine ranching projects guarantee 'Ecological First'?] *Chinadialogue: Ocean*, 9, 10–11. Retrieved from https://chinadialogue-production.s3.amazonaws.com/uploads/content/file_ch/10841/_____C_S.pdf

Zhao, W., & Shen, H. (2016). A statistical analysis of China's fisheries in the 12th five-year period. *Aquaculture and Fisheries*, 1, 41-49.

Zheng, Y., & Tang, Y. (2017, December 20). Yinru minjian ziben zhutui haiyang muchang jingxihua kaifa [The introduction of private capital to boost the focused development of marine ranching]. *Hainan Daily*. Retrieved from http://hnrb.hinews.cn/html/2017-12/20/content_7_5.htm

Appendix A

Approval for Human Participant Research

University of Victoria | Office of Research Services | Human Research Ethics Board
Administrative Services Building Rm B202 PO Box 1700 STN CSC Victoria BC V8W 2Y2 Canada
T 250-472-4545 | F 250-721-8960 | uvic.ca/research | ethics@uvic.ca

Certificate of Renewed Approval

PRINCIPAL INVESTIGATOR:	**Guodong Wang**	**ETHICS PROTOCOL NUMBER:** Minimal Risk Review - Delegated	**18-160**
UVic STATUS:	**Master's Student**	ORIGINAL APPROVAL DATE:	23-May-18
UVic DEPARTMENT:	**PAOR**	RENEWED ON:	18-Apr-19
SUPERVISOR:	**Dr. Andrew Marton**	APPROVAL EXPIRY DATE:	22-May-20

PROJECT TITLE: **The Rise of Marine Ranching in Eastern China: An Assessment of the Institutional Framework**

RESEARCH TEAM MEMBER None

DECLARED PROJECT FUNDING: **None**

CONDITIONS OF APPROVAL

This Certificate of Approval is valid for the above term provided there is no change in the protocol.

Modifications
To make any changes to the approved research procedures in your study, please submit a "Request for Modification" form. You must receive ethics approval before proceeding with your modified protocol.

Renewals
Your ethics approval must be current for the period during which you are recruiting participants or collecting data. To renew your protocol, please submit a "Request for Renewal" form before the expiry date on your certificate. You will be sent an emailed reminder prompting you to renew your protocol about six weeks before your expiry date.

Project Closures
When you have completed all data collection activities and will have no further contact with participants, please notify the Human Research Ethics Board by submitting a "Notice of Project Completion" form.

Certification

This certifies that the UVic Human Research Ethics Board has examined this research protocol and concluded that, in all respects, the proposed research meets the appropriate standards of ethics as outlined by the University of Victoria Research Regulations Involving Human Participants.

[redacted]

Dr. Rachael Scarth
Associate Vice-President Research Operations

Certificate Issued On: 18-Apr-19

18-160 Wang, Guodong

Appendix B

Interview Question Clusters

Group 1: Project leaders of White Dragon Islet marine ranching

- When and How did you start the business of commercial marine ranching in the place?
- How is the financial structure of the company determining the personnel structure of the project and what is a relatively good
- What external actors do you need to approach during the construction of the marine ranching project and are there different degrees of importance on these actors?
- How did you form and maintain the relationships with these external actors?
- How did these relationships boost the development of the project?
- Are there any negative impacts brought by these external actors and how did you overcome the negative impacts?
- What might be the developmental direction of the company in the future?

Group 2: Government officials related to the WDI project

- What's the local government's attitude towards commercial marine ranching project in the region?
- Do you actively reach the CMR project and the company or passively waiting for the company coming to you?
- Is there difference between dealing with marine ranching projects and regular aquaculture activities?

- How do you feel about forming and maintaining relationships between officials and project leaders of CMR?
- What benefits do you think that CMR project can get from relationships?

Group 3: Local villagers in the region where the WDI project locates

- What do you think about the settlement of the WDI project to the region?
- Do you feel any developmental transformation of the regional industry after the WDI project getting settled here?
- Has the settlement of the WDI project affected your daily life?
- Do you think if the project brings positive or negative impacts to the region and if the region, including the government and locals, gives the project any advantage or disadvantage?
- Did you benefit from the project?

Group 4: Company Employees of the WDI project (since most of company employees are local villagers, their questions are based on questions above).

- What benefits related to working conditions did you receive?
- As a company employee, do you also bridge the company to the locals through yourself?
- What will be the limit of the WDI project?

Appendix C

Email Recruitment Script

(This script is delivered in Chinese)

Dear [Name]:

I, Guodong Wang, a graduate student of Pacific and Asian Studies Department at the University of Victoria in Canada, am contacting you regarding my upcoming research study entitled “The Emergence of Commercial Marine Ranching in Eastern China: An Assessment of Institutional Frameworks”. This study will provide the analysis of connections between key actors in the settlement of commercial marine ranching in China. Your personal knowledge and experiences will be of great value of the study.

The purpose of the study is to highlight the features and elements of commercial marine ranching operation and distinguish it from other types of marine ranching and then take a close look at the evolution of connections between involved stakeholders and key actors during the construction of the commercial marine ranching (hereafter CMR) project. This investigation will be collecting information to address impacts and relations from the actors to the CMR project. It will use first-hand experiences provided by interviewees to explore the formation and development of these connections within the institutional structure of the CMR project.

The differences between CMR project and other marine ranching types must be clearly addressed. A comprehensive analysis of building connections between and among key actors in doing CMR project is important to achieve the successful settlement of projects in the future. The results will be of interest to academics, institutional leaders, policymakers, and private entrepreneurs.

I will interview 8 to 10 people related to the marine ranching project. These people are categorized into 4 groups, including the project leaders, the public sector, the project staff, and local villagers. The aims of interviewing with different people in these groups are to gain individual connections to the project and their own perspectives on the settlement. The interviews will take approximately forty-five minutes, to a maximum of an hour, at a convenient time and location for the participant.

I would like to assure you that 1) research participation is voluntary and all interviewees are under no obligations to participate; 2) choosing to participate or not will not affect stance, position, or relationships, etc.; 3) all information and materials collected will remain anonymous. The research has been reviewed and received ethics approval through the University of Victoria Human Research Ethics Board.

I look forward to hearing back from you and am excited to discuss with you about the research soon. Please get back to me through telephone or email, if you are interested.

Sincerely,

Guodong Wang