Planning and Practices of Chinese Eco-Development:

A Case Study of Chongming Eco-Island

by

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Abstract

Since the turn of the twenty-first century, eco-developments as experimental solutions to create sustainable pathways for a harmonious relationship between humans and nature have begun to unfold in China. This research argues that there is a gap in the analysis of current eco-development in China in which insufficient attention is given to the shaping and reshaping dynamics of an eco-development project throughout time, and different stakeholders' roles and perceptions in the planning and practices of an eco-development. Integrating both empirical and methodological insights from ecological modernization and political ecology, this research aims to critically evaluate Chinese eco-development as a whole from design, through delivery, and to local effects. An integrative approach allows a more fruitful understanding of the local dynamics and complexities of Chinese eco-development from both a top-down perspective that dissects the formation and implementation of strategic policies and planning initiatives, and a bottom-up view that explores local individual and community's perceptions of and responses to eco-development. The research is founded on an intensive case study of Chongming Eco-Island in Shanghai, China. The analysis is built upon data collected through archival research, in-depth semi-structured interviews with both state and non-state actors, focus group meetings with local communities, and on-the-ground observation and documentation.

The findings of this research show that despite a welcome transformation from the previous pro-growth ideology and practices to a more ecology-centric construction, eco-developments on Chongming have been driven by strategic entrepreneurial planning of the Shanghai municipal state and by quantitative targets that are designed to address primarily the city's overall development needs. Privileging an ecological modernization thinking and largely excluding local knowledge and concern,

eco-developments on Chongming instead of promoting local sustainable development, generates unintended and adverse results for the local environment and the community. This research contributes to debates on Chinese eco-development by formulating an integrative framework to allow a holistic examination of local eco-development planning, practices and effects, and to investigate the views and values of both state and non-state actors. This research also provides an attractive alternative strategy for those seeking to analyse a more nature-focused, locally-relevant means to promote urban sustainability planning and development.

Publications

Journal Articles

Xie, L.[*], Flynn, A., Tan-Mullins, M., and Cheshmehzangi, A., 2019. The making and remaking of ecological space in China: the political ecology of Chongming Eco-Islands. *Political Geography.* 69: 89-102.

Xie, L., Flynn, A.[*], Tan-Mullins, M., and Cheshmehzangi, A., 2019. Water and land: environmental governance and Chinese eco-development. *Journal of Cleaner Production.* 221: 839-853.

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Den Hartog, H., Sengers, F.[*], Xu, Y., **Xie, L.**, Jiang, P., and de Jong, M., 2018, Low-carbon promises and realities: Lessons from three socio-technical experiments in Shanghai. *Journal of Cleaner Production,* 181: 692-702.

Book Chapter

Xie, L.[*]**,** Tan-Mullins, M., and Cheshmehzangi, A., 2019. Political Ecology of Chinese Smart Eco-cities. In Zhang, X. (eds): *Remaking Sustainable Urbanism: Space, Scale and Governance in the New Urban Era.* Palgrave Macmillan.

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List of Acronyms

CFB   Chongming Finance Bureau

CWAB   Chongming Water Affairs Bureau

EM   Ecological modernization

HPE   Historical Political Ecology

KPIs   Key Performance Indicators

MEP   Ministry of Environmental Protection

MOHURD   Ministry of Housing and Urban-Rural Development

MOST   Ministry of Science and Technology

NEDZ   National Ecological Demonstration Zone

NDRC   National Development and Reform Commission

PE   Political ecology

SCDG   Shanghai Chongming District Government

SCDRC   Shanghai Chongming County Development and Reform

             Committee

SHDRC   Shanghai Municipal Development and Reform Commission

SHLRC   Shanghai Municipal Land Reserve Centre

SHPLRA   Shanghai Municipal Planning, Land and Resources Administration

SHSTC   Shanghai Municipal Science and Technology Commission

SLG   Shanghai Land Group

SMG   Shanghai Municipal Government

SOM   Skidmore, Owings & Merrill LLP

STLRC   Shanghai Tidal Land Requisition Company

SUPDRI   Shanghai Urban Planning and Design Research Institute

SUPMB   Shanghai Urban Planning Management Bureau

UNEP   United Nations Environment Programme

Chapter One: Introduction

1.1 The debates of Eco-development

In the face of climate change and increasing environmental, economic and social pressure, sustainable development has become a strategic issue for cities around the world. No longer a "nice to have" addition to development-as-usual, sustainability ideas have diffused into city planning principles at all scales and become embedded into a multiplicity of urban initiatives (De Jong et al., 2015; Shao, 2015; Joss et al., 2011). Since the 2000's, eco-city has emerged as a leading vision and approach for the shaping of urban sustainability.

With its root in Ebenezer Howard's garden city movement in the early twentieth century, the idea of the "eco-city" was firstly proposed by Richard Register (1987) in reference to a visionary city that is physically compact and fitted into the bio-region, minimizes its resource input and waste output, and serves as home to a vibrant egalitarian civil society. However, due to the lack of a commonly accepted definition for eco-city in both academia and in practice (Joss, 2011; Yu, 2010 and 2014), current understanding of the concept and the practical initiations of eco-city has absorbed much of the rising and influential narrative of sustainable development, which covers a wide range of social, economic and environmental aspects (Lehmann, 2010). The idea of the eco-city thus expands and encapsulates a multiplicity of progressive policies and measures, including degraded environment restoration, urban eco-diversity preservation, public and non-automobile transportation promotion, affordable and mixed housing provision, green and innovative technologies development and more (Kenworthy, 2006; Roseland, 1997). Although many scholars have attempted to clarify the eco-city from different perspectives (see for example, Kline, 2000; Robinson and Tinker, 1998; Song, 2011; Wong

and Yuan, 2011; Yu, 2009), it is suggested that the eco-city has become an "umbrella term that covers various notions of and approaches to sustainable urbanism, rather than a conceptually coherent and practically uniform phenomenon" (Joss, 2012: 5; also see Rapoport, 2014). The eco-city concept thus was stretched and moulded to fit a range of urban interventions that aimed to connect (to varying degrees) cities with the "environment".

Today, the concept of eco-city remains largely open to interpretation both in terms of definition and focus (Flynn et al., 2016; Pow and Neo, 2013; Joss et al., 2013; Joss et al., 2015). As it moved from scholarly and practitioner discourse to build reality in the 2000's, its already vague and malleable definition was also expressed in built form. Whilst it is noted that the eco-city has become a ubiquitous planning and urban design theme (Joss et al., 2013; Shwayri, 2013), in practice the eco-cities that are currently under the process of planning or construction are varied in types, trends and patterns (Joss et al., 2011). Many seem to have been largely co-opted by political, corporate and market-focused goals that have hollowed out many claims initially made by proponents of the eco-city (Rapoport, 2014).

Consequently, contemporary eco-city practices have drawn many critics. For example, it is claimed that eco-city projects can be seen as global products resulting from the production of normative urban blueprints and masterplans by global planning, engineering and design elites (Rapoport, 2015), and thus largely disengage from the locality. A further line of critique has identified how the eco-city ideal is often deployed as a foil for urban development projects and thus linked eco-developments to entrepreneurial city governance, which pursues first and foremost an economic agenda (see Chien, 2013). Moreover, existing research on specific eco-cities has revealed a common concern over the often-marginalized social sustainability (Cugurullo, 2013; Caprotti, 2014a; Caprotti et al., 2015; Pow and Neo, 2015). These debates suggest a strong and ongoing need for critical interrogation

of the concept of the eco-city, its circulation at different geographical contexts and governance levels, its interpretations and materialization on the ground, and its effects in terms of promoting environmental, economic and social sustainability.

This is particularly imperative in China, which has been at the forefront in both debates and practices of eco-city developments. Since the turn of the twenty-first century, the Chinese state has recognized the scale and severity of environmental problems and started to explore a sustainable pathway for a harmonious relationship between development and environment. As one of the active advocates as well as a vigorous promoter of eco-developments, China has initiated and implemented a vast number of eco-projects in a range of geographical locations and with diverse scales. According to nationwide surveys undertaken by the Chinese Society of Urban Studies, around 97% of prefectural cities, including sub-provincial cities and metropolises under the direct jurisdiction of the State Council, had announced or started an eco-city (or alike low-carbon city or low carbon eco-city) as part of their development strategy by 2012 (Chinese Society for Urban Studies, 2012).

Although mostly still under construction, the vast number of eco-developments in China have manifested distinct features that separate them from Western practices as they are characterized by: 1) a typical top-down mechanism in which the state plays a pivotal or even a sole role (Flynn et al., 2016; Yu, 2014); and 2) an alignment of the weak ecological modernization ideology that believes the reconcilement and co-thrive of economy and environment, and privileges "technocratic" approaches towards sustainability (De Jong et al., 2016; Neo and Pow, 2015; Caprotti et al., 2015; Wu, 2012). Consequently, Chinese eco-developments are argued to be underscored by a pro-growth ideology that associates to urbanization, urban entrepreneurialism, and green capitalism, as shown in its mainstream new-town style development patterns (Chang and Sheppard, 2013; Chien,

2013; Caprotti et al., 2015; Pow and Neo, 2013). These features, whilst largely shaped the materialization of Chinese eco-developments on the ground, also significantly influence the discourse and research revolving around these eco-practices and other urban sustainable development in China.

Initiated by various levels of governments, eco-developments in China are embedded in the wider urban political-economic context and incorporate and manifest the desires of the state. Therefore, governmental policies and plans play a decisive role in shaping the materialization of eco-development on the ground. Unsurprisingly, existing academic research on Chinese eco-developments show overwhelming interest and concerns over the formulation dynamics and the interpretation of policies and plans. Main topics include the rationale and the driving factors of the eco-initiatives (Chien, 2013; Pow and Neo, 2013; Joss and Molella, 2013); different modes of governance and the framework (De Jong et al., 2016; Joss et al., 2015); detailed planning process and design of an eco-development (De Jong et al., 2013a and 2013b); and the dynamics of knowledge transfer or policy mobility, both on the transnational interactions between Chinese eco-developments and their foreign governmental or non-governmental partners in adopting foreign-born urban sustainability ideas (Hult, 2015; Pow and Neo, 2015) and on the learning process between a previous failed project and a new eco-initiative within China (Chang, 2017; Chien et al., 2015). This wealth of studies provides substantial insights that help to contextualize eco-development in China.

Nevertheless, there are a number of gaps and shortcomings. Firstly, whilst these studies tend to focus on one (or sometimes two) specific factor's effect on the shaping and reshaping of eco-development, such as the influence of policy transfer and different governance mode, they also risk simplifying the causality and complexity of the formation of an

eco-development. This often involves interwoven political, economic, social, technological and environmental forces from a diverse scale. Secondly, most existing studies are to some extent constrained in a limited time span and emphasize immediate, recent, or proximate political and or ecological drivers and results. In this vein, an eco-development project is treated as a product that is either being formed or in the process of production that follows an established pathway that has been set out in the policies and plans. However, similar to all types of urban development, eco-development is a process and full of enormous uncertainties (Yu, 2014). Its development is subject to political-economic, social, technical and environmental changes (as will be seen from the case study of Chongming eco-development in this research) and thus evolves through time. Therefore, a holistic and critical examination of an eco-development project needs to adopt an expanded time scale to explore its development process as a whole to investigate changes and the reasons behind. Thirdly, as most attention has been placed on the top-design of Chinese eco-developments, less is being investigated in their detailed on-the-ground implementation and effects.

Currently, existing research on the implementation and effects of Chinese eco-developments focus mainly on evaluating the overall condition (e.g. Ma et al., 2017) and revealing the gaps between ideas and realities in individual cases (for example, see Caprotti, 2014b; Caprotti et al., 2015; Chang and Sheppard, 2013; De Jong et al, 2013; Joss and Molella, 2013). As these studies commonly identified the problematic green capitalism and technocratic solutions underscored current eco-development practices in China, they also pointed out their inadequate consideration of and negligible contribution to (and even adverse effects on) environmental and social sustainability. Nevertheless, these arguments were largely based on secondary data attained from documentation analysis (mainly policy claims, planning documents and news outlets), or first-hand data mainly attained from on-the-ground observation and interviews with key state actors such

as officials, planners, corporate executives, and members of governmental research institutes (see, for example, Caprotti, 2014b; Joss and Molella, 2013). These studies often uncritically treat official accounts as reality, and there have been few efforts to examine the local impacts from the local view. Whilst some researchers do engage the local level in analysing the implementation and effects of eco-development (like involving local residents for interview), they either lack in-depth and substantive engagement (see, for example, Caprotti et al., 2015; Chang and Sheppard, 2013), or mainly focus on new residents' lifestyle for assessment (Flynn et al., 2016). A recent work carried out by I-Chun Catherine Chang (2019) pioneered attempts to study affected indigenous people's livelihood change induced by eco-developments. However, the effects of eco-developments on local ecology, social culture, and long-established human-nature relationship remain largely unknown.

Consequently, whilst previous studies on Chinese eco-development abound, there are still considerable gaps of knowledge concerning the evolution of eco-developments through time, their detailed and on-the-ground implementation practices, and the local environmental and social-cultural impacts as well as local perceptions of eco-developments. Questions remain largely unexplored: how is the state driving eco-development through the contents of policies and plans? What form do eco-developments take on-the-ground? How do policy makers and communities respond to changes that have been produced regarding environmental, economic, and social issues? More specifically, how are local communities and residents affected in terms of their socio-economic condition? Is a more sustainable trajectory emerging? Addressing these questions is crucial in understanding and further advancing eco-developments in China, and more importantly, in promoting environmental sustainability in China and subsequently the world.

There are three key reasons why it is of pressing importance to provide detailed analysis of eco-developments in China. First, the prominence of China in urban ecological experimentation and its state-led, ecological modernization-guided development approach make it worthy of research interest. This is because while some expect that the Chinese authoritarian policy-making style would be more rather than less amenable to efforts to materialize eco-developments (Neo and Pow, 2015), others argue against this (De Jong et al., 2013). Given the potential significance of eco-developments for realising more sustainable urban futures, debates on whether China can promote an alternative development model matter. Second, despite claims to integrate economic with social and environmental objectives, recent research on Chinese eco-practices suggest that mainstream eco-developments are wedded to the values of ecological modernization and promote, first and foremost, economic growth, and largely ignore issues such as environmental well-being and social equity (Chang and Sheppard, 2013; De Jong et al., 2013; Hult, 2015; Joss and Molella, 2013; Pow and Neo, 2013; Neo and Pow, 2015; Yu, 2014). Again, it is imperative to better understand the challenges of current eco-development practices. Third, as numerous eco-projects are progressing, and new initiatives keep emerging across the nation, there is a growing need for an up-to-date and on-the-ground assessment of current practices to inform the timely debate and learning for future eco-development improvements. This thesis contributes to the gaps of knowledge of current eco-development in China and to the wider debates of urban sustainable development through an in-depth case study of Chongming eco-development in China through an integrated approach that combines Ecological Modernization (EM) with Political Ecology (PE).

1.2 An integrative approach to the study of eco-development in China

This thesis will analyse Chinese eco-development with a case study of Chongming Eco-Island (as well as its precursor – the Dongtan eco-city) for three major reasons (see a more detailed explanation in Chapter Three). First is its representativeness of Chinese state-led eco-development, so an understanding of Chongming, to some extent, enables a deep insight into eco-development in China. Second is its relatively integrated vision and planning when compared with other eco-initiatives in China and its general positive reputation at home and abroad, which make Chongming an ideal case for a critical examination of current Chinese eco-developments. Third is its existing complex social structure, abundant ecological resources, and rich historic and cultural contents, which endow it with both political and ecological value, and thus make Chongming an apt setting for a critical analysis of the changing human-nature relationships over time and the environmental and socio-economic consequences of eco-developments.

To analyse China's eco-development, more specifically, Chongming eco-developments, in a more holistic manner, I integrate the empirical and methodological insights from two major theoretical approaches, namely ecological modernization (EM) and political ecology (PE). EM is an analytical framework and school of environmental thought to be applied in policy-making and environmental management (Hajer, 1997). There are five major essences of ecological modernization: first, advocating industrial development is compatible with environmental conservation; second, utilizing industrial capacities and technological advancement to tackle environmental problems; third, searching for a rational and reflexive mode of industrial development; fourth, reconciling the binary understanding between society and nature; and fifth, addressing the changes in environmental behaviours and practices (Hajer, 1997; Mol, 1995; Mol and Sonnenfeld, 2000). EM is a key model for guiding and interpreting

eco-development in China. The boom of eco-projects in the 2000's has been described as a "turn towards ecological modernization" (Wu, 2012: 170). It is noted that Chinese new eco-urban developments are largely based on blueprints that clearly focus on technology and specific vision of the state-market nexus as mechanisms through which to deliver improvements in urban sustainability (Caprotti et al., 2015). Thus, the role of government and the business community is central to the delivery of eco-development in China (Flynn et al., 2016). EM, with its emphasis on the role of state and market in promoting institutional re-arrangement and technological advancement to reconcile economy and environment, provides valuable insights into the formulation of governmental policies and strategies of eco-development. Moreover, methodologically, an EM approach led to the collection of data, which often include policy documents, research reports, archival materials, and official statistical data, to understand how the local states and also the market rationalize and promote eco-development practices.

However, we also need to recognize the limitation of EM. Firstly, a key problem identified by EM theorists is the limited role of civil society in China (Mol, 2006). Privileging a top-down analysis of policy directives and steering, EM may not effectively portray how farmers and marginalized indigenous groups perceive eco-development and its attendant environmental and societal changes. Secondly, the challenge of an EM methodological approach is an over dependence on the state's accounts to examine environmental policies formation and implementation. It is an over-simplified approach that typifies power as cascading down hierarchies, and thus fails to understand the complex power dynamics in different scales that together shape the eco-development on the ground.

In seeking to address the gap of EM, more radical concepts providing contesting views of urban-nature relationships emerged (Keil, 2003; Swyngedouw, 1997). A popular alternative perspective is political ecology

(Muldavin, 2013; Neo and Pow, 2015; Yeh, 2009), which concerns both ecology and political economy (Blaikie and Brookfield, 1987). Generally speaking, a PE framework questions scaled politics and unequal power relations in environmental governance and management in a bottom-up fashion. It thus opens up opportunities for research on marginalized groups such as farmers, and yields more societal research on power and discourse, environmental justices, as well as multi-level governances in developing countries (Bryant and Bailey, 1997; Robbins and Sharp, 2003; Swyngedouw and Heynen, 2003; Tilt, 2009; Yeh, 2009). Whilst EM stresses the macro and meso-scale understanding of formal policy formation and implementation, PE provides a multi-scalar analysis to understand the interrelationships between the state (institutions) and environmental users by considering how state intervention in local environmental governance and management alters long-established human-nature relationships and causes environmental degradation, social inequality and marginalization. Therefore, for its advocates, PE is a productive approach that usefully picks up issues that an EM framework fails to address in eco-developments, such as the distribution of costs and benefits between the environment and development and between generations, the intensification of social injustice (Yeh, 2009), and the power relations between different stakeholders in effecting environmental changes. Since these social-economic and environmental challenges and problems are also shown to be present in the majority of Chinese eco-developments (e.g. Caprotti, 2014a, 2014b; Caprotti et al., 2015; Grydeh and Kelman, 2016; Hodson and Marvin, 2010), it is important that they are investigated. Moreover, as PE highlights a historical socio-nature examination to understand contemporary ecological dynamics (Mathevet et al., 2015; Peet and Watts, 2004), it enables an exploration of the changing human-environment interaction and sheds a great deal of light on the long-term effects of social and environmental changes caused by the "modern" eco-development. At a methodological level, although PE shares

similar methodological approaches with EM, it emphasizes qualitative approaches that include in-depth interviews to understand and compare state officials' and farmers' perceptions of environmental and social-economic changes in China, and Chongming.

More detailed discussion of these two concepts and approach will be presented in Chapter Two. But as can be seen from the above discussion, EM and PE provide different perspectives to examine contemporary eco-development in China. For instance, while EM is relatively silent on nature it is central to PE thinking (Chan, 2015). Meanwhile, whilst EM focuses on the capabilities, rationale and actions of state and market in promoting eco-development, PE calls attention to the social and environmental justice questions elided by EM. Further, rather than assuming that eco-development naturally results in environmental goods (as state's claims and EM study often appear to do), PE takes the environmental effects as an empirical question, and gauges them based on local on-the-ground evidence. Therefore, this research combines EM and PE to first examine eco-development in terms of its top-down formation and implementation and bottom-up responses and effects, second to link up political dynamics with environmental and socio-economic consequences, and third to integrate both official accounts with micro ethnographic analysis and combine state actors' perceptions with farmers' voices. This therefore provides an effective theoretical lens and analytical framework to address current debates and issues of Chinese eco-development, including: 1) the complex and dynamic urban development and ecological challenges at the local level; 2) the gaps between eco-ideals and political promises and local implementation effects; and 3) the potential alternative pathway for more ecologically informed and socially sustainable approaches to eco-developments. This study also contributes to the illustration of how these two approaches play commentary roles to elucidate China's eco-development, and more broadly, local environmental governance, politically, socially and ecologically.

1.3   Research agendas and significance of this research

Through the theoretical lens of EM and PE, this research contributes to debates on urban sustainable development through a critical examination of current state-led eco-development in China. It aims to examine the eco-development process as a whole, through formation and delivery and then to how these developments affect local ecology and community. The eco-development on Chongming in Shanghai, China provides an insightful case study to achieve a holistic examination of the planning, practices and effects of current Chinese eco-development. Informed by both EM and PE and their respective top-down and bottom-up perspectives, the empirical analysis of this study flows through a macro-level policy analysis, to a meso-level practices study based on detailed environmental governance measures, and finally to a micro-level examination of the environmental and socio-economic effects of eco-development on the locality. Informed by the EM perspective that privileges the state's efforts and complemented by PE that advocates for a local view, this research brings to the fore a host of stakeholders' voices and knowledge (both state actors and non-state actors, especially those often-marginalized grassroots) to critically dissect Chinese eco-developments. Three main research questions will be addressed in this thesis:

1) How is urban eco-development interpreted by local governments and state actors in China through the contents of policies and plans?

2) What are the on-the-ground practices and (ecological and socio-economic) effects of eco-developments in China?

3) How do non-state actors perceive and respond to eco-development in China?

Integrating the analytical and empirical strength of EM and PE allows this research to interrogate and theorise the local dimension of eco-development in China. This research thus provides new empirical understanding and contributes to theoretical foundations of China's eco-developments and environmental governance in three major ways:

First, empirically, it provides an up-to-date theoretically informed and critical on-the-ground assessment of eco-developments in China, which enables an in-depth understanding of the rationale, formation and evolution, implementation, effects, and challenges of an eco-development project. As will be seen from the empirical study, the case of Chongming Eco-Island vividly demonstrates the distinct features and paradox of current state-led eco-developments on the ground. A detailed analysis of the policies and plans reveals the evolution of eco-development on Chongming. Interrogating the evolution sheds light on the shaping and reshaping of Chinese eco-development under specific political-economic context in specific geographical and temporal contexts. Meanwhile, examining the implementation of eco-development on the ground reveals the destructive impacts of state intervention on local long-established human-nature relationships. The subsequent interrogation of local environmental and socio-economic effects from a local view shows the paradox of ecological and social destruction through eco-development and the contesting views between local grassroots and state experts. The findings prompt a rethinking of the governance and approach of current eco-development and an exploration of a more ecologically friendly and socially just form of eco-development in China.

Second, theoretically, it shows the fruitfulness of combining the "orthodox" ecological modernization with a more locality-concerned political ecology in analysing eco-developments, and in promoting a more just planning for urban sustainability. Incorporating a PE view that advocating marginalized stakeholders and environment, the case of

Chongming Eco-Island demonstrates how well-intended eco-initiatives can, in fact, have destructive effects if the locality, namely local ecological features, cultural characteristics, historical and societal contexts, and environmental knowledge and traditions, are not fully considered and respected. Contesting the state-dominant and top-down governance and development, this study demonstrates that building a "local dimension" of eco-development provides better solutions to align political pursuit, local socio-economic context, and natural environment at the local level to take collective actions to achieve eco-development. This paradigm advocates state and non-state actors to speak and share their experience and knowledge in environmental changes and offers valuable insights for policy makers and planners to better understand and address the paradox of current eco-practices.

Third, methodologically, this research demonstrates how to combine political-economic macro-analysis with in-depth empirical data, and to triangulate governmental accounts with local people's comments, and first-hand data collected from extensive field survey. This innovative approach is highly applicable for Chinese urban researchers and ecological modernists because it helps them to strengthen the bottom-up views about environmental practices and thus presents a detailed and on-the-ground picture of the eco-development process and effects that might never be shown in official narratives. Meanwhile, as political ecologists are urged to work to better understand state institutions (Robbins, 2003), Yeh (2015) has specifically argued that to enrich political ecology scholarship of China, there is a need for detailed local analyses to uncover the mosaic of human-environment relations. This study contributes to these tasks by integrating EM and PE frameworks in studying current eco-development in China. The framework could be equally well applied to other urban sustainability projects in China.

1.4 Structure of the thesis

Chapter one has introduced the current debates and gaps in knowledge of eco-development in China and proposed integrating EM and PE approaches to address the challenges and remedy the knowledge gaps of Chinese eco-development. This integrative approach provides a holistic view: (1) to critically evaluate the formation, implementation and effects of current state-led eco-development in China, and (2) to reflect on the comments and environmental values of both state and non-state actors.

Chapter Two is the literature review that presents the research context and discusses the two main theoretical frameworks of this research, namely EM and PE, in contributing to the study of Chinese eco-development. It begins by discussing the characteristics of Chinese governance of eco-development to situate the study in China's distinct political-economic and institutional context, which is marked by fragmented authoritarianism, upward accountability, and planning centrality. It highlights the critical role of the local state in shaping on-the-ground eco-development practices through the contents of policies and plans. The chapter then proceeds to review the theory and debates of EM, its nexus with Chinese eco-development, as well as its strength and weakness in interpreting the practices of Chinese eco-development. This is followed by detailed elaboration of the PE's contribution to both complement and contest the views of EM, and its links with eco-development in China. The review highlights PE's integration of politics and ecology, historical views of ecological and social changes, and emphasis on power, scale and action of the political dynamics in shaping eco-development, which provides valuable insight in dissecting the paradox of current eco-development in China. Finally, it argues an integrative approach that draws on both EM and PE's empirical and methodological insights to conduct a critical and holistic analysis of contemporary Chinese eco-development.

Chapter Three elaborates on the research methodology employed. It first presents a justification for using Chongming Eco-Island as a case study and reviews existing academic work on Chongming eco-development to draw useful references and to identify gaps and shortcomings that this research can make contributions to. The chapter then proceeds to explain the main qualitative methods adopted to collect data for empirical analysis. These mainly include archival research, interviews with both state and non-state actors, focused group meetings with local residents on Chongming, and on-site observation and documentation. Such diverse sources of empirical data in conjunction with mixed analytical methods provide insightful arguments that answer the research questions.

In Chapter Four, the formation and evolution of Chongming eco-development are examined, mainly drawing on official accounts such as governmental policies and plans and the narratives of key state actors (such as governmental officials, planners, enterprise executives and academic consultants). Findings reveal that eco-developments on Chongming have experienced a transformation from pro-growth greening urbanization in the 2000's to pro-ecology environmental construction in the 2010's. It argues that the shaping and reshaping of Chongming eco-development by the state (mainly the Shanghai Municipal Government) has changed with the political-economic dynamics of the regime. Moreover, an analysis of the official accounts of the achievements and effects of eco-development on Chongming further inform the state actors' perceptions and interpretations of environment and eco-development, which can then compare to a more bottom-up approach that emerges from the PE perspective (as will be seen in Chapter six). An in-depth analysis of the policies and plans of Chongming eco-development also sheds light on the main features of the development of Chongming, namely 1) a dominant role played by the Shanghai municipal state; 2) the exclusion of the locality and limited civil society participation; 3) a vague and constantly changing vision; and 4) an indicator-driven planning mechanism. These features underpin the implementation measures and

effects of eco-development in local Chongming, which are further discussed in Chapters five and six.

Chapter Five investigates the on-the-ground practices of eco-development with a specific focus on the governance of land and water on Chongming. Based on both historical and contemporary records, governmental and folk archives, as well as state actors' accounts and local residents' narratives, this chapter documents how, over time, there have been transformations in land and water practices and governance and how these shape the understanding of the ongoing construction of Chongming Eco-Island. The findings are examined from both EM and PE perspectives. As shown, relations between local people and place are increasingly being broken as state actors gradually intervene in managing the environment and resources through the construction of eco-island. Eco-development that values urban aesthetics and draws on an external expertise simultaneously marginalizes local knowledge and breaks the long-established people-nature relationship on Chongming.

Chapter Six examines the effects and outcomes of the eco-development and its attendant changing environmental governance on the local environment and community. Adopting a PE perspective that advocates a bottom-up view, this chapter draws from local residents' observations, perceptions, experiences, and responses to environmental and socio-economic changes during the eco-development. Tracing the disappearing reeds (a native wetland plant) on Chongming, it first presents a detailed assessment of the environmental transformation and outcomes of the ongoing eco-developments on the island. Following this, it then elucidates how eco-development on Chongming affects local people's social-economic well-being, before discussing the changing and differing perceptions held by local people and their responses towards eco-development. Findings reveal the unintended and pernicious impacts of eco-development on local ecology and community. Moreover, state-led

eco-development on Chongming also causes perception changes and further behaviour changes in the local population in terms of environmental management, which further exacerbates the detrimental environmental impacts on the island.

Chapter Seven concludes the thesis. It firstly reflects on the value and complementary role of both EM and PE as the theoretical lenses and methodological frameworks. It then summarises the main empirical findings of this research in terms of the planning, practices and effects of Chongming eco-development. This is followed by a discussion of the main challenges of eco-development of the present day, and a presentation of specific policy recommendations for advancing eco-developments on Chongming and in China. Whilst the case study of Chongming eco-developments has demonstrated the fruitfulness of an integrative approach that combines EM and PE in critically analysing the planning and practices of Chinese eco-developments, it also offers direction and methodological framework for future research in urban sustainability initiatives. Three suggestions provided in this research are: 1) opening up expended discursive space and building real intellectual bridges between different stakeholders and concerned groups to enable more locally-relevant, participatory, and adaptive practices in eco-development; 2) involving governance and institutional reform in eco-development to promote a new planning approach that can match top-down and bottom-up processes, empowering the local community and allowing their participation in policy making and articulation; and 3) considering long-term environmental impacts instead of short-term gains in designing the political performance evaluation criteria. The chapter is concluded by identifying potential avenues for future research.

Chapter Two: Literature Review

2.1 Introduction

The literature review is tailored and organized to answer three central research questions: first, to analyse how "eco-development" is interpreted by local governments and state actors in China and how they drive eco-development through the contents of policies and plans; second, to investigate what are the on-the-ground practices and environmental and socio-economic effects of Chinese eco-developments; and third, to investigate how do non-state actors perceive eco-development and how they respond to changes that have been produced. To answer these questions, this chapter reviews the environmental governance in China to contextualize the research, and elaborates the concepts and debates of EM and PE to combine their empirical and methodological insights to better understand how eco-development operates on the ground in China.

This chapter is organized into five sections. Following the introduction, section two elucidates the characteristics of Chinese governance of eco-development to situate the study in China's distinct political-economic and institutional context. Section three illustrates the concepts of ecological modernization and examines its approaches and debates, as well as its nexus with Chinese eco-development and its strength and weakness in interpreting the practices of eco-development in China. Section four elaborates the concept of PE and its contribution to both complement and contest the views of EM in studying eco-development in China. Section five concludes this chapter by proposing an integrative approach that draws on both EM and PE's empirical and methodological insights to conduct a critical and holistic analysis of eco-development on Chongming.

2.2 Governance of Chinese eco-developments

Critical analyses of eco-development must have at their heart an understanding of governance (Flynn et al., 2016). To study and examine the formulation and operations of Chinese eco-initiatives, it is thus important to understand the institutional system in which the urban and environmental governance is shaped and performed in China. Although there are many points that could be raised to highlight the distinctiveness of environmental/urban sustainable development governance in China, three are particularly matter to the study of Chinese eco-development in this research. First is the fragmented authoritarianism which performs a hierarchical governance that is featured by top-down policy delegation accompanied by decentralization of planning power. Second is the practices of upward accountability that local governments and cadres are evaluated by specific targets designated by upper-level governments. These two key features of Chinese environmental governance have led to the third institutional characteristics of eco-development in China, namely the planning centrality and the decisive role of the local state in shaping and reshaping eco-development. Each feature will be elaborated in turn below.

2.2.1 Fragmented authoritarianism

The post-socialist Chinese political governance system is better understood as fragmented authoritarianism (Lieberthal and Oksenberg, 1998; Lieberthal, 1992). On the one hand, due to the one-party control, China remains necessarily authoritarian (as manifested in the party-controlled cadre personnel appointment and management), compared with most western countries. On the other hand, power and responsibility are delegated horizontally between state ministries with different, often competing functional responsibilities, as well as downward

to provincial and local levels of government (Xie and Van Der Heijden, 2010)[1]. As a result, Benewick (1998, p. 459) observes a political "power drift" occurring "from the party to state institutions and from the centre to the regions and localities." In considering the impacts on eco-development, at the national level, different central government Ministries stipulate various related but different eco policies, creating greater political space for sub-national local governments to apply or compete (De Jong et al., 2016; Tan-Mullins et al, 2017a). For instance, the Ministry of Environmental Protection (MEP) initiated an 'eco cities' program; the National Development and Reform Committee (NDRC) one for 'low carbon cities'; and the Ministry of Housing and Urban-Rural Development (MOHURD) one for 'low carbon eco cities' (De Jong et al., 2016; Yu, 2014). In doing so, they have assumed the role of patrons of provinces, cities, districts and counties across the country in supporting sustainable urbanization, and have stimulated hundreds of various eco-initiatives.

At the provincial/municipal level, the decentralization of planning power due to the fragmented authoritarianism system has created considerable space for local autonomy. Chinese planning is known to be a top-down system in which planning powers are formally assigned according to the vertical, nested hierarchy of territorial governments (Yu, 2014). Nevertheless, it is argued that city planning in China was never really made to be hierarchical (Wu, F, 2015). For instance, although MOHURD has the power to approve the master plans of large cities, it is extremely difficult to monitor and examine the implementation in full detail. Meanwhile, central policies have become general "directives," which are articulated with increasing detail as they travel down China's hierarchical bureaucratic structure to regional and local governments (Jiang, 2006). Increasingly,

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[1] This is often referred as tiao-kuai matrix of authority within the Chinese party-state with ministerial bureaucracies as tiao [strips] and territorial jurisdictions as kuai [chunks].

environmental strategies and the execution of specific policies occur at the local level. Consequently, local authorities have been endowed with considerable space of flexible discretion (especially in local land management) in creating local eco-development plans (Chien, 2013) to pursue their perceived local interests (Wu, 2002; Xu and Yeh, 2005; Tan-Mullins et al., 2017a).[2] Moreover, as initiatives and decisions on a local level are usually more decisive for achieving final results with far reaching consequences (Den hartog, 2017), such fragmented authoritarian governance, which is marked by top-down policy delegation with decentralization of planning power, resulted in the diversification of Chinese eco-projects in terms of their development emphasis, approaches, and results (Xie et al., 2019a). This thus highlights the decisive role of local states in shaping local plans and on-the-ground practices of eco-developments in China (see further discussion in Section 2.2.3), and also calls for an in-depth and thorough evaluation of planning and implementation of eco-development in China.

2.2.2 Upward accountability measured by quantifiable indicators

The second major feature of Chinese political governance is its upward accountability system. Under the context of the Chinese Communist Party's (CCP) party-state authoritarian regime, where local leaders are not elected by people but assigned by their upper-level governments, those leaders seeking to further their careers are most likely motivated to follow the CCP's performance-based personnel evaluation system (Chien, 2010; Tan-Mullins et al, 2017a). In general, local leaders are assigned to

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[2] Here the "local" does not necessary mean the site of the eco-project, but refers to the initiator, decision-maker, and planner of the eco-project. For example, as will be shown in the case of Chongming Eco-Island, the Shanghai Municipal Government as the principle actor formulates plans and policies in the interest of the city of Shanghai, and within this process, the interest of Chongming might not be the prime concern.

accomplish certain targets from upper-level authorities. Those cadres who accomplish targets and even outperform among same-level counterparts in the period of their tenures under their jurisdiction will have more opportunities for political promotion. After the reform and opening up, China entered a rapid economic development period. Chinese cadres thus have long been assessed by their economic performance. In 1988, the CCP Department of Organization established official guidelines for an annual evaluation of party secretaries and government executives at the county and township level. Called the "target responsibility system", the guidelines standardize and systematize the evaluation of cadre performance on a wide range of functions at the local level. Three main categories of indicators were set by upper-level governments, namely economic measures (such as per capita gross domestic product levels and state taxation and local fiscal capacity), social undertakings (such as social stability, education, and environmental protection), and party performance (such as the political structure and organizations) (Chien, 2010). Among these, economic performance is overriding, as in career advancement, the greater the economic development growth, the better chances there are for local leaders to achieve political promotions (Chien, 2010). Therefore, until late last century, Chinese planning policies in general have long been in essence based on GDP-oriented motivation.

About three decades' rampant industrialization and urbanization are at the expense of resource and environment: in China, 50% of the drinking water below international standards, upwards of 40% of the arable land laced with heavy metals and other toxins, and 90% of the cities having polluted air (Shepard, 2017). With an increasing public concern over health and environmental pollution, environmental protection and sustainable development have drawn more and more attention in the politic realm. In 2003, the CPC Central Committee put forward the Scientific Outlook on Development, promoting urban sustainable development across the country. Following this, a mandatory target system (MTS) has been

introduced during the 11th and 12th Five Year Plan (FYP) (2006–2015), which is one of the most important mechanisms in the practice of environmental governance in China. It adopted the method of multi-layer decomposition, in which the environmental objectives on unit energy consumption and major pollutant emissions are assigned to local governments, and the corresponding reward and punishment measures for the completion of objectives are stipulated in detail (Tang et al, 2016). In 2015, the new Environmental Protection Law (EPL) took into effect, giving local governments greater environmental protection responsibilities while formalising a system where local officials are assessed on environmental performance in their respective jurisdiction. This environment "Target Responsibility System" with Chinese characteristics is deemed to have substantial effects in shifting incentives for local officials to prioritise environmental protection, motivating local government's implementation of eco-developments (Tang et al, 2016).

Indeed, the past decade witnessed an upsurge of eco-cities and the like urban sustainable development initiatives across the country (De Jong et al., 2016). A study conducted by the China Society for Urban Studies reported that in 2011 more than 80 percent of prefecture-level cities had at least one eco-city project in the works, or at least one that has been partly or fully implemented (Chinese Society for Urban Studies, 2012). This is argued to be owing to the interlink between the performance of eco-development projects and the assessment of local leaders in achieving assigned eco-targets from upper level governments (Chien, 2013). This move is often taken as a hopeful sign that China is finally reversing its direction and becoming an environmental state – a government that integrates environmental logics into its management strategy (Li et al., 2011; Mol and Carter, 2006; Yeh, 2009). On one hand, it is true as environmental performance has indeed been incorporated into cadre assessment system. But at the same time, it is noteworthy that these environmental criteria accounts for only a small proportion of the overall assessment of local

officials. As it is reported that in Zhengzhou (the capital city of Henan Province in central China) in 2017, whilst the city's environmental protection performance was rated as unqualified, its overall government performance was rated as excellent. It is found that the so-called "increasing ecological assessment" in Zhengzhou results in only 16% of environmental assessment weight, while the weight of economic achievement is as high as 50% (Xinhua, 2017). With economic concern still dominating the cadre assessment, care for the environment and quality of life often is of secondary importance. This dual consideration of economy and environment sheds light on the adoption of an ecological modernization principle in Chinese urban sustainable development governance that supports the reconciliation of economy and environment (see detail discussion in Section 2.3), and the strategic planning enacted by local state in promoting urban eco-developments in China.

2.2.3 Planning centrality and local entrepreneurialism

Underscored by fragmented authoritarianism and the upward accountability, Chinese governance system places the plan-makers (often the provincial/municipal government) in the decisive role in practicing environmental policies. It also determines the centrality of planning in shaping various on-the-ground eco-initiatives (Flynn et al., 2016). The city planning ordinance of 1984 in China formalized the practice of the two-tier planning system. At the top was the urban master plan that designates the major function and size of the city and overall land uses; and at the lower tier was the detailed construction plan to specify the physical layout and design of urban infrastructures and buildings, and the regulation of urban landscape and ecology. Therefore, planning not only materializes the general and often vague policies (such as building ecological civilization) initiated by the central government, but also provide substantive instruction and measurements guiding on-the-ground constructions of

specific eco-developments (Figure 1). As such, the planning of an eco-development has a great extent to determine the project's outcomes.
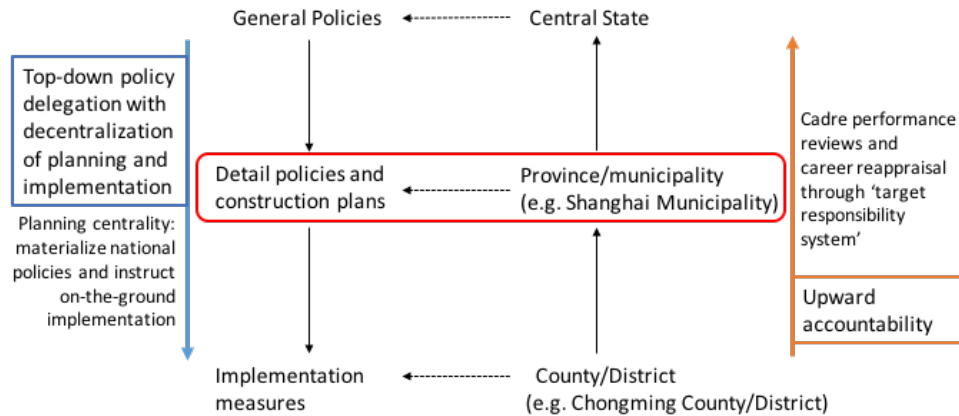
Figure 1. The governance system of Chinese eco-developments

Source: the author.

Contemporary Chinese urban planning has two main accounts, namely as the regulatory instrument and as an entrepreneurial tool (Smith, 2018). On one hand, urban planning in post-reform China functions as the party-state's representation in regulating market activities. In this sense, it is similar to European and American comprehensive rational planning in protecting the public interests by constraining the behaviour of private property holders, resolving externalities, and providing public goods (Smith, 2018; Wu, F, 2015). On the other hand, due to the state entrepreneurialism, planning is argued to become a tool in support of the municipal governments' pursuit of perceived local interests (mainly economic growth) (Smith, 2018; Wu, 2018). Increasingly, the latter – the entrepreneurial account of planning – dominates the debates over current Chinese urban sustainable practices, especially relates to those new-town style eco-city projects (Chien, 2013; Pow and Neo, 2013). It is deemed as the root of the pro-growth paradox facing numerous eco-development projects today.

That state entrepreneurialism and (urban) sustainability are closely intertwined in an interdependent and mutually enhancing relationship has been widely recognized in recent years (see e.g. Chang and Sheppard, 2013; Chien, 2013; Wu, F, 2015). Since China's economic reform in 1978, along with the decentralization of economic decision making to municipal governments, Chinese local governments have transformed from passive regulators in the previous planned economy to entrepreneurial agents that initiate local developments (Walder, 1995; Wu, 2002; Wu and Zhang, 2007). Increasingly, there are efforts to apply the entrepreneurial governance approach to interpret shifts towards more ecologically informed development (Pow and Neo, 2013, 2015; Xu, 2017; Wu, F, 2015). Pow and Neo (2013), for example, argue that state-business coalitions are 'Imagineering' eco-forms of development as ways of promoting urban development and renewal. As Pow and Neo (2013: 2264) point out a more entrepreneurial approach from government actors fits well with officials who are sympathetic to pro-growth thinking and the potential advantages of local economic development for their career advancement. As a result, development is only partially environmentally led with priority given to the visible: "the selective incorporation of ecological goals" focuses on remade city landscapes that are clean and green (Pow and Neo, 2013: 2264). Xu (2017) similarly points to the tensions between entrepreneurial governance and eco-development but argues that "these may not always be contradictory. There are genuine efforts of Chinese governments to pursue ecological goals" (Xu, 2017, 688). Following the work of While et al (2004), Xu argues that there needs to be a better understanding of how state power plays out in different national and city contexts, because in some cases environmental issues are not simply a response to a national agenda but rather integral to a revised local development perspective. As Xu (2017, 692) puts it: "urban entrepreneurialism might depend on the active remaking of urban ecologies." Planning for eco-development can therefore be simultaneously "both environmental and entrepreneurial" (Xu, 2017:

703). Considering planning's central, multiple and strategic roles in promoting eco-development, it is thus of great significance to interrogate the incentive and motivations that underlie eco-developments' planning practices, and to understand how planning power plays out in different level of governance. This will further help to explain planning processes that might otherwise appear anomalous (such as the constant coastal reclamations during the process of Chongming eco-development of this research).

An analysis of the characteristics of Chinese governance of eco-developments illuminates the critical role of the local state in shaping development process, opportunities for participation and interpretations of nature and resources through detail policies and plans. Therefore, to interrogate the eco-development planning and practices in China, more explicitly, on Chongming, it is crucial to interrogate how "eco-development" is interpreted by local governments and state actors and the underlying rationale and incentives of its policies and plans. To do so, an ecological modernization framework provides effective insights.

2.3   Ecological Modernization

2.3.1   Debates on ecological modernization

As an analytical framework and school of environmental thought to be applied in policy making and environmental management (Hajer, 1997), ecological modernization (EM) has strong European roots. The theory of EM emerged from debates on capitalism, sustainability, and the state dating back to the 1980s. EM recognizes the processes of institutionalisation of environmental practices in European countries with partnerships among governments, businesses, environmentalists, and scientists (Mol, 1995). These processes include changes to the modes of production and resource distribution through technological innovation and market signals. Earlier EM scholars advocate moulding capitalist institutions to account for environmental causes such as efficiency and externalities. Christoff (1996)

calls such an approach "weak" EM, representing a corporate, technocratic solution to environmental problems. A "strong" EM should address the economic, systematic, communicative, deliberative, democratic, and international dimensions of environmental institutions.

Whilst there are various debates about the notion of EM, its central ideas are widely recognized to be the growing compatibility of environmental protection and economic growth (e.g. Hajer, 1997) and that technology is the key to any modern project of environmental reform (Christoff, 1996; Humphrey et al., 2002). Unlike the neo-Marxists' view on capitalism which sees it as a fundamentally unsustainable regime due to its drive for endless growth, profit maximization, and capital accumulation, EM advocates argue that the processes of modernization and capitalization can be compatible with environmental priorities (Zhou, 2015). With this guiding logic, the paradigm of EM places emphasis on reconciling and mutually enhancing economy and ecology relations, which demands, as ecological modernists believe, the sophisticated deployment of new environmental technologies. Such technologies range from optimizing production processes and using resources more efficiently to the implementation of environmental management systems in the organization (Pow and Neo, 2013). With the faith on the capability of technological advancement, ecological modernists decline to accept the "limit to growth" discourse because technological advancement and innovative knowledge can be applied in utilising resources, recycling materials, and redeveloping dynamic relationships among social actors in different production and consumption cycles (Mol et al., 2009).

Whilst environmental technological innovations are expected to be led by private entrepreneurs (with minimal state intervention), EM also places considerable emphasis on the roles of state actors to come up with the appropriate environmental policies and regulation to ensure its success. In so doing, one ''accepts that the prescriptions that can be derived from the theory of ecological modernization [are] at the forefront of policymaking''

(Murphy, 2000: 3). In some sense, the process of 'ecologically modernising' the city highlights the importance of policy-making; it cannot be done without the explicit approval and encouragement of the city authorities or policymakers. Thus, in the views of EM, the success of urban sustainable development lies in two interrelated strands of the availability of technology and the presence of amenable policies, regardless of local specificity.

Whilst the emphasis on the capability of technological advancement and institutional re-arrangement in addressing environmental and economic contradiction underscores the theory of EM, it also draws most of the criticisms. A strand of criticism links to its technological slant. A common question concerns whether technological advances alone can achieve resource conservation and better environmental protection, particularly if left to business self-regulation practices (York and Rosa, 2003). Meanwhile, it is argued that EM's emphasis on technology operates in a social vacuum and thus it tends to uncritically treat new technologies as a universal good that is accessible to all people and places (Milanez and Bührs, 2007). Such criticism relates to the second strand of critique, which revolves around EM's emphasis on the capability of the state and the market in addressing environmental problems, which simultaneously neglect the role and fate of the local communities in the face of such new technologies and policies. In other words, as some have argued, EM, focuses too much on technological solutions and top–down policy dissemination and less on the underlying social-ecological processes and concerns (for example, social justice and public participation) (Pow and Neo, 2013; Zhou, 2015). These arguments, as will be seen in the Chongming case, are echoed in the way that eco-developments have implemented in China.

It is noted that there are three stages of intellectual development within EM: the first stage stresses "technological-fix" as a governing tactic to tackle production problems; the second stage stresses collaboration between the role of state and market to tackle environmental problems; the third stage

of EM emphasises policy transfers, including theoretical frameworks, technologies and experiences of ecological modernity from OECD countries to developing countries (Mol et al., 2009). Since the turn of the century, EM has increasingly spread across the globe and shaped urban policy and practice in developing countries (Mol, 2001; Mol et al. 2009). China, as undergoing a transition of its urban and economic development, started to apply EM in its urban strategies and environmental governance to explore a more sustainable pathway.

2.3.2 EM with Chinese characteristics

According to Shapiro (2012), China has started to apply western-style modernization since the Maoist period. Mao's famous slogan "ren ding sheng tian" ("Man Must Conquer Nature") supported this modernization ethos, causing human suffering and destruction of the natural environment (Shapiro, 2012: 89). The past three decades of the modernization process have led to rapid economic growth in China, but at the same time has precipitated severe ecological crises and widespread environmental pollution. Since the late 1990s, following the global trend of environmental protection for sustainable development and responding to domestic rising environmental awareness and concerns, China has been shifting its development agenda from traditional to ecological modernization. The 17th National Congress of the Communist Party of China (CPC) (2007) proposed the idea of ecological civilization (EC) as a national goal. For the first time, eco-civilization had been written into the CPC's National Congress report, showing the country's commitment to environmental improvement and sustainable development. The decision of the CPC had followed that of the influential China Modernization Report 2007: Study on ecological modernization published by the Chinese Academy of Sciences (CAS). This 450-page report marks the official articulation of ecological modernization (EM) theory in China (China Centre for Modernization Research, 2007), and shows the attempt of the Chinese government to "insert ecological

rationality into the modernization discourse, policy-making, and practice in China" (Zhang et al., 2007). Since then, China has been vigorously implementing EC across the country, and EM is the dominant guiding development theory and approach. The original term "ecological civilization" is even deemed as a synonym for "EM with Chinese characteristics" (Muldavin, 2015: 1000).

EM is an optimistic, pragmatic, and policy oriented theoretical framework (Zhou, 2015). For its proponents, EM provides insights into effective practices in a variety of social and economic contexts that can promote more environmentally informed policy changes (ibid.). China, as a developing country that is undergoing a transition from a planned to market economy is having to cope with alarming environmental degradation while continuing to pursue a rapid development and growth. Perhaps, not surprisingly, with its promise of being able to reconcile economic and environmental goals, EM thinking has been widely embraced in China: EM principle has been embedded in various urban eco-development policies, plans, and reports at different administrative levels (e.g. the national ecological civilization construction policy, China National Human Development Report 2013); and the EM framework has been increasingly employed as the key model for interpreting China's environmental governance and urban eco-developments (see for instance, Carter and Mol, 2007; De Jong et al., 2018; Zhou, 2015; Pow and Neo, 2013; Chien, 2013).

Drawing heavily upon EM theory, Chinese environmental governance and urban sustainable development demonstrate a set of typical EM features, including 1) the firm belief that economic and environmental objectives are complementary and that technological advancement, with careful consideration of the distribution of negative externalities, can increase Chinese environmental capability to solve environmental problems (Mol et al., 2009); and 2) a stress on the role of state and market as resource allocators to create an eco-production model to solve environmental problems (Buttel, 2001; Spaargaren & Mol, 1992). There are,

though, significant differences between Western and Chinese versions of EM. As shown in the CAS's 2007 report and many subsequent governmental documents, Chinese interpretations of EM are primarily limited to the economic-technological dimensions of sustainable development, assuming a 'win–win' achievement of economic development and environmental clean-up (Zhang et al., 2007; Muldavin, 2015). The wider institutional and governance innovations, that include roles for pressure groups and more inclusive decision making, that are integral to Western perspectives on EM, are outside of the scope of the Chinese version (Yeh, 2009; Zhang et al., 2007). Consequently, researches that employ an EM framework in interpreting Chinese environmental governance and eco-developments also share a number of common characteristics.

First of all, researchers adopt an EM viewpoint in examining Chinese environmental governance tend to highlight the correlation between economic growth and environmental protection, and thus largely exclude social dimensions. For instance, in a critical review of two influential books that study Chinese environmental governance – namely *Environmental Governance in China* edited by Neil T. Carter and Arthur P.J. Mol, and *China Shifts Gears* wrote by Kelly Sims Gallagher (2006), Huan (2007) succinctly points out the generalized narrow view of EM adopted in both researches that gauge Chinese environmental governance based on a combination of economic elements, namely economic growth, change of economic structure, improvement of economic and technical basis, and an environmentally-friendly state, which then leads to over-optimistic conclusions that China is becoming an environmental state and becoming a "frontier of ecological modernization" (Mol, 2006). The stress on advanced economy and technology, whilst provides substantial insights into the transitional environmental governance system in China, simultaneously obscures the political and societal dimensions, such as an institutionally established democracy, active public participating and involvement, and environmentally aware citizenships, in advancing ecological modernization

and environmental protection (Huan, 2007). Such criticism has also been frequently raised by scholars when conducting research on Chinese eco-developments (see Hult, 2013; Joss et al., 2013; Neo and Pow, 2015; Rapoport and Hult, 2017). As commentators have pointed out eco-developments emphasize the capability of economic advance and technological fixes in addressing environmental challenges, but in doing so adopt an overly anthropocentric version of the environment and marginalize social well-being (De Jong et al., 2013; Yu, 2014; Hult, 2015; Pow and Neo, 2013). Consequently, the Chinese version of EM is characterized as a weak form of EM that adopts a corporate, technocratic solution to environmental problems (Christoff, 1996), and for its critics is particularly problematic (Muldavin, 2015).

Meanwhile, as EM focuses on the effective institutionalization of environmental objectives into their respective political-economic systems (Mol and Buttel, 2002; Milanez and Bührs, 2007), ecological modernists often stresses macro and meso-scale understanding of the formation and implementation of policy and plan, and seldom considers the on-the-ground practices and effects. From an EM perspective, there is a focus on knowledge about the institutional factors, which facilitate the institutionalization of new governing bodies, environmental policies, and jurisdictions along different administrative levels in China's environmental institutions; for instance, the development of the State Environmental Protection Agency (SEPA), the implementation of cleaner protection measurements in industrial production, and the enactment of pollution control regulations, as well as the "River Leader System" introduced in 2016 (which will be seen in the case study of Chongming Eco-Island in this research). Ecological modernists emphasise how environmental practices become institutionalised over a period of time (see for example Lo and Tang, 2006), and highlights the institutional analysis of China's environmental policies and project delegations from central to local state. In this vein, EM stresses the macro or meso-scale understanding of the institutional

arrangement and transition of China's environmental governance (Economy, 2006; Ma and Ortolano, 2000). The strength of this approach is to provide a fruitful understanding of the environmental governance structure in China. The challenges of this approach are an over dependence on the state's statistics and documents to examine environmental policies, with an over-simplified approach that typifies power as cascading down hierarchies. As dominated by official rhetoric and policy documents and plans, EM studies thus often fail to recognize the multi-scalar political-economic and social dynamics that shape and reshape environmental governance and eco-developments in China. Micro examination of local effects is oftentimes out of the scope.

Another point, which also links to the argument above, is that under China's strong state and top-down policy making context, the EM-guided environmental governance that emphasizes on state and market forces and institutional system has little appreciation of locality. It thus marginalizes alternative voices and perspectives, which further results in homogenizing the understanding of eco-developments in China. The roots of this feature might be found in the EM theory as environmental modernist like Mol (2001) sees local contexts as impeding or interfering with the universalizing and homogenizing process of EM. In his discussion of globalization, Mol (2001: 216) laments the fact that "local factors," including indigenous actors with diverse "environmental priorities," are an "obstacles" to "environmental universalism". Moreover, he argues that in the final analysis institutional and market forces will lead to homogenization, making EM theory "more uniformly valid" (Mol, 2001: 222). Therefore, it is argued that EM's prescriptive claims tend to marginalize people and projects that depart from the restricted vision of ecological modernization and whose alternative perspectives and practices may be critical to building a sustainable future (McLaughlin, 2012). This is evidenced in the case of Chongming Eco-Island development, where the EM principles adopted in the construction of local environment emphasizes scientific and technical

perspective, especially of engineers and landscape designers, and marginalize local knowledge and expertise which is more sensitive of the local environment (see Chapter five).

In sum, EM as a dominant theory in Chinese environmental governance and urban sustainable development privileges a technocratic, state-led and market-driven development process. It emphasizes on the role of state and market mechanisms in producing a conducive policy environment for China to conserve its environment, and thus largely ignores the profoundly uneven power relations and structural constraints in the Chinese social structures. Consequently, traditional studies on Chinese environmental governance and eco-developments from an EM perspective concentrate on key strategic documents and the voices of political and economic elites, and thus marginalizes alternative voices and perspectives from different political and social scales. Therefore, key weaknesses in the Chinese approach to EM include limited civil society participation and a negligible concern for social sustainability (Muldavin, 2015; Zhang et al., 2007). In official Chinese EM discourses, there has been little if any discussion of equity, equality, citizen empowerment and the like. Consequently, EM may limit understanding of (and available solutions) to China's environmental problems (Muldavin, 2013; Huan, 2007). At present, it remains largely unexplored as to what might be the local effects of current China's EM-led eco-developments. Moreover, there is also the scope for research that explores the potential alternatives for more ecologically informed and socially sustainable approaches to eco-developments.

This thesis recognizes both the strengths and weaknesses of an EM analytical framework. Firstly, it adopts an EM perspective to understand the decision-making process, steering approaches, and policy design and implementation of eco-development on Chongming Island. At a methodological level, EM leads to the collection of data (mainly through governmental documentation analysis and interviews with key state actors and informants) to understand how local states (i.e. Shanghai Municipal

Government and Chongming County/District government) promote the institutionalization of environmental rationality and practices. Secondly, acknowledging EM's weakness in understanding local environmental and social context and in addressing environmental justice and social sustainability, this research employs a PE framework to provide complementary and counter views of urban-nature relationships (especially from historical and multi-scalar perspectives), with which to assess the current and future prospects of Chongming Eco-Island.

2.4   Political Ecology

2.4.1   The "political" and the "ecology" of political ecology

Whilst critiques of Chinese state-led and EM-guided eco-developments become increasingly evident (see Chien, 2013; Joss and Molella, 2013; Neo and Pow, 2015; Pow and Neo, 2013; Yu, 2012; 2014), more radical concepts providing contesting views of urban-nature relationships at odds with EM ideals emerged (Keil, 2003; Swyngedouw, 1997). A popular alternative perspective is political ecology (PE), which unequivocally resists both capitalism and associated modernization thinking (Muldavin, 2013, Yeh, 2009), and is generally concerned with the relations between social and environmental conditions and uneven power relations (see Brown and Purcell, 2005; Bryant, 1998; Bryant and Bailey, 1997; Keil, 2003; Robbins, 2012).

PE is a broad approach that examines a diverse range of topics in geography concerning human-environment relationships. In their foundational text, Blaikie and Brookfield (1987: 17) defined the field as the following:

> The phrase 'political ecology' combines the concerns of ecology and a broadly defined political economy. Together this encompasses the constantly shifting dialectic between society and

land-bases resources, and also within classes and groups within society itself.

During the past three decades, a basic notion of PE as the coming together of political economy and cultural ecology has been applied and developed through research, analysis, and practice across disciplines including anthropology, biology, geography and political science (Paulson et al., 2003).

Despite the variety of PE approaches and applications, it is noted that they are developed around a shared set of core concepts (Blaikie and Brookfield, 1987; Paulson et al. 2003; Paulson and Gezon, 2005; Offen, 2004). The first concerns about the excessive demands of resources that are organized and transmitted through social relations, which may result in the overexploitation of the environment (this view contradicts EM's decline to accept the "limit to growth"). Second is the recognition of the plurality of positions, perceptions, and interests related to environment possessed by different social groups such that "one person's profit may be another's toxic dump" (Paulson and Gezon, 2005: 2). Third is the idea of global relatedness through which extra-local political-economic processes shape and are also affected by local practices; and forth is a refined concept of marginality, in which political, economic, and ecological expressions may be mutually reinforcing: "land degradation is both a result and a cause of social marginalization" (Blaikie and Brookfield, 1987: 23). As the first two notions point out the complexity of social ideology and interrelationship that affects the production of urban nature, they enquire into the power contestation and struggles behind local environmental governance and interventions, and call for a multi-scalar approach of research (as indicated in the third point). The final point further emphasises the interwoven social-environment relationships with a specific focus on the marginal groups. The focuses on power relation in multi-scalar political-economic

dynamics and marginality in environmental changes and management are thus central in the PE field.

Inquiry and action along these lines have generated debates over PE's research methods, its conceptual apparatuses, its internal logic, and its ability to wrestle with new issues and problems thrown up by history (Paulson et al, 2003). Nevertheless, the perennial tension in PE seems to be the relative weight given to the two terms – the "political" and the "ecology" (Offen, 2004; Walker, 2005) and how politics and ecology are linked and intertwined (Forsyth, 2015). Debates on whether PE should focus on politicized environments or on examining how ecology and biophysical processes affect human use of natural resources, shaping political processes in turn, seem to be contentious. Andrew Vayda and Bradley Walters (1999), for example, have argued that current PE tends to privilege political explanations of resource use and environmental change, and thus largely neglect environmental characteristics and ecological processes. By excluding biophysical ecology, and by leaping to assumptions, they argue that the approach should be termed political geography, environmental politics, or political science (Vayda and Walters, 1999). Such criticism has also been raised by Zimmerer and Bassett (2003), who point out that the biophysical environment in PE too often becomes simply a stage upon which struggles over resource access and management take place. They further argue that the field of PE has become "politics without ecology" (Bassett and Zimmerer, 2004: 103). These claims of critics have propelled political ecologist to reassess the "ecology" within "political ecology". Peter Walker, for example, by sketching the roots and contemporary expressions of the field, argues for the persistence of biophysical ecology and environmental science in PE studies, but warns the future diversion of PE as it moves in directions that call into question the centrality of biophysical ecology (Walker, 2005).

In contrast to the concerns over the marginalization of the "ecology", the role of politics in contemporary and current PE seems to be

unchallenged. It is noted that comparing with other intellectual traditions that attempt to explain environmental problems, the defining characteristic of PE today is "the difference between a *political* and an *apolitical* ecology" (Robbins, 2012: 13). The discussion and debates of the "politics" of PE is thus often not about its existence or extent, but revolves around its practicability in the real world, namely how to *act* (to wield power) to promote a just form of nature-society interaction rather than just to *understand* the political dynamics that shape environmental changes (see for example, Paulson et al., 2003; Paulson and Gezon, 2005; Walker, 2007).

Indeed, it is noted that most political ecological research emphasized just one of the dimensions – either "political" interrogation or "ecology" study (Zimmerer and Bassett, 2003), and there seems to be two camps in PE that are divided by their perceived centrality. However, as such contestation evidences the broadness and diversity of PE, they also illustrate the two foci of the discipline, namely the "politics" and the "ecology". While recognizing the various interpretations of "political ecology", it is argued that scholars should nonetheless always consider how politics and ecology mutually shape each other, rather than assuming that either of these terms is fixed (Forsyth, 2015). As urged by Zimmerer and Bassett (2003), it is imperative to find a synthesis of the political and ecological processes whose outcomes produce distinctive problems and suggest particular solutions. This is especially crucial in studying Chinese eco-development as on one hand, it is a political creation initiated by the upper-level governments and implemented by state actors (lower-tier governments and state-owned enterprises, and in some cases in corporation with international actors (governments or corporations) in a top-down manner; on the other hand, its main goal (at least stated in the official rhetoric) is to improve environmental quality and promote environmental protection during the development process, and thus an examination of the environmental transformation and outcome is essential

to evaluate the implementation process and effects of eco-development project.

This study thus engages both the ecological and the political dimensions of environmental issues in studying the eco-development on Chongming Island in China. In order to incorporate political dynamics into environmental analysis and to dissect their inter-relationships in effecting environmental and attendant social changes, this study draws on the PE's questioning over multi-scale politics and unequal power relations in environmental governance and management, and its historical approaches in dissecting changing human-nature relationships and in evaluating environmental and societal impacts of eco-development in a historical context. The aim here is articulated by Paulson et al (2003: 210) as to integrate political and environmental studies "in ways that do not dilute the study of the ecological, but rather strengthen our ability to account for the dialectical processes through which humans appropriate, contest, and manipulate the world around them, and the understand and act on the ecological and social impacts of those processes."

2.4.2 Power, scale and implications for action

Two central themes in PE that constitute a politicized environment are power and scale (Bryant and Bailey, 1997; Bryant, 1998; Zimmerer and Bassett, 2003). It is noted that politics are found in the practices and mechanisms through which power is circulated (Paulson et al., 2003), and to understand "where power lies and how it is used" is a central task set up in PE (Blaikie, 1985:6). Meanwhile, as Neumann (2005) highlights the power asymmetries within and between scales and the scalar practise of social actors in PE study, Rangan and Kull (2009: 29) argue that scale "plays a role in *making* ecological change 'political'". Therefore, political ecologists share a consensus that power and scale are very closely linked as the latter is the product of the compartmentalisation of socially-produced space according to power systems (Zulu, 2009). In this vein, to unravel the political dynamics

in effecting environmental changes, PE has its focus on the scale examination to identify the socio-politics of governance, and on the power studies.

Whilst power and scale are crucial in unpacking the political dimension of PE, another main issue that has been often discussed is the limited engagement and "impact" of PE in the policy, development and conservation worlds (Robbins, 2012; Walker, 2006, 2007; Blaikie, 2001, 2012). It is argued that without serious consideration of the action/engagement/impacts, PE might be "largely deskbound, and, ultimately, *apolitical* and *powerless* in practice" (Walker, 2007: 364, emphasis added in original text). Therefore, another key theme in the "political" of PE is much about finding practical solutions to environmental problems as identified through the study of those phenomena (Paulson et al, 2003). Here, I review these key themes in PE study, namely power, scale, and actions, to extract knowledge that could inform the study of the "political" underlying Chinese eco-developments.

Power

Rooted in the PE concept is the assertion that environmental issues are not solely subject to natural science, but are inherently associated with political, economic and social actions, and more precisely, with questions about the place and power (Bryant, 1998). Power is a central element in the various definitions of PE. For instance, Greenberg and Park (1994: 1) define PE as providing a synthesis of "political economy, with its insistence on the need to link the distribution of power with productive activity and ecological analysis, with its broader vision of bio-environmental relationships". Robbins (2012: 20) argues that PE can be understood "to address the condition and change of social/environmental systems, with explicit consideration of relations of power." Paulson and Gezon (2005:11) wrote that PE was characterised by an "[a]wareness of the deep and complex ways in which dynamics of unequal social and political power affect ecological systems." As widely recognized, the power relations are at

the heart of the PE framework (Bryant, 1998; Castree and Braun, 2001; Paulson and Gezon, 2005; Peet and Watts, 2004; Tan-Mullins et al, 2017b).

However, what power is, where it is located and how to recognize it, is conceptualized quite differently across the field. Some PE scholars portray power as "a social relation built on an asymmetrical distribution of resources and risk" (Hornborg, 2007:1), as a "personal attribute", as the "ability of an individual to impose his or her will" or as the "power to shape environments for human action and interaction" (Paulson et al., 2005: 28). Some, as inspired by Michel Foucault and Judith Butler, perceive power as a constitutive dimension of social life that produces subjectivity, resources and places, and "shapes and pervades all human interactions" (Paulson et al., 2005: 29). Therefore, it is argued that there are significant theoretical differences between the divergent definitions of power in PE – it can be conceived as "an 'entity' that does something ('circulates'), a resource that can be unequally 'distributed' or 'held', and as a social relation" (Ahlborg and Nightingale, 2018).

Asking "where is the power in political ecology?", Svarstad et al (2018) make a most recent attempt to theorize power in PE and insightfully identify three theoretical approaches that provide crucial power perspectives in the PE literatures: the first type consists of actor-oriented power perspectives that focus on the agencies of actors; the second draws on neo-Marxist power perspectives that emphasize how power is exercised through economic domination and exploitation; and the third form of power includes variations of discursive power perspectives drawing on poststructuralism, and in particular the Foucauldian theories. They argue that the combinations of these social theories form a synergy of power perspectives that provide a set of rich and nuanced insights into how power is manifested in environmental conflicts and governance (Svarstad et al, 2018). Firstly, insights from actor-oriented perspectives are useful for evaluations of efforts and effects in exercising power by a complexity of actors, including state agencies, corporations, NGOs, and others, whilst

those marginalized groups who are often affected negatively by consequences of these efforts and often muted (or absent) during the policy-making process, are also made visible and given voices. Secondly, the neo-Marxism-grounded power perspectives contribute to understand how constantly changing economic structures provide opportunities for capital accumulation for some actors, while at the same time, disempowered and marginalized many others. It is further argued that power analysis on this basis is crucial in exploring sustainable alternatives to the ongoing development in a neoliberal direction (Svarstad et al, 2018). Thirdly, the examination of the exercises of discursive power by main actors (often involve political elites, governments, corporation or international NGOs) as well as ways in which dominant discourses are modified, adapted and resisted is important in political ecologists' interrogations on contestation over land and other natural resources. Whilst they note that each of the three main perspectives of power constitute aspects that are essential in studies of power in shaping environmental changes and contestations, Svarstad et al. (2018: 359) stress that these three perspectives are complementary in that "they involve a multi-faceted and nuanced focus on agency, power economy structures, and discursive formations". These three power perspectives provide useful insights in the empirical study of PE and inspire the formation of the theoretical framework in this thesis that studies the power relations underlying the environmental governance of Chinese eco-developments as exemplified in Chongming Eco-Island.

As can be seen in the empirical analysis below, to dissect the political-economic rationale that underlies the governance and development of Chongming Eco-Island, this study draws on different stakeholders' various, even competitive attitudes and values toward resource and places, and analyse how different groups are variably empowered and how they effect change on the environment. Meanwhile, it also examines how current Chinese political economic context and the incumbent institutional arrangement endow state actors with ultimate

authority over environmental governance, and in the meantime largely exclude other stakeholders (especially grassroots) in the planning and decision-making process. Furthermore, it also interrogates the role of various discourses revolve around "eco", "environment", and specifically the notion of "eco-development", in shaping the development of Chongming Eco-Island, and how these discourses are formed and evolved over time and especially through the development process.

Scale

Like the theme of power, scale is ingrained in the theory of PE and has been a topic of considerable debate in this field. The most basic argument is that ecological and social change occurring in particular places needs to be understood as the outcomes emerging from the interactions of political and economic processes at local, national, and international levels (Blaikie and Brookfield, 1987). Blaikie and Brookfield argued that it was necessary to develop an approach that could:

> [E]ncompass interactive effects, the contribution of different geographic scales and hierarchies of socio-economic organizations (e.g., person, household, village, region, state, world), and the contradictions between social and environmental changes through time. Our approach can be described as regional political ecology. The adjective 'regional' is important because it is necessary to take account of environmental variability and the spatial variations in resilience and sensitivity of the land, as different demands are put on the land through time. The word 'regional' also implies the incorporation of environmental considerations into theories of regional growth and decline. (Blaikie and Brookfield, 1987: 17)

In calling their approach "regional political ecology", Blaikie and Brookfield aimed to draw attention to the spatial and temporal scales at which environmental variability, geographic variations, and social organization operated to produce a constantly shifting relationship between nature and society. They further introduced an analysis method – the "chain of explanation" – to identify causes of environmental degradation. It follows several steps: first to explore and measure the environmental change; second is to investigate the rationality of the local land managers (can be the individuals, households or institutions that directly use and manage natural resources) and their practices; third is to bring external influences on land management into the analysis, which can take the form of national laws, policies and bureaucratic practices as well as global forces (international conventions, discourses, funding agencies, investors). This methodology, as it highlights the causal chains running one-way from higher to lower geographical levels, reflects a conscious attempt to integrate 'politics', that is, 'questions of access and control over resources – relations of production as realms of possibility and constraint – into human ecology' (Peet and Watts, 1996: 6), and thereby make it reflective of broader political and economic processes driving ecological change and resource degradation in particular places. Many subsequent PE research have broadly followed or adapted Blaikie and Brookfield's "chain of explanation" approach for analysing ecological and social change (see for example, Bryant and Bailey, 1997; Forsyth, 2004; Neumann, 2005). Hereinto, Neumann (2005) has argued that although this approach is largely used to explain ecological and social change in agrarian societies and rural contexts, it can easily be applied to urban contexts and to exploring "the socio-ecological interconnection that operate at multiple scales and that link cities to each other and to rural regions" (2005: 157).

Nevertheless, whilst Blaikie and Brookfield's work established the foundation for the rapid development of PE as an approach for studying ecological and social change, their "chain of explanation" has often been

criticized for being an inadequate framework of analysis. Peet and Watts (1996: 8), for instance, argued that the "chain of explanation" provides no sense of how or why some factors became causes, and criticize it as "an extremely diluted, diffuse, and on occasion voluntarist series of explanations" that does not produce a theory that allowed for or explained complexity. A growing group of scholars has taken up Peet and Watts (1996)'s criticisms and called for alternative ways of understanding ecological and social change through "integrated analysis" and "cross-scale" linkages (Rangan and Kull, 2009). For example, Zimmerer and Bassett (2003) point to problems of conceptualizing scale as 'pre-given socio-spatial containers' and not recognizing the varying time-space scales of environmental and social change; Paulson and Gezon (2005) argue for the need to identify the most appropriate scale for analysis and figuring out how to move between scales; and Robbins (2012) notes the need to move beyond static conceptions of scale by focusing instead on how social actors exercise power and authority by incorporating human and ecological subjects into scientific, economic, and political networks. The centre of gravity of scale discussion in PE is thus gradually moving from linear or simple vertical hierarchies (chains of explanation) to complex assemblages, webs of relation and ''rooted networks'', with hierarchies embedded and entangled in horizontal as well as vertical linkages (Rocheleau, 2008).

This strand of interpretation of scale in PE resonates the standpoint of the scholarships of "politics of scale", which views scale as socially and politically produced and compartmentalised (Brenner, 2001; Marston, 2000). The "politics of scale" conceptualizes scales as networks or "tangled hierarchies" that highlights three dimensions, namely: size (or spatial extent), level, and relation (Howitt, 2003). Here, levels are "locations on a scale" (Gibson et al., 2000: 219), namely "hierarchies of socio-economic organisations" as in the passage cited previously from Blaikie and Brookfield (1987: 17). It captures agency as "differences in powers and capacities, opportunities and constraints, among nested spaces" (Leitner and Miller

2007: 119). Relation captures linkages between levels. As PE of scale incorporates the key precepts of the politics of scale into the existing framework that highlights power relations and a dialectical approach towards nature–society relations, it emphasises on actors' scalar practices and power relations in in-depth location-specific research (Neumann, 2009). Therefore, it is argued that through a scale interrogation in PE, ecological and biophysical change and attendant social change can be viewed an interpreted as "disruption" to places, regional "transformation", or as regionalized "evolution" (Rangan and Kull, 2009). As PE centralized its analysis in multi-scalar approach and power relation study, it is well-positioned in the study of politicized environmental changes and related social transformation, as in the eco-developments on Chongming Island in this research.

A study of a specific Chinese eco-development project demands a multi-scalar perspective to dissect the complex power relationships and dynamics that shape and reshape local practices. This is because urban (sustainable) developments do not take shape in isolation but emerge through networked processes that connect such projects with others. Tilt (2007) argues that local decisions and actions regarding the environment are seldom strictly local; rather, they are conditioned by the values, priorities and policies of other actors at various geographic and administrative scales. Under the hierarchical mechanism of the Chinese administrative and planning system, cities (urban spaces) are organized into a regional (city) system. At the same time, local governments practice horizontal coordination between territorial jurisdictions to maximize development opportunities. Therefore, an eco-development project, as embedded in a broader city region context, inevitably subjects to external/extra-local actors' desires and demands. As will be seen in Chapter four, the evolution of the principal planning ideals of Chongming Eco-Island from previous pro-growth thinking to ecology-centric ideas stems from the shifting national and Shanghai municipal development priorities and

agendas. Such ideology transformation beyond the local scale shapes the construction and reconstruction of environment and society on Chongming. This echoes the scale and power argument of PE as elaborated above. In this vein, PE is well-positioned to assist an exploratory research of the vertical administrative governance and the horizontal coordination between territorial jurisdictions in effecting urban sustainable developments and social-ecological changes.

Actions

In their article "Locating the political in political ecology: an introduction", Paulson et al. (2003) observe that one of the basic challenges confronting PE is "to develop ways to apply the methods and findings [from PE research] in addressing social-environmental concerns" (p. 208). Indeed, concerns to make politics not only a research subject but a practice have long been an explicit and central goal of PE (Batterbury and Horowitz, 2007; Batterbury, 2015; Walker, 2007). Peet and Watts (1996: xi), for example, highlight the "liberatory potential of environmental concerns of current political activity around environment and resources". Similarly, Zimmerer (2000: 357, emphasis in original), states that PE "seeks to contribute *both* to sound environment (including nature conservation) and to the empowerment of disadvantaged social groups." Growing attention to struggles and strategies of marginalized social groups engaged in conflicts over ecological resources and risks has created an intimate tie among politics, practice, and theory within the PE scholarships.

As political ecologists increasingly consider the possible real changes that can be made from their studies and analysis, vital question has been raised concerning their positions and actions in the frame of analysis. As Leff (1999:15, as cited in Paulson et al., 2003) noted:

An important goal of political ecology is to understand and participate in the ensemble of forces linking social change, environment and development. This goal suggests new questions for political ecologists. How do we situate ourselves in the circuits of power-knowledge (say, the apparatus of biodiversity production) that we seek to understand?

Such self-reflective inquiry propels many discussions on political ecologists' roles as environmental scholars and practitioners. Blaikie (2001, as cited in Neumann, 2008), for instance, has argued that political ecologists have a responsibility to consider the effects of their scholarship on people and landscapes. Walker (2007: 367) pointed out the ethical obligations of political ecologists and argued that political ecologists should "give back" to their research subjects (most often are the poor and disadvantaged social groups in the third world) by making tangible material or social progress. Similarly, Blaikie and Muldavin (2015) note that political ecologists can be "useful outsiders", making important contributions to environmental policy-making in a development context.

Besides these verbal commitments, political ecologists have also made substantial efforts in exploring methods and approaches to promote social change in practice and to develop a more constructively engaged PE. Blaikie and Muldavin (2015), for example, elaborate a method based on what they call the "policy reform dossier", which denotes a research path for creating, presenting and following through with knowledge from diverse actors in aid of policy reform. Whilst it is noted that there are significant institutional constraints within academia that limit the capacity of scholars to engage in more applied or activist work (Walker, 2007), it is also suggested that the engagement of PE with different audiences "outside the academy" and strategic cooperation with selected development institutions, especially those involve conserving natural resources, tackling persistent poverty, and fighting for environmental justice can effectively translate political

ecologists' works into action (Batterbury and Horowitz, 2005; Batterbury, 2015). These and many other approaches proposed enhancing the actions of political ecologists share a common core, namely the multi-scale partnerships that bringing in a wide variety of actors in civil society and government.

Indeed, many political ecologists have taken up the responsibilities to act in real practices, tying their research directly to activist efforts to improve human well-being and environmental sustainability through various forms of local, grassroots activism and organization (see for example Batterbury and Horowitz, 2007; Forsyth, 2004; Forsyth and Walker, 2007). These pioneering works illustrate the significance of integrating different actors' informal knowledge and experience about environmental issues into the policy process in promoting positive change in keeping with social and environmental justice. They also evidence PE's potential in contributing to politically progressive reform of environment policy.

In supporting Batterbury's (2015) argument that "analytical critic" is necessary, but not sufficient, as it works best when it at least provides some tractable alternative proposals to the environmental and social problems that the research uncovers, this thesis thus seeks to combine both critique and solution in PE analysis of Chinese eco-developments. A key aim here is articulated by Robbins (2012: 12-13) when he argues that PE can serve as "hatchet" and as "seed": the "hatchet" is an incisive critique and a search for causation that reveals deficiencies in dominant approaches to the environment, and the "seed" offers fresh and useful ideas by specifying equitable and sustainable alternatives and solutions that can feed through into direct advocacy and activism (see also Batterbury and Horowitz, 2007). This is of great significance considering the enormous potential contributions of Chinese ecological movement to the global environment and the current increasingly apparent paradox confronting eco-developments in China. The implication of PE as a contesting and complementary perspective to EM in interpreting and informing Chinese

eco-developments is discussed further in the conclusion of this thesis (see Chapter seven).

2.4.3 Historical approaches in PE

Whilst PE's interrogation of power and scale enables a critical and in-depth understanding of the underlying political-economic and societal dynamics of environmental actions and changes, a historical approach of PE enables a longitudinal evaluation of the changing human-environmental relationships and helps to unpack the "ecology" by revealing the environmental and social transformations produced by eco-development. Although being variously defined and interpreted (Forsyth, 2004; Neumann, 2005; Peet and Watts, 2004; Robbins, 2004; Zimmerer and Bassett, 2003), PE has its deepest historical roots in the study of both biophysical ecology and social science (Paulson et al., 2003; Peets and Watts, 1996; Walker, 2005). As an eclectic approach to research on environmental change, PE has historical analysis as an important component since its emergence as a field of study in the 1970s and 1980s (Blaikie, 1985; Blaikie and Brookfield, 1987; Davis, 2015; Offen, 2004; Peluso, 1992; Neumann, 1998; Robbins, 2012). The significance of historical analysis has been highlighted by many political ecologists. For example, Davis (2015) argues that the historical components of PE research help to guard against "apolitical" analyses as "it is only with a sophisticated and critical understanding of the historical development of landscapes/environments, of social relations, and of knowledge and the privilege that attends it, that we can reveal the hidden relations of power often at play in the questions studied by political ecologists" (Davis, 2015, p. 263). This is echoed by Mathevet et al. (2015) who argue for PE as an intrinsically historical approach because contemporary political-ecological configurations need to be understood as constructed in and through past processes, transformations, and dynamics. Moreover, it has been pointed out that PE needs more historical depth and that "doing environmental

history" can help to extend the frontiers of political ecology (Peet and Watts, 2004, pp. 12-16).

Scholars who highlight the historical dimensions in PE promote an explicit sub-field of historical political ecology (HPE) (Offen, 2004; Biehler 2009; Davis, 2009; Peluso, 2009, 2012; Widgren, 2010). Just as there is no single theoretical or methodological approach to PE (Peet et al., 2011; Peet and Watts, 2004; Robbins, 2012), there is no single definition of or approach to "historical political ecology". One of the most often cited definitions of HPE is provided by Karl Offen, suggesting that "a historical political ecology can be characterized as a field-informed interpretation of society-nature relations in the past, ... how and why those relations have changed (or not changed) over time and space, and the significance of those interpretations for improving social justice and nature conservation today." (Offen, 2004: 21). In this interpretation, Offen (2004) highlights two main aspects that characterize a HPE, namely 1) a field-informed perspective that often involves lengthy field immersion such as ethnography and participant observation research, and 2) an explicit linkage between social justice and management of natural resources. With support of this argument, Davis (2009) further adds that historical political ecology also explicitly addresses the political and economic forces of environmental change, environmental policy formulation, and environmental narratives. These features, while help to define the concept of historical political ecology, also help to differentiate the field from other related disciplines, such as environmental history and historical geography.

HPE is commonly recognized to share an affinity with environmental history and historical geography in studying human-nature relationship (Offen, 2004; Davis, 2015; Zimmerer and Bassett, 2003). However, there are a couple of key features underscored the HPE that differ it from the other two related sub-disciplines. Firstly, historical political ecologists explicitly view nature in light of social and political issues, and thus tend to be problem-oriented while environmental historians and historical

geographers tend to present the story of environmental transformation chronologically (Offen, 2004; Davis, 2015). In general, environmental history is about the history of the mutual relationships between humankind and the rest of nature (Mcneill, 2003). Isenberg (2014: 6) succinctly points out that environmental history "understands the environment in a historical context, while at the same time understanding human history in an environmental context". Therefore, the mainstream environmental history often operates on a grand scale that deals with global and international issues (e.g. Bsumek et al., 2013, Crosby, 1986; Cushman, 2013; Schleper, 2019), the relationship between nature and nation (e.g. Von Hardenberg et al. 2017), and often with regional and urban issues (McNeill, 2001; Wang, 2016; Melosi, 1993; Mosley, 2014; Schott et al., 2005), which does not explicitly seek to dissect the underlying political-economic and societal dynamics that causes the environmental changes and problems. Political ecologists, on the other hand, are frequently more interested in providing historical detail(s) of certain aspects of their analysis that they consider important for understanding the research problem. As Jake Kosek explains, his book about Northern New Mexico is "not meant to be a detailed history of place but rather a place-based history of the articulations and politics of nature and difference" (Kosek, 2006: 28).

Secondly, PE study's strong contemporary policy relevance also sets it apart from environmental history and historical geography which do not explicitly seek to link their topics of inquiry to social or environmental justice issues in the present (Offen, 2004). It is noted that the majority of historical political ecologists (and political ecologists in general) deliberately relate their research to contemporary situations in order to try to envision/facilitate environmental development that is more socially just and ecologically appropriate (Davis, 2009). Meanwhile, much work in PE has an aim in making tangible improvements in the "real world" (Castree et al., 2010). Environmentalism and political engagement are thus the spirits of this discipline. In this regard, eco-development projects, which experiment

on a sustainable pathway for a harmonious relationship between humans and nature, have a common ground with HPE.

Thirdly, the theoretically informed triangulation of multiple methods also often differentiates the research of these three sub-disciplines since political ecologists nearly always combined insights from lengthy field, biophysical, and historical research to examine the relationships between social and environmental change (Davis, 2015; Offen, 2004). For instance, one of the most influential early works, Michael Watts' (1983) *Silent Violence*, is a profoundly historical account firmly grounded in five months of archival research as well as over a year of meticulous field work that included interviews, participant observation, surveys, and documentary analysis at the village level.

In sum, historical analysis in PE implies more than locating contemporary human-environmental processes in a historical context to explain the present. It also involves making connections between social process and material outcomes across spatial and temporal scales; using combined insights from ethnographic and biophysical research and data field to examine the relationships between social and environmental change; exposing the contemporaneous and current meaning of past social-environmental processes for multiple actors—many of whom left little trace in the historical record; and ultimately informing present-day politics for improving social justice and nature conservation (Offen, 2004).

There is a number of classic PE works exemplifying much of what has been laid out above for historical political ecology (e.g. Blaikie, 1985; Blaikie and Brookfield, 1987; Peluso, 1992; Neumann, 1998), although these authors did not explicitly categorize themselves as historical political ecologists. More recent contributions include Tom Bassett's *The Peasant Cotton Revolution in West Africa* (2001), Judith Carney's *Black Rice* (2001), Christian Kull's *Isle of Fire* (2004), and Diana Davis's *Resurrecting the Granary of Rome* (2007). Whilst their methods and objectives vary, these studies have demonstrated the effectiveness of a HPE approach in

understanding the long-term effects of social and environmental changes by exploring both ecological and political-economic histories.

Among many illuminating works, this research has been substantially inspired by Mathevet et al. (2015)'s HPE study on the management of the Camargue wetlands of southern France. Seeing contemporary environmental problems as products of complex past conflicts and their resolutions, Mathevet et al. (2015) examine the social-natural history of the wetland to analyse the shifting dynamics between power relations under a variety of political-economic arrangements, and the changing ecology of the marsh environment. Their historical examination of the case of reeds in the Camargue shows how European or national conservation actors' construction of a place as "natural" affect its use, conservation, and management. It well demonstrates that relational socio-natural histories are crucial to understanding social-ecological dynamics in the present and contributes a critical perspective to ways of knowing and interpreting these dynamics. Drawing from the study, they succinctly conclude that "history is not only a hallmark of political ecology, but a way of understanding the ecological changes that can help advance biodiversity conservation science and policy" (Mathevet et al., 2015: 11). Mathevet et al. (2015)'s study well demonstrates the fruitfulness and effectiveness of a historical study of the social, environmental and ecological forces in examining the formation and transformation of environmental problems, especially in highly modified or engineered environments, as it is noted that in such sites, the explicit roles of humans are clear and acknowledged, as are often conflicting claims.

The historical approach of PE as well as the fruitful precedents offer substantial theoretical and methodological insights on studying eco-development in China, especially on Chongming Island in this study. As a significant number of Chinese eco-cities are being built in the *tabula rasa* way locating on brownfield sites and largely constructed from scratch (Joss et al., 2011), existing studies of Chinese eco-development often adopt an ahistorical view, prioritizing immediate, recent, or proximate political and or

ecological drivers and outcomes. Nevertheless, Chongming Eco-Island is a large-scale environmental project and a political programme being planned and constructed in a mature built environment and community with a rich history and culture. Such massive intentions on the local environment and community inevitably effect on the long-established human-nature relationships, which should be examined from a historical perspective. The historical approach and insight of PE thus can assist the understanding of how external factors and development pressures are changing the historical account of local environment and resource on Chongming and the shed light on the environmental and social transformation of the island over time, especially since the eco-developments.

2.4.4 PE study of eco-development in China

A review of the literature of PE above well demonstrates the nexus between PE and the study of eco-developments in China. Firstly, as PE probes the "restructuring" of social and environmental relations at multiple scales during policy changes, and reveals the dynamics of unequal power, territories/spaces, and nature/resources, it offers insights for the understanding of the nature of contemporary governance of ecological development in China (Harris, 2017; Muldavin, 2013). Currently, PE scholarship still occupies a small share of the rapidly growing literature on environmental governance in China (Yeh, 2015). Nevertheless, for its advocates, PE is a productive approach that usefully picks up issues that an EM framework fails to address in eco-developments, such as the distribution of costs and benefits between the environment and development and between generations, and the intensification of social injustice (Yeh, 2009). Since these social-economic and environmental challenges and problems are also shown to be present in the majority of Chinese eco-developments (e.g. Caprotti, 2014a, 2014b; Caprotti et al., 2015, Grydehøj and Kelman, 2016; Hodson and Marvin, 2010), it is important that they are investigated.

Secondly, as PE advocates a historical examination of the interaction between human and nature, it pays close attention to change, causation, contingency, and context, and thus can serve as a critical method in understanding and evaluating the challenges of on-going eco-projects in China. Whilst eco planners are notoriously blind for past developments, a historical approach of PE provides an understanding of why and how landscapes and ecologies, flora and fauna, as well as livelihoods of local populations have changed over time (as will be seen in Chapter six about the disappearing reeds on Chongming Island). The fact that past societies have often managed their relationship in a more sustainable way than present societies, can help planners move forward in a more considerate way (McNeill and Roe, 2013: 15). It may also help to uncover alternative pathways for eco-projects with a view toward more locality-appropriate and more sustainable development.

Thirdly, PE harbours an ethnographic component and privileges the rights and concerns of marginalized groups and a marginalized environment by challenging mainstream environmental management approaches that are commonly dominated by powerful political and economic elites (Bryant and Jarosz, 2004). Within a system of authoritarian environmental governance that favour an EM thinking (Tan-Mullins et al., 2017a; Tilt, 2007), grassroots voices are rarely listened to and are all too easily ignored in Chinese eco-developments. PE focuses on communities' perceptions of their environment, how that is changing and the opportunities that they have to voice their views. It thus enables an analysis of what communities' value in their environment and how that may differ from the perspective of officials who seek to manage a locality from a distance (as will be seen in Chapter five about the water and land governance on Chongming Island). This results in more comprehensive efforts to disentangle socio-political, economic, and ecological dynamics in explaining eco-developments. In this way, PE helps to address the research questions of this thesis that concern the formation, implementation and effects of eco-development by drawing

out contested and complementary perceptions held by different key stakeholders on the local environment and resource, and on eco-development.

Fourthly, as a "vociferous critic of all forms of capitalism" (Neo and Pow, 2015, p. 406), a PE framework provides a critical examination and welcome antidote to current EM-guided pro-growth eco-developments in China. At the heart of PE, is the notion of the environment. While Chinese ecological civilization and narrow views of ecological modernization begin to find ways to internalize the environment into everyday actions and practices, they are essentially anthropocentric. For both ecological modernization and Chinese eco-development policy there is a narrow view of the environment and what it means for local people; environment becomes part of an anthropocentric perspective that is seeking win-win outcomes. For political ecologists, though, local people have a more intuitive, eco-centric perspective which rejects or at least does not connect with such a rationality (as will be seen in the discussion of water and land governance on Chongming Island in Chapter five). There does, though, need to be some caution in not prematurely closing off an important topic for study by assuming that local, rural people, in particular, will have a more eco-centric approach to nature (as will be seen in Chapter six about the divergent views of environment possessed by local residents on Chongming). Attention also needs to be given to the ways in which local actors' perspectives on nature may be shaped and reshaped by their engagement with the wider debates on eco-development.

2.5   Conclusion: an integrative approach to the study of eco-developments in China

The above review of the characteristics of Chinese local governance of eco-development and two conceptual frameworks (ecological modernization and political ecology) shed light on this research in three major ways: 1) it helps this research to address questions about how

eco-development is interpreted by local governments and state actors in China and how do they drive eco-development through the contents of policies and plans; 2) it helps this research to investigate the on-the-ground practices and ecological and socio-economic effects of eco-developments in China; and 3) it helps this research to interrogate how non-state actors perceive and respond to eco-development in China?

Hitherto, EM is a key model for guiding and interpreting eco-development in China. It has provided persuasive accounts of policy developments (see for example, Zhang et al., 2007; Zhou, 2015) and is an important narrative in policy documents for Chinese eco-developments, as well as for Chongming Island specifically (Ma et al., 2017; Pow and Neo, 2013). Its emphasis on institutionalization and the role of state and market in promoting technological advancement to reconcile economic growth with environmental protection caters to development needs of Chinese government in balancing economy and environment, and provides valuable insights in the formulation of governmental policies and strategies of eco-development. Whilst the powerful EM rhetoric shapes the contemporary environmental terms in Chinese urban sustainable development, it simultaneously homogenizing the understanding of "eco" and always leads to the narratives of political or economic elites. Therefore, it marginalizes alternative voices and perspectives, especially from those who experience changes in an environment. On the contrary, a PE framework that incorporates a historical perspective and questions uneven power relationships and multi-scalar dynamics in environmental transformation privileges a bottom-up approach that concentrates on the locality, especially those marginalized groups' perceptions and experience of changes. Nevertheless, its understanding of state is rather poor. However, within the distinct governance context of Chinese eco-developments, both the state actors' practices and non-state actors' responses and perspectives are crucial in understanding and evaluating the implementation and effects of eco-development on the ground. Therefore, this research aims at

integrating the empirical and methodological insights from EM and PE to theorise the local practice of eco-development in China. This is for three major reasons.

Firstly, integrating both EM and PE perspectives enables this research to evaluate the on-the-ground practices of eco-developments from a multi-scalar perspective. To study eco-developments in China, there is a need to recognize the distinctive governance setting of China (Horowitz, 2015) because of its state authoritarianism (Xie, 2015), which shapes the development process, opportunities for participation and dominant interpretations of nature. While EM provides helpful insights of the high-level environmental policy initiatives, PE provides supplementary views on how policy affects communities, how development reshapes people's perceptions of their environment and resources, and of people's ability to give voice to the nature of development in their communities. As it is noted that the disproportionate and overwhelming influence of Chinese state in environmental interventions may often lead to unintended and even pernicious socio-environmental results (Bryant and Bailey, 1997; Neumann, 2005; Peet et al., 2011; Robbins, 2012), a theoretically informed and critical detailed local analysis is crucial for evaluating eco-developments in China.

This is especially important in the study case of Chongming Eco-Island, considering its geographical features and the spatial context. The Island is a rural space, the traditional heart of PE (Leff, 2015), but it is also part of the much larger urban-industrial complex of Shanghai that drives processes of scaling (Barca and Bridge, 2015). In a state-driven economy that seeks to control planning and development, scale becomes both a contextual and an explanatory factor in the account of ecological relations on Chongming. For example, Chongming can be portrayed as an eco-Island, almost detached from Shanghai, a place that is to be a model of sustainable work and living. Chongming can also be described as the green lungs of Shanghai, in which case it becomes possible to justify further urban land intensification because a high-quality green space is being preserved within the city

boundary. Both of these constructions of Chongming have implications for the citizens of the Island and whether or not space within a city can be socially, environmentally and economically equitable. An integrated approach can help to untangle the multi-scale politics in shaping and reshaping Chongming Eco-Island, as well as to examine the effects of eco-development on the locality.

Secondly, an EM and PE integrated approach also enables this research to draw on different key stakeholders' contested and/or complementary views on eco-developments. As a consequence of state authoritarianism, non-state actors' voices are often muted (or absent) during the policy-making process of Chinese eco-developments (Caprotti and Gong, 2017; Flynn et al, 2016), and voices of dissent may be more covert, what have been termed 'persistent persuaders' (Lang and Xu, 2013) and will certainly be subtle. Whilst ecological modernization privileges the narratives from political and economic elites and marginalizes local actors and grassroots, PE helps the environmental opaque actors and victims to voice their needs from the ground. This is of great significance as whilst numerous environmental studies in China highlight institutional analysis of the policy mechanisms (Economy, 2006; Ma and Ortolano,2000), there are lacunae in literature and approach to incorporate state policies with farmers' voices to understand the policy dilemma at the local level. This research remedies to this gap through a case study of Chongming Eco-Island from both an EM top-down state perspective and a PE bottom-up local view.

Thirdly, the theoretical lens of EM and PE can provide insightful directions for China to consider environmental policies holistically. On one hand, EM can provide reflexive thinking and rationalities for Chinese policy makers to use technology, institutionalise environmental practices, adopt market instruments, and reorganize institutional arrangements to increase the capacities of the state to maintain economic growth and tackle environmental risks. On the other hand, political ecologists contribute relational thinking of co-functionality, multi-scalar and relational schema for

Chinese policy makers to realize how politics marginalizes subordinated groups, increasing environmental vulnerabilities, and accelerating ecological risks in China (Yeh, 2009). Therefore, integrating EM and PE thinking in eco-development may help policy-makers, planners, and practitioners to think and work differently around sustainability to explore a more holistic, nature-focused, and locally-relevant means in promoting just planning for urban sustainability.

In the next chapter, this research will introduce the methodology and data collection activities to obtain relevant data to contextualise the eco-developments in China through the Chongming Eco-Island case study.

Chapter Three: Methodology

3.1 Introduction

To critically evaluate the formation and evolution of policies and plans, on-the-ground practices and effects of Chinese eco-development, this research is grounded via an in-depth case study of Chongming Eco-Island development in Shanghai, China. The empirical analysis incorporates both a top-down analysis informed by an EM perspective that interrogates state's intention, efforts and practices, and a bottom-up examination informed by a PE perspective to analyse the local environmental and socio-economic effects and coping measures. It seeks not only to describe that which is noticeable in the official documents and observable in the environment, but also to understand that which is less known and not observable, namely, less visible social, political, economic dynamics underlying the eco-development and various perceptions held by different stakeholders which shape and are shaped by environmental changes. To acquire data that are useful to foster such complex knowledge and nuanced understanding on environmental and social-economic change, the empirical research of this thesis is qualitative, an approach which can be typified as concerned with an "intersubjective understanding of knowledge, [an] in-depth approach, [a] focus on positionality and power relations, [and] contextual and interpretive understandings" (Dwyer and Limb, 2001: 6).

The adoption of a qualitative methodology was deemed appropriate to this research, as it aims to provide an in-depth understanding of socio-political features and processes that are shaping the practices and outcomes of the studied eco-development programme, as well as the roles and perceptions of different stakeholders during the development process. This research started with a list of research questions and themes to explore, but no hypotheses to test. As such, it has been designed to be

inductive, aiming for abstractive theory generation and grounded research, which argues for a research strategy that is "open to what the site has to tell us, and slowly evolving a coherent framework rather than imposing one from the start" (Glaser and Strauss, 1967; Punch, 1998). Therefore, the relatively broad and general research questions guided the initial desk research and fieldwork and gradually led to explicit research themes, which are crucial for fostering insights to address the research questions. This research is based on an in-depth case study. Main research methods adopted include archival research, interviews with a multiplicity of stakeholders (including semi-structured interviews and focus group), and on-site observation and documentation.

This chapter is organized into nine sections. Following the introduction, section two elucidates the benefits of a case study approach and the attributes that make Chongming Eco-Island an ideal study case will be presented. Section three elaborates the qualitative methods utilized in this thesis study, with particular attention to why methods were chosen and how they complement the study's contribution. Section four explains the language challenge during field works and the coping strategies. While section five explicates the interview and focus group meeting recording, and note-taking strategies during field investigation, section six further details the transcription and data analysis. Section seven briefly explains the data storage, and section eight examines the ethics issue in conducting fieldwork in this research. At the end, section nine concludes this chapter.

3.2   Case study of Chongming Eco-Island

This research adopts a single-case study of the Chongming Eco-Island in Shanghai to conduct in-depth and critical analysis of eco-development in China. The case study approach has become a common aspect of qualitative research and is valuable in the overlapping epistemology that is "oriented towards analysing concrete cases in their temporal and local particularity,

and starting from people's expressions and activities in their local contexts" (Flick, 2002: 13). Whilst this approach is often lauded for its ability to produce in-depth information about a specific locality, it is criticized for its lack of generalization findings. Whilst this is inevitably true, the value of the research undertaken in this thesis lies not in the development of a widely applicable theory or model of governance process, but in the recognition of the current defects and dilemmas of the governance and development of eco-development projects in China. This sub-section first briefly introduces the study case – Chongming Island – before presents a justification for using it as a case study. This is followed by a literature review of the existing academic researches of Chongming eco-development, and a discussion of the main contributions of this research.

3.2.1 An overview of Chongming Island

Chongming Island (31°25′–31°38′N and 121°50′–122°05′E) is located twenty miles northeast of Shanghai's glitzy downtown at the mouth of the Yangtze River (Figure 2). With an area of 1,267 square kilometres, it is the largest river alluvial island in the world. The formation of the Chongming Island traced back to the reign of Wude in Tang Dynasty around 620 AD when two embryonic sandbanks called Dongsha and Xisha formed by the deposits of the Yangtze River and gradually surfaced from the estuary.[3] Around 937 AD, during the period of Five Dynasties and Ten Kingdoms, a town was established in Xisha and named "Chongming", which was the earliest administrative record of today's Chongming. As sandbanks grew, merged and expanded, the island has been gradually shaped; and due to more recent extensive reclamation activities, the island has doubled in size

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[3] "Suzhou Chronical · Evolution · Chongming County" (Suzhou Fuzhi · Yange · Chongming Xian); "Wanli Chongming County Chorography · Evolution" (Xinxiu Chongming Xianzhi), edited in 1605; "Essentials of Historical Geography · Suzhou Chongming Old Town" (Dushi Fangyu jiyao · Suzhoufu Chongmingxian Chongming Jiucheng).

since the 1950s. With a history of over 1,300 years, Chongming has nurtured a rich culture, and is now housing nearly 510,000 residents (Chongming Statistics Bureau, 2017).
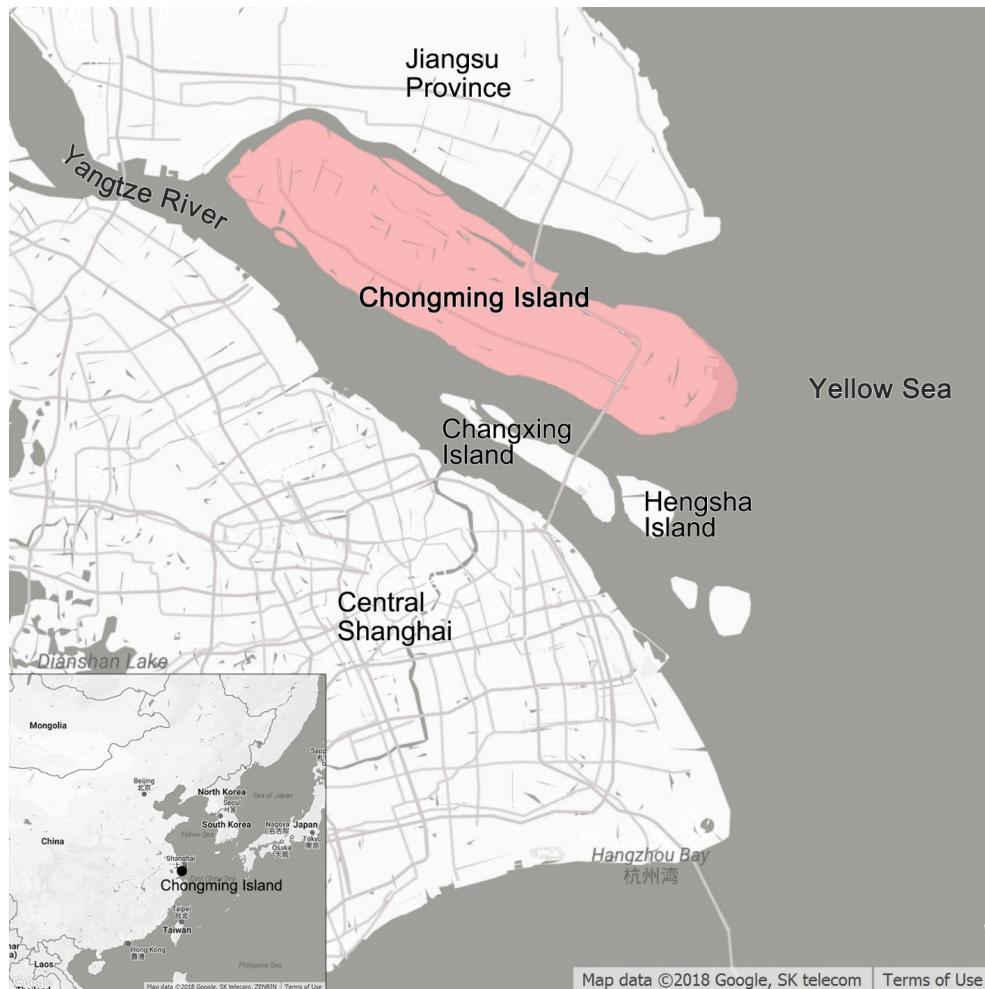
Figure 2. Location of Chongming

Source: mapped by the author on the base of the google map.

The accession of Chongming Island to the jurisdiction of Shanghai was after the founding of the people's Republic of China. In 1958, Chongming County (then covers just Chongming Island), together with the other nine counties, has been re-assigned by the central government from the Jiangsu Province to the municipality of Shanghai. In 2005, two small surrounding islands – Changxing Island and Hengsha Island – were transferred from the

administration of Baoshan District of Shanghai to the jurisdiction of Chongming County (State Council, 2005). This thesis focuses on eco-developments on Chongming Island but will touch on the other two islands when involving policies and plans that apply to all three islands.

Chongming remained in its county administrative level until 2016 when it was upgraded to become a municipal district of Shanghai. In China, institutional system operates in vertical hierarchical levels. County is a basic administrative unit in the third level of the administrative hierarchy in provinces and autonomous regions, and the second level in direct-controlled municipalities (e.g. Shanghai) (see Figure 3). Comparing with municipal districts, county has relatively independent financial and administrative power and rights. Generally, the central state employs political power and legal forces to deliver policy directions and commands from the central down to the local state. County government has the autonomy in how to devise specific projects and implement, interpret and negotiate in its own methods to achieve central state's directives (Chan, 2016). Nevertheless, as will be discussed in detail in Chapter four, eco-development policies and plans of Chongming have been mainly formulated by the Shanghai Municipal Government since the inception. With a focus on the actions of local state in materializing central state's eco-development policies (e.g. eco-city building and ecological civilization construction) through a case study of Chongming, this thesis thus takes into consideration of the roles played by both Shanghai Municipal Government and Chongming Government in promoting Chongming eco-development. Being attentive to the complex power dynamics in effecting environmental changes, it also pays attention to non-state actors' places in eco-development.
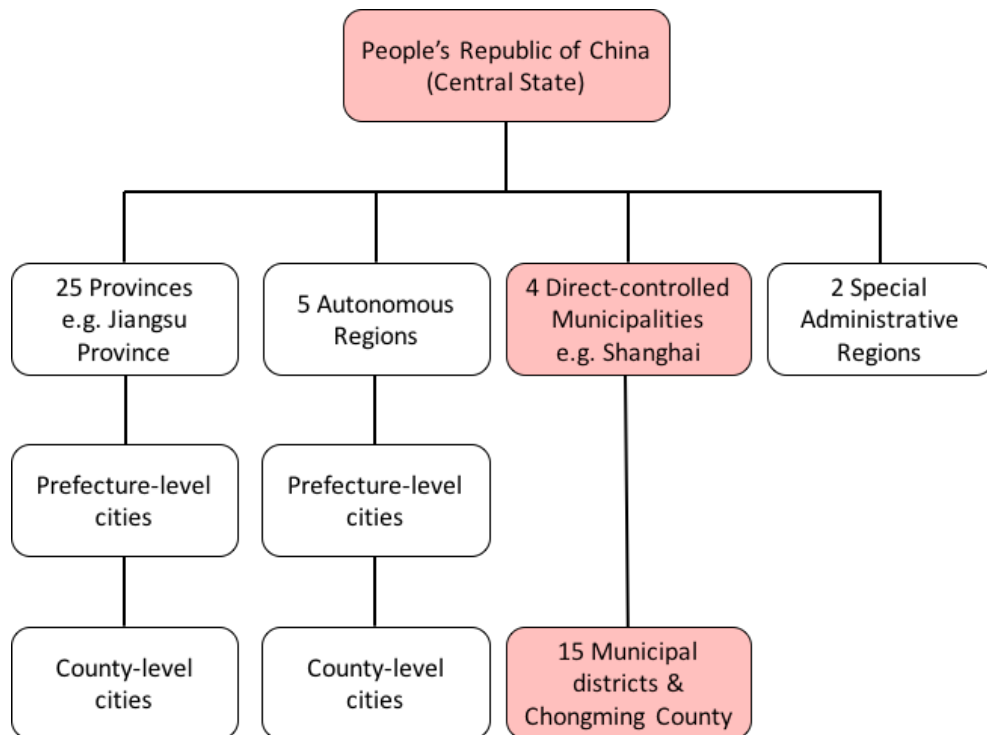
Figure 3. Administrative levels of Chongming County (before 2016)

Source: adapted from Chan (2016).

Since the PRC, Chongming has experienced three stages of development (SMG, 2018). The first stage was till the 1980s, featuring large-scale reclamations and agricultural development. Since the late 1950s, the city of Shanghai has organized a series of major land reclamations on Chongming, creating a number of farms and tree farms (including eight large state-owned farms) to carry out large-scale agricultural production. Decades of reclamation and cultivation have gradually transformed Chongming into the production base of grain, cotton and oil, as well as of aquaculture for Shanghai. The second stage was from the 1980s to the mid-1990s, which is characterised by the booming of industrial development. After the Reform and Opening Up in China in 1978, the country has witnessed the rise of Township and Village Enterprises (TVEs) in its large rural areas. A variety of TVEs emerged on Chongming, mainly involves ship-breaking industry, production of household electrical

appliances, textile, pharmaceuticals, metallurgy alloys, as well as steel. It is noted that the number of TVEs on Chongming reached more than 1,700 of its peak (SMG, 2018), and the small household electrical appliances produced on Chongming were well-known at home and abroad. In 1992, the total output value of Chongming's industry and agriculture reached 4.668 billion yuan, ranking the 50th among the top 100 counties in China.[4] Nevertheless, with the deepening of China's reform, due to its remote location and the poor connection with the mainland Shanghai (before the operation of the Changjiang Tunnel-Bridge Expressway in 2009, the island was accessible only through boats and ferries that were subject to the weather condition), Chongming gradually lost the competition with other regions surrounding the central Shanghai. Exploring for new development opportunities, Chongming entered the third development stage since the mid-1990s, which features a rising ecological development agenda. The Shanghai Urban Master Plan (1999-2020) issued in 2001 (SMG, 2001a) for the first time identified Chongming as the key strategic reserve space for Shanghai, and proposed the functional orientation of the island as ecological conservation and food production. Since then, eco-developments have been the main theme of the development of Chongming, and a series of plans and policies have been promulgated and implemented to develop Chongming into an "Eco-Island".

Today, Chongming Island is still a largely rural space with diverse landscapes ranging from wetlands, crop fields, forests, and urban built areas. The agro-ecosystems dominate most of the land use and provide most of the food supply, and the natural wetland ecosystems are mainly distributed along the coastline and provide important habitats for many wildlife species. However, in recent years, due to the hyperactive eco-development

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[4] See https://new.qq.com/omn/20181217/20181217A0EJB0.html (accessed on 12 May 2019).

implemented on the island, the landscape of Chongming has experienced rapid modification by human-induced activities. Along with the environmental transformation are the social-economic and cultural changes.

3.2.2 Reasons for a case study of Chongming

There are three major reasons contributing to the selection of Chongming eco-development as the study case in this research. First, Chongming has from the outset been the central locus of Chinese eco-development practice and thus has witnessed and embodied the features and evolution of Chinese state sustainability innovations and ideals. Chongming typifies state-led planning eco-initiatives. In 1996, Chongming County was selected as one of the pilots for constructing the National Ecological Demonstration Zone, and successfully attained the award in 2002 (MEP, 2002). In 2005, the Dongtan Eco-city project, which is located at the east end of Chongming, was launched with a claim to be the world's first purpose-built eco-city (Arup, 2008; Head and Lawrence, 2008). It represents China's first attempt at building a sustainable urban model from scratch (Pow and Neo, 2013). Although this renowned project has been indefinitely suspended since 2008 due to a complicated set of reasons (cf. Chang and Sheppard, 2013; Cheng and Hu, 2010; Pow and Neo, 2013), its planning and development ideas and methodology have, in some respects, influenced the wider plan of Chongming Eco-Island project, and further inspired subsequent eco-initiatives in China (such as the flagship Sino-Singapore Tianjin Eco-city) (Chang and Sheppard, 2013; Chang, 2017; Pow and Neo, 2013). One year after the publication of the Dongtan eco-city project, the Shanghai Municipal Government and Chongming County government issued the "Master Plan for Chongming Three Islands (2005-2020)" (hereafter referred to as "Master Plan (2005-2020)", announcing the

decision to develop Chongming Island and two small surrounding islands (Changxing and Hengsha) into "eco-islands" (SMG, 2006a)[5]. Since then, Chongming has undergone more than a decade's construction, and now there is an ambition to build a world-class eco-island (SMG, 2016b). Therefore, understanding Chongming Eco-Island, to some extent, contributes to the achievement of a deep insight into urban sustainable/ecological practices in China.

A second reason for the case study selection is that whilst the majority of eco-development practices are conceived of or delivered primarily in terms of technological innovations, Chongming Eco-Island has been recognized as prioritizing a more integrated sustainability vision and planning approach (Joss et al., 2011). It is anticipated by UNEP that Chongming can serve as a model of China's eco-progression, and an example of developing an ecological economy for less developed regions of the world (UNEP, 2014: 96). With such a positive reputation among Chinese eco-developments, Chongming thus serves as an ideal case for a critical examination of current Chinese eco-developments.

Third, the existing complex social structure, the abundant ecological resources, and the rich historic and cultural contents of Chongming endow it with both political and ecological value. Whilst a significant number of eco-cities are being built in the *tabula rasa* way locating on brownfield sites and largely constructed from scratch (Joss et al., 2011), Chongming Eco-Island is planned and constructed on high quality rural land with diverse landscapes ranging from wetlands, crop fields, and forest, and is home to nearly 700,000 people who have nurtured a rich culture. Chongming thus

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[5] Changxing Island and Hengsha Island, which were originally under the administration of Baoshan District of Shanghai, have been transferred to the jurisdiction of Chongming County in 2005 (State Council, 2005). This thesis focuses on Chongming Island but will touch on the other two islands when involving policies and plans that apply to all three islands.

provides an apt setting for a critical PE analysis of the changing human-nature interactions and their attendant environmental and socio-economic consequences in Chinese eco-developments.

In the view of Flyvbjerg (2006, p. 235), single case study research is a powerful means to "generate ideas and evidence" which "can be linked in many ways". Whilst the focus of this research is eco-development in China and specifically Chongming Eco-Island, the findings are of wider significance. This is because the eco-modernist narrative typifies Chinese eco-development and is also to be found elsewhere (Rapoport, 2015), so lesson-learning from Chongming becomes more relevant. Moreover, the application of a PE perspective complementing and contesting the mainstream EM approach to eco-development in China in this study remains novel and so provides a valuable evaluation of its utility.

3.2.3 Existing researches of Chongming eco-development and the contribution of this research

With the global repute to be the world's first dedicated eco-city, Dongtan Eco-city has received extensive attention in academia (e.g. Chang, 2017; Cheng and Hu, 2010; Hald, 2009; Pow and Neo, 2013; Sigrist, 2009). Whilst it was largely stalled and gradually died down, the subsequent Chongming Eco-Island plan continues to attract increasing scholarly interests (e.g. Chang and Sheppard, 20013; Chang, 2019; Den Hartog, 2017; Den Hartog et al., 2018; Ma et al., 2017). Existing researches have covered a wide range of topics of eco-developments on Chongming, including their genesis and nature (Chang and Sheppard, 2013; Pow and Neo, 2013; Sze, 2015); detail design and planning (Cheng and Hu, 2010); specific sectors such as energy (Pan et al., 2017; Li et al., 2017; Liu et al., 2017a; Wang et al., 2018a) and water resource and utilization (Luo et al., 2018; Ni et al., 2012); and their overall development and implementation effects in terms of spatial transformation (Den Hartog, 2017), general policy achievements (Den Hartog et al., 2018; Ma et al., 2018; Sigrist, 2009), and local livelihood

changes (Chang, 2019). These precedent researches have provided valuable insights into the features of Chongming eco-developments. Hereinto, three important arguments/notes have been commonly stressed and inform the development of this research.

First is the emphasis on contextualizing Chongming eco-developments in the Shanghai region. For instance, Hald (2009) pointed out Shanghai's significant influences on the design and plan of Dongtan Eco-city as the project developers, namely the British consultant company – Arup and the Shanghai municipality-owned enterprise – Shanghai Industrial Investment Corporation (SIIC), designed the eco-city based on the analysis of the city-living, space and building orientation of Shanghai. Sze (2015) argued that Chongming is in essence the "staging ground" for the "bold new" eco-future for Shanghai, representing the city's "eco-desire" (Sze, 2015: 12). Chang and Sheppard (2013) argued that for Dongtan and Chongming, interrogation of their interpretations and materializations of urban sustainability must be placed within the context of urbanization in the Shanghai area. Den Hartog (2017) showed Shanghai's intervention and influences in shaping Chongming eco-developments, especially in the spatial transformation on the island. These arguments have highlighted the inseparable connection between Chongming eco-developments and Shanghai political-economic and urban dynamics, which reflects the dominant role played by the local state in shaping eco-development and echoes the scale argument of PE that advocates an examination of local environmental issues with an extra-local view. This multi-scale perspective, as will be seen in the empirical chapters, has been incorporated in this research.

The second important highlight of existing researches is the (sub)urbanization nature of Chongming eco-development, especially in its initial stage, namely during the Dongtan Eco-city era and the Chongming Eco-Island in the 2010s. For example, Sigrist (2009: 13) argues that Dongtan eco-city is a model of "sustainable suburbanism," creating edge cities on

undeveloped land of a metropolitan city. Chang and Sheppard (2013) stated that the meanings of sustainability in Dongtan and Chongming reflect the context of urbanization in the Shanghai area, and further argued that the nature of Dongtan project is exemplifying a unique "suburbanism", or a green/sustainable urbanism (68). Den Hartog (2017) highlighted the (spatial) consequences of the urban pressure from Shanghai on the rural Chongming, which promote a rural to urban transition via eco-developments. These studies and arguments inform the analysis of features of Chongming eco-development of this research, as will be discussed in detail in Chapter Four.

The third is a common critic of the adoption of a weak form of Ecological Modernization ideology in the design, planning and practices of Dongtan and Chongming. For instance, Pow and Neo (2013: 2256) argues that Dongtan eco-city project as an "entrepreneurial urban prestige-project" that fuses the city's pursuit of economic growth and focuses on technological solutions and top-down policy dissemination, which largely ignores the social-ecological processes and concerns. Similarly, Chang and Sheppard (2013) pointed out adopting an EM principle, both Dongtan and Chongming seek to develop green technologies as a way to reconcile ecology and economy, producing a unique form of urban sustainability, and or "green capitalism", which does not appropriately address social equity issues and environmental problems. Similar criticism has also been raised by Sze (2015) who argued that eco-developments on Chongming as not challenging the systems of production that underpin the environmental crisis of today's cities. Her exploration of the narratives and practices of eco-modernism on Chongming argues that environmentalism has been manipulated to support urban growth agenda. Such critics highlight the problematic EM approaches adopted on Chongming and thus propel a thinking on alterative measures and possible solutions, which constitutes an important part of the research in this thesis.

Nevertheless, whilst existing academic work provides certain guidance and knowledge in understanding eco-developments on Chongming, there are a number of gaps and shortcomings. Firstly, previous studies have almost exclusively focused on the state (as well as political-economic elites)'s narratives and efforts in Chongming eco-developments, and the research on local effects and responses remains very limited. This is perhaps due to the dominant role played by the state and market in shaping policies and practices of Chinese eco-developments (Yu, 2014). Therefore, although many scholars have criticized the top-down approach in decision-making and the lack of public participation, which constrained its contribution in promoting social equity (e.g. Cheng and Hu, 2010; Pow and Neo, 2013; Sigrist, 2009; Hald, 2009), it remains largely unexplored as to what the local effects are and how local communities perceive and respond to eco-practices on the island. One exception is the recent work conducted by Chang (2019) who draws on an urban ethnography to discuss the livelihood transitions of local residents at Dongtan eco-city and Chongming eco-island during the replacement and displacement process. However, since it only touches a fraction of social living on Chongming, additional studies to understand more completely the local environmental and socio-economic outcomes are required to inform a holistic examination of current eco-development practices.

Secondly, the present studies on Chongming eco-developments are largely fixed in time, and failed to recognize changes in both policies and plans, as well as their on-the-ground implementation and local effects on environment and society. This is common in numerous researches on Chinese eco-development. As eco-city is a modern product in the 21st century, and in China, it is mainly practiced on brownfield sites from scratch in a tabula rasa way (Joss et al., 2011), studies of these newly-built eco-city projects thus often adopt an ahistorical view, emphasizing immediate, recent, or proximate political-economic and or ecological drivers and results. However, Chongming is a mature rural settlement with high quality rural

land and a rich history and culture. Dramatic human interventions such as the construction of eco-city and eco-island inevitably modify the original ecology and landscape on the island and affect the local communities that have been built and dependent on the environment for generations. Meanwhile, as will be seen in Chapter four, eco-developments on Chongming are not one-off product but subject to constant revision and transformation. The complex local context and the continuing volatility of the visions and strategies of eco-development on Chongming thus require an up-to-date and on-the-ground examination of the environmental and societal transformation on the island to illuminate the formation, evolution and local consequences of eco-developments.

This research seeks to remedy these gaps in knowledge by providing an up-to-date theoretically informed and critical on-the-ground assessment of eco-development on Chongming. The contributions of this research are, therefore, first to enrich the broader understanding of eco-developments in China, especially concerning the evolvement of ideas and approaches, the variety of perceptions held by different stakeholders, and the materialization approaches and effects; second to provide critical insights in to the understanding of society-environmental relations in eco-development as will be shown in the changing human-nature interactions along with the changing environmental governance on Chongming; and third to develop a more nuanced and historically-informed and locally-relevant understanding of eco-development to inform more sustainable development in China; and to these by fourth, developing an integrative approach that draws on both historical and contemporary data, state and non-state actors' perceptions and narratives, and local and extra-local dynamics, in analysing the formation, implementation, and results of eco-development in China.

3.3　Qualitative research methods in the study

The research for this thesis was undertaken over a two-year period from September 2016 to September 2018. Grounded in a qualitative research methodology, the empirical sections of this thesis are built upon data collected through archival research, interviews with a multiplicity of stakeholders, focus group meetings with local residents on Chongming, and on-site observation and documentation. Each method will be elaborated in turn below.

3.3.1　Archival research

Aiming to examine the formation, implementation and effects of eco-development on Chongming from both a top-down state perspective and a bottom-up local view, the archival research of this study involves both contemporary documentations relevant to the planning and development of Chongming eco-initiatives (namely Dongtan eco-city and Chongming eco-island) and historical records that document local environmental and socio-economic status and transformation before and after the eco-development.

Firstly, given the dominant role of the Chinese state in shaping eco-development through policies and plans, the centrepiece of research methodology involved the collection and analysis of governmental documentations to examine the "official line" or dominant policy narratives produced by different levels of governments. At the Shanghai municipal level, primary documents studied include the *Master Plan for Chongming Three Islands (2005-2020)* (SMG, 2006a), *Chongming Eco-Island Construction Outline (2010-2020) (SHDRC, 2010), Twelfth Five-Year Plan for National Economic and Social Development in Shanghai (2011-2015)* (SMG, 2011), *the Thirteenth Five - Year Plan of Chongming World - class Eco-Island Development*　(SMG, 2016b), and the recently published *Shanghai Master Plan 2017-2035* (SHPLRA, 2018), and M*aster Plan and General Land-use of Chongming District, Shanghai, 2017-2035* (SMG, 2018). At the Chongming

local level, key governmental documents include the *Twelfth Five-Year Plan for National Economic and Social Development of Chongming (2011-2015)* (Chongming, 2011) and the *Thirteenth Five-Year Plan for National Economic and Social Development of Chongming (2016-2020)* (SCDRC, 2016). These official policies and plans and its supporting documents enable an initial understanding of how states (i.e. Shanghai Municipal Government and Chongming County/District Government) interpret the notion of eco-development, how they depict their vision of Chongming Eco-Island, and what methods and actions are implemented to achieve such a vision. To evaluate the state's accounts for these policies and practices, it then draws on a wider variety of documents including reports from both governmental and non-governmental organizations, press coverage, and academic publications; and quantitative evidence from Chongming Statistics Bureau and Shanghai Municipal Government to describe the socio-economic and environmental changes.

Secondly, to examine the changing human-nature relationships as well as the environmental and socio-economic consequences of eco-development on Chongming, this research draws on historical records to understand the characteristics and the governance and management of environment on Chongming in the past to reconstruct the environmental history and societal changes of the island. With a long county history, Chongming has a relatively large amount of historical records, including multiple versions of Chongming County Chorography, genealogies, and local gazetteers. Among them, local chorography provides abundant information on local social, economic, political and sometimes environmental status at the time it was edited, and is thus a valuable source for constructing the history (McNeill, 1998). The compilation of Chongming County chorography began in the Yuan Dynasty. It has appeared in 11 editions before the establishment of the People's Republic of China (PRC) in 1949. Seven of

them have survived through time.[6] The 1924 for the Republic of China period has also survived. In 1989, the Chongming County Government has published a newly-edited "Chongming Country Chorography", which added the updates of Chongming since 1949. Meanwhile, there are also a number of official local records which provide supplementary information, including *Chongming County Land* (Chongming Xiangtu Zhilue) and *Chongming Civilian Common Sense* (Chongming Pingmin Changshi) published in 1924, and *Chongming Chorography Draft* published in 1960. These chorographical records well document the historical evolution of Chongming's natural geography, social condition, politics, ecology, economy, and culture. Meanwhile, this research also referred to folk literature of Chongming that often depict local living, culture and customs, and social life, wherein the local landscape and environment would be described. While some elements in folk literature may be imagined rather than real, the overall description of social life appears to be quite realistic (Zhao & Ma, 2017). These materials are valuable supplements to official formulaic histories, which often has little consideration for the environment and landscape change and thus has not much documentation of local flora and ecologies (such as a native plant – reed – on Chongming, which will be discussed in detail in Chapter Six as a lens to examine the environmental transformation on Chongming). Together, these rich historical documents provide extremely valuable references for the analysis of the changing environmental governance of Chongming (see Chapter Five) and the destructive consequences of recent eco-development on local long-established ecology and landscape, as well as local community and society (see Chapter Six).

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[6] These include editions for the period of Emperor Zhengde and Wanli during the Ming Dynasty; and Kangxi, Yongzheng, Qianlong and Guangxu during the Qing Dynasty.

3.3.2 Semi-structured interviews

To explore and develop in-depth and contextualized understanding of recent and ongoing eco-development policies and planning on Chongming, and to examine different stakeholders' involvement and perception, as well as their personal experiences of eco-development, the research methodology also involved semi-structured interviews with both state and non-state actors. Semi-structured interviewing allows researchers the flexibility in exploring issues that arise during the conversation and that were not previously anticipated (Dunn, 2005). Meanwhile, Interviews serve to further meaningful understanding of various perceptions on phenomena being studied through detailed interactive discussion, and also can provide a partial representation of research participants (Mason, 2002). Therefore, it helps to solicit rich contextual data that are uniquely present in the study case – the Chongming Eco-Island – in this research, and to efficiently gain knowledge about different stakeholders' perceptions on the eco-development.

During the two-year fieldwork, in total of eight fieldwork visits have been conducted on Chongming with an average duration of six days – the shortest stay lasted for two days and the longest for ten days.[7] During these field surveys, alongside on-site observation and documentation (which will be discussed in detail in the following Section 3.3.4), key person, semi-structured interviews have been conducted on Chongming Island as well as in the city of Shanghai, involving in total 25 key state actors (such as Shanghai municipal governmental officials, Chongming local cadres, planning professionals, academic scholars that were acting as the consultants for the Shanghai Government, and representatives of local

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[7] Eight fieldwork visits were conducted on: (1) 25-27 November 2016; (2) 21-24 December 2016; (3) 13-15 April 2017; (4) 9-10 June 2017; (5) 29-30 August 2017; (6) 12-17 November 2017; (7) 23-31 March 2018; and (8) 8-17 September 2018. See Appendix 2 for more details about eight field works.

state-owned enterprises) and 34 non-state actors (such as indigenous residents and local farmers) (see Table 1). Most interviews lasted between 30 and 90 minutes, and in particular cases a second or even a third interview was organized (though either face-to-face meeting or on-line communication) to follow-up on, and explore in greater depth, particular issues and themes.

Table 1. Key person interviewees and research themes

Stakeholder groups	Interviewee background	Number of interviews	Research themes
State actors	Planning and land development professionals	8	• Policy/plan formation and evolution
	Academic experts	6	• Approaches to policy delivery
	Governmental officials and cadres	8	• Past and current governance of Chongming
	Representatives of local enterprises	3	• Resource management (especially in land and water)
			• Perceptions of Eco-Island development
Non-state actors	Indigenous residents on Chongming	28	• Knowledge, perceptions and evaluation of Eco-Island development
			• Personal experience and change of life
	Eco-farmers	4	• Perception of Chongming

Migrant workers	2	• Perception of Eco-Island development
Total	59	

Access to interviewees from different stakeholder groups took different approaches, and semi-structured questions were tailored to different interviewees. Initially the key person interviews started with planning professionals and academic researchers, who were identified from planning documents, academic papers, media reports and through personal networks[8]. Interviewees were selected for their extent of involvement in developing the Chongming Eco-Island plan or their research or knowledge of eco-development on Chongming. In total, 14 face-to-face interviews were conducted, involving eight planning professionals and six academic experts. Interviews with planners/scholars were focused on the development strategies, the rationale underlying the strategies, development processes, and the challenges and outcomes of the past and current eco-development on Chongming, as well as their perceptions and visions for the eco-island. Data collected from these interviews revealed the tortuous process of Chongming Eco-Island development and its contentious visions and development dilemma (see Chapter Four).

Through the planners and scholars, further contacts were established with eight key governmental officials and local cadres, who are either the liaisons between the Shanghai/Chongming government and the planning institutions, or the principal cadres of specific projects or programmes of

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[8] This research was conducted as a part of a three-year EU-China joint research project – "Smart-eco-cities for a green economy: a comparative study of Europe and China" (see http://www.smart-eco-cities.org/). Through personal networks of fellow researchers, the researcher was able to build up contacts with key informants from Shanghai planning institutes and universities.

Chongming Eco-Island development. Although the number of key governmental informant interviews might be comparatively small, these informants held critical professional positions in local environmental governance and policy delivery that enabled them to provide sufficient information to reconstruct the eco-development on Chongming. Interview requests were sent either by letters via electronic mail or fax, or by phone calls. The main information collected addresses the policy formation and deliveries, the implementation achievements and shortcomings, the past and current governance on Chongming, as well as the challenges of eco-development. This was further supplemented by interviews with three representatives from local state-owned enterprises on Chongming and Shanghai, namely the Chenjia Town Dongtan Construction Group Co., Ltd. (aka. Chenjia Town Construction Development Corporation), the Shanghai Wisdom Island Data Industrial Park, and Shanghai Gaoze Xiangyuan Ecological Agriculture Co., Ltd. As the former two enterprises are both key developers that carry out the construction work of Chongming Eco-Island in Chenjia Town, interviews with their representatives further shed lights on the evolvement of policies and strategies, as well as the on-the-ground practices of eco-development on Chongming. It is noteworthy that in undertaking interviews, I was sensitive to the understanding of the authoritarian state in the Chinese context. During interviews, I carefully listened to the voices of those who spoke to me to detect nuances in meaning. I also actively sought out those who are not typically heard (such as farmers, older people and women). These people were likely to provide a different perspective on local resource management and eco-development to the key person interviewees.

Access to non-state actors, especially the often-marginalized local community members, was sought mainly via gatekeepers and via acquaintances who then acted as the sponsors (Bryman, 2012). This was a strategic approach to enable accesses to as wide a range of individuals relevant to the research as possible rather than sampling research

participants on a random basis. The approach worked as follows. In the early stages of the research, on-line sources were reviewed for collecting public opinions concerning the eco-island development. A local resident who is active in disclosing environmental destruction on the Island and in petitioning local authorities on environmental measures was initially identified. Through informal online conversation with this local environmental activist and two follow-up face-to-face interviews, mutual trust has been built and I have attained rich knowledge about the local context and the experience of local residents during eco-development. Through this local activist I came to meet others. For instance, to gain knowledge of river management projects carried out across the island, I asked about who performed such tasks and were introduced to one of the first "river cleaners" on Chongming who shared details of his work (see Chapter Five). While to better understand more traditional river management practices I gained access to a former village head who explained annual collective river-dredging activities (also see Chapter Five). This purposeful approach to interviewee identification was complemented as the interviews progressed by 'snowballing techniques' (Taylor, 1993:16) in which participants were asked to identify and recruit additional key informants. Key person interviews ended when a) the snowballing approach was leading to suggestions of interviewees who had already been contacted and b) interviewees were reinforcing rather than adding to knowledge. In total, 32 semi-structured interviews were conducted with local residents individually or jointly, focusing on their observations, experiences, and perceptions of eco-developments which reveals the changing environment governance and the local consequences of eco-development on Chongming.

In addition to formal interviews, informal interviewing was used as a means of establishing contacts, exploring specific themes related to eco-development, gathering local opinions, and getting a sense for which research participants could yield the most meaningful data as formal research participants. These interviews proved to be a fertile ground for the

exploration of local perceptions towards eco-development on Chongming Island, and for the ideas and themes that were presented during field work. I had originally planned on using participant observation in addition to semi-structured interviews and informal interviews as a method in the study. However, given the considerable depth and scope of these interviews – and not to mention their immediacy – I decided instead to privilege these contents as the definitive methodological centrepieces of the study. There will, however, be points in which I interject comments in the result section as to give context to specific statements.

3.3.3 Focus group

Focus groups bring together a small group of people to discuss a topic, although their characteristics vary widely (Morgan and Krueger, 1993). The focus group was chosen as an appropriate method in this study to explore the social meanings and effects of eco-development policies and to provide a source of information on the ways people construct and debate knowledge relating to these issues (Hoggart et al., 2002). As the levels of trust have been gradually developed in the local community, three informal focus group meetings with villagers from Hongqiao Village of Jianshe Town in Chongming were conducted in 2018. The first one was on 31 March 2018 and lasted for 3 hours. The meeting was attended by three male and one female elderly (above 60 years old) villagers. One participant was a former local production team leader who managed collective activities during the 1980s. They shared their memories of the Island's past and their life changes and their attitudes towards the eco-developments on the Island since the 2000s. Following this, another two informal focus group meetings were carried out on 12 September 2018. The first was with three male and two female elderly villagers and the second with four male and three female elderly villagers, involving one "river cleaner", one former village head, and one current local village cadre. These meetings had three objectives: 1) provide a voice for grassroots' accounts of environmental

changes on the Island, and policy and planning implementation and their consequences; 2) address how local stakeholders perceive ecology, environmental protection and improvement, socio-economic progress, and the notion of an eco-island; and 3) understand and further evaluate the on-the-ground construction in detail.

3.3.4 Field record: notes and photographs

Nearly all interviews (except two in which interviewees were unwilling that our conversation to be recorded, and notes were taking instead) and the focused group meetings were recorded with the permission of the participants using a digital voice recorder or the mobile phone to limit disruptive note taking and permit fluid, attentive conversation with participants. Meanwhile, field notes were kept both during and after fieldwork periods. These were used to keep a written record of all research carried out and topics or themes that arose from these. These field notes also served as a tool for reflexivity by providing a medium to express thoughts concerning motivation, decision-making and positionality (Dwyer and Limb, 2001). It jots notes during research that I may have not recalled afterwards, while allowing an opportunity to reflect upon and review the research process. Field notes, if not taken during interviews or fieldwork, were typically typed at night during the field trip for a time period of thirty minutes to two hours, depending on the day research activities. Writing up notes from the activities carried out each day was a vital tool for reflexivity and also allowed freedom for me to take minimal notes during discussions.

A wide variety of field notes were transcribed. These included notes taken during visits to key sites on Chongming such as main tourist attractions, Chongming Planning and Exhibition Hall, Chongming Archives Centre, Chongming Ecology Science and Technology Museum, a number of local farms (including state-owned farm, private organic farm, and traditional household farms) and villages, experiences that took place during visits to communities, various rivers and fields I noticed while

travelling on the Island, comments made about eco-development during informal conversations, and future research questions or possibilities that were raised during field work. These detailed field notes are valuable for tracing the details of interactions with locals and for self-reflection on the direction of the research.

Moreover, large number of photographs has been taken by the researcher as part of the field notes to document the local environmental status, residents' social activities, and on-the-ground construction situation of Chongming Eco-Island. Meanwhile, one local resident who was active in disclosing environmental destruction on the island and fervent in assisting the research voluntarily shared photos taken on the Island before and after the eco-development, which provide valuable information about the ecological and landscape transformation on Chongming throughout the eco-development (see figure 23 in Chapter six). These research-generated and extant photographs played significant roles in this research. Firstly, these photos provide a visual representation of the environmental situation of Chongming in the past and in the present, which enable the researcher to contextualize the narratives of different interviewees and to better understand their views toward the local environment and the eco-development. For example, when local residents repeatedly mentioned the massive afforestation programme enforced on the island that mainly planted unitary tree species with little consideration of the local ecology and biodiversity, photos of numerous monotonous and inanimate woodlands in various size taken on the island in the course of fieldwork enable the researcher to empathize with the resident's concerns (see figure 13 & 14 in Chapter five). Moreover, photos are also the main source of data about the field. Comparing the historical photos provided by local resident and photos taken by the researcher during the fieldworks in the same place (e.g. in a river on the island) and comparing the photos taken by the researcher in the same place in different time in different field trips well illustrate the visual changes of local environment and landscape before the

implementation of Eco-Island development on the Island (see figure 16 in Chapter Six). In addition, photos were also used as prompts for discussion to entice people to talk about what is represented in them during the fieldwork. They helped to illustrate points and enliven what might be otherwise be a rather dry discussion of findings.

3.4   Language

It is noted that "the China field is characterised by a strong focus on the necessity of proficient language skills and contextual knowledge in order to do qualified academic work" (Sæther, 2006, p. 45). As a native Chinese, the researcher is fluent in speaking and listening to Mandarin, which provided the necessary language proficiency to understand the social and cultural contexts in the research site. However, local farmers on Chongming Island, especially the village elders, may speak local dialect (known as *sha di hua*) during the interviews. To resolve this problem, besides learning how to listen their dialects and interpret their body language, important strategies to understand local residents' comments and opinions include first asking local interviewees to translate their core ideas in Mandarin, and second to invite a local resident to act as the interpreter. Recognizing the artificiality associated with translation through an interpreter (Frey and Fontana, 1991; Evans et al., 1994), translated transcripts were double-checked with the help of a second interpreter – an acquaintance of the researcher who is from Nantong City in Jiangsu Province (in the north of Chongming) and speaks the same dialect as Chongming people – based on the interview recordings. Besides making some clarifications, the second interpreter was helpful in supplementing information that was omit by the local interpreter during the interviews. However, as Law (2008) states, to translate is to make two words equivalent, but two words are never equivalent. Therefore, translation is both about making equivalent and about shifting; it is about moving terms around, linking and chaining them (ibid.). There is a risk of

losing nuances in the act of translation. Moreover, I would also like to point out that I wrote this thesis in a language which is not my mother-tongue, which limits my realm of expression. However, translation, in many different respects, is part of doing research. In this thesis, I try to acknowledge some of the numerous acts of translation that took place within this research.

3.5   Transcription and analysis

The research relied on "selective transcription" as not all interviews (or segments of interviews) yield insights of particular significance. It means that the recordings of interviews and focus groups were transcribed in cases where this was deemed necessary for further understanding, or where the interview or focus group proved particularly rich in information or discourse.

Table 2 below illustrates the flow of data collection and analysis of this research. It started with rather broad themes to explore, namely the planning and practices, and the perceptions of different stakeholders of eco-developments on Chongming. Three issues – environment, society, and economy – that are three pillars of sustainability are emphasized to guide the desk research and fieldworks. Through the initial study, especially during semi-structured and informal interviews in the early stage of the fieldworks, it became evident that certain themes (such as the river regulation, reclamation, land acquisition and transfer, disappearing reeds, and afforestation programmes on Chongming) were repeating themselves and demanded that precedence be taken in expanding upon these ideas. Coding for themes began in situ and further questions were added to the initial interview schedule in order to follow up on important themes (such as land and water governance, which will be discussed in detail in Chapter Five). Upon returning from field work, these themes were further hashed out and coded in order to identify connections between the perceptions of

research participants and the eco-development planning and on-the-ground practices. During this process, interview passages, which elaborate or describe recurring themes, have been extracted from interviews in order to form a critical argument.

Transcripts and analysis of the interview passages were done manually with the use of Microsoft Office Word. Computer-assisted qualitative data analysis software (CAQDAS) (e.g. QSR NVivo) is not adopted in this thesis for two major concerns. First is the risk of losing the narrative flow of interview transcripts and events recorded in field notes as CAQDAS highlights the tendency for the code-and-retrieve process, which often leads to the fragmentation of the textual materials and the decontextualization of the data (Bryman, 2012). Considering the significance of context in this study, the prospect of it being side-lined is not attractive. The second concern relates to the language restriction of many CAQDAS that mainly operate in English. Although a few software, such as the NVivo, has the capacity to work in other than English language (including Mandarin Chinese), researchers have discussed many problems they experienced when using NVivo with Chinese text, including its poor navigation of data and its weak compatibility with other word processing software such as MS Word (e.g. Vallance and Lee, 2005). Meanwhile, considering that many interviews with local farmers in this study are conducted in local dialect – *Sha Di Hua* – rather than Mandarin, the reliability and validity, as well as the main merit of timesaving of the CAQDAS are disrupted. Therefore, manual coding is employed in this study as it is deemed as a more accurate and efficient procedure. Transcription was carried out by the researcher and the data was firstly transcribed into Chinese, and then being further translated into English.

Table 2. Flow of data collection and analysis

Broad themes to explore

- **Planning and practices of eco-developments**
- **Perceptions of eco- developments**

Key issues:

➢ Environment

➢ Society

➢ Economy

Key themes to delve

➢ River regulation

➢ Reclamation

➢ Land acquisition & transfer

➢ Afforestation

➢ Landscape changes (e.g. reeds)

Key themes identified:

- **Land governance**
- **Water governance**

Data collection

Data collection

Main methods for research

- **Archival research**
  - ➢ Policies and plans of eco-developments
  - ➢ Governmental reports
  - ➢ Press coverage
- **Interviews**
  - ➢ State actors (policy/plan formation and evolution; approaches to policy delivery; visions of eco-developments)
  - ➢ Non-state actors (knowledge, perceptions and evaluation of eco-development; personal experience and change of life)

Main methods for research

- **Archival research**
  - ➢ Detailed policies and plans of land and water governance
  - ➢ Historical records
  - ➢ Folk literature
- **Interviews**
  - ➢ State actors
  - ➢ Non-state actors
- **Focus group of local residents:** co-construct and debate knowledge around key themes
- **On-site observation and documentation:** first-hand data on local environmental & social status

3.6 Ethics and data protection

All participants were informed of the research and consented to participate before the start of the survey of this research. At the beginning of each interview, prospective interviewees were given a letter of informed consent that introduce the researcher, explained the researcher's institutional affiliation as a doctoral student in the Department of Architecture and Built Environment at University of Nottingham Ningbo China and as a doctoral researcher of the international collaborative research project "Smart Eco-Cities". The letter also described the nature and focus of this research project and the interviewees' rights as a participant of this research. Meanwhile, permission to record the interviews was acquired where the voice recorder was used and where permission was not granted (in two instances), voice recorder was not used and, instead, notes were taken during the interview.

Research in the past has been heavily criticised for its extractive, exploitative nature on participants (Kitchin and Tate, 2000). In this research, I attempted to address this issue by building in aspects of reciprocity into the research design. Participants were compensated for their time, using food or appropriate gifts (such as university goods and souvenirs) rather than cash, whenever possible.

Confidentiality and anonymity were assured in the project. The storage and handling of data—whether in the form of interviews, photos, or field notes—was done with attention towards protecting the confidentiality of research participants. Audio files from interviews and the transcriptions, along with images and typed field notes, were stored on a flash drive and kept in a secured hotel room during the field investigation. Upon return from the field, these materials were stored in a secured residence. For the purposes of anonymity, the names of research participants, or instances where they referred to individuals in the projects have been removed

whenever this is not critical to the narrative or to provide context to the statements made.

3.7   Conclusions

This chapter introduces the qualitative methods utilized in this study to investigate the planning and practices and the on-the-ground effects, as well as different stakeholders' various perceptions of Chongming eco-development. Through a mix of qualitative approaches, mainly archival research, semi-structured interviews, focus group meetings, and on-site observation and documentation, three major research questions are critically addressed with relevant data: How is "eco-development" interpreted by local states in China and how is the state driving eco-development through the contents of policies and plans? What form do eco-developments take on the ground and what are the environmental and socio-economic effects? How do local individuals and communities perceive and respond to changes that have been produced?

The findings of these questions are presented in the following three chapters: the following Chapter Four sets out to examine the policies and plans of the Chongming Eco-Island and their evolution over time. Adopting a multi-scale perspective, it lays out the context and nature of the Chongming eco-development programmes (namely the Dongtan Eco-City and Chongming Eco-Island), and also draws out their key development features and present the official accounts for current eco-development on Chongming. To challenge the top-down interpretations and approaches in eco-development, Chapter Five critically examines how policies and plans of eco-development set up by the municipal state are translated into local practices on Chongming. Focusing on the changing environmental governance before and after eco-development, this research explicitly examines the transformation of land and water governance to investigate the human-nature interactions under the eco-development movement.

Chapter Six further investigates the effects and outcomes of Chongming eco-development on the local environment and community. With a PE perspective that privileges a bottom-up view, it draws from local residents' observation, perceptions, experiences, and responses to environmental and socio-economic changes during the eco-development. Through a critical analysis of the planning, implementation and effects of Chongming eco-development that draws on both state official narratives and local views, this research is able to illustrate the paradox and dilemma of current eco-development in China and contribute to timely debates for future improvement.

Chapter Four: Planning for Chongming Eco-Developments: Evolution and Features

4.1 Introduction

Since the public announcement of the Dongtan Eco-City project in 2005, Chongming Island has now undergone more than a decade of eco-development (see Table 3). Whilst strongly adhering to the ecological modernization principle, its development emphasis and main approaches have undergone several changes. This chapter examines the shaping and reshaping of Chongming eco-development by the state. Considering the dominant role of master planning in China's state-led urban and environmental development and its top-down workflow, this chapter dissects the various plans and policies of Chongming eco-development through its construction process. Drawing on these governmental documents and in-depth interviews with policy-makers, planners and scholars, it first examines the eco-development course of Chongming (including the Dongtan Eco-City and the Chongming Eco-Island programme) to interrogate the state's intentions of building an eco-city and an eco-island. It then continues to examine the governmental plan monitoring and self-evaluation of Chongming eco-development to further understand how eco-development is interpreted by local governments and state actors. This enables a further analysis of the key governance features of Chongming eco-development, which can shed light on the on-the-ground practices of eco-development on Chongming (as will be discussed in detail in Chapter Five).

Table 3. Chongming eco-development timeline

1996	Chongming County was selected as one of the pilot areas for constructing the National Ecological Demonstration Zone.

2002	Chongming County was officially recognized as a National Ecological Demonstration Zone (MEP, 2002).
2001	Shanghai Municipal Government promulgated the "Shanghai Urban Master Plan (1999-2020)", which identified Chongming as the key strategic reserve space for Shanghai. The functional orientation of the island was planned as ecological conservation and food production (SMG, 2001a)
August 2005	Dongtan Eco-City project was planned on the eastern tip of Chongming Island. Arup – the UK-based global planning, engineering, and design corporation – was contracted by Shanghai Industrial Investment Corporation (SIIC) – a Shanghai municipality-owned developer to design and plan the Dongtan Eco-City.
2006	Shanghai issued the "Master Plan for Chongming Three Islands (2005-2020)", positioning Chongming as an eco-island and proposed six main functions of Chongming, namely forest garden island, ecological habitat island, leisure vacation island, green food island, marine equipment island and science-technology island (SMG, 2006a).
2008	The construction of Dongtan was indefinitely halted.
October 2009	The Shanghai Yangtze River Tunnel-Bridge (six lanes and two reserved rail lines) was completed and opened, directly connecting the east of Chongming Island (the Chenjia Town) and central Shanghai, reducing a 45-minute ferry trip to a 20-minute car drive.
January 2010	Shanghai Municipal Development & Reform Commission (SHDRC) approved and issued the "Chongming Eco-Island Construction Outline (2010-2020)" which, for the first time, announced the ambition to build Chongming into a *world-class*

	eco-island. Meanwhile, the first Key Performance Indicators (KPIs) system for Chongming Eco-Island was also introduced (SHDRC, 2010).
January 2013	The "2010-2012 Chongming Eco-Island Construction Performance Evaluation Opinion" was issued by the SHDRC, performing a thorough examination of the implementation of the Eco-Island plan introduced in the "Construction Outline (2010-2020)" from 2010 to 2012 (SHDRC, 2013).
March 2014	United Nations Environment Programme (UNEP) issued the "Chongming Eco-Island International Evaluation Report", which systematically evaluates the staged achievements of Chongming Eco-Island development (UNEP, 2014).
January 2016	Chongming government released the "Thirteenth Five-Year Plan for National Economic and Social Development of Chongming (2016-2020)", introducing a new development strategy – "Eco Plus" – for Eco-Island development (SCDRC, 2016).
July 2016	The State Council transformed the administrative status of Chongming from (rural) county to (urban) district of Shanghai (SMG, 2016a).
December 2016	Shanghai Municipal Government promulgated the "Thirteenth Five-Year Plan of Chongming World-Class Eco-Island Development", in which a more explicit and demanding indicator system has been introduced (SMG, 2016b)
May 2018	The "Master Plan and General Land-use Plan of Chongming District of Shanghai, 2017-2035" has been released (SMG, 2018), in which the "Eco Plus" strategy introduced in 2016 has been de-emphasized, whilst a new strategy – "Plus Eco", which emphasizes on environmental protection and construction,

	has been introduced and highlighted.

Two key issues are highlighted in the analysis. First concerns scale (both spatial and temporal). It is argued that local environmental decisions and actions are conditioned by the external values, priorities and policies at various geographic and administrative scales (Tilt, 2007). Considering China's "sea of complex internal local and regional politics" (Sze, 2015: 93), wherein policies and plans for eco-developments are formulated and implemented, a multi-scalar perspective that takes into account both local particularities and extra-local political-economic dynamics is crucial to contextualize and rationalize the eco-development on Chongming. Meanwhile, an extended time-scale is adopted to trace the genesis and evolution of eco-developments on Chongming to dissect the transformation and the rationale underlying the transformation. Second is about power and power relations. Whilst an EM perspective directs the research to focus on the role played by the state and market in effecting environmental changes, a PE perspective stresses the different power possessed and wielded by different actors, which include different level of governments and non-state actors. Adopting an integrated approach that combines insights from both EM and PE, the analysis of the planning of Chongming eco-development is thus attentive to the multi-scalar and power dynamics.

This chapter is divided into six sections. Following the introduction, sections two and three elaborate the two phases of Chongming eco-development, namely the pro-growth *greening urbanization* in the 2000's and the ecology-centric *ecological construction* in the 2010's. Section four investigates the governmental plan monitoring and self-evaluation of Chongming eco-development to further examine how local governments and state actors account for eco-development in terms of environmental, economic, and social dimensions. Based on the analysis of the planning evolution and governmental evaluation, section five discusses the key findings and argues for four key features of Chongming eco-development. Section five is the conclusion of this chapter.

4.2   Greening urbanization in the 2000's

An analysis of the eco-development process on Chongming identifies two distinct development phases divided by the promulgation of the 'Chongming Eco-Island Construction Outline (2010-2020)' in 2010, which for the first time introduced an environmental evaluation index system for the Eco-Island construction. The first phase of Chongming eco-development covers the initiation of Dongtan Eco-City project and the inception of the Chongming Eco-Island in the 2000's, which featured a *greening urbanization* development mode. The second development phase – since 2010 – has witnessed an increasing emphasis on environmental construction and remediation, although economic pursuit still persists in the Eco-Island development agenda. Chongming eco-development in the 2010's is thus marked by radical *ecological construction* which emphases on the enhancement of ecological assets (such as tree cover and wetlands) and aestheticized landscapes building. With an attention to the scale and power dynamics, this session and the following session 4.3 examine each development phase of Chongming eco-development respectively by analysing the national and municipal political-economic climate during the period and the key policies and plans initiated to guide eco-development practices.

4.2.1   Fervent urbanization with awakening environmental awareness in China

Chinese political and economic climate in the 2000's can be characterized by fervent urbanization with awakening environmental awareness. Firstly, the country's urbanization process started from the declaration of the "Reform and Opening-up Policy" in 1978 continues to speed up at the turn of the century. In 1991, the central government released the 'Report on the Outline of the Ten-Year Plan and the Eighth Five-Year Plan of National Economic and Social Development', which proposed to "programmatically boost urbanization process". Since then,

transferring rural population to the urban area and to non-agricultural industries has become a key national development guideline, signalling the inception of an urbanization era in China (Chen et al., 2016). Following this, the central government introduced a preceding fiscal and tax reform in 1994, introducing a tax sharing system through which central government increased its share in tax revenue, while the proportion of local fiscal revenue was drastically reduced, with only one quarter of value-added tax (VAT) retained locally. Meanwhile, it is set that land related revenue such as land-transferring fees and land use tax, belong to local government. Given that land finance has now become the mainstay of local government's revenue income, local governments were driven to vigorously develop land, build up industrial and economic zones and stimulate real estate market (Tian, 2014). Consequently, innumerable Development Zones (*kaifaqu*) at diverse scales have been built across the country in the 1990's, and it has further incentivized the launch of more aggressive and large-scale New City (*xincheng*) projects in semi-rural areas in the early 2000's (Hsing, 2012).

In the meantime, fuelled by these place-making featured urban entrepreneurial developments, the country's unprecedented urban expansion has been further exacerbated, expanding to the rural fringe and continually moving farther out to the rural area of the metropolitan region (Hsing, 2012). In October 1998, the Third Plenary Session of the 15th CPC Central Committee passed the 'Decision on Major Issues of Agriculture and Rural Work', proposing "small-town construction" as the major national strategy to promote rural development. The term "urbanization" (*chengshihua*) has been substituted by "City and town-rization" (*chengzhenhua*), and promoting the concentration of rural populations to towns and cities has become the key strategic measure to speed up the country's urban and rural socio-economic development. As urban governments mobilized both the regulatory tool of land-use planning at township and city level and the spatial strategy of concentrated development, both urban and rural, rural areas have been brought into the

city's development planning and the subsequent governance and management (Hsing, 2012). Acting as a "supporter" for the city development, Chinese rural area has been largely neglected (Chen et al., 2016). Whilst urban expansion has been continually aggravated, a large number of villages have suffered from hollowing out effects and gradually disappeared.

Since the late 20th century and the beginning of the 21st century, as urbanization proceeded at a furious pace in China, it is argued that Chinese policy placed overriding emphasis on economic growth, with much less consideration paid to the society and environment (Huang et al., 2009). However, as increasingly serious environmental degradation and societal problems (such as the withered countryside and the widening wealth gap) have gradually garnered extensive attention at home and abroad, Chinese development has been under pressure to move towards a more energy efficient and environmentally friendly model. In 2003, the Third Plenary Session of the 16th CPC Central Committee introduced the guiding ideology of "Scientific Outlook on Development", advocating "the adherence to the people-centred principle and the establishment of a comprehensive, coordinated and sustainable development concept, to promote socio-economic and people's all-round development". The following "harmonious society" proposed in 2006 further stressed the central government's resolve to promote harmonious development of society and of human and nature. More potent and specific demands concerning the social and environmental wellbeing were put forward in 2007, when the Party's 17th National Congress first introduced the concept of "ecological civilization", marking the country's commitment to promote sustainable and ecological development. These national initiatives laid a theoretical foundation for progressing sustainable development in China. Consequently, the late 2000's witnessed a boom in the number of urban sustainable development initiatives (such as *eco-city, low-carbon city, and low-carbon eco-city*) across the country. According to nationwide surveys undertaken

by Chinese Society of Urban Studies, around 97% of prefectural cities, including sub-provincial cities and metropolises under the direct jurisdiction of the State Council, had announced or started to build an eco-city (or low carbon city or low carbon eco-city) by 2012.

4.2.2 Suburban development of Shanghai

Within China, Shanghai is considered the economic 'head of the dragon', an internationally oriented 'global city' with unrivalled urbanization intensity and spatial extent. It thus exhibits the country's exploration and evolution on urban development policies and practices, and is deemed as a 'pioneer' in terms of experimenting with innovative green urban design and building solutions (Den Hartog, 2010). One of the biggest problems faced by Shanghai in retaining its competitive position is the shortage of development land (Song, 2005). From the promotion of industrial satellite town construction in the late 1950's to 1970's, to the development of Pudong New Area during the 1990's, Shanghai has been constantly extending its reach and impact from the city centre to suburban and rural areas to alleviate the intense pressure on the existing built area (Shen, 2012; Shen and Wu, 2013; Sze, 2015; Tian et al., 2017). Considerable efforts have been invested into the spatial structuring of the municipality's outer-lying rural hinterlands (McGee et al., 2007), mainly revolved around the "Three Concentrations" (*sange jizhong*) strategy that promotes the consolidation of the rural population into larger, more compact settlements, the concentration of rural factories in industrial zones, and the amalgamation of farmers' farmland (through various cooperative or shareholding mechanisms) into larger farms in order to improve productivity (SMG, 2004). The goals of the "Three Concentrations" (*sange jizhong*) were stated to achieve "urban-rural integration, rural urbanization, and agricultural modernization" and "the transformation of farmers into urbanites" (SMG, 2004). In other words, the intention was to integrate rural land resources for more effective and profitable urban land development.

To support the ambitious goals set in the "Three Concentrations" policy and to accelerate sub-urban integration, Shanghai municipal government called for the rapid provision of essential infrastructure, facilities, and services, including roads, transport, water, communications, sewerage, garbage collection, health care, education and entertainment. In short, the "Three Concentrations" strategy was conceived as a measure to bring urban standards of living to the countryside (Bray, 2013). Along with the process, traditional villages would be demolished and replaced by larger scale, fully serviced, residential settlements.

Entering the 21st century, the municipal government of Shanghai introduced a planning principle that "the central city shows urban prosperity while the suburbs maintain economic strength" (SMG, 2001b: 1), fastening the development of the city's suburb for capital and resource accumulation. Guided by this principal, in 2001, the Shanghai Master Plan (1999-2020) was approved to transform the metropolitan area of Shanghai into a spatial structure characterized as "multi-axis, multilayer, and multinuclear" (SMG, 2001a). An experimental project known as One-City-Nine-Towns (*Yi Cheng Jiu Zhen*) was launched during the period of 2001 to 2005, planning nine new towns in each of the nine outer districts in Shanghai. This was followed by a plan known as the "1-9-6-6 Urban System" Plan that further promoted suburban development with "one central city, nine new towns, sixty new market towns and six hundred central villages" (SUPMB, 2005). It is worth noting that at the time it was released, the Municipality of Shanghai still had 109 towns (*zhen*) and 1,862 administrative villages under its jurisdiction (Bray, 2013). Therefore, a large number of rural towns and villages would be either demolished or merged into the city. This "1-9-6-6" plan was deemed as a significant scheme to combine the rural planning (underscored by the "Three Concentrations") with the urban development policies (such as the small-town urbanisation strategy) to create a graduated urban system that extended across the entire continuum of urban and rural territory of Shanghai. Meanwhile, it is

argued that these plans for new town development, aimed to attract capital investment in real estate in the periphery region, can therefore be deemed as spaces of capital accumulation (Shen and Wu, 2016).

In the meantime, although the national policy reflected a trend to incline towards ecological improvement and environmental protection in the 2000's, the practical system has not yet formed, and thus had weak binding to the lower tiers of governments. A review of the major policies and plans of Shanghai during this period shows that environment was far from being the priority of the municipalities. For example, in Shanghai's 10th Five-Year Plan of 2001 to 2006 (SMG, 2001c), there is no chapter, out of a total of eight, dedicated to environmental issues. Meanwhile, whilst the Shanghai Master Plan (1999-2020) outlines a framework of a "Circle, Wedge, Corridor and Garden" green systems in central urban area and to develop large-scale man-made forests in the suburbs (SMG, 2001a), the intention is more of a city image creation that contributes mainly to economic promotion. Certain improvement occurred as international and national sustainable development discourse gradually entered politics and society in the mid-2000's. Shanghai government started its exploration of a development pathway that could generate mutual benefits for economy and environment. In the 11th Five-Year Plan, it has advocated to develop a circular economy so as to build Shanghai into a resource-saving and environment-friendly city (SMG, 2006b). Meanwhile, a number of eco-themed suburban real estate developments have been launched. Among them is the grand Dongtan eco-city project.

4.2.3 Eco-development on Chongming: greening urbanization

Due to the geological barriers and the long-term lack of modern-day transportation, Chongming has been the most rural area of Shanghai. Before 1995, the county was positioned by Shanghai as a "basic production and processing base for agricultural and sideline products" (SMG, 2018). Its development focus was placed on the county seat – Chengqiao Town, and

the eight municipality-owned state farms. As a rural county, there was no systematic master plan for Chongming. However, in the late 1990's, due to the waning TVEs, Chongming started to explore a new development pathway that could revitalize the local economy. In 2000, the "Chongming County Structure Planning (2000-2020)" proposed to build Chongming into an "eco-island of the 21st century with the characteristics of the outer suburbs of Shanghai metropolis". Although the plan put forwards the idea of constructing an "eco-island", the main highlights in its content were the functions and orientations of the island, which include free trade, transit shipping, export processing, ecological agriculture, island tourism, etc. (SMG, 2018). As can be seen, planning for Chongming at that time still geared towards industrial development to boost local economy. In 2001, the "Master Plan of Shanghai" positioned Chongming as the "strategic space for Shanghai's sustainable development in the 21st century" (SMG, 2001a). This ambiguous rhetoric illustrated the city's intention to both promote urban/economic development on Chongming and to practice a sustainable development mode (at least on a rhetoric level). In July 2004, during a visit to Chongming, then President and General Party Secretary of China – Hu Jintao – pointed out that Chongming should follow the guidance of Scientific Outlook to maintain its ecological advantage. The head of the state's visit and his view of the future of Chongming had been widely publicized in local and national medias. Since then, eco-development has underpinned Chongming's development policies, and a series of plans and measures have been launched.

Dongtan Eco-City

The Dongtan Eco-City project launched in 2005 was the first major attempt of eco-development on Chongming. Jointly initiated by Arup – the UK-based global planning, engineering, and design corporation, and the Shanghai Industrial Investment Corporation (SIIC) – a state-owned investment company of the Shanghai Municipality, the Dongtan Eco-City

project is argued to be an incarnation of Shanghai's desire to reconcile urban development needs with ecological pursuit (Chang and Sheppard, 2013; Sze, 2015). An area of 86 square kilometres land next to the Dongtan Natural Reserve was designated as the construction site of the eco-city. Arup's plan proposed a planning concept of "integrated urbanism" that considers the environment, social, and economic aspects to create sustainable communities (Cheng and Hu, 2010; Pow and Neo, 2013). A central goal of the plan was to incorporate human activities and the physical environment into a self-sufficient ecosystem with a low ecological footprint (Chang, 2017). Guided by this goal, Dongtan's master plan envisioned a compact city with low-rise condominiums and high-tech, energy-saving residences interspersed with green spaces that would rely completely on renewable energy such as bio-mass, solar and wind power (Chang and Sheppard, 2013). It encompassed housing, energy, transportation, ecosystem and socio-economic development (Head and Lawrence, 2008; McGray, 2007; Castle, 2008), and deployed integrated infrastructures connecting various material flows. According to the master plan, Dongtan Eco-City would have a 60% smaller ecological footprint (2.6 global hectares per person) than conventional Chinese cities, a 66% reduction in energy demand, 40% energy from bio-energy, 100% renewable energy in buildings and on-site transportation, reduction of waste to landfills by 83%, and almost no CO_2 emissions (Cheng and Hu, 2010). Ultimately, the Dongtan Eco-City would be developed into a demonstrative city of 30 square kilometres with a population of half a million people (equivalent to the population size of current Chongming Island) upon completion in 2050 (Arup, 2008; Head and Lawrence, 2008).

Nevertheless, as typifying a "new-town-style" eco-city development project that is planned and constructed from scratch on an undeveloped land outside of the downtown area (Chien, 2013), the high-profile Dongtan Eco-City is criticized as rather a model of "sustainable sub-urbanism", a replication of the western suburban sprawl that creates edge cities (Sigrist,

2009: 13). Similar critics have been raised by Chang and Sheppard (2013) as their interviews with local cadres and scholars indicate the original intention to launch the Dongtan project was to construct a new suburban town settlement. Moreover, research that traces the genesis and development of Dongtan Eco-City has unveiled its commitment to a weak form of ecological modernization, which believes that economic development can avoid damaging the environment (Chang and Sheppard, 2013; Chang, 2017; Cheng and Hu, 2010; Sze, 2015). Therefore, although being underscored by advanced environmental technologies and measures, the Dongtan Eco-City is argued to be, in essence, a rural urbanization project that aims to transform an almost virgin land (part of which are natural wetlands) with high natural and agricultural values into urban built environment.

Nevertheless, this ambitious and widely publicized project never materialized except for the completion of a lone conference centre. The official suspension of the Dongtan Eco-City project was announced in 2008, although it was known to be stalled as early as 2006 (Chang, 2017). Whilst some parts of the vision (such as wetland conservation and eco-tourism) have later been adopted by the subsequent local Chongming Eco-Island plan, the master plan produced by Arup was mostly abandoned. No definitive reason for the dramatic halt can be identified, but previous research points to three main issues (see Chang and Sheppard, 2013; Chang, 2017; Cheng and Hu, 2010; Den Hartog, 2017; Pow and Neo, 2013). One relates to the ''inappropriate location'', as Dongtan was planned on wetland and farmland with high agricultural productivity, and development became prohibited after the area was re-designated for natural conservation and farmland protection. The second is the political leadership change in Shanghai. As Dongtan was launched under the auspices of Shanghai's Party Secretary Chen Liangyu, along with his removal from the office in 2006 and his subsequent conviction on high-profile corruption charges in 2008, the Dongtan project lost the political support crucial for its actual implementation. A third factor is the financial difficulties as it remained

unclear till the suspension who would pay for this enormous and costly project. Nevertheless, whilst the Dongtan Eco-City project has not been completed, its pro-growth and urbanization-featured planning idea(l)s and methods have been extended to the local plan of Chongming Eco-Island.

'Master Plan for Chongming Three Islands (2005-2020)'

Inspired by the Dongtan Eco-City, Shanghai started to develop a plan for the whole Chongming County in the mid 2000's. The planning of Chongming has been conducted by two agencies of Shanghai Municipal Government (SMG), namely the Shanghai Municipal Planning, Land and Resources Administration (SHPLRA) and the Shanghai Municipal Development and Reform Commission (SHDRC). The first master plan of Chongming Eco-Island – the Master Plan for Chongming Three Islands (2005-2020) was drafted by the SHPLRA and was approved by the SMG in 2006 (SHPLRA, 2006). SHPLRA has long identified Chongming Island as potentially serving as a recreational and environmental preserve for the municipality and as a future industrial zone (Ma et al., 2018). In the drafting period of the "Master Plan (2005-2020)" during August to December 2003, SHPLRA and the Chongming government organized an international planning competition and invited four international renowned design and urban planning companies from the US, Japan and the UK to draft preliminary master plans for the island. The proposal drafted by American Skidmore, Owings & Merrill (SOM, 2004) won first prize and the plan was formally approved by China's Central Government in September 2004. The substance of SOM's master plan is to transform Chongming into an environmental and sustainable district for Shanghai that preserves the ecology while housing 800,000 people. It discerns six themes: Wilderness and Eco Systems, Organic Farms, Green Systems, Transportation, Green Villages, and eight Compact Coast Cities (see Table 4). Based on SOM's master plan, the Shanghai Urban Planning and Design Research Institute (SUPDRI), a unit under SHPLRA, drafted the

Master Plan for Chongming Three Islands (2005-2020) in August 2005 (SUPDRI, 2005).

Table 4. SOM's master plan of Chongming Eco-Island (2004)

Themes	Concept	Principles
Theme 1: **Wilderness and Eco Systems**	Creating communities in nature while creating a premier ecological tourist destination	Restoring wetland wilderness areas, forming natural habitats for a broad community of wildlife
Theme 2: **Organic farms**	Elevating farming to a 21st century green industry	Maintaining farming as core business, shifting the focus to organic products and direct sales to Shanghai restaurants
Theme 3: Green systems	Creating systems that ensure environmental quality	Tying all cities to green filtration-lake system and introducing an island wide lake system
Theme 4: **Transportation**	Creating green transportation options	Preserving historic farm grid of narrow streets and connect all cities by rail to Shanghai
Theme 5: Green Villages	Creating new settings for 40 farm villages	Defining 40 farm villages organized around lakes within close proximity to the farmlands
Theme 6: 8 Compact Coastal Cities	Creating compact mixed-use cities along the waterfront	Organizing 8 cities along the south coast focused on rail transit

Source: Ma et al. (2018).

Incorporating most of SOM's ideas, SUPDRI's master plan proposed the overall goal of constructing a "modern eco-island area", in which with the Chongming Island was featured as "a comprehensive eco-island", Changxing Island as a "marine equipment manufacturing island", and Hengsha Island as an "ecological holiday island" (SUPDRI, 2005). Six major functions were specified:

(1) Forest garden. To establish the ecological conservation function centred around the Yangtze River estuary wetland reserve, international migratory bird sanctuary, plain forest and estuary water system.

(2) Ecological habitat. To establish an ecological living area with rational layout, elegant environment, convenient transportation and advanced culture.

(3) Leisure and vacation. To establish ecological tourism featuring leisure vacation, sports and entertainment, recuperation, training, and trade exhibition.

(4) Green food. To establish ecological agriculture featuring organic agricultural products, characteristic plantation and aquaculture, and green food processing

(5) Marine equipment. To establish a marine economy featuring modern shipbuilding and port machinery manufacturing.

(6) Science and technology research and development. To establish a 'knowledge' economy featuring headquarter offices, scientific research and development, international education, and consulting seminars.

Meanwhile, the 'Master Plan (2005-2020)' also divided the whole Chongming County into seven sub-regions for specifying functional zones. These sub-regions are Chongbei, Chongzhong, Chongnan, Chongxi, Chongdong on the Chongming Island, and the Changxing and Hengsha sub-regions on the other two smaller islands respectively. It also further

outlined the industrial layout of the three islands: the Chongming Island is planned to promote comprehensive industrial development featuring a balanced development of primary, secondary and tertiary industries and led by ecological industries; the Changxing Island focused on shipbuilding and the marine industries; and the Hengsha Island focused on service industry and agroforestry. To promote these industries, a series of construction projects has subsequently been deployed on the ground, such as the construction of Dongtan Wetland Park, the Shanghai Wisdom Island Data Industrial Park and a large-scale Sports Training Base in the Chenjia Town Area.

The spatial arrangement and the industrial plan of Chongming is well embodied and aligned with the three key development principles highlighted in the 'Master Plan (2005-2020)' of Chongming, namely: 1) adhering to an ecological modernization pathway to leapfrog traditional industrial urbanization to construct an modern eco-island; 2) conserving natural ecological spaces and securing land capacity for future international projects; and 3) adhering to the "Three Concentrations" principle (i.e. concentrating land operations, industrial development, and farmers' residences) to effectively solve the "Three Agricultural Problems" (problems of rural areas, rural population and agricultural industry) (SUPDRI, 2005, pp.5-6). These three planning concepts have shaped a series of detailed measures of the Eco-Island development on Chongming in the subsequent years. Hereinto, the EM principle, as now being revealed, is the cornerstone for Chongming Eco-Island, as it has sustained as the guiding principle for many subsequent plans despite several adjustments of their development emphasis and practical approaches.

The modernization thinking has underscored Eco-Island development on Chongming. It is specified in the 'Master Plan (2005-2020)' that the goal is to build Chongming into "a modern eco-island with harmonious and beautiful environment, economical utilization of resources, and coordinated economic and social development" (SUPDRI, 2005, p.7; SMG, 2006a). Such

integrated concerns over environment, resource, economy and society conform to the ideology of sustainable development. However, a critical review of the detailed measures outlined in the 'Master Plan (2005-2020)' reveals that, guided by the ecological modernization, the environmental measures outlined in the "Master Plan (2005-2020)" privilege engineering and technocratic solutions and with urban aesthetic governing as the underlying logics. For instance, with regard to the ecological protection and landscape construction, four key themes have been highlighted in the 'Master Plan (2005-2020)': 1) landscape water system construction with a focus on the river regulation and improvement; 2) greening system construction with a focus on public green space and ecological landscape areas (a target has been set to raise the forest coverage rate of Chongming to 55%); 3) waste water management; and 4) clean energy use. Taking the water governance as an example. Guided by the landscape water system development instruction, Chongming Water Affairs Bureau (CWAB) and Chongming Finance Bureau (CFB) jointly promoted a large-scale river regulation project called "Ten-Thousands Rivers Regulation Operation" (Wan He Zheng Zhi Xing Dong) in 2006, aiming to transform 453 township-level river sections and 4,434 village-level river sections on Chongming. Explicit guidance was set, such as 6-meter-surface width requirement for village-level rivers and plantation on the river banks. The implementation was conducted by responsible township governments. Nevertheless, as will be elaborated in Chapter Five, the state-led river regulation implemented on the ground adopts technocratic and engineering methods in canalizing and reorganizing the river and river ecology on Chongming, which shows little concern for the local ecological context and biodiversity.

The second principle – conserving natural ecological spaces and securing land capacity for future international projects – highlights the environmental integrated management and land consolidation on Chongming. As elaborated in the 'Master Plan (2005-2020)', the intention is

to form a planning framework that can "adapt to the real sustainable development of Shanghai in the future" (SUPDRI, 2005). Of particular caution is that the "sustainable development" written in the plan is nothing like the commonly accepted notion that refers to an integrated development of economy, environment and society. Rather, the "sustainable development" here highlights the capacity for supporting future industrial/economic development on Chongming. As stated in the 'Master Plan (2005-2020)', since there were many undetermined large projects proposed on Chongming (such as the Disney park proposed in Chenjia Town) at the time the 'Master Plan (2005-2020)' was drafted, vast stretches of land are reserved for accommodating future international project. As can be seen, the underlying ideology of eco-island development in this stage is still dominated by a pro-growth thinking.

The third principle – the "Three Concentrations" principle – is directly adopted from the SMG's suburban development strategy introduced in 2004 (SMG, 2004). Echoing Shanghai's One-City-Nine-Town experimental project (SMG, 2001b), the 'Master Plan (2005-2020)' proposes a One-City-Nine-Town structure for Chongming. Accordingly, a three-level urban system – "new city – new towns – central villages" has been introduced. The new city and new towns are planned to contain a number of residential communities, which are either formed by the merge of towns or reserved areas of large-scale settlements (SUPDRI, 2005). Meanwhile, the 'Master Plan (2005-2020)' also sets an ambitious target to increase the urbanization rate of Chongming to 80% in 2020 (SUPDRI, 2005), whilst at that time in 2005, the urbanization rate of Chongming was merely 21.2%. To achieve this goal and guided by the concentration strategy, many rural villages and towns on Chongming are to be demolished; affected villagers are to be relocated in modern residence blocks; and farmlands are to be consolidated and transferred to government or enterprises for scale operation (detailed implementation measures will be elaborated in the following Chapter Five). According to the Chongming Yearbook 2008, the

years of 2006 and 2007 witnessed the swift implementation of a number of homestead replacement and land transformation projects in the Chenjia Town area – where the Dongtan Eco-City was based and where one of the two key development areas of Chongming Eco-Island was planned (the other is the Chengqiao Town). Consequently, thousands of peasant households were relocated and great areas of rural lands have been transformed into urban land use (the destructive effects of these relocation and land transformation projects will be discussed in detail in Chapter Six).

As can be seen from both Dongtan Eco-City project and the first master plan of Chongming Eco-Island, the main theme of the initial stage of Chongming eco-development is to promote ecological industries whilst urbanizing this rural suburb of Shanghai. Under the EM guidance that assumes eco-development can be achieved through "technological fix" methods, the plan of Dongtan and the initial Chongming Eco-Island featured novel environmental technologies and green industries. The nearly uncontaminated environment of Chongming and its large land base were viewed as natural capital that can enable economic development of Chongming and Shanghai. Meanwhile, guided by the "Three Concentrations" principle, the Eco-Island plan of Chongming focused on the spatial layout and functional division, which largely follow the traditional urban planning method that highlights zoning for economic efficiencies. At this fledging stage of eco-development on Chongming, the SHPLRA's final plan has not established any (environmental) indicator system, nor a monitoring and surveillance mechanism (Ma et al., 2018). It is argued that both the Dongtan eco-city and the Chongming eco-island plan are part of Shanghai's urban development strategies to develop its suburban area and to promote overall economic growth and city competitiveness (Chang and Sheppard, 2013; Sze, 2015). It is thus featured as a *greening urbanization* development mode.

4.3 Ecological construction in 2010's

4.3.1 Rising environmental status in national policies

In the early 2010's, in response to urban management problems and severe pollution in the country's cities, the Chinese authorities shifted the policy focus from growth alone to sustainable development. The national government has been vigorously progressing urban sustainability from both theoretical and practical perspectives. The concept of "ecological civilization" introduced in 2007 was raised to become a national strategy in the Party's 18th National Congress in 2012. Since then, sustainable development and ecological civilization construction have been increasingly heightened in the country's policy agenda. Additionally, a comprehensive environmental governance reform has been carried out at national level. In December 2013, China's National Development and Reform Commission (NDRC) issued its first national blueprint for climate change, followed by a long list of environmental targets for 2020 (NDRC, 2018). In 2014, the Chinese government pledged all new urban development to be green, eco-friendly and sustainable in its National New-Type Urbanization Plan (Xinhua, 2014). In the same year, the government amended its environmental law that was established in 1989 to better fight pollution. Furthermore, at the 19th Communist Party Congress held in October 2017, President Xi Jinping proposed an ambitious blueprint of ecological civilization reform in his report. It is argued fighting pollution and constructing ecological civilization have now become the nation's top priority (de Boer, 2017). Under this context, substantial regulatory, administrative, and political and planning measures are set at national, provincial, and lower district levels to address the challenges of promoting urban eco-development and sustainable environment (Wang et al., 2018b).

One key reform measure introduced is the changing cadre evaluation system. At the beginning of the 11th Five-Year Plan (2006-2010), Chinese authorities established quantitative environmental targets that were

assigned to leading cadres of the party and government at all levels (Wang, 2013). These environmental targets are incorporated into a target responsibility system (*mubiao zeren zhi*), wherein the central government sets an overall national target and then assigns specific targets for particular areas (Kostka, 2014). Unlike being loosely regulated in the past, these environmental goals have been substantially elevated to a level of priority that was previously reserved for only the most important party-state mandates, such as economic growth, social stability, and the one-child policy (Hu, 2011; Wang, 2013). Differentiated by their relative importance, environmental targets are divided into two types: "soft" or expected (*yuqixing*), and "hard" or restricted (*yueshuxing*). The latter can be understood as targets with "veto power", which were written into local leading cadres' annual responsibility contracts and became important criteria in their promotion decisions. This means that whether or not these targets are achieved will significantly affect the responsible cadres' political career (Heberer and Senz, 2011; Ran, 2013). The aim of this reform was to get local officials to give greater priority to the environment. With this powerful incentive, leading governmental officials at all ranks started to take serious actions in environmental protection and construction, and thus started the country's fervent environmental campaign.

4.3.2 Shanghai's "eco-desire" and will to green

Conforming to the national policy direction, Shanghai took substantial efforts to practice eco-development by putting forward a series of policies and plans. Besides launching the Dongtan Eco-City project, the host of the Shanghai World Expo in 2010 is noted to clearly display the centrality of ecological discourse in Shanghai's urban policy (Sze, 2015; Zhu, 2010). Publicity materials for this grand event explained that the official slogan, "Better City, Better Life", was meant to represent "a powerful and lasting pilot example of sustainable and harmonious urban living", reflecting Shanghai's "eco-desire" or will to green (Sze, 2015). Besides, significant

changes to the city's development strategy can be seen in the city's new master plan.

In May 2014, Shanghai Municipal Government held the 6th Planning and Land Working Conference, announcing the inception of preparing the new round urban master plan. During the working conference, a fundamental principle was introduced as to "strictly abide by the land use bottom line and to achieve 'zero growth' of the city's overall construction land". Wherein, the land use bottom line is defined by the environmental constraints (SMG, 2014a, 2014b), which puts a ceiling on the city's development scale, i.e. the construction land area and population size. This has then become a key theme of Shanghai's urban and rural development. In December 2017, the State Council approved the 'Shanghai Master Plan 2017-2035', which was then officially released by the Shanghai government in 2018 (SHPLRA, 2018). The new master plan has set a target to transform Shanghai into an innovative, humanistic and eco-friendly metropolis with global influence, aiming to build an "excellent global city" by 2035. A major highlight of this new plan is its tight control on the city's scale and development. As stated in the plan, the city's population will be limited to 25 million by 2035 – there is nearly no change as at the end of 2016, there were 24.19 million residents in Shanghai. Meanwhile, the master plan also mandates a "negative growth" of the total area of land planned for construction, limiting it to 3,200 square kilometres. As can be seen, in contrast to the fervent pro-growth suburban development in the 2000's, the city of Shanghai is now changing its long-term new-land-development-led urban development model.

Along with the changing urban development pattern, a number of specific requirements for environmental improvement are introduced in the new master plan. For example, it is stipulated that the forest coverage rate of the city will rise to 23% and there will be more than 13 square metres of public parks or green land for each resident on average by 2035. The aim is to achieve one of the three main development goals of this round's master

plan, namely to "construct a more adaptable and resilient eco-city as well as a benchmark for international megacities in terms of green, low-carbon and sustainable development by developing pilot spaces and infrastructures" (SHPLRA, 2018). As can be seen, environment has now been raised to a priority concern of the city of Shanghai. Such dramatic transformation has significant impacts on the development of Chongming Eco-Island in the 2010's.

4.3.3 Eco-development on Chongming: ecological construction

As Shanghai is advancing urban sustainable development and ecological construction, the role played by Chongming is increasingly prominent. It is noted by Sze (2015:65), "the features that made Chongming Island historically 'backward' – its natural and rural character, open space, underdevelopment, and lack of industry – are now […] the source of its natural capital", and a valuable asset for Shanghai's ecological development. Whilst urbanization was slowly progressed on the island under the guidance of the initial Eco-Island plan, Chongming's "eco" value receives increasing attention, and has been re-evaluated by planners and officials. In May 2008, Mr. Han Zheng, then mayor of Shanghai, pointed out that the construction of Chongming Eco-Island is a long-term goal and a gradual process, and it should be carried out under the guidance of a comprehensive indicator system (Sheng and Zhu, 2015). Following his instruction, from 2008 to April 2009, the Municipal Science and Technology Commission (SHSTC) led other bureaus and committees to launch a research on producing the Chongming Eco-Island Construction Index System, which constituted a major part of the later Chongming Eco-Island Construction Outline (2010-2020) (hereafter referred to as "Construction Outline") (SHDRC, 2010). The official promulgation of the "Construction Outline" in 2010 marked a new development phase of Chongming Eco-Island, featuring ecological construction with specific emphasis on the enhancement of ecological

environment (such as increasing green coverage) and aestheticized landscape building.

'Chongming Eco-Island Construction Outline (2010-2020)' (and the 'Twelfth Five-Year Plan for National Economic and Social Development of Chongming (2011-2015)')

In January 2010, Shanghai Municipal Development & Reform Commission (SHDRC) approved and issued the "Chongming Eco-Island Construction Outline (2010-2020)" (SHDRC, 2010). This is of epoch-making significance for Chongming's eco-development, as the Construction Outline not only for the first time announced the ambition to build Chongming into a *world-class* Eco-Island, it also for the first time introduced a set of tailor-made systematic Key Performance Indicators (KPIs), establishing explicit environmental construction targets for 2020 (see Table 5). In total, twenty-two indicators were outlined in the plan, which were selected with the participation of experts from academic institutions (Ma et al., 2018). These indicators are not specifically categorized into general groups, but more focused on ecological development, re-utilization of life waste and agricultural resources, and environmental protection.

As shown from the list of indicators, the new eco-island plan has broadened and enriched its comprehension of environment, recognizing the importance of biodiversity, ecological resources and value. For instance, it is stipulated that by 2020, the number of waterbird species accounting for 1% of the global population on Chongming should exceed 10, the forest coverage rate should reach 28%, and the natural wetland conservation rate should increase to 43% (SHDRC, 2010). Moreover, the Construction Outline also stipulated that by 2012, the environmental performance weight in Chongming's cadre performance appraisal should reach 20%, and will increase to 25% by 2020 (SHDRC, 2010). Public opinion on the environment has also been incorporated in the KPI system and it is specified that from 2012 to 2020, the public's satisfaction rate with the environment will

exceed 95% (ibid.). As can be seen, the new plan of Chongming Eco-Island takes into consideration biodiversity (although with a narrow focus on rare species) and natural resources such as forest and wetlands. Meanwhile, the significance of environment in the political realm has also been stressed as environmental compliance is now a part of cadres' performance evaluation, which can influence local officials' prospects for promotions.

Table 5. List of key evaluation indicators in Chongming Eco-Island Construction Outline (2010-2020)

No.	Indicators	Unit	2020
1	Proportion of built area	%	13.1
2	Water birds over 1% of the global species population	species	≥ 10
3	Forest coverage	%	28
4	Urban green coverage	%	15
5	Proportion of protected ecological area	%	83.1
6	Natural wetland conservation ratio	%	43
7	Life waste utilization	%	80
8	Livestock and poultry manures utilization	%	> 95
9	Agricultural straw utilization	%	> 95
10	Renewable energy power-generating capacity	10,000.000W	20-30
11	Comprehensive energy consumption per unit of GDP	Metric tons of standard coal/RMB10,000	0.6

12	Proportion of main rivers of water quality III or above	%	95
13	Centralized treatment rate of town sewage	%	90
14	Day(s) of Grade-1 API	Day	> 145
15	Noise compliance rate in the regional environment	%	100
16	Environmental protection's weight in performance assessment	%	25
17	The public's environmental satisfaction	%	> 95
18	Proportion of main agricultural products certified as non-polluted, green and organic (including the proportion of certified green and organic food)	%	90 (30)
19	Chemical fertilizer intensity	Kg/hectare	250
20	Agricultural soil Nemerow index	-	0.7
21	Added value of the tertiary industry's proportion in GDP	%	> 60
22	Financial expenditure for social undertaking development per capita	RMB10,000	1.5

Source: Chongming Eco-Island Construction Outline (2010-2020) (SHDRC, 2010)

Meanwhile, as it is stated that constructing Chongming into a modern ecological island is "an inevitable choice for Chongming's economic and

social development" (SHDRC, 2010), the Construction Outline continues to firmly stick to the ecological modernization ideology. It is noted that the achievement of coordinated socio-economic development and environmental protection relies on the promotion of scientific and technological innovation, and the development of circular economy and low-carbon ecological industries. Accordingly, the Construction Outline highlights three key aspects in promoting green industrial development on Chongming, namely: to develop modern eco-agriculture and to construct a green agricultural base; to promote clean production and high-tech eco-industries; and to construct modern service industry to adjust economic structure (SHDRC, 2010). Moreover, the Construction Outline also indicated six major action areas for constructing the Eco-Island, including: (1) the protection and utilization of natural resources; (2) circular economy and the comprehensive utilization of waste; (3) energy utilization and energy conservation and emission reduction; (4) environmental pollution control and ecological environmental construction; (5) development of ecological industries, and (6) improvement of infrastructure and public services. As can be seen, at this stage, despite the increasing emphasis on environmental protection and construction, green industry development and technology advancement are still deemed as important strategies for developing Chongming Eco-Island.

Furthermore, the key centralized development strategy introduced in the 2000's is still implanted in the Construction Outline, although it was no longer explicitly written into the document, and the extent of "concentration" was seen to reduce in practice. The urbanization and reorganization of the rural settlement continued, but the aim has been humbled: the target of urbanization rate set up in the 'Master Plan (2005-2020)' as achieving 80% by 2020 (SUPDRI, 2005) was reduced to 70% by 2020 (SHDRC, 2010). Nevertheless, in Chenjia Town – one of two key development areas on Chongming Island, villages were continuously being

demolished, and ten functional zones were deployed, covering the original base of the Dongtan Eco-City (Figure 4).
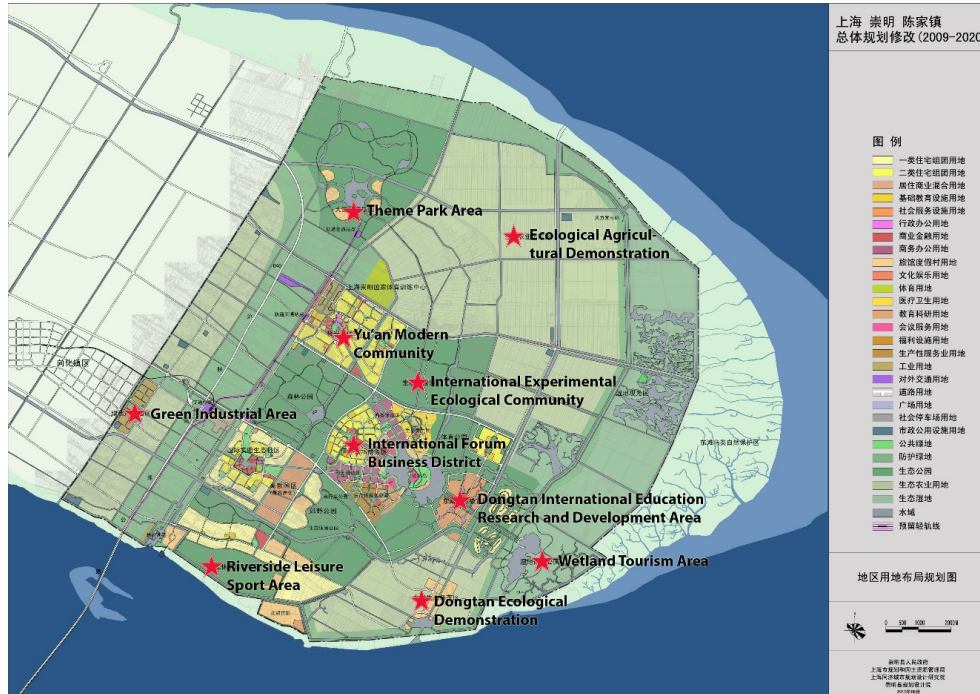
Figure 4. General Plan of Chenjia Town (2009 – 2020) and its regional spatial layout.

Source: adapted from Shanghai Municipal Government (SMG, 2010).

It is noteworthy that following the municipal government's issue of the Construction Outline, Chongming County Government introduced the Twelfth Five-Year Plan for National Economic and Social Development of Chongming (2011-2015) in February 2011 (Chongming, 2011), which largely absorbed the essence of the Construction Outline. A detailed classification of 34 indicators was established and divided up into four categories: economic development; provision of people's livelihood; ecological achievement; and public service. The goal of this plan was to explore a low-carbon development mode and formulate a set of green industries to sustain the modern eco-island construction by 2015. The local five-year plan

sets up phased target and detail measures to ensure the achievement of the Construction Outline.

'The Thirteenth Five-Year Plan of Chongming World-Class Eco-Island Development' (and the 'Thirteenth Five-Year Plan for National Economic and Social Development of Chongming (2016-2020)')

In December 2016, SMG issued the 'Thirteenth Five-Year Plan of Chongming World-Class Eco-Island Development' (SMG, 2016b), envisioning Chongming Island as a *world-class* eco-island that can "match the status and function of Shanghai's global cities and is featured as green, humanity, smart and sustainable". In this plan, a more explicit and demanding indicator system has been introduced (SMG, 2016b). Comparing to the previous KPIs of the Construction Outline issued in 2010, targets put forward in this plan were divided into two types: anticipated and obligatory, through which the priorities of environmental tasks can be identified (see Table 6). As the latter can be understood as being accorded "veto power" status, meaning that, whether or not these targets are achieved would directly affect the promotion of the responsible cadres to upper-level positions, it can be seen from the table that the performance of environmental improvement on Chongming Island mainly depends on increasing natural resources (including forest and wetland), and improving environmental quality (these measures correspond to the "Plus Eco" strategy that is formally introduced later in the 2018's Eco-island master plan). Higher demand and more stringent regulation on environmental preservation and construction have been set up, as the target of ecological indicators are raised to a new level. For example, the 2020 target for forest coverage rate has been raised from 28% set in the Construction Outline in 2010 to 30% in the new plan. Similarly, the urban sewerage treatment rate has been adjusted to achieve 95% (90% in the previous plan) by 2020. Moreover, a number of new criteria have also been added to the KPIs system, such as the Surface Water Environmental Functional Area

Compliance Rate, the Rural Sewage Treatment Rate, and the Proportion of Green Transportation. As can be seen, the 2016's Eco-Island plan takes environmental concerns to a new height.

Table 6. List of key evaluation indicators in the Thirteenth Five-Year Plan of Chongming World-Class Eco-Island Development

No	Indicators	Attribute	2015	2020
1	Forest coverage rate (%)	Obligatory	22.53	30
2	Natural wetland conservation rate (%)	Obligatory	38.07	43
3	Number of waterbird species accounting for more than 1% of the global population	Anticipated	7	10
4	Surface water environmental functional area compliance rate (%)	Obligatory	78	Approximately 95
5	Urban sewage treatment rate (%)	Obligatory	85	95
6	Rural sewage treatment rate (%)	Anticipated	76	100
7	Recycling rate of domestic waste resources (%)	Anticipated	28.8	80
8	The rate of good ambient air quality (AQI measurement) (%)	Obligatory	74.8	78
9	Resident population (Ten thousand)	Obligatory	69.6	Approximately 70
10	Construction land (km²)	Obligatory	262	265 (3 km² less than the original

				planned construction land)
11	The average growth rate of energy consumption (%)	Obligatory	/	No more than 2
12	Reduction rate of energy consumption per unit of GDP (%)	Obligatory	/	17
13	Renewable energy installed capacity (10MW)	Anticipated	29	50
14	Gigabit network coverage rate (%)	Anticipated	/	100
15	The proportion of green transportation (%)	Anticipated	76	More than 80
16	Green food certification rate (%)	Anticipated	27.5	90
17	Per capita income for rural residents (%)	Anticipated	/	More than doubled than 2010

Source: Shanghai Municipal Government (2016b).

Besides the increasingly demanding KPIs, the Thirteenth Five-Year plan also formally introduced a new development strategy called "Eco Plus" (SMG, 2016b). The Eco-Plus was firstly proposed in a Chongming local plan – the "Thirteenth Five-Year Plan for National Economic and Social Development of Chongming (2016-2020)" – released in January 2016 (SCDRC, 2016). As interpreted by Mr. Ma Yuesheng, the Chongming party secretary, this strategy is to "*integrate the construction of ecological civilization into all aspects and processes of economic, political, cultural and social development, so as to promote the integration and development of ecology and industry, science and technology, and people's livelihood, and constantly enrich the connotation of ecological civilization construction, and*

transform ecological advantages into development advantages" (SMG, 2016c). In the SMG's plan, the Eco Plus strategy is further interpreted as to "increase ecological assets, reduce ecological liabilities, and to develop an ecological economy" (SMG, 2016b). As can be seen, underlying the Eco Plus strategy is the persistent desire to boost economy, which encapsulates the EM pro-growth thinking that dominates Chongming eco-development in its early stage (as discussed in Section 4.2.1).

Nevertheless, a noticeable change in the 2016 plan for Chongming Eco-Island (both the municipal and local Thirteenth-Five Year Plan) is the highlight to achieve negative growth in total construction land on Chongming (SCDRC, 2016; SMG, 2016b). As elaborated in the SMG's plan, the strict control of the scale of construction land is along with the optimization of the urban-rural land linking system, or "linking system" (guagou) for short. This system is argued to hinge on China's shortage of agricultural land (Hayward, 2018). Despite the country's vast land area, a relatively small amount of it is suitable for agricultural cultivation. To preserve its arable land to ensure national and food security, the central government has decreed that the arable land should be maintained at a minimum level of approximately 1.8 million mu (around 1,200 square kilometres) by 2020. However, due to the country's extraordinary rate of urban expansion, by 2005 China's agricultural land had fallen almost to this "red line", which means that no more agricultural land can be used for urban development, unless a corresponding plot elsewhere of equal size is brought back under cultivation. Any such new plots can be 'swapped'—added to a regional system of land quotas and auctioned to urban developers, allowing them to build on a plot of agricultural land elsewhere—generally in a more lucrative location on the borders of a city or township (Hayward, 2018). This linking system is argued to be designed to facilitate urban development without reducing the national agricultural land area (Cui, 2011).

In short, under the "linking system", the agricultural (or "green") land consolidated and generated on Chongming can be used to compensate the agricultural (or "green") land lost in mainland Shanghai during urbanization, so as to achieve the city's overall balance of arable land requisition and compensation. This also coincides with the administrative status adjustment of Chongming from a (rural) county to a/an (urban) district in 2016 (SMG, 2016a). As stressed by Mr. Han Zheng – then secretary of the Shanghai municipal party committee – the transformation of Chongming County into Chongming District is an important measure to "optimize urban layout and promote coordinated and sustainable development of urban and rural areas and regions".[9] With a negative growth of construction land (as stated in the plan, the total amount of construction land will be controlled within 265 square kilometres by 2020), it is evident that urbanization – which once underscored the eco-development on Chongming (see Section 4.2.1) has now been curbed, while ecological construction – mainly about creating green land for Chongming and Shanghai – have gradually become the primary task.

'Master Plan and General Land-use Plan of Chongming District of Shanghai, 2017-2035'

Nevertheless, shortly after the introduction of both the municipal and local Thirteenth Five-Year plans for Chongming Eco-Island, the Autumn of 2016 witnessed the inception of another significant policy transformation on Chongming eco-development. Interviews with local developers, bureaucrats, planners and academic researchers all agreed on the nature of an ongoing reform on the island in which nearly all development and construction were stopped by the municipal government. Since the late

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[9] See
http://www.shanghai.gov.cn/nw2/nw2314/nw2315/nw4411/u21aw1148623.html
(accessed on 20 April 2019).

2016 no new development permits can be issued. The halt in development followed a visit to the Chongming Island by a senior political leader of Shanghai in September 2016. He heavily criticized the nature of development on Chongming and pointed out that as an eco-island, its key development areas showed no difference from other urbanized districts of Shanghai, and thus called for (i.e. required) immediate change and reform to the pattern of development. As the political leader orders a reconsideration of the previous plans and actions and a search for new visions and plans begins, so the ecological modernization-guided, centralization-led practices are under challenge. Nevertheless, ecological modernization remains the most important framework that will be utilized by consultants and officials in producing future plans. Once again, it is the state shaping development on the Island and marginalizing alternative eco-development perspectives.

In May 2018, Shanghai Municipal Government approved and issued the 'Master Plan and General Land-use Plan of Chongming District of Shanghai, 2017-2035' (hereafter referred to as 'Master Plan (2017-2035)' (SMG, 2018), following the promulgation of the *Shanghai Master Plan 2017-2035* (SHPLRA, 2018). This new master plan is another vital document that marks a new development stage of Chongming with new development strategies. It systematically reviews the implementation and effects of the last master plan – the 'Master Plan (2005-2020)' and introduces new guidelines and requirements for the future development of Chongming Eco-Island. Dramatic changes can be found concerning the development strategies of Chongming Eco-Island: four key strategies have been highlighted in the new master plan, namely: 1) sticking to the Environmental Bottom Line; 2) vigorously implementing the "Plus Eco" strategy; 3) prudently proceeding with the "Eco plus" strategy; and 4) practically shifting towards "ecological living and production". Perhaps the most significant transformations compared to previous plans are shown in the heavy emphasis on ecological protection and development (the highlight of Environmental Bottom Line

and the new strategy – "Plus Eco") and the weakening of the "Eco plus" strategy.

As detailed in the plan, the new prominent development strategy – the "Plus Eco" – contains five key elements, namely: 1) ecological bottom line; 2) ecological resources (which highlights the increase of natural wetland conservation rate and forest coverage rate); 3) ecological network; 4) ecological nodes; and 5) ecological remediation. Guided by this new strategy, the new master plan sets up even higher demands and even more stringent regulation on environmental preservation and construction, as ecological indicators are again raised to another new height (for instance, the forest coverage rate is targeted to reach 35% in 2035 and the natural wetland retention rate is set to reach 43%). The emphasis on ecological construction and protection (the "Plus Eco") and the de-emphasis on economic pursuit (the "Eco Plus") suggest that the eco-development on Chongming is now shifting from an economy-oriented path towards an ecology-centric one.

A review of the key policies and plans of the Chongming eco-development (including the Dongtan Eco-City and the Chongming Eco-Island) has shown its dynamic process, featuring a gradual shift from greening urbanization that privileges a pro-growth agenda to ecological remediation and construction that advocates an ecology-centric ideology. The evolution of Chongming eco-development's planning and development over time also reflects the specific political-economic context at national and municipal level. Table 7 below summarises the key features of each development phase of Chongming eco-island. The following section continues to analyse the plan monitoring and government's self-evaluation of eco-development on Chongming to further understand the official accounts of eco-developments.

Table 7. Two phases of Chongming eco-developments

Development phases and key features	Greening urbanization of the 2000's	Ecological construction of the 2010's
National political-economic context	Fervent urbanization with awakening environmental awareness	Shifting policy focus from growth alone to sustainable development, and increasing emphasis on environmental protection and construction
Shanghai municipal development agenda	Urban-rural integration through "Three Concentrations" strategy, and promoting suburban development with green urban design and building solutions	Building an "excellent global city" with eco-friendly as an important feature; advocating "negative growth" with "Bottom Line Constraint"
Key political discourse	Urbanization	Ecological civilization
Main ideology for Chongming	Pro-growth economic development	Ecology-centric development
Key policies and plans of Chongming eco-development	- Dongtan eco-city master plan; - Master Plan for Chongming Three Islands (2005-2020)	- Chongming Eco-Island Construction Outline (2010-2020) (and the 12th Five-Year Plan for National Economic and Social Development of Chongming (2011-2015)) - The 13th Five-Year Plan

		of Chongming World-Class Eco-Island Development (and the 13th Five-Year Plan for National Economic and Social Development of Chongming (2016-2020)) • Master Plan and General Land-use Plan of Chongming District of Shanghai, 2017-2035
Key strategies	1. Ecological modernization – development of green industries and advancement of technology 2. "Three concentrations" strategy – centralized urban development and removal of rural settlement	1. "Plus Eco" – ecological conservation and construction 2. "Eco Plus" – utilizing ecological capital for economic benefits
Main measures	1. Rural land acquisition for urban development 2. Urban infrastructure construction 3. River regulations	1. Rural land acquisition and transfer for green land creation 2. Large-scale afforestation 3. River regulations

Source: the author.

4.4　Plan monitoring and self-evaluation: official accounts of Chongming eco-developments

Under the guidance of the 'Construction Outline' issued in 2010, the municipal government of Shanghai and the Chongming county government compiled a three-year action plan (from 2010 to 2012) to refine the short-term tasks to facilitate the implementation of Chongming Eco-Island (SHDRC, 2010). A key measure introduced in the plan is the establishment of a monitoring and evaluation mechanism that involves "an annual small evaluation and a triennial thorough appraisal". Accordingly, based on a preliminary self-assessment conducted by the Chongming County, SHDRC produced and issued the '2010-2012 Chongming Eco-Island Construction Performance Evaluation Opinion' in 2013, presenting a systematic examination of the eco-island construction from 2010 to 2012 (SHDRC, 2013). Moreover, following this, in 2014, the UNEP released the 'Chongming Eco-Island International Evaluation Report' (UNEP, 2014), which was part of the agreement signed by the Science and Technology Commission of Shanghai (SHSTC) and the UNEP in 2011 – the Memorandum of Understanding on Chongming Eco-Island's construction (MOST, 2011).[10] It is noteworthy that the evaluation carried out by UNEP was based upon data generated locally by Shanghai Municipality (Ma et al., 2018). Therefore, although being fairly impartial, the UNEP's report to some extent also represents the state's account for eco-development on Chongming. Besides these two key official evaluation reports, the 'Master Plan and General Land-use Plan of Chongming District of Shanghai, 2017-2035' issued in 2018 also provides an overall evaluation of the development outcomes of the previous master plan – the 'Master Plan (2005-2020)' – issued in 2005 (SMG,

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[10] According to the Memorandum, UNEP was invited to conduct an examination of the implementation effects of Chongming Eco-Island and offer future development guidelines (MOST, 2011).

2018). An analysis of these official documentations, together with data collected from governmental press conference[11] and interviews with key state actors and informants, enable an overall understanding of the government's plan monitoring and self-evaluation for eco-development on Chongming, which can shed further light on the governmental interpretation of eco-development and its construction features (as will be discussed in the following section). To evaluate the official (or dominant) accounts of the implementation and achievements of the Chongming eco-development, this section is organized by three themes, namely the three pillars of sustainable development – the environment, economy, and society.

4.4.1 The ecology: environmental improvement demonstrated by gratifying statistics

Natural capital is typically identified as the only resource enabling development of Chongming (Chang and Sheppard, 2013), and there is little doubt of its value in the planning of Dongtan Eco-City and the larger scale of Chongming Eco-Island. Infused with the EM ideologies, the initial official accounts of the eco-development, and more specifically, the environment, privileges a pro-growth thinking. In a critical research of the Dongtan Eco-City project, Chang and Sheppard (2013) pointed out that Dongtan was seen as a form of green capitalism, featuring the commercialization and commodification of nature, incorporating and internalizing ecological process into the circuits of capital accumulation. In their research, it is shown that the developer of Dongtan Eco-City referred to Chongming's

[11] Such as the press conference held by SMG to release the evaluation report on 9 January 2019, in which more detail explanations on the progress of the Construction Outline have been presented through the answers provided by key governmental officials (including then deputy director of the SHDRC, deputy director of the Municipal Environmental Protection Bureau, the secretary-general of SHSTC, and the head of Chongming Island) to reporters.

almost uncontaminated environment as "natural capital" that can booster economic development for both Chongming Island and Shanghai. Such interpretation aligns with the EM thinking that believes in mutual reconcilement and benefits of environmental and economic development. Inheriting Dongtan's development ideologies and approaches and under the EM guidance, the subsequent plans for Chongming Eco-Island also seek to "translate the ecological advantages and natural capital of Chongming into development advantages" (SCDRC, 2016; SMG, 2016b). Such pursuit has been encapsulated in the "Eco Plus" strategy introduced in 2016, which aims to exploit ecological resources and assets for socio-economic gains. As can be seen, for a decade, the EM-guided Chongming Eco-Island seeks to "sell the nature" (Chang and Sheppard, 2013, p.60).

However, since 2016, significant change of the governance logics of environment has been gradually apparent, featuring an increasing emphasis on ecological construction to build up and enhance the environmental resources on Chongming. This is evident from the introduction of the "Plus Eco" strategy in the latest plan for Chongming Eco-Island – the 'Master Plan (2017-2035)' (SMG, 2018), which put forward stringent regulation on environmental remediation and protection and resource construction and conservation on Chongming. As argued by Pow (2018) that contemporary eco-city development in China (as shown in the case of Sino-Singapore Tianjin Eco-City) signals a shift from a dominant techno-scientific foundation of planning toward an eco-aesthetic normativity, the progress of Chongming eco-developments serves as another vivid case.

Although proposed environmental strategies in the eco-development plans and policies cover a wide variety of aspects of the environment such as water, vegetation, soil, atmosphere, acoustic environment and other ecological elements, the EM-guided eco-developments are steered by "technological fixes" which emphasize engineering measures and are led by explicit indicator systems. Since 2010 when the first set of key performance indicators (KPIs) was introduced in the Eco-Island plan, the subsequent

plans of Chongming Eco-Island gradually increase the demands and introduce even more stringent regulation on environmental preservation and construction to guide the environmental actions on Chongming. These indicators provide quantitative measurement for the success or otherwise of the implementation of Eco-Island construction, and thus matter to local government and cadres. In both governmental reports and plans, as well as interviews with planners and officials involved in Chongming Eco-Island, KPIs have often been highlighted as major environmental milestones achieved in the implementation of the plans and projects.

As shown in the fascinating statistics of the indicators, it seems that state-led environmental efforts on Chongming have achieved much. For example, from 2000 to 2015, the forest coverage rate on the Island has risen from 10% to 22.53% (SMG, 2016b); and according to the 'Master Plan (2017-2035)', in 2016, Chongming District was able to safeguard 38.07% of its natural wetland, and there was an 85% urban sewage treatment rate (SMG, 2018). For local government, there is considerable pride that 80% of the rivers in the Shanghai Municipality that meet the national 'Environmental Quality Standards for Surface Water' are located in Chongming District (SMG, 2016b). Meanwhile, both planners and academic researchers fully praise the environmental measures adopted in the Eco-Island construction. The following comments are typical:

> "Positive environmental outcomes have been achieved during the development of the Eco-Island: there no longer exists polluting industries; green land has expanded; and the number of migrant birds remains stable. Above all, the power of the capital is so fierce that it can bring dramatic change to the Island

in the blink of an eye. Shanghai and local government have tried their best to avoid this."[12]

"Without the Eco-Island policy and plan, Chongming would be surely encroached by the fierce urbanization movement from both Shanghai and Jiangsu province. The Eco-Island plan has protected Chongming's natural environment and has provided Shanghai residents with a "backyard garden" for leisure and entertainment."[13]

Planners' gratification of the environmental achievements of Chongming Eco-Island construction is also shared by governmental officials and international institutes. According to the UNEP's evaluation report, Chongming enjoys the advantages of wetland conservation, waterfowl protection in critical habitats along the East Asian-Australasian Flyway, the establishment of ecological compensation mechanisms, and the enhancement of drinking water safety. Meanwhile, the ecological achievement has been highly praised by the municipal government as shown in the SHDRC's (2013) Evaluation Opinion. It is stated that a major accomplishment of Chongming Eco-Island is the construction of water, land and woodlands: the island's forest coverage rate ranked first in the city, and has successfully established the 'National Sustainable Development Experimental Zone' of the Ministry of Science and Technology (MOST). Meanwhile, along with the implementation of the river channel comprehensive improvement project, water environmental quality has been noted to be significantly improved (SHDRC, 2013). According to these official narratives, the environment has been well preserved and improved

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[12] Interview with a local planning expert who is involved in the planning of Chongming Eco-island on 13 April 2017 in English.

[13] Interview with a local planning expert on 9 July 2017 in Mandarin, translated by author.

on Chongming during the eco-development, which, as will be shown in Chapter Five, has a great contrast with the local views and circumstances.

4.4.2 The economy: from a boost of green economy to a trade-off for ecology

A key feature of ecological modernization is its claim to carry together economic and environmental imperatives for mutual benefits. Guided by EM, both Dongtan Eco-City and Chongming Eco-Island promise a self-sustaining economy based upon circular-economy and featured novel environmental technologies and green industries. The eager to develop local economy has been further encapsulated in the "Eco Plus" strategy introduced in 2016, highlighting the integration of ecology with green industries and science and technology to promote socio-economic development on Chongming (SCDRC, 2016; SMG, 2016b). These industries outlined in the Eco-Island plans are deemed as the key for boosting a green economy on Chongming.

To promote various green industries outlined in the Eco-Island plans (e.g. tourism and vacation, outdoor sports, modern office service etc.), eco-development on Chongming adopts traditional zoning methods: lands have been carved up and zoned into different functional areas, which has catalysed the completion of a series of construction projects. For instance, in Chenjia town – a key development area of Chongming Eco-Island – several "ecological villages" that aim for eco-tourism, organic farms, modern residences, villas, two golf courses with upmarket hotels, and a few office buildings have been built. Benefiting from the upgrading of tourist service facilities, the tourism industry on the Island has witnessed considerable growth. Along with the opening of the Shanghai Yangtze River Tunnel-Bridge in 2009, which directly connects the east of Chongming Island and central Shanghai, tourism revenue nearly quadrupled from 2008 to 2016, rising from 272.53 million to 1090 million RMB (Chongming Statistics Bureau, 2017). However, it is worth noting that tourism in

Chongming remains largely limited to the weekend and holiday season and has not yet evolved into a strong economic sector; tourism only contributes a small amount of the Island's revenue (approximately 3.5% in 2016) (Chongming Statistics Bureau, 2017).

Despite development of the tourism industry, the economic outcomes seem to be a far cry from the expectation as little progress has been shown in other proposed industries on the Island. Apart from the quickly-built real-estate projects and big blocks of residences to accommodate the relocated farmers whose homes were demolished to create space for the planned industries, the site proposed for the construction of the International Forum Business District remains largely as flat fields of vegetables and brownfields surrounded by newly-built modern residences (Figure 5). Moreover, as of mid-2018 only the office buildings of the Shanghai Wisdom Island Data Industrial Park have been completed (Figure 6) and the first phase of the Sport Training Base is still under construction, but building is taking place at a very slow pace.

Figure 5. Wide open field at the site planned for the International Forum Business District of Chenjia Eco-Town.

Source: the author (photo taken on 15 September 2018)

Figure 6. Newly-completed Shanghai Wisdom Island Data Industrial Park

Source: the author (photo taken on 15 September 2018).

Meanwhile, as shown from the research conducted by planners from the China Academy of Urban Planning and Design Shanghai Branch (CAUPD-SB), Chongming has been suffering from a severe hollowing out of industry after the large-scale removal of the TVEs in the late 1990's. An analysis of Chongming County's revenue composition in 2014 reveals that 85% of the County government's enterprise revenue comes from "registered enterprises" (enterprises who are registered in and paid taxes to Chongming, but are located outside of Chongming), with merely 15% of revenue from enterprises on the island (Ge and Zhang, 2016). In the meantime, Chongming has been relying heavily on transfer payments from Shanghai municipal government to maintain its fiscal balance and governmental operation, as the transfer payment income accounts for 60% of its governmental income in 2014 (Chongming Finance, 2015). Clearly the economy on the island remains stagnant.

One might argue that a sluggish local economy could arise because of the long distance from Chongming to central Shanghai, which discourages investors (Chang and Sheppard, 2013). However, interviews with local bureaucrats and planners provide further insights. According to a local planner:

"Before the opening of the Tunnel-Bridge, the inaccessibility of Chongming was obviously the major constraint for local development. However, the opening of the Tunnel-Bridge did not change the situation as it charges 50 RMB toll per trip. In my own opinion, it shows that the Shanghai government is still reluctant in developing Chongming. So, on the one hand, it did not vigorously promote industrial development; on the other hand, it provides substantial financial support for Chongming County to support the local development needs."[14]

A local government official further explained that:

"The reasons for the slow development are really complex. What was planned in the first place might be proved to be inappropriate for the Eco-Island. For example, the theme park area in Chenjia Town, which was proposed and reserved for Disneyland, was criticized for its adverse impacts on migratory birds and for its connected effects that could jeopardize the fragile environment on the Island. Meanwhile, the policy volatility of Chongming also discourages potential investors. The Dongtan project led by the Shanghai Industrial Investment

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[14] Interview with a local planner on 30 August 2017 in Mandarin, translated by author.

Company (SIIC) is a vivid example as its construction land has been again and again cut short by the government."[15]

These comments show that there seems to be a recognition of the inappropriateness of original plans that were poorly conceived with the local environmental context, and a sign of positive changes in planning that shift the previous prominent consideration over economic development towards ecological conservation. There is, though, an important note of causation. A shift for a more eco-centric development strategy is not being formulated for positive reasons so as to move towards new environmental relationships but rather for negative and passive ones because of uncertainty over future development and the changing political agenda from the national government. As a planner who is involved in drafting the plan explained:

"Over a decade's development of the Eco-Island, little economic progress has been made under the previous "Eco plus" strategy, whilst the construction activities have significantly changed the fabric and landscape of this rural island. As the local and municipal government is still struggling in identifying alternative development pathway that can improve the economy without sacrificing the nature, it is a cautious action to emphasize environmental protection in the current stage. Besides, it is in line with President Xi's new instruction of the development of the Yangtze River Economic Zone to "stick with protection and forbid large-scale development" (gong zhua da bao hu, bu gao da kai fa)."[16]

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[15] Interview with a local government official on 30 August 2017 in Mandarin, translated by the author.
[16] Interview with a local planning expert on 9 July 2017 in Mandarin, translated by the author.

Consequently, along with the progress of Chongming eco-development that increasingly emphasizes on environmental conservation and construction, economy is regarded as a trade-off or inevitable cost for ecological development. A local planner disclosed:

"Indeed, due to the increasingly rigid regulation on urban development and construction on Chongming, the economic level of Chongming remains relatively low in Shanghai. However, Shanghai government is rich enough to financially support Chongming [through transfer payment], so it does not require Chongming to develop its own economy. After all, building ecology is the mission of Chongming in the overall development strategy of shanghai."[17]

Nevertheless, although the standstill of economy of Chongming is widely recognized by planners and scholars, both the UNEP's evaluation report (UNEP, 2014) and Shanghai Municipal Government's Evaluation Opinion (SHDRC, 2013) praised the economic/industrial achievements of Chongming eco-development. According to the UNEP's report, Chongming has established an eco-industrial system dominated by organic green agriculture, environmental-friendly industries and ecological services, in which unique ecological advantages play an important role to brand Chongming. Although it also points out the challenge of a relatively low economic base of Chongming, the UNEP anticipates that Chongming Island can serve as a model of China's eco-civilization promotion, and as an excellent example of developing an ecological economy for the less developed regions of the world, particularly small islands. Meanwhile, the SHDRC's Evaluation Opinion (2013) also praises the progress made in

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[17] Interview with a local planning expert on 13 November 2017 in Mandarin, translated by the author.

adjusting the industrial structure and developing green industry on the island during eco-development (SHDRC, 2013). As stated in the Evaluation Opinion, Chongming eco-island has successfully developed efficient ecological agriculture and become the largest vegetable base in the Shanghai city. It is also noted that eco-tourism has been largely established on Chongming. Such positive narratives masked the local economic woes of Chongming.

4.4.3 The society – constructing an "urban" Eco-Island

Ecological modernization is at its weakest in addressing social issues (Gouldson and Murphy, 1996; Pepper, 1998). It is not surprising, therefore, to find that social issues and how they interact with the economy and environment have been amongst the most neglected in the development of Chongming Island. Being planned to be built from scratch on a large greenfield that was mainly reclaimed from the sea, Dongtan Eco-City would not directly involve local community and people that live on the island. Therefore, its considerations of fulfilling social sustainability were mainly targeting its future residents, namely domestic and international elites and the upper-middle class living in the central city of Shanghai (Chang and Sheppard, 2013; Den Hartog, 2017; Hald, 2009; Sigrist, 2009). Unlike the Dongtan eco-city, the larger scale Chongming Eco-Island plans covers the whole island of Chongming and thus directly links to the 700,000 residents on Chongming. Nevertheless, whilst at an abstract level the 'Master Plan (2005-2020)' of the eco-island purports to achieve a "beautiful environment, intensive usage of resource, and coordinated development of the economy and society" (SMG, 2006a), in practice there is a mismatch. Among the 22 key indicators raised in the Construction Outline, only two indicators are linked to a social dimension, namely "public satisfaction rate with the environment" and "per capita fiscal expenditure of social undertaking development" (SHDRC, 2010). These two are not even directly linked to

"social well-being" nor "social justice", which are the two key themes concerning social sustainability (Liu et al., 2017b).

Accordingly, in the official evaluation reports of Chongming Eco-Island development, social issues are very little considered. The SHDRC's Evaluation Opinion states that the construction of people's livelihood is one of the five major achievements of Eco-Island development from 2010-2012. Such assertion is based on the development progress of Chenjia New Town and Dongtan Eco-City (here it refers to the reduced scale of development on Dongtan, mainly about the SIIC's senior community project), the village ecological transformation demonstration project, the construction of rural road network, the science and educational, cultural, and ecological brand creation projects, as well as the improvement of medical and other public service systems (SHDRC, 2013). As can be seen, the official consideration over the social undertaking of Chongming eco-developments is mainly based on urban developments and infrastructure construction, whilst local people's livelihood and wellbeing are largely neglected.

Not unexpectedly, during the interviews, social issues were rarely brought up by policy-makers and planners. Local planners pointed out that the current planning system of Shanghai, which is based on an urban context, simultaneously excludes or even compromises the interests of rural community and residents during the development process:

"The current planning system of Shanghai is built up especially for urban development, and thus is not fit for the rural setting like Chongming. The initial Eco-Island plan's emphasis on the new town developments in Chenjia Town and Chengqiao Town and the concentrated inhabitation of villages reflects such urban

thinking. During this process, rural communities and people were not sufficiently considered."[18]

The challenges of a lack of concern over the local society and residents as well as the insufficient public participation during the policy-making and implementation process are also recognized by the UNEP report. Indeed, it pointed out that the long-established government-led model of development planning as well as the lack of knowledge and awareness among local residents on the island led to the weak social sustainability concerns of the current Chongming eco-island, and this would hinder the achievement of a win-win situation as outlined in the eco-island plan (UNEP, 2014). Nevertheless, despite the warning from the UNEP, few measures have been produced or taken in the following eco-Island plans. A planner's comment helps to illuminate the situation:

"For Shanghai, the value of Chongming is the ecology. The rural villages and the local people are much less concerned by Shanghai."[19]

4.5 Discussion: Planning features of Chongming eco-developments

Tracing its evolution and examining the official accounts of eco-development based on the governmental plan monitoring and self-evaluation unravel the unique features of the planning of eco-development on Chongming. These include: 1) a strong municipal state; 2) limited participation of local community; 3) a vague and constantly

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[18] Interview with a local planner on 9 June 2017 in Mandarin, translated by the author.
[19] Interview with a local planner on 9 June 2017 in Mandarin, translated by the author.

changing vision; and 4) an indicator-driven planning mechanism. Understanding these planning features helps to not only deepen our understanding of the formulation of policies and plans on Chongming over time (as discussed in section 4.3 and 4.4), but also sheds light on the on-the-ground practices of eco-development as will be further discussed in Chapter Five. This section elaborates each of these features in turn.

4.5.1 Strong municipal state

The first prominent feature of the planning of Chongming eco-development is the strong role played by the Shanghai municipal government. Due to the authoritarian and hierarchical nature of the Chinese state and the operation of local planning processes, the planning and development of Chongming Eco-Island practices a top-down manner. Nevertheless, it should be noted that, although Chongming remained as a county – a basic administrative unit in China with relatively independent financial and administrative rights comparing with an urban district – till 2016 before being transformed into a municipal district of Shanghai, in practice, it has little autonomy in formulating its own development plans.[20] Its planning has long been conducted directly by the Shanghai municipal government with local planners explained the governance of Shanghai:

> "The municipal government of Shanghai is a strong government. Although it practices a system of "three-level governments (which means municipal, district/county, and township governments) with two-level governance (which means

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[20] The biggest difference between the administration of a county and an urban district lies in the planning and construction rights. In China's administrative system, county retains relatively independent financial and administrative rights and thus has greater autonomy in planning and development. Whereas, municipal district, as being subordinated to the municipal government, is under the municipal government's direct governance (see Hu, 2017).

governance is conducted by municipality and district/county)",
in practice, it is almost like one-level governance as urban
planning and executive power are held by the municipal
government. Therefore, the administrative division adjustment
of Chongming from a county to a municipal district in 2016 has
caused limited changes as the planning and development of
Chongming has long been conducted by the municipal
government before the adjustment."[21]

"All municipal-level departments in Shanghai are very strong
and, for instance, the Shanghai Municipal Development and
Reform Commission (SHDRC) is very powerful. Normally the
county governments will draft their own Five-Year Plan.
However, in Shanghai, SHDRC draws up development plans for
each district and county. What the local district or county
governments need to do is just to follow."[22]

Indeed, as can be seen from the evolution of Chongming
eco-developments (section 4.2 and 4.3), nearly all key plans and policies of
Chongming Eco-Island are promulgated by the SMG, whilst the two
Chongming local plans – the Twelfth Five-Year Plan for National Economic
and Social Development of Chongming (2011-2015) (Chongming, 2011) and
the Thirteenth Five-Year Plan for National Economic and Social
Development of Chongming (2016-2020) (Chongming, 2016) – are noted to
largely follow or execute the municipality-drafted plans (i.e. the
'Construction Outline' and the 'Thirteenth Five-Year Plan of Chongming
World-Class Eco-Island Development') and eventually approved by the

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[21] Interview with a planning expert on 30 August 2017 in Mandarin, translated by the
author.
[22] Interview with a planning expert on 30 August 2017 in Mandarin, translated by
the author.

municipal government. Therefore, the planning and development of Chongming eco-developments are mainly driven by the Shanghai municipality's will and interests, which are also reflective of the changing political-economic context in the national level. As can be seen, the evolution of Chongming eco-development from the greening urbanization in the 2000's to the ecological construction in the 2010's are results of the Shanghai city's overall urban development strategies. The former is shaped by Shanghai's eagerness to develop its suburbs to release the pressure of the central area and to establish new economic growth poles that at the same time demonstrate the city's ecological and green efforts; and the latter is shaped by Shanghai's increasing desire to be green and eco (as shown in the quantifiable environmental indicators) and optimization of resource allocation that can generate maximum political and economic value (as it practices a strategic intra-city coordination of resources in which green lands created on Chongming are used to compensate the green lands lost in mainland Shanghai during urbanization). The transformation of development is accord with national political-economic climate.

Meanwhile, besides the decisive impact on local planning and development, Shanghai Municipal Government's mighty power is also shown in its strong executive capacity. A local planner further stressed:

"Shanghai's governance power might be the number one in China. Everything the government wants to do can be done. If the municipal government wants a development land, the land will be prepared shortly. The governmental management is very strong, and the power devolved to the district/county can be retrieved to the municipality in a short time. So, normally the

municipal government sets the rules, and the district/county government have to follow them very strictly."[23]

The strong governance and strict administration of Shanghai municipal government is demonstrated through the rigid enforcement and swift execution of policies and plans on Chongming Eco-Island. As a planning expert noted:

"In 2016, as the municipal government convened planners, experts and research institutes to reconsider the vision of Chongming Eco-Island, they sent drones to videotape the construction status of the Island. It is found that nearly all construction on the island complied with the eco-island plans." [24]

The powerful execution of plans and the strict regulation of developments ensure the effective implementation of the eco-island plans made by the municipal government. Nevertheless, due to the municipal state's disproportionate and overwhelming influence in local environmental interventions, the development of Chongming Eco-Island simultaneously excludes much of the local concern, and lack of actual participation of local actors.

4.5.2 Limited participation of local community

Within a system of authoritarian environmental governance (Tan-Mullins et al., 2017a; Tilt, 2007), grassroots voices are rarely listened to and are all too easily ignored. This is even evident in the Chongming

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[23] Interview with a planning expert on 30 August 2017 in Mandarin, translated by the author.
[24] Interview with a planning expert on 30 August 2017 in Mandarin, translated by the author.

Eco-Island development that is dominated by the municipal government in coordination with various governmental agencies, state-owned enterprises, and local scientific research institutions, and privileges domestic and international elites and the upper-middle class living in the central city of Shanghai (Chang and Sheppard, 2013; Den Hartog, 2017; Hald, 2009; Sigrist, 2009). Although public participation and social assessment were written into the policies and plans of the Eco-Island (e.g., SHDRC, 2010), they remain underdeveloped. During interviews, planners and bureaucrats admit that it was unclear to them as to how to effectively apply public participation in eco-development, especially in the policy-making and planning-design process. As one local planner explained:

> "In the current planning and governance system, it is very difficult and impractical to involve the masses in the planning process. Most of the local people are undereducated and only concerned with issues that are directly related to them. So normally they would be actively engaged in the preliminary stage when we are dissecting the local context and identifying the problems, but they would rarely participate in the decision-making process."[25]

A similar point of view has been raised by an academic researcher from a Shanghai-based research institute, who claimed:

> "Public participation is no doubt important. But local farmers are mostly undereducated and with little knowledge about

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[25] Interview with a local planning expert on 30 August 2017 in Mandarin, translated by the author.

urban development, so it is quite difficult for them to effectively

participate [in the policy-making process]."[26]

As can be seen, deemed as too poor, too uneducated and too concerned with the exigencies of making a meagre living to have concern about environmental problems and construction, local communities and users have enormous difficulties in finding a voice (Brogden and Greenberg, 2003) and participating in the decision-making process. As there are no specific or detailed measures proposed in the policy and plan to effectively involve the public, the impression here is that lurking behind the rhetoric of the Eco-Island planning and policy there is an attempt to reach social cohesion merely at the symbolic level.

Moreover, the almost complete absence of local-level civic participation means that local knowledge and perceptions in managing local environment have been largely excluded during the eco-development process. As shown in the planning principals and measures for Chongming Eco-Island, rural areas and their communities are being framed as a problem to be solved by urban professionals promoting an ecological modernization agenda. The value of local people and their environmental knowledge was marginalized. However, it is local communities, who often are both the most dependent upon and the most knowledgeable about the local environment and its resource. These are the very same people who have the greatest difficulty having their voice heard, and they have been largely left out of the Eco-Island planning and development. As will be further discussed in Chapter Five, this has made the approach to building an eco-island problematic as it accentuates local people's economic disadvantage and social injustice. Some local people have sought to rescale expertise and decision making to the Island so that their concerns could be more fully

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[26] Interview with an academic researcher from a Shanghai-based research institute on 13 April 2017 in Mandarin, translated by the author.

recognized. However, the authoritarian and hierarchical nature of the state and the operation of local planning processes have largely inhibited these efforts (but have been unable to halt the development of a counter narrative).

4.5.3 The vague and constantly changing vision

An analysis of the evolvement of the Chongming Eco-Island plans also reveals the changes in thinking and planning over time. Although abiding by the EM ideology and principle, the interpretation and vision for an Eco-Island is not static and fixed. The transformation of plans and developments of Chongming, whilst is influenced significantly by the nation's transforming development agendas, also reflects the constant exploration of the idea of "eco" and "eco-development" of policy-makers and planners. As noted by a number of governmental officials and planners, the volatile development of Chongming is due to the lack of a clear definition of the "eco-island". The following comment is illuminative:

> "There is no clear idea of what makes an eco-island, and there is no recognized good case that Chongming can look up to and learn from. To develop an 'Eco-Island' is unprecedented. Therefore, it is an exploring process and is full of uncertainty."[27]

On one hand, the lack of a clear vision of developing an "eco-island" on Chongming allows different interests and political agendas to partake in creating local eco-development plans. Due to the dominant role played by the Shanghai municipal government in the policy-making process, eco-developments on Chongming embody the city's pursuit for economic and ecological gains in different development phase. On the other hand, the inconclusive vision also propels policy-makers and planners to constantly

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[27] Interview with a local planner on 13 April 2019 in English.

review the effects and outcomes of Chongming Eco-Island development and to ruminate over its future development directions. Noted by Yu (2014), urban sustainable/ecological development is muddling through experiment with enormous uncertainties. As demonstrated by the case of Chongming Eco-Island, there are, to be certain, some hopeful signs emerging as planners, governmental officials, and developers are learning from the planning and implementation process. For instance, the initial "Three Concentrations" strategy proposed in the first master plan of Chongming Eco-Island has been widely criticized and has been abandoned in the current eco-island plans. A local planner shares her view:

> "To be frank, creating big new towns (the Chenjia Town and the Chengqiao Town) to concentrate development and population on Chongming is unrealistic and un-ecological. A 40-square kilometre new town (on Chenjia Town) will be simply too big to be filled up, and will be very difficult to attract industries and businesses. I also doubt there will be many people visiting the new town when they come to Chongming as the majority of tourists on Chongming are seeking natural sceneries and rural experiences. Meanwhile, we also need to consider whether demolishing farmers' houses and ghettoizing local people in modern high-rise condominium has any benefits to the socio-economic development and environmental protection on Chongming."[28]

A review of the previous development measures and a self-examination of the implementation effects informs policy-makers and planners in

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[28] Discussion with a local planner in the "International Symposium of Climate Change and Adapted Sustainable Planning and Development" held on 8th to 9th October 2015 in Cardiff.

adjusting the eco-development on Chongming. A local planner who participated in drafting the 'Construction Outline' in 2010 and was involved in producing the new 2018 Master Plan shares his view:

"As the government is now [in 2017] searching for a new vision for Chongming Eco-Island, it all seems to be back to the starting point. However, more than ten year's eco-development is by no means meaningless. It is true that the vision is still unclear at present, but it is surely clearer than before. Because in the past decade, people have seen what has been built on the island, and realize that certain adjustments and improvements should be made to construct a true eco-island."[29]

As most of the interviews with key informants and state actors of this research were conducted in late 2016 and 2017 when the municipal government of Shanghai was requesting new visions and proposals from local planning and research institutes and universities, interviewees were initiatively discussing their ideas on future Chongming Eco-Island with the researcher. Various visions have been brought up, including constructing a high-tech Eco-Island promoting mainly robot, artificial intelligence, big data and health care industries[30], and transforming Chongming into a national park with minimum inhabitants[31]. Nevertheless, whilst proposals vary and seem to be laudable, again, they are produced in a top-down manner with little consideration of the local context and the local community. The results, as will be seen in Chapter five, are often counteractive.

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[29] Interview with a local planner in English on 13 April 2017.
[30] Interview with a local planner in English on 13 April 2017.

[31] Interview with a local planner in Mandarin on 9 June 2017, translated by the author.

4.5.4 An indicator-driven planning mechanism

As discussed in the previous sections, the sign of a shifting ideology and approach of Chongming eco-development is the formal introduction of the first key performance indicators (KPIs) in the 'Construction Outline' (SHDRC, 2010). Since then, the will to green of Shanghai and Chongming is demonstrated by enumerating the goals and benchmarks in the following series of policies and plans. Scholars have widely acknowledged the quantitative logics and mechanisms of Chinese eco-developments. For instance, Hoffman (2009) argued that quantitative mechanisms and statistics play a significant part in framing governmental actions relating to the environment in contemporary China. Chien (2013: 139) observed that Chinese local leaders continue to "promote eco-cities not because of pressure from civil society but in order to meet the criteria stipulated by development indicators set by upper-level governments". Pow (2018) argued that complex urban environmental problems are often reduced to a set of measurable and politically neutral technical indicators, as shown in the Sino-Singapore Tianjin Eco-City. The increasingly demanding indicators of Chongming eco-development set by the SMG is another vivid manifestation of such logics and mechanisms, as a local cadre shared:

> "The most important thing of Eco-Island construction is to achieve the assigned indicators. Our works centre around the indicator system. Failure to accomplish the target means we are not doing things right, and our works are not qualified."[32]

As can be seen, indicators matter to local government and developers. For example, for the former the indicators serve as a key evaluation criterion for local cadres' performance, while for the latter they set

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[32] Interview with a Chongming local township cadre on 28 March 2018 in Mandarin, translated by the author.

boundaries to development and thus illustrate where environmental and economic issues interact. This echoes Hoffman's (2009) argument that numbers do not merely represent reality but help in part to construct reality through mechanisms of quantification and by creating the social fact of measurement and quantification. In the interviews with planners and officials involved in Chongming Eco-Island, KPIs have often been highlighted as major milestones achieved in the implementation of the plans and projects.

For officials who are keen to improve their political performance, meeting targets and KPIs set by upper-level governments is often a path for career advancement (Pow, 2018). Whilst local practitioners endeavour to meet their assigned targets, what is problematic is that the indicators tell little about their means of delivery but these may also be unsympathetic to local practices. As will be illustrated in the local environmental governance and implementation of eco-development projects in Chapter Five, indicators listed in the governmental plans are an important instrument to shape the environmental backdrop against which local, oppositional voices seek to be heard.

4.6   Conclusion

To understand the planning of Chongming eco-developments, this chapter dissects versions of key policies and plans of Chongming and analyses the official accounts of its development. By integrating a multi-scale analysis and being attentive to power dynamics, it reveals that its shaping and reshaping by the local state (here mainly the SMG) has changed with the political-economic dynamics of the regime. In the 2000's, the national policies of China featured a fervent urbanization with awakening environment awareness. Accordingly, Shanghai endeavoured to promote urban-rural integration through centralized development in the city's suburb, whilst advocating a green development pathway.

Consequently, the Dongtan Eco-City and the subsequent Chongming Eco-Island initiatives adopt ecological modernization, which advocates the reconcilement of economy and environment, as the guiding principle, and feature a pro-growth urbanization mode with green branding. As the country gradually shifts its policy focus from growth alone to sustainable development, and raises the construction of "ecological civilization" to a prominent national policy, the city of Shanghai adjusts its urban development strategy to practice a "negative growth", constraining the population size and construction scale of the city and promoting eco-friendly development. With the introduction of the first KPIs in 2010, Chongming Eco-Island has increasingly focused on environmental preservation and construction. As can be seen, eco-developments on Chongming have experienced a transformation from pro-growth greening urbanization in the 2000's to ecology-centric environmental construction in the 2010's.

To further understand how eco-development is interpreted by local governments and state actors, this chapter continues to examine the governmental plan monitoring and self-evaluation of the achievements and effects of the eco-development. It draws out key environmental, economic, and social debates and issues emerging from the eco-development process and investigates how policy-makers and planners respond to these issues. Firstly, the environmental measures adopted in the Chongming Eco-Island plan receive ample praise from planners, scholars, and policy-makers, who are proud of the environmental achievements of Chongming; as shown in the satisfying statistics of the indicators. Secondly, it is found that the ecological modernization's promise of boosting the local economy through green industries has not been fulfilled, and the growing emphasis on ecological goals and objectives gradually stall the economy of Chongming. Although interviewed planners and governmental officials all recognize and point out the standstill of economy on Chongming, official reports praise the economic progress of Chongming eco-development for its proposed

eco-industrial system. Thirdly, findings have shown that the state-led, ecological modernization-guided eco-development on Chongming has negligible concerns over local people's livelihood and wellbeing. Deemed as too poor, too uneducated and too concerned with own interests, local communities and users have been excluded from the decision-making process. Social issues and how they interact with the economy and environment have, therefore, been amongst the most neglected in official accounts on Chongming eco-development.

An analysis of the planning of Chongming identifies its four main features, namely: 1) a dominant role played by the Shanghai municipal state; 2) the exclusion of the locality; 3) a vague and constantly changing vision; and 4) an indicator-driven system. Firstly, the strong executive power and capacity of the Shanghai municipal state is demonstrated through the strict enforcement and swift execution of policies and plans. Secondly, a significant problem identified in the Chongming Eco-Island concerns an almost complete absence of local-level civic participation in policy-making and planning; the process is resolutely top-down. Thirdly, the development of Chongming has been plagued by the lack of a clear vision of what makes an "eco-island". Policy-makers and planners' constant explorations of the concept of "eco-island" results in the volatile eco-development policies, while at the same time, it creates substantial room for various interests to penetrate into the eco-development. Finally, guided by the ecological modernization principle, measures employed to construct the eco-island are led by explicit indicator systems. These features, as will be seen in the following chapters, have shaped the on-the-ground practices of Chongming eco-developments, and resulted in unintended and pernicious effects on the locality.

A thorough analysis of the policies and plans of Chongming eco-developments provide substantial insights on the shaping and reshaping of the eco-Chongming. Judging from the official narratives and accounts alone, eco-development on Chongming can be praised for its

increasing attention to environmental preservation and construction, especially comparing with the majority of new-town-style land speculation-oriented eco-city projects in China (Chien, 2013). Nevertheless, the official narratives only offer a partial view of the actual practices of eco-development, as little has been told about the means of delivery of the governmental polices and plans and the on-the-ground effects, especially concerning local ecology and community. Consequently, questions remain concerning the practices and effects of Chongming eco-development on the ground: how does the state utilize the planning measures to promote its ecological modernization perspective on eco-development? How have eco-development policies and plans materialized on the ground and with what effects? To address these questions, the following two chapters shift the lens from the state's deployment of policies and plans "from the above" downwards to examine the eco-development practices that materialize from these policies and plans (Chapter Five), and then further to the effects on the local environment and community "from the ground" (Chapter Six).

Chapter Five: Practices of Chongming Eco-Developments: Land and Water Governance

5.1 Introduction

Municipal state's comprehensive eco-policies and plans might be commendable and clearly demonstrate the ecological commitment of the government as well as the efforts that are being made to improve the local environment and society on Chongming. Nevertheless, they represent a top-down and techno-scientific approach and calculative governmental logic to environmental management. Most significantly, they tell little about their means of delivery. Therefore, to understand in what form eco-development takes on the ground requires an in-depth assessment of its actual practices. This chapter examines the on-the-ground implementation of Chongming eco-development, dissecting how top-down policy/plan enforcement meets with bottom-up local community's resistance/compliance, and how they together shape the local eco-development practice on Chongming.

From the data collection, two key themes in understanding and evaluating the practices of Chongming Eco-Island development, namely *land* and *water,* were initially identified. According to Smil (1993), an enquiry into the biospheric foundation of any modern society must start with a close examination of water and land resources. This is especially crucial on Chongming, as land and water have been, from the very outset, the essential components that shape current Chongming. As an alluvial island formed by deposits of the Yangtze River, Chongming is a large, flat, fertile wetland area with thousands of rivers and ditches, and many lakes and ponds. Examining the changing status of land and water on the Island can therefore shed light on the environmental governance of Chongming throughout its history, especially during the eco-development process.

Meanwhile, as a large agricultural rural settlement, land and water are of great significance for the construction of local living and culture. Indigenous people have for a long time relied on the relationship between land and water for growing food and have formed a strong connection with the local environment. Therefore, evaluating the effects of Eco-Island development on local understandings of land and water and their further impacts on the local economy and society is key to understanding human-nature relationships and how those have been affected by the recent eco-developments. In interpreting how land and water are managed, a third theme – the governance – emerged during the analysis. This covered the relationships between key actors (e.g. different levels of governments, state sectors, and local grassroots) and forms of policy delivery (e.g. masterplans, regulations, and detailed measures). Moreover, by placing this research on eco-developments on Chongming around land and water it echoes and enriches the continuing debates over "place" and "resource" in PE scholarship (see e.g. Bryant and Bailey, 1997; Hung and Sheu, 2010). Throughout the data collection and analysis phases of the work, these three themes, namely land, water and governance, are continually being reflected on and refined.

This chapter is organized to examine the ways in which local communities and external actors seek to manage and reshape land and water resources on Chongming. With an integrative perspective that combines both EM and PE, it not only examines how state actors shape local environmental governance through the trickle down of policies and plans, but also provides an historical account of the relationship between people and place and how that has shaped their environment. A longer-term narrative avoids the ahistoricism that can characterise case studies and also makes it analytically more straightforward to evaluate whether eco-development proposals for Chongming mark a break with previous environmental management strategies or are better understood as a continuation of longer-term development initiatives and their relationship

to the environment. Through the analysis, it is argued that place matters to people, that people's experiences of their environment on a day-to-day basis shape how they perceive resource and environmental changes, and that a political ecology approach is giving a voice to those who are marginalized in the policy-making process. Whilst local communities and some key actors are becoming increasingly aware of the tensions in seeking to promote eco-development on Chongming Island, influences from EM are likely to remain highly significant in official policy narratives.

This chapter is divided into four parts. Following the introduction, in sections two and three, the transformations in land and water governance and practices will be discussed, with specific emphasis on the human-nature relationships changes induced by the construction of Chongming eco-developments. Section four is the conclusion of this chapter.

5.2   Changing Land governance: emerging "ecological enclosure"

To fully appreciate the transforming land governance and changing human-land relationship on Chongming it is necessary to understand the nature of the environment. Today's Chongming Island covers a vast area of land – with a total area of 1,267 square kilometres, it is the third largest island in China. As the most remote and largely untouched territory, Chongming largely maintains its rural feature. The land is mainly used for agriculture, aquaculture, and since recently, urban infrastructure construction. Meanwhile, as an alluvial island, lands on Chongming are naturally growing due to the sedimentation effects. It also expands due to anthropogenic land-making activities – coastal reclamation. Therefore, land governance on Chongming throughout the history involves the management of coastal wetlands/lands and inland lands. This section starts with an examination of the land governance history of Chongming before investigates the land governance change due to the implementation of eco-development.

5.2.1 Land governance in the history

The island of Chongming is essentially a sand bar of the Yangtze River estuary. Over a thousand years, various sandbanks surfaced, developed and merged, and finally shaped the basic form of today's Chongming Island. As an estuary sandbank that is geographically isolated in the middle of the sea and opens to erosion by currents and tides, Chongming has an extremely unstable land base. As a consequence, land governance and management on Chongming were rather unique comparing with the mainland area. At first, people only came to the island (previously several sandbanks) for fishing and collecting firewood. Gradually, refugees and speculators tried to settle on the island by enclosing lands from the sea and by cultivating the land attained. For a long period of time, the reclamation and cultivation activities were undertaken spontaneously by individuals without any regulation or supervision from the authorities. Gradually, as there were more and more people vying to dike fields, local authority started regulating and controlling the exploitations – a licensing system was introduced that an official permit was required before any reclamation activities, accompanying by certain amount of charges.

As an alluvial island, most of the land on Chongming was transformed from grass flats to reed marshes, and eventually to fields that were fit for growing crops and for construction (Song, 2005). Considering the different status of the land and their varying productivity, the authority implemented different tax policies for different type of lands. For example, newly-emerged sand flats (locally known as Tu) were taxed a third of those mature crop fields, and lands covered with lush plantation (locally known as Dang) were taxed a half of those mature crop fields. Meanwhile, due to the unstable land base on Chongming that underwent constant collapse and siltation, a land administration order – *San Nian Yi Zhang, Tan Ze Chu Liang, Zhang Ze Bo Min, Liu Shui Wei Jie* ("三年一丈，坍则除粮，涨则拨民，流水为界") – was promulgated by the imperial court In the 12th year of Yuan Emperor Zhiyuan (1275). This decree stipulated four basic rules on

Chongming's land managements, namely 1) conducting land measurement every three years; 2) granting tax immunity to collapsed lands; 3) distributing newly-silted lands to local residents; and 4) defining land borders by flowing water. According to this order, emerging lands that were connected with existing shore lands would be allocated to local communities (called *Lipai* or *Jia*– the basic administrative unit) via draw-lots-method.[33] The local communities then rented or sold these lands to local residents and levied agriculture taxes. Meanwhile, those lands that rose in the middle of the water would firstly be measured and recorded by the local government officials before being handed over to Lipai for pricing and selling.

People attained lands firstly harvested grasses and reeds for sales to increase income, and gradually started to plant them in order to promote production as well as to boost the siltation process. After years of silt up, the soil became solid and the salt and alkali were gradually diluted. Dikes and dams were built and water was channelled into the hinterland. Farmers even organized their own forces to excavate numerous ditches (known as Min Gou [civilian ditches]) to bring river water into their fields. Gradually people grew cotton and grain on the island and agriculture has been gradually developed (Wei, 1983). As can be see, the formation of Chongming Island was a long and tortuous process, and land has been hard-won and precious on Chongming. Through the process and through agricultural activities, generations of Chongming people has formed an intimate relationship with their lands.

With the establishment of the PRC in 1949, a much more interventionist approach to the environment emerged (Shapiro, 2001). At first, during the Maoist period, embracing the state's call to wage a "war against the earth" to "turn the empty lands into an earthly paradise" through agriculture (Yeh,

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[33] The basic administrative unit of local community was called Lipai 里排, or Jia.

2009), massive reclamations were carried out along the coast to transform "wastelands" into arable farmlands. In December 1955, the first large-scale reclamation on Chongming in the middle of the northern area reclaimed 12,400 mu (about 826.67 ha) of land, more than twice of the size of the land reclaimed during 1917 to 1948 (around 400 ha).[34] Since 1958, Chongming (along with other nine counties that used to be under the jurisdiction of Jiangsu Province) has been re-assigned by the central government to be under the direct-control of Shanghai. This decision followed the policy guideline of "Agriculture Protecting the Centre" (*Nong Ye Bao Zhong Xin*) that aims to enlarge the suburban area of Shanghai to enable adequate food production for supporting the vast population in the city area. A massive reclamation programme was launched that targeted the seashore to extend the area of cultivated land as part of Shanghai government's determination to "transform the reed and grass marshes on Chongming into the city's food supply base" (Bian Chongming lutan, caotan wei chengshi fushipin gongying jidi) (Xu, 2013). For decades, large-scale and organized reclamations have long been the main development feature of Chongming.

Since the mid-1950s there have been regular and large-scale land reclamation activities (see Table 8 and Gong and Cui, 2011). These have enabled the building of two new towns (Xincun Town and Luhua Town) and the creation of eight state-owned farms on Chongming. Over more than six decades of reclamation, the area of Chongming has more than doubled, expanding from about 600 square kilometres in 1949 to around 1,267 square kilometres in 2018 (Figure 7).

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[34] From 1917 to 1948, there were 17 reclamations recorded on Chongming, and a total of 6000 mu (400ha) of lands have been attained (Chongming County Water Affairs Bureau, 1987).

Table 8. Reclamation activities on Chongming Islands (including Changxing and Hengsha Islands) from 1955 to 2010

Year	Size of reclamation (hectares)	No. of reclamations
1955 to 1984	40,837	55
1985 to 1995	10,411	16
1996 to 2010	12,961	14

Source: Chongming County Annual Compilation Committee (1989); Shanghai Agricultural Reclamation Records Compilation Committee (2004); and Gong and Cui (2011).

Figure 7. Reclamation on Chongming County/District since the 1950s.

Source: drew by the author based on Chongming County Chorography (Chongming County Annals Compilation Committee, 1989) and Shanghai Agricultural Reclamation Records (Shanghai Agricultural Reclamation Records Compilation Committee, 2004).

It is noteworthy after the founding of the PRC, China established socialist public ownership system that the land was owned by the state and the collectivity. Before the Reform and Opening-up, urban land in China practiced a single administrative allocation system that the state provided indefinite land use rights to land users for free, and the land use rights cannot be transferred between different land users. In the meantime, the rural areas practiced a land collective ownership system that lands were governed by the "three-level ownership, with the Production Team as the basic accounting unit" [35]. On Chongming, whilst major large-scale reclamation projects were launched and enacted by the city government of Shanghai, there were a number of reclamations initiated and conducted by the locality, including the county government, rural towns, villages and local communities. Therefore, those reclaimed lands had different property rights and land uses – lands reclaimed by municipal government and military army had transformed into municipal state-owned or military farms (by 1984, eight municipal state-owned farms and two military farms have been established), while on the lands reclaimed by rural collectivity, new towns and villages and various rural farms, as well as later many Township and Village Enterprises, had been built, (Figure 8). It is noted that since the mid-1980s, the high-quality rice, pigs, eggs, milk, citrus and other agricultural and sideline products produced on the reclaimed lands belonging to the local county, township and village (more than 400,000 mu - around 266.67 km²) accounted for more than half of the Chongming County's total output (Xu, 2013). Along with the reclamation, Chongming has developed its agricultural industry.

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[35] The people's communes established in 1958 generally have three levels: communes, production brigades (management areas), and production teams. The third-level ownership means that the production materials and products are owned by the commune, the production brigade and the production team respectively.
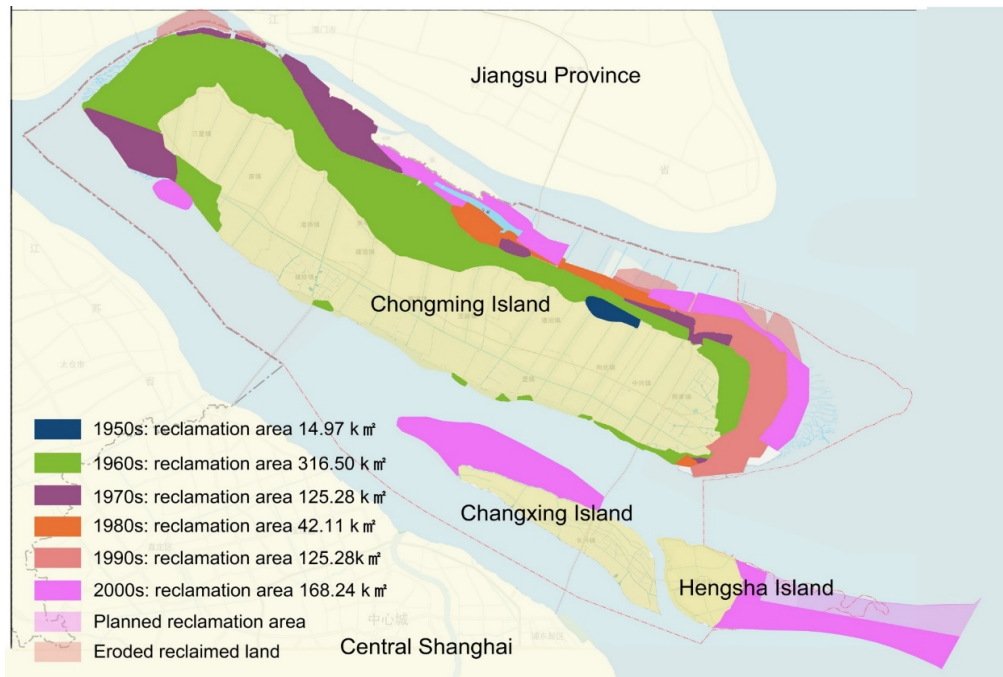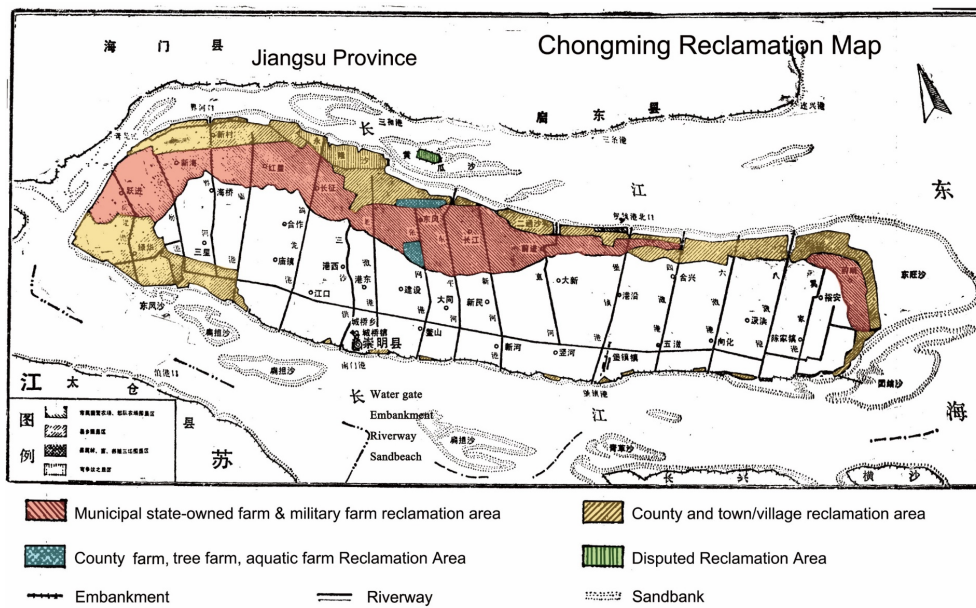
Figure 8. Reclaimed land on Chongming by 1984.

Source: drew by the author based on Chongming County Chorography (Chongming County Annals Compilation Committee, 1989).

As can be seen, during this period, although major large-scale reclamation activities were implemented under the municipal state's unified deployment and command,[36] the governance of reclaimed lands generally followed the principle of "who reclaims, who benefits" – a principle that was formally introduced in the "Regulation on the Management of Shanghai Tidal Flats", which was approved by the Standing Committee of the Municipal People's Congress in 1996. Also stated in the "Regulation" is that "the [Shanghai] City encourages and supports domestic and foreign investors to develop and utilize tidal flats, and who invests, who benefits." Therefore, the "who reclaims, who benefits" principle is argued to be initiated to encourage coastal reclamation and development (Zhang et al., 2015). According to this governance principle, lands reclaimed by

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[36] In 1960, the Shanghai Municipal Committee of the Communist Party of China set up the Reclamation Headquarters to organize and coordinate the reclamation activities in Shanghai.

Chongming county, towns or villages were managed by the locality (often the entity that initiates and conducts the reclamation); and lands reclaimed by municipal government or military were deployed to serve the city's or army's development needs. The establishment of the Yingdong Village is a vivid example of how lands were reclaimed and managed by local community. In 1985, the then leader of the production brigades of Chongming Seed Multiplication Farm – Lu Wenzhong – led six local farmers to conduct reclamation in the eastern end of Chongming. After several years' reclamation, 4,000 mu (around 2.67 square kilometres) land has been attained. People who have participated in the reclamation then settled down on the reclaimed land and established the Yingdong Village in 1989. Starting from freshwater aquaculture economy, Yingdong Village has gradually developed ecological tourism and agricultural industry. With a total of 76 households and 202 villagers, Yingdong Village has the highest collective assets among all villages on Chongming (around 22 million Yuan).[37]

5.2.2 The creation of "eco-enclaves" in eco-development

However, along with the launch of eco-development at the turn of the century, there have been significant changes of land governance in both the coastal and inland area of Chongming. In 2002, a reform of the development and management of coastal area has been launched by the Shanghai municipal government. The new governance system authorized the Shanghai Land Group (SLG) – a municipal state-owned enterprise – and Shanghai Municipal Land Reserve Centre (SHLRC) – an affiliated institution of the land and resources management department of Shanghai – to conduct unified development and management of all tidal flats throughout the city area (Zhang et al., 2015). Since then, the municipal government of

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[37] See http://ld.eastday.com/l/20090528/u1a579676.html (accessed on 30 May 2018).

Shanghai has gradually taken over the governance of the city's coastal lands. In 2009, SMG further issued the "Implementation Opinions on Improving the Management Operation Mechanism to Promote the Reclamation Works in Shanghai" to clarify the responsibility of SLG (and SHLRC) in developing and managing the tidal flats resources in the city. Other units or entities that attempt to conduct reclamation need to attain a permit from the municipal government before carrying out any construction works. With such increasingly tightening control over coastal tidal flats and wetlands by the municipality, Chongming local authority is left with responsibilities of routine supervision.[38]

As Eco-Island development progresses on Chongming, and as coastal wetlands are now under a unified control from the city of Shanghai, arguably we can expect a more environmentally minded management of Chongming coastal wetlands considering their tremendous and significant ecological values. Nevertheless, it seems that the grand plan of building Chongming into an Eco-Island has failed to curb the exploitation of local ecological and land resources. Reclamation continues on coastal Chongming with a variety of justifications, such as, for establishing reservoirs, for constructing or strengthening embankments, and for reserving future development land. Even worse, it is found that reclamation has continued within the designated natural reserve (see the case of Dongtan below). Perhaps the only significant difference to previous rounds of reclamation is that these lands are now under the direct management of the municipal government and may be turned into agricultural landholdings to compensate for the farmland loss in the central city area, or developed into various industries, or even simply left idle. Consequently, a number of "ecological enclaves" have been created on Chongming. Whilst they

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[38] Interview with an official from Shanghai Chongming Water Authority on 28 March 2018 in Mandarin, translated by the author.

undermine the interests of local economy and society, these "ecological enclaves" also pose a threat on local environmental integrity and could destroy the long-established human-nature relationship on Chongming. Here, I explicitly analyse two cases, namely the Dongtan Area and the North Lake Area to explore in greater depth the development pressures and their ecological and social consequences.

The Case of Dongtan Area

Dongtan, the eastern tip of Chongming Island, has a vast wetland with abundant benthic and vegetation resources. Situating on the East Asian-Australasian Flyway, it is an important resting place and habitat for migratory birds and a wintering ground for waterfowl – 312 species of birds have been recorded in Dongtan. The importance of the area has been recognized and its status has been successively upgraded over time (see Table 9).

Table 9. Designations of Chongming Dongtan Nature Reserve

Year	Designation
1992	In the "China Biodiversity Conservation Action Plan" promulgated by the State Council, Chongming Dongtan was listed as an A2 level wetland ecosystem with international significance.
1998	Shanghai municipal government officially approved the establishment of "Shanghai Chongming Dongtan Bird Nature Reserve".
1999	Chongming Dongtan Nature Reserve was officially listed as the East Asian–Australasian Flyway network site.

2001   Chongming Dongtan Nature Reserve was upgraded to a national nature reserve by the State Council.

2002   Chongming Dongtan Nature Reserve and the adjacent 84 square kilometres of constructed wetland were listed as a Ramsar Site

Source: compiled by the author based on the official website of the Shanghai Chongming Dongtan National Nature Reserve.

However, records show that even during the period of increased protection – from the late 1990s to the early 2000s - several major reclamation projects were carried out in the Dongtan area: in 1998, a total area of 67 square kilometres of land was reclaimed; in 1999, 22 square kilometres were added; and in the winter of 2001, another round of reclamation of 6 square kilometres was enforced in the core area and buffer zone of the Dongtan Nature Reserve (Figure 9) (Zhao, 2002; Xie et al., 2004). The original border of the Dongtan Nature Reserve has undergone several changes. In the meantime, due to the slow siltation of the tidal flats, reclaimed wetlands could not properly regenerate and function. Consequently, the migratory birds were suffering from habitat loss and reeds and other wetland plants and creatures were gradually dying out (Ma, 2010; Song, 2005; Xie et al., 2004). According to a survey, the population of the migratory Little Swan, a national second-class protected bird, has dramatically decreased from 3,000-3,500 in the early 1990s to 51 by the winter of 2000 (Zhao, 2002). Ironically, as the researcher probed into the intentions behind these reclamation activities, one of the justifications given was to treat the invasive plant - Spartina Alterniflora in the Reserve

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Area[39], which was firstly introduced on Chongming in the mid-1990s to speed up the siltation process to facilitate reclamation and embankment consolidation (Chen, 2004).

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[39] Interviews with a wetland ecology scholar based on Chongming and an official from Shanghai Chongming Water Authority in March and June 2018.

Figure 9. Transformation of Dongtan area from 1997 to 2006 to 2016.

Source: compiled by the author based on Google Earth historical image.

Except the core area of the Dongtan Nature Reserve that is managed by the Shanghai Green and Urban Appearance Bureau, vast stretches of farmland on Dongtan as well as the majority of the newly reclaimed land (in total 85 square kilometres) were passed to the Shanghai Industrial Investment Corporation (SIIC), a municipality-owned property developer. In 2005, SIIC launched the Dongtan Eco-City project, which was then confirmed to be indefinitely suspended in 2008. Among a complicated set of reasons for the halt of the project is argued to be the state's increasingly strict regulation over the cultivated land (Pow and Neo, 2013), as the 85 square kilometres of land possessed by SIIC are all classified as agricultural land to be preserved. Consequently, the former resource-rich wetland and now a greenfield site, is largely idle, except for the 6.5 square kilometre Dongtan Wetland Park (where an artificial wetland has been created as a paid-access visitor attraction) and a recently completed 1.67 square kilometre luxurious senior housing complexes – SIIC Rui Ci Garden (which remains largely vacant). The Dongtan case illustrates how land reclaimed from wetlands under the municipal guidance, at some ecological and social

cost for the local community, can end up, at least in the short-term being idle or inefficiently used.

The case of Beihu Lake Area

Similarly, another case illustrates how land management on Chongming is subject to constant revision to meet policy demands from external actors and how ecological construction instead of improving the environmental quality, brings damage to the natural ecology. In northern Chongming, the North Lake (Beihu) Area became the subject of development in 2002 with the claimed purposes of water conservation, comprehensive land construction, and eco-tourism development.[40] As mentioned earlier, the governance reform of Shanghai tidal flat in 2002 has converged the coastal land development rights to the municipal state actors (i.e. the SLG and SHLRC). The first project initiated by SLG, via a subordinate company – the Shanghai Tidal Land Requisition Company (STLRC) (*tantu zaodi gongsi*), was the reclamation the North Lake in 2003. The reclamation covered a total area of 30 square kilometres (including a water surface area of 17.6 square kilometres), which is owned by the SLG (Huang et al, 2005). After the reclamation, the North Lake Area became the largest artificial lake of Shanghai. In the "Master Plan of Chongming Three Islands (2005-2020)" issued in 2006 (SMG, 2006a), the North Lake Area was designated as one of the four main tourism and leisure spaces of Chongming (another three were Mingzhu Lake in southwestern Chongming, Dongtan Area, and the Hengsha Island) (SMG, 2018). Nevertheless, 15 years after it was reclaimed, there still appears no clear development or protection plan for the North Lake Area.

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[40] See:
https://baike.baidu.com/reference/5478930/92f5oqPaY89vlwwSRgIk2WdPI7DT22suPc1GA_fWksyYED-Cirfp3ASnzSglVNBA8AlnPo9wnuc69losXoa_8ism7MALhl-qz7ZlfgslCs_FYEw (accessed on 1 May 2019).

For a decade, due to the lack of specific development plans, the North Lake Area has escaped large-scale human interventions. Gradually, a unique natural ecology has formed. Since its water body was directly connected to the East China Sea, the North Lake can be either a freshwater lake or a saltwater lake. It thus harboured a plenty of fish and benthic creatures, and it was an important habitat for migrating and wintering birds. Moreover, there were endangered animals such as black-faced spoonbills and black-billed gulls, protected animal such as red throated diver, golden plover, and Limicola falcinellus, as well as rare birds such osprey and Peregrine Falcon, inhabited in the North Lake Area. Local residents and bird lovers recalled the natural ecology and landscape of the North Lake Area:

"I used to go to the North Lake to take a walk or for fishing and catching crabs. The environment was very good there, with large reed marshes and many birds. There were many people coming just for watching birds and taking photographs."[41]

"The North Lake was one of the main bird-watching bases in Chongming. You can always find a variety of wild ducks there. During winter time, flocks of migratory birds were wintering or migrating in the North Lake. With luck, you could see some rare birds."[42]

However, massive construction works in the North Lake Area were documented in 2015 by an official of the Dongtan Nature Reserve during a monitoring survey of 1% water bird species on Chongming for the Eco-Island development assessment. The construction works mainly

[41] Interview with a local resident on 12 September 2018 in Mandarin, translated by the author.
[42] Online interview with a bird lover from Shanghai on 20 March 2019 in Mandarin, translated by the author.

involved cutting reeds and grasses and levelling the land. It is noted that these land preparation projects were pre-works for the subsequent large-scale afforestation project in the North Lake Area (Wu, W, 2015). Considering the massive tree planting throughout Chongming to create green lands for the city of Shanghai since 2010, it is evident that the aggressive ecological construction movement has arrived the North Lake. Due to the fierce intervention, the North Lake Area experienced dramatic habitat changes. In the construction area, there were no waterfowl can be observed and only 20 herons were recorded in the remote remained tidal area. Meanwhile, the water level in the North Lake was continuing to decline, and the water area has been greatly reduced: a large area on the west side of the North Lake has dried up (Wu, W, 2015b). This has led to a significant decrease of the species and amount of water birds during the investigation: Pochard, which in previous years has a large population in the North Lake Area, was not found in the 2015's survey. As can be seen, the interventions for ecological development in the North Lake caused significant destruction on the natural ecology and landscape, and the fauna and flora living on it.

In 2017, the deputy of the Municipal People's Congress, Wu Deping, pointed out that due to the lack of professional management, the North Lake had become a "wild lake" with deteriorating environment and potential security hazards (Wu, 2017). The use of the phrase "wild lake" is revealing as it shows that lakes, like other water areas, are to be managed in a manner that emphasises their aesthetic rather than their biodiverse value.

On a field trip to the North Lake in March 2018, a metal gate and a fence that is miles long blocked me from entry to the site (Figure 10). The notice attached to the gate says, "*The Chongming North Lake area is a legally owned property of Shanghai Tidal Land Requisition Company. It is strictly forbidden for any individual or unit to enter without the permission of the compan*y". The signing date is February 7, 2017. As the "legally owned

property" of STLRC, North Lake Area is now a forbidden zone for Chongming people and bird lovers, and an "enclave" that falls outside of Chongming's planning and administration. Since the North Lake reclamation project, STLRC has reclaimed a total of 182 square kilometres land on the three islands of Chongming County/District (Wu, 2017). Being directly managed by the municipal government, those reclaimed lands have no correlation to the local people, and the Chongming government is also left to provide help with routine supervision.[43]

Figure 10. The metal gate at the entrance of Chongming North Lake.

Sources: the author (photo taken on 29 March 2018).

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[43] A follow-up on-line interview with an official from Shanghai Chongming Water Authority on June 2018 in Mandarin, translated by the author.

5.2.3 Land acquisition and land transfer for eco-development

Besides transferring the rights of developing and managing coastal lands on Chongming to the municipality of Shanghai, Eco-Island planning and development rather than curbing development seem to have also triggered a substantial reshuffle of the land ownership and use rights on Chongming. A series of opportunistic developments, not only real estate and tourism industries, but also agriculture and forestry, has been widely carried out on Chongming. These development projects are transforming the human-land relationship on the Island by dramatically changing local landscapes and local lives. These are mainly done by two major ways: land acquisition and land transfer.

In China, generally speaking, the state owns urban land and rural collectives own agricultural land and contract it to farmers for use with a 30-year duration. Land acquisition (*tudi zhengyong*) is an activity dominated by the government transferring the land ownership from collective owned (rural land) to state owned (urban development land), but this must be for the "public interest" [44] and farmers would get "appropriate compensation."[45] Land transfer refers to transferring the land use right to a third party that allows a contractor of the right to possess, utilize or obtain profits from agricultural land.[46] However, the land use rights based on agricultural household contracts cannot be changed arbitrarily for non-agricultural purposes,[47] and thus requires state's approval. In China, land acquisition is the primary means used by governments to meet increasing land demand driven by rapid economic and urban growth (Ding,

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[44] 1998 Land Management Law, Article 2.

[45] 2002 Law on Land Contract in Rural Areas, Article 16.

[46] 2007 The property Law of the People's Republic of China, Article 125.

[47] 2007 The property Law of the People's Republic of China, Article 128

2007), and land transfer has been seen as the prerequisite for the development of modern agriculture or scaled-up agriculture (Ye, 2015). Nevertheless, as shown in the case of Chongming eco-development, massive land acquisition and land transfer are mobilized by the local government to create lands for addressing the new eco-development needs, including infrastructure construction and tree plantation. The extensive land ownership and management changes have significantly transformed the long-term human-land relationship on Chongming by dramatically changing local landscape and local lives.

Land acquisition during eco-developments

Chongming has been a traditional agricultural island with swathes of farmland and village houses lined up or dotted between rice fields. Through agriculture, Chongming people have an intimate relationship to the land. On their homesteads, local people build up their homes with distinct local features: country cottages with sloping roof that often in various shades of red lining along a ditch, and each is completing with a front courtyard and a back garden, wherein residents grew various vegetables and fruits (Figure 11). However, many indigenous people's traditional rural livings have ended when their lands were expropriated by the government for eco-developments.

Figure 11. Aerial photography of Hongqiao Village on Chongming

Source: author (photo taken on 30 March 2018).

Initially, featuring a greening urbanization development mode with EM and "Three Concentrations" as the guiding principles (see Chapter Four), Chongming's eco-development involve large-scale urban construction that spawn huge demand for development lands. To create spaces for new development, besides reclaiming new lands from the sea (see above Section 5.2.2), a great quantity of the collective-owned rural land on Chongming has been converted into the state-owned constructing land by way of expropriation. Accompany with the land ownership change is the transformation of farmers into urbanites. The sheer scale of land acquisition thus can be seen from the increasing urbanization level on Chongming: the urbanization rate on Chongming has risen from 21.2% in 2005 to 41.7% in 2016 (Chongming Statistical Society, 2017), and is planned in the eco-development policies to reach 70% by 2020 (SHDRC, 2010) and 80% by 2035 (SMG, 2018).

Academic research has long debated the socio-economic consequence of land acquisition in China, especially concerning the increasing social tension and injustice that may impose a long-term threat to stability and sustainable development (see Ding, 2007). Chongming is no exception. Even worse, land acquisition on Chongming involves transforming high quality rural lands into urban construction lands that has far less ecological value, and thus may result in the degradation of local environment. Land acquisition and the relocation of local farmers in the early stage of Chongming eco-developments (in the 2000s) has been studied in detail by I-Chun Catherine Chang (Chang, 2019). Her ethnographic research with six households in Chenjia Town area on Chongming reveals the swift and brutal relocation on the project site of Dongtan eco-city and the nearby Chenjia Town areas as part of the Chongming Eco-Island project. It is showed that in the inception of the Dongtan eco-city project in 2005, local habitants were only given a sudden notice to move out from their rural houses within a year to make room for the eco-city and eco-island development. Although a compensation package that includes moving the family first into a rental unit, and then back into a newly built apartment has been given to displaced farmers, without any knowledge of the eco-city and eco-island projects, and discontented with the governmental relocation and compensation scheme, local residents firstly resisted the order by reporting their grievances to the Shanghai municipal government. However, such attempt was abruptly dismissed by the Shanghai government by the excuse of the significance of building the very first eco-city around the world and the eco-island on Chongming. As quoted by Chang (2019: 160), disaffected local residents were exhorted by governmental officials that *"you [the villagers] don't understand the benefits of becoming part of the eco-city. We (the officials) can arrange some hearings and have our planners explain the projects to you. But in the future, you will understand why we do it anyway."* Furthermore, dispossessed farmers' later quest for public's attention and support was also turned down by the local news media. Instead of voicing

residents' concerns, local journalists tried to "educate" local residents about the legitimacy and rightness of the eco-development on Chongming and how they should appreciate "the exciting sustainable upgrade for their outdated villages" (Chang, 2019: 170). Such superior narratives referred by the governmental officials and local journalists show how external actors perceive eco-development on Chongming that depreciate those who live on the island and experience the environmental changes. Considering the disproportionate power in discourse and politics between state actors and urban elites, and local non-state actors, eco-development simultaneously neglect or even compromise the interests of the local community.

Without any effective resistance, many villages were soon demolished, and villagers were relocated. Although the relocation would be monetarily compensated (often based on the market value and the size of the demolished house, the household's share in collectively owned farms and ponds, the number of agricultural farmers registered in the household, and the estimated time between relocation to resettlement), it was mainly one-off and it is noted the compensation fee can only merely cover the cost of a new apartment (Sze, 2015). Whilst a small group of relocated farmers benefited from the land acquisition by opportunistically exploiting the relocation process and compensation scheme (see Chang, 2019), the majority of affected peasants became dispossessed victims facing livelihood difficulties (see more details of the social-economic dilemma of local dispossessed farmers in Chapter Six). Meanwhile, the environmental consequences also cannot be ignored. Rehousing of villagers takes them from their local environment with a consequent loss of their land management knowledge and practices, which will reduce the availability of an alternative expertise to challenge external, professional notions of a good environment so hastening further change.

Although recent years' policies and plans of Chongming eco-development witnessed a weakening emphasis on urban development (as discussed in Chapter Four), land acquisition continues on Chongming

and villages are demolished for meeting new development needs (mainly for the development of eco-industries). This is evidenced from a field investigation in September 2018, as I came across a demolition site where a whole row of village houses along the Jianshe road in the Jianshe Town on Chongming was razed to the ground (Figure 12). On-site inquiry with local people reveals that the demolition is part of the modification and extension project of the 8.1km long Jianshe Road, which is a part of a grand development plan preparing for the 10th China Flower Expo to be held in 2021 on Chongming. The site planned for hosting the Flower Expo is in the Dongping National Forest Park and its surrounding areas in the north-central part of Chongming Island, covering a total area of 10 square kilometres. Besides the Jianshe Road, the Beiyan Road, which was praised by local residents and tourists as the most beautiful road on Chongming,[48] is also planned to be broadened from current two lanes to four lanes. Considering the substantial demand for the construction land, rural villages on Chongming are continuously at stake.

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[48] Interview with local residents and tourists from 2016 to 2018.

Figure 12. Demolished village houses along the Jianshe Road

Source: the author (photo taken on 13 September 2018).

Land transfer for massive afforestation

Besides transforming rural lands into urban construction lands through government-led land acquisition, eco-developments on Chongming also induce extensive land transfer activities. As briefly mentioned above, rural land is "collectively" owned in China but may be leased to peasants on 30-year contracts (this round of land contracting started in 1998 and will end in 2028).[49] In October 2008, at the key meeting of the Third Plenary

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[49] On August 27, 1997, "the Notice of the General Office of the Central Committee of the Communist Party of China and the General Office of the State Council on Further Stabilizing and Improving the Contractual Relationship of Rural Lands" was issued and stated that the land contract period will be extended for another 30 years before the first round of land contracting is about to expire, which means a new round of land contracting starts from 1998 and will end in 2028.

Session of the Seventeenth Central Committee, China's leaders formally recognised the practice of land transfers (tudi liuzhuan). This meant that land remaining nominally under collective village ownership, and under contract to peasant households, could be 'transferred' (leased out) to third parties (Hayward, 2018). These measures in effect divided the dual land rights of the household responsibility system into three—ownership, contract, and management rights—a system which has come to be known as the "separation of three rights" (san quan fen zhi). It is argued that this shrewd innovation seeks to consolidate scattered rural household land plots in the hands of a smaller number of farming entities (e.g. large farm household or agribusinesses) for developing modern agriculture, or scaled-up agriculture (Hayward, 2018; Ye, 2015). Whilst such case can also be found on Chongming, land transfer on Chongming nevertheless shows some distinct twists due to its eco-development context: besides for agricultural development, the majority of transferred lands on Chongming is utilized for the ecological construction, such as the afforestation project or landscape building under the eco-development scheme.

According to a report produced by the deputy director of Chongming Statistics Bureau, by the end of 2014, 359,000 mu (around 239.33 km²) out of the total 547,000 mu (364.67 km²) contracted area of agricultural land on Chongming has been transferred (Song, 2016). It is noted that there are three major transfer approaches, namely subcontracting, leasing, and expropriation for ecological forest construction (ibid.). Among various functions (e.g. grain plantation, vegetable and fruit plantation, aquaculture, etc.), utilizing for ecological forest construction accounts for 37% of the total transferred land. Such phenomenon is rather unique as most of the land transfer in China is for land concentration operation so as to develop modern agriculture or simply to implement upper-level government's agricultural policies (see Gong and Zhang, 2017). However, it shows the significant impacts of eco-developments on local land management on Chongming.

As discussed in Chapter four, eco-development on Chongming progresses with an increasing emphasis on ecological construction that highlights environmental regulation and the building up of environmental assets (i.e. increased tree cover). As local cadres' performances are now evaluated by their achievements in realizing quantifiable environmental indicators such as the forest coverage rate, they crave for lands for planting trees to meet their assigned targets. This thus has caused large-scale land transfer on Chongming. As outlined in the Eco-Island plan, the coverage rate of forest is expected to reach 30% by 2020 (SMG, 2016b). Accordingly, a total area of 70,000 mu (around 46.67 km²) forest should be added on Chongming during the Thirteenth Five-Year Plan. To achieve this target, a series of measures and projects have been enforced on the island. One of which is the "ecological corridor" construction project that has been initiated and implemented by Chongming government since the early 2015.[50] Guided by the principle to "stress the landscape effect while taking into account the criteria of forest land", the key strategy of the "ecological corridor" project is called "one town, one tree species" (yi zhen yi shu zhong), which means each township government plant a different tree species in their respective jurisdiction. The specific tree species is chosen randomly from the list provided by the Chongming government.[51] Consequently, there are more than 20 species of trees planted separately in each town of Chongming, including imported varieties such as Quercus

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[50] Governmental documents include "Guiding Opinions on the Construction of Ecological Corridor Projects in Chongming District in 2017", "Construction Opinions of Ecological Corridor Construction in Chongming District" and "Technical Regulations of Ecological Corridor Construction in Chongming District", and the "Implementation Management Measures for Ecological Corridor Construction Project in Chongming District (2016-2018)".

[51] Interview with a local planner on 30 August 2017 in Mandarin, translated by the author.

rubra, and Acer rubrum.[52] As of June 2017, a total area of 20,443 mu (around 13.63 km²) ecological landscape corridors has been built across Chongming. In 2018, the forest area of the whole Chongming District has exceeded 440,000 mu (around 293.33 km²). Among them, more than half (about 239,000 mu) is transferred from local farmers' contracted land. This involves 18 townships and more than 230 administrative villages on Chongming. Such extensive and swift land transfer owes to the substantial intervention from the local governments.

Land transfer in China is known to take place predominantly through administrative procedures rather than market processes (Vendryes, 2010). Nevertheless, scholars have raised concerns over the farmers' rights during the land transfer process considering the power of the capital and the strategic local authorities driven by their political or economic interests (Gong and Zhang, 2017; Hayward, 2018; Vendryes, 2010). Studies have reported the coercive tactics which may be used to get unwilling villagers to transfer their land (see Gong and Zhang 2017). Meanwhile, it is argued that local authorities' manipulation of the institution of collective property may resulted in the exploitation of peasants' land entitlements (Hayward, 2018). These issues also occur in Chongming.

As elsewhere in China, land transfer in Chongming is seldom conducted individually, but is often carried out collectively with the village committee as the intermediary agent between farmers and contractors (or even township governments). A local government news has implied that village cadres have made substantial efforts to get villagers to agree on the land

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[52] For instance, plum blossom is planted in ecological corridors in Dongping Town, mangnolia for Shuxin Town, begonia for Sanxing Town, albizia flower for Gangxi Town, maple tree for Miaozhen, ginkgo tree for Bu Zhen, and zelkova tree for Chengqiao Town.

transfer schemes.[53] Interviews with local cadres and farmers reveal details of the land transfer process. Firstly, the Chongming County/District government assigned afforestation target to each township and village (it also set up certain areas designated for forest lands or ecological corridor construction sites, which also serve as demonstration area for the Shanghai government inspection team). Township and village governments then consolidated farmland by persuading or pushing peasant households to lease their land to village committee or, less often, directly to large-scale private contractors who undertake local government's afforestation projects (who, as indicated by some farmers, have close relationships ("guan xi") with local cadres). Agreeing on the transfer of lands, households would receive for each mu of leased out land around 1140 yuan of rent.[54] This might include the special subsidies from the Chongming Agricultural Committee for forest lands (210 yuan/mu per year). Many farmers expressed that they voluntarily forgo the land as the rental fee paid to them came close to or even more than they would make by working the land themselves, and those households who faced a labour shortage (as young people has moved to the city for wage works) were especially willing to lease out their land.[55] Therefore, overall there was not any significant resistance from rural households to the local state-brokered land transfers.

Nevertheless, interviews with local farmers also found that, to some extent, land transfer on Chongming involves means of coercion: those who initially had been unwilling to lease out their fields were pressured or even compelled to comply eventually—not through any physical coercion by local

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[53] See: https://baijiahao.baidu.com/s?id=1622042487485262301&wfr=spider&for=pc, (accessed on 2 May 2019).

[54] Interview with local residents in 2018. Noted here is that rent of transferred land in different villagers is slightly different.

[55] Interviews with local residents in 2018.

officials but through pressure or compulsion by practical circumstances. One main issue is the difficulty to maintain tradition farming due to the alteration of irrigation system. The highly fragmented distribution of landholdings in rural China means that a household's small plots of land are typically interspersed among those of other households, and irrigation of all these plots must be coordinated. Once the surrounding plots were scheduled to be leased to large-scale managers doing tree planting, to continue traditional cropping on one's own plots became practically impossible, since the previous irrigation system will no longer operate to meet the needs of the small stand-alone crop fields (similar circumstance has been studied in Gong and Zhang (2017) in a county in Hunan Province in China). Local farmers were admonished by village cadres about such issue, as a farmer elaborate:

> "At first, we do not want to transfer our lands because we want to grow our own grains. My son and daughter in law have decent jobs in Shanghai, so frankly we do not rely on farming for living. But village cadres later came and talked to us, explaining that transferring our lands is for the good of the village and for the eco-island. They also explained the difficulties to operate our isolated lands after other villagers have transferred their lands, like there will be no irrigation, and it would be difficult to access our land after the surrounding lands have been planted with trees. So, at the end, we agreed to lease out our lands."[56]

It is easy to understand why local cadres actively broker land transfers for tree plantation, as the fulfilment of tree planting targets accounts for a significant part of their performance evaluations, and they would also

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[56] Interview with an indigenous resident on 19 June 2017 in Mandarin, translated by the author.

receive financial bonuses from the county/district or municipal governments for satisfactory implementation. However, local farmers also pointed out the alliances between village cadres and private contractors in reaping benefits from the afforestation project of eco-development on Chongming.[57] Deals are often made by corporations/contractors in league with local governments, bypassing village participation and sometimes against the wishes of householders. Nearly all farmers interviewed stated that they have no idea of who are the final contractors of their lands as they only interact with the village cadres throughout the whole land transfer process. Consequently, large stretches of lands on Chongming have been transferring from farmers' hand to become corporations and governments' property, and from various traditional agricultural uses (including cropping, vegetables and fruits growing, and fishing) to unitary tree planting.

Whilst the detachment of local peasants from their lands significantly changes the traditional human-land relationship and causes social-economic destructions on Chongming (which will be further discussed in Chapter six), it also resulted in unintended and pernicious ecological and environmental effects. First of all, the massive land transfer for meeting the tree plantation target of the eco-island construction inevitably occupies some of the fertile farmlands on Chongming, exacerbating the already tense agricultural land shortage (Song, 2016). Meanwhile, to economically and swiftly accomplish the tasks of afforestation, tree plantation on Chongming adopts unitary tree species without much concern about the local ecology and nature. As a local resident describes the situation:

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[57] Local government can use funds from fiscal transfers received from the eco-island project or other eco-development schemes to create subsidy for contractors who implement tree planting on Chongming. Many local farmers suspected that village cadres attain certain payback from the contractors by leasing the lands to them.

"In recent years, much of the farmers' land has been expropriated or transferred by local government to construct the so-called "public ecological forest" (gong yi lin). In a pursuit of efficiency and profit, most of the trees planted are largely composed of fast-growing and unitary species.[58] Since then, wild animals are gradually disappearing, and even birds are leaving."[59]

As can be seen, the government's aggressive strategy to plant more trees on Chongming has homogenized the landscape on the island, as acres of newly-planted, neatly spaced trees are widely spread across Chongming (Figure 13 & 14). Ironically, the very efforts of ecological construction under the eco-island scheme have at the same time damage the local environment and biodiversity, causing irreversible ecological changes.

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[58] Trees planted on the island are mostly Metasequoia glyptostroboide, which is a fast-growing, deciduous tree, with a good adaptation for a diversity of climate and site conditions. Due to its wind-tolerance character, it is deemed as the most suitable tree species for afforestation on Chongming (interview with a local planning expert on 30 August 2017).

[59] Interview with a local resident, also an environmental activist on 13 February 2017 in Mandarin, translated by the author.

Figure 13. Tree planting sites that were transformed from original agricultural land (1)

Source: the author (photo taken on 14 September 2018)

Figure 14. Tree planting sites that were transformed from original agricultural land (2).

Source: the author (photo taken on 14 September 2018)

5.3   Changing water governance: from collective efforts to state intervention

Whilst on lands generations of Chongming people have constructed their lives, water plays a key part in shaping the environment of Chongming. As a large wetland, Chongming is critically dependent on its management of water. The embryonic sandbanks of Chongming Island are recorded as surfacing from the estuary of the Yangtze River in the late 7th century, and gradually grew, expanded and merged together. Since the reign of Emperor Zhiyuan in the Yuan Dynasty (1264-1294), key rivers in the east and west of the Island stabilized as people constructed many secondary rivers. Over time, these rivers in turn were connected by ditches and drainage channels to draw water into crop fields (see Figure 15).[60] The ongoing management of the water system has been crucial for the agricultural development of Chongming and provided the base for the local economy. While water was a valuable environmental resource, it was also a source of vulnerability for the islanders who had to cope with flood risks due to the tidal variations and sedimentation effects which could silt up rivers and ditches. Thus, water courses on Chongming require regular dredging and maintenance. According to Chongming County Water Affairs Bureau (Marine Bureau) (2014), at the end of 2012, there were a total of 15,923 rivers on the Island, running for 9,352.30 kilometres.

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[60] More details in the Chongming County Chorography Draft (1960) and Chongming County Chorography (1984).
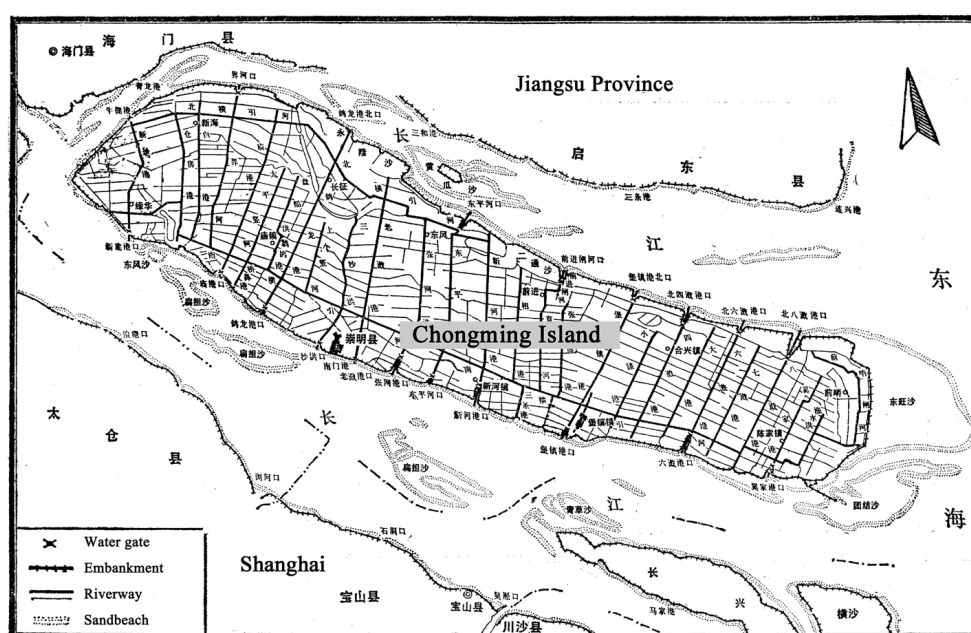
Figure 15. Chongming Island's water conservancy status in 1984.

Source: Chongming County Chorography (Chongming County Annals Compilation Committee, 1989).

In a similar way to land management, the water governance on Chongming has experienced a shift from collective efforts to increasing state intervention. As recorded in Chongming County Chorography Draft (1960) and Chongming County Chorography (Chongming County Annals Compilation Committee, 1989), for most of Chongming's history, water conservation and management were mainly done by locals. Government involvement was very limited. Since 1949, local governments have started to carry out a series of river dredging and remediation projects. However, these projects mainly covered arterial rivers on the island. Management and maintenance of numerous small rivers and ditches remained a collective work that was mainly conducted by local communes. However, ever since the implementation of Eco-Island plan and river regulation projects in the early 2000s, all rivers on the island were nationalized and put under unified management by the government. The shift from local (community) governance to state (government) governance of water on

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Chongming has caused the detachment of local communities from the management of their environment, and consequent destructive effects on local water ecology. This section elaborates on the shifts in the management of water on Chongming throughout the history to fully appreciate the changing relationship between local people and their environment on Chongming during the recent eco-development.

5.3.1   Water management in the past: collective efforts

Water conservation has always been a priority of the governance of Chongming throughout history.[61] The efforts of successive local governors and local landowners to maintain watercourses are well documented in versions of the Chongming County Chorography. However, the Chongming Chorography Draft published in 1960 points out that peasants were the actual major force in water management[62], and the following Chongming County Chorography published in 1984 provides supplementary information that help us to reconstruct the water management history of Chongming. It is recorded that in the late Qing Dynasty, Chongming county magistrate stipulated that dredging must be performed once a year on all arterial rivers, and the responsibility and cost were shared by "Lipai", leaders of the then basic unit of a local community. Between 1921 to 1948, river dredging was mostly initiated by local political elites, and project costs were normally shared by beneficiaries or local inhabitants. Local government's financial contribution to projects was very limited. In the meantime, smaller projects such as the maintenance of secondary rivers and ditches were treated by

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[61] Minguo Chongming County Chorography (Minguo Chongming Xianzhi), 1924. Chapter 4; Chongming County Chorography Compilation Committee, 1989, Chapter 12.

[62] Chongming County Chorography Draft (Chongming Xianzhi Gao), edited in 1960, reviewing previous historical records and documenting the history of Chongming from 1912 to 1949 in the Republican period.

farmers as their own affair – they took the responsibility for what was perceived to be their waterway - without any guidance or supervision from government. While I would not wish to romanticize the experiences of rural dwellers or present a narrative that suggests a harmonious relationship between local people and their environment, there is nevertheless a sense of local knowledge of water management that is reproduced on almost daily basis. Practices surrounding water management help to create both a unique environment and sense of social identity. As will be argued below, there is an increasing disconnect between people and place as non-local actors seek in various ways to manage the environment of the Island.

After the establishment of the PRC in 1949, there were efforts to promote more formal management of waterways, to make it more amenable to human needs (Shapiro, 2001). Local government provided funds and mobilized cadres and the public to carry out a series of river dredging and remediation projects. These projects mainly covered the south-north arterial rivers. In terms of the secondary rivers and tertiary ditches, there are no explicit records of any maintenance works. However, there are reports of river banks collapsing and being repaired during the 1970s and 1980s. Guided by the County Revolutionary Committee and the Chongming County Water Conservancy Society, local communes (She Dui)[63] experiencing river bank problems planted reeds and built buffer platforms to consolidate the riverbanks (Chongming County Chorography Compilation Committee, 1989).

The maintenance efforts of communes in the early years of the PRC were seen by residents as somewhat similar to the collective river management that had previously prevailed. In the interviews with elderly

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[63] She Dui, also known as Sheng Chan Dui [Production Team], is an organizational form in China's socialist agricultural economy. It is the basic unit of labor organization in state farms, and in the rural areas, it is a cooperative economy of collective ownership by the working people.

indigenous people, they recalled the annual ditching and dredging led by a village "Production Team" (sheng chan dui)[64]:

> "Guaranteeing the water is flowing is very important. Our field crops rely on it, and we need clean water for cooking and for washing. Every year or every two years, the Production Team will organize people to conduct ditching and dredging. Each household will send one or two people to join the team. Besides dredging the silted riverbed, we also reaped reeds, which then we used for firewood or handcrafts."[65]

Maintaining the watercourse was of great significance for local living and food production. More than that, though, river management was attached to strong personal emotions. Events and activities became ways of passing on knowledge and representing skilful management of the environment. As one of the indigenous residents elaborated:

> "In the past, each household still owned a section of the riverbanks as part of their fields, which we used to call "Zhi Bian" 植边 (refers to the river slope or the river platform by the road). Every household treats their Zhi Bian carefully as it is part of our own lands, and as it also shows the characteristics of your family – if your vegetables or plantings are growing very well, the neighbours will praise you; and if not, then people might think you are not industrious or not skilful. Some families, like my grandparents, grew trees there. And I actually grew up with one of

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[64] See above footnote 63.

[65] Interview with an indigenous resident on 19 June 2017 in Mandarin, translated by the author.

them as it was planted when I was born. However, they [Zhi Bian]

no longer exist anymore." [66]

5.3.2 Water governance in eco-development: state intervention

The growing distance between local people and their management of the environment has become increasingly apparent and accelerated since the beginning of the 21st century. On 27 July 2004, then President and General Party Secretary of China – Hu Jintao – came and visited Chongming. He pointed out that Chongming should follow the guidance of Scientific Outlook to maintain its ecological advantage. Following Hu's visit, Chongming County promulgated the "Chongming County Ecological Village Standard", which was the then first and the only standard for ecological village construction. The Standard outlines specific regulations on the ecological environment of rivers, roads, houses and farmland for Chongming villages. In terms of the river regulation, it is stipulated that "*there should be no interruption section, and no water-blocking materials (including fishing nets and cages, reeds on the water surface, water bamboo and other plants) in village-level ditches/rivers; the river dredging should be conducted annually; there should be no flotsam and jetsam on the water surface; and there should be no scale breeding section (points) in the village-level ditch.*" This regulation heralded a series of river measures enforced on Chongming (Table 10).

Table 10. Major river regulation measures on Chongming since 2006

Year	River regulation measures	Targets for implementation

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[66] Interview with a local resident, also an environmental activist on 13 February 2017 in Mandarin, translated by the author.

2006	"Ten-Thousands Rivers Regulation Operation" (*Wan He Zheng Zhi Xing Dong*)	454 township-level river sections (a total of 920.13 kilometres); 4,434 village-level river sections (a total of 2,182.66 kilometres)
2009	"Village and House River Regulation" (*Cun Gou Zhai He*)	4,068 village-level river sections (a total of 1,669.57 kilometres)
2011-2013	1. "Ecological River Regulation" (*Sheng Tai He Dao Zheng Zhi*); 2. "Medium and Small Rivers Maintenance" (*Zhong Xiao He Dao Yang Hu*)	Targeting a number of main rivers in built-up area – completed the ecological river course construction and the maintenance of river revetments of 22 river sections (a total of 30.38 kilometres).
2014	"Township- and Village-level Rivers Dredging" (*Zhen Cun Ji He Dao Lun Shu*) (2014-2019)	All township-level and village-level rivers/ditches on Chongming
2017	"River Leader System" has been enforced on Chongming	All rivers/ditches

As can be seen from Table 9 above, since 2006 there are more systematic attempts at water regulation, which coincided with the official announcement of the "Eco-Island" development plan (SMG, 2006a). Among them, in the Implementation Operation on "Ten-Thousands Rivers

Regulation Operation" that was jointly issued by Chongming Water Authority and Chongming Finance Bureau in 2006, nine explicit requirements have been outlined: 1) effectively remove mud from the river bottom; 2) clean the river gates; 3) remove illegal constructions by the riverbanks; 4) reconstruct blocked culverts; 5) better control sources of river pollution; 6) remove waste from the water and riverside; 7) maintain river bank slopes; 8) improve water quality; and 9) cover the riverbanks with greenery. Guided by these criteria and many detail measures introduced in the following regulation projects, there was a rapid transformation of numerous rivers on Chongming, which mainly employed typical engineering solutions, including canalizing rivers to improve their flow to reduce flood risk and to secure riverbanks.

Attempts to manage and regulate water continue with the Eco-Island construction. In the 13th Five-year Plan of Chongming World-class Eco-Island Development (SMG, 2016), a set of key performance indicators (KPIs) were stipulated, that provide criteria for quantitative measurement of the success or otherwise of the implementation of eco-island construction. Out of 17 indicators, there are four directly related to water management, namely Natural Wetland Retention Rate, Surface Water Environmental Functional Area Compliance Rate[67] (to measure water quality), Urban Sewage Treatment Rate, and Rural Sewage Treatment Rate. All, except the Rural Sewage Treatment Rate which is an "anticipated" target, are "obligatory" targets, so are 'must-be-completed' tasks for local government. Inevitably, these targets guide where resources are allocated

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[67] The Chinese national standard, GB3838-2002 – Environmental Quality Standards for Surface Water, mandates the water quality that applies to all surface water with functions such as rivers, lakes, canals, channels, reservoirs, etc. According to the Standard, surface water is classified into five categories according to their level of functions, ranging from National Nature Reserve, primary protected area of concentrated drinking water, rare aquatic habitat, to general industrial water use areas and agricultural water areas.

and where attention is focused. Moreover, these are activities that government can manage directly to increase control over them. Almost by default, communities and their expertise are marginalized.

From a political ecology perspective, different groups' knowledge and diverse interests in "place" and "resources" result in divergent environmental measures (Bryant and Bailey, 1997; Neumann, 2005; Peet et al., 2011; Robbins, 2012). In understanding the changing governance of rivers and riverbanks on Chongming it is important to note the role of the main management bodies (represented by "river cleaners" and "river leaders") and their adoption of non-ecological and engineering practices.

River cleaners were employed as part of the "Ten-thousand, Thousands and Hundreds Employment Project" (wanren qianbairen jiuye xiangmu). This was initiated in 2005 and aimed to help people experiencing employment difficulty, especially people in their forties and fifties (called "4050 groups") back into work (Chongming Social Construction Committee Office, 2013). River cleaning is one of the jobs providing by this project that does not require high levels of education or skills[68]. Alongside the launch of the "Ten-Thousands Rivers Regulation Operation" in 2006, Chongming Water Authority employed hundreds and thousands of cleaners managing rivers at all levels. Their main work tasks include watercourse cleaning and maintenance of green spaces. River cleaners were given clear performance assessment criteria that they had to work to[69]. An interview with a former "river cleaner" hired in 2007 has revealed details of his job:

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[68] The other posts include forestry conservation, home-based cares, traffic management, community security, community assistance etc.

[69] A follow-up on-line interview with an official from Chongming Water Authority on 18 June 2018 in Mandarin, translated by the author.

"I am part of the first batch of river cleaners on Chongming. I remember each river cleaner was allocated an 840-meter long river section, and the main requirements included cleaning the water, clearing all kinds of [fishing and fish-farming] cages and fast-growing aquatic plants to ensure a smooth flow of the water, and removing all reeds, wild rice shoots and any other plants on the river banks within a year. No plants were supposed to be found within 50 centimetres below the water surface. There were monthly inspections and failure to fulfil the task would lead to salary deduction, which was often quite a lot. To accomplish the job, we used herbicides to clear the riverbanks."[70]

Without proper guidance for their job, combined with a lack of ecological knowledge of the disastrous effects of herbicides, local river cleaners attempted to meet their job requirements (to gain their full salary) without knowing that their actions were simultaneously destroying the original river ecology. Moreover, ecological is being reinterpreted from traditional river management practices of working with nature to seeking clean, green managed spaces and rivers that are undisturbed by plants. An indication of the shift in practices is that reeds were planted by local communes under the guidance of county government in the 1970s and 1980s as one of the major measures to protect riverbanks from collapsing were now to be removed. Since rural sewage is largely discharged directly into the numerous rivers on the Island (and in 2016, the rural sewage treatment rate was only 16%), without the water purification function of reeds, the water quality of Chongming's rivers rapidly deteriorated. A local resident in Hongqiao Village in Chongming, who is also an environmental activist, commented:

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[70] Interview with a local "river cleaner" who was hired by the Chongming Water Authority from 2007 to 2009 to conduct river cleaning and maintenance on 12 September 2018 in Mandarin, translated by the author.

"From what I observed and experienced, Chongming suffered the worst ecological transformation in the past ten years [2007-17]. Those ecological projects enforced by the government are actually destroying our ecological nature day by day. The most severe problem is the river regulation. Projects enforced to harness rivers and riverbanks adopted traditional hardening techniques, cementing the original natural riverbank by impermeable concrete retaining walls, which cut off the exchange of material, energy and information between rivers and the banks, and thus disabled rivers' self-purification abilities. Meanwhile, as the village sewage treatment has not been improved, the quality of processed wastewater that is directly emitted into rivers is very low, which profoundly threatens the river water environment. Consequently, rivers on the Island were persistently polluted, which gravely harms the aquatic organisms and further induces biodiversity loss".[71]

The residents' narratives highlight the technocratic and engineering solutions to environmental problems pursued by the Chongming Eco-Island plans. On-site surveys enabled the author to empathize with the residents' concerns. During the longitudinal study, I have documented the transformation of a river alongside the Xinjiang Road before and after the riverbank construction (Figure 16). On November 14, 2017, as I came across this river that still maintains its natural state with wild plants by its banks, I found a truck laying down concrete columns by the road preparing for the river regulation project. Four months later, I revisited the river and found that the implementation of the project has totally transformed the landscape of the river. Concrete columns have been installed and typical riverside vegetation has been eradicated to be replaced by a managed, neat

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[71] Online interview with a local resident, also an environmental activist on 13 February 2017 in Mandarin, translated by the author.

and manicured green. Alongside these visual changes will be the disappearance of the river's original and natural ecology.

Figure 16. Transformation of Xinjiang Road River under the river regulation project from 14-11-2017 to 29-03-2018.

Source: the author (photos taken on 14 November 2017 and 29 March 2019).

The engineering measures employed in river regulation projects that cemented riverbanks and elaborately trimmed the greenery by the river are in line with the guiding ecological modernization principles adopted in the eco-island plans. These ecological modernization principles included emphasizing scientific and technical perspectives, especially of engineers and landscape designers come to the fore and marginalize local knowledge and expertise; an emphasis on resource efficiency (e.g. in land use, water flow), and urban aesthetics (e.g. in landscape design) (Pow, 2018); and the use of technology and techniques to manage the environment (e.g. straightening rivers). Whilst at more strategic policy and planning levels thinking may have been informed by EM, their translation into revised working practices on the rivers showed limited knowledge of how to best manage the local environment. For example, a key set of practices are revealed through an examination of the River Leader System (Hezhang Zhi) initiated in early 2017 on Chongming. The Chongming River Leader System Office appointed the river leaders for each river on the Island (normally held by a town cadre and the village head), and the river leaders are responsible for the management of the river environment. Their working objectives, as clearly stated on an orange billboard put up on each river on Chongming,

involve enforcing "*no crops in the streambank and river platform, no illegal constructions, no piles, no garbage, no fallen trees, no flotsam and jetsam in the river surface, no obstructions in the river channel, no illegal emissions, no withered plants in and by the river*" (Figure 17). Typically, local officials are quick to respond to the superior governments' instructions, and in this case local cadres (river leaders) on Chongming would seek the most efficient solutions that can generate rapid and visible effects (similar to river cleaners' adoption of herbicides). Cementing the riverbank is one of the quick solutions to address all of the requirements stated on the billboard. Biodiversity and ecology are outside of the scope of performance assessment and thus out of local government officials' consideration during the development process. As a result, the previously diverse riverbanks, that had ecological value and meaning for local people are replaced by increasingly homogenous, clean and tidy riverbanks (Figure 18).

Figure 17. Billboards put up on the riverbank by the River Chief System Office of Chongming.

Source: the author (photos taken on in 2017 and 2018).

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Figure 18. Typical riverbanks of Chongming that have been transformed during the river regulation projects

Source: the author (photos taken in 2017 and 2018).

5.4 Conclusion

Local practices for land and land management helped nurture an environment that was cherished by its members. Ecological expertise was valued and sustained by day-to-day interactions with land and water as well as rituals and events, which well manifested the nature-culture binary that underscored political ecology (Yeh, 2009). Nevertheless, unequal power possessed by different stakeholders determined their effects on environmental changes (Bryant, 1998; Tan-Mullins et al., 2017b). As shown in Chongming, relations between local people and place are increasingly being broken as state actors gradually intervene in managing the environment and resources through the construction of an eco-island. Maoist efforts to control nature established the dominant role of the Shanghai Municipal Government over Chongming's land and nature. More recent state-led eco-development practices, even though these have been led by more environmentally informed policies and plans, have introduced notions of environmental management that are aesthetic and clean and draw on an external (Beijing and Shanghai) expertise that further marginalizes local knowledge. Shanghai's power and authority far outweighs that of the locality. So, the city's continuing drive for

development results in farmland compensation from Chongming. This, in turn, leads to environmentally destructive reclamation and a loss of valued local environmental resources. While changes in access to land deny people the opportunity to visit (formerly public) tidal flats (wetlands). Similarly, eco-development rather than curbing development has triggered extensive land acquisition and land transfer on Chongming with seemingly righteous reasons for ecological construction, either for urban infrastructure or tree plantation. The displacement or exclusion of the local disadvantaged residents gradually destroys the local long-established people-environment relationships, which could cause severe environmental and socio-economic consequences (as will be discussed in detail in Chapter Six).

Moreover, the dominance of ecological modernization thinking in plan making and delivery for the Island has been typified by engineering measures employed in constructing the environment. Riverbanks, for example, have been replaced by concrete retaining walls. The on-the-ground practices of Chongming Eco-Island (as shown in the governance of land and water) verify its development features as discussed in Section 4.5 – marked by a strong municipal state, exclusion of local concern and knowledge, constantly changing visions and emphasis, and the employment of ecological modernization methods and technocratic indicator-driven system. Community concerns about the nature of development are voiced but have only very limited opportunities in which to be heard. Moreover, a pervasive reformation of the landscape due to the strong intervention of municipal state, while beneficial to achieve ambitious ecological construction targets, has not led to sustainable land use and environmental benefits. The effects of eco-development on the local environment and society deserves further interrogation, which will be discussed in the following chapter.

Chapter Six: Effects of Eco-Developments on Local Environment and Community

6.1 Introduction

The preceding chapter examines how the policies and plans of Chongming eco-developments, which are made by the Shanghai Municipal Government, reshaped the environmental governance on Chongming (as demonstrated in the shifting land and water management). It has shown that the long-established close relationship between local people and nature has been broken due to the compelling municipal state's intervention in managing local environment and resources. This chapter further examines the effects and outcomes of the eco-development and its attendant changes on the local environment and community. With a PE perspective that privileges a bottom-up view, this chapter draws from local residents' observation, perceptions, experiences, and responses to environmental and socio-economic changes during the eco-development. It is organized into five sections: following the introduction, section two evaluates environmental consequences of eco-development policies. This is conducted through a micro-environmental history study of Chongming via the story of the disappearance of a native plant – reed. Tracing reeds throughout Chongming's history – the changes in their ecology as well as their role in the local economy, society and culture – help to unravel the environmental transformation of the island and enable a detailed assessment of the environmental outcomes of the ongoing eco-developments. Section three elucidates how eco-development on Chongming affects local people's social-economic well-being. Section four discusses the changing and differing perceptions held by local residents on Chongming to understand their responses (or silence) towards eco-development. To the degree that the government has successfully

influenced local perceptions through eco-development measures, the environmental impact becomes magnified. Section five is the conclusion of this chapter.

6.2   The disappearing reeds: an ecological victim of eco-development

Exploring environmental histories provides an understanding of why and how landscapes and ecologies, flora and fauna, as well as livelihoods of local populations have changed in the past, and thus can shed light on the environmental outcomes of eco-development on Chongming. However, the rich history of Chongming Island, the vastness of the land and permanent historical change also pose great challenges for an in-depth environmental history study. To overcome these barriers, this study adopts a micro environmental history method that helps to understand an "ocean through a drop" (Zhao, 2015; Zhao and Ma, 2017), namely examining Chongming Island's transformation through a specific research object. Here, the fruitful object is reed – a native wetland plant on the island. Based on data collected from archives, through oral history and through on-site fieldwork, this section reconstructs and studies the transformation of Chongming Island's reed ecology throughout history. This allows a general understanding of the ecological environmental changes on Chongming Island, which can shed distinct lights on the examination of the current ecological development on Chongming

Reed (Phragmites communis Trin) is one of the most widely distributed wetland plants worldwide. Its rootstock (or rhizome) is well-developed and intertwined, and plants usually grow up to a height of 2.5-3.5 meters, with an average diameter of 10 mm and a maximum of up to 14 mm. Reed is a highly productive grass that can be found in almost any wet sites like the shores of lakes, along riverbanks, and on fens and marshes (Köbbing et al., 2013.). It normally grows wildly, and can even thrive in disturbed soils, such

as roadsides, dredged areas, polluted lands and nutrient-rich peatlands. That being said, anywhere you find water you find reed.

It is now unverifiable when and how reed arrived in Chongming, but historical records vividly show that reeds have existed since the formation of the island, and that it thrived for more than a thousand years. In the coastal wetlands, reeds are the single dominant species, mainly growing in the supra-tidal zone and the upper part of the inter-tidal zone. Together with other wetland plants, reeds serve as green buffers protecting shores, and as prime habitats harbouring aquatic and avian creatures. In the inland riverbanks, reed helps to mediate micro-climate, purifying water, and conserve soil. Meanwhile, for a long history on Chongming with a barren saline soil and scarce material resources, reeds have long been the raw materials for crafts and for construction. It has been an integral part of local daily lives, economy, ecology, and culture. However, decades ago, this highly productive plant began to disappear on the island. Today it is difficult to find reed by riverbanks, lake sides and coastal shores while in the past lush reed marshes could be found in these areas. Searching on the island, besides the two constructed wetlands – the Dongtan Wetland Park and the Xisha Wetland Park (Figure 19) - only sporadic areas with reeds can be found. These areas include the flattened land areas that have not been developed, creeks and streams that have not been "ecologically rehabilitated", and a small number of paddy fields that have not been thoroughly dug and cultivated. What happened to this indigenous, essential, and once widely distributed plant is puzzling and intriguing.

Figure 19. Reed marshes on Chongming Xisha Wetland Park.

Source: the author (photo taken on 15 November 2017).

What caused such drastic disappearance of reed environments? And how is the life experience of reeds related to the environmental transformation of Chongming? Solving these puzzles will help to unravel the environmental transformation of the island and provide perspective for the assessment of eco-developments that are still ongoing on the island. Therefore, this section traces reeds on Chongming throughout the history – its origin, characteristics, its role in the local economy, society and culture, and its vicissitudes on Chongming, in order to explore the environmental history of the Island, with an intention to understanding and to critically evaluating its current place in eco-developments.

6.2.1 Reed lands of plenty in the history

"As a coastal land, it is an eyeful with reeds." (Bin hai zhi di, mao wei mi wang)

– Kangxi Chongming County Chorography (1684).

In the early seventh century, the interaction between the Yangtze River and the sea created the two sandbanks that would later become Chongming Island.[72] Reed was native on these sandbanks and, attracted the first human settlers (Song, 2005). The earliest written records of human activity on the island date back to 696, as fishermen from the adjacent region started to fish and harvest reeds there (Chongming County Chorography Compilation Committee, 1989). For more than a thousand years, reed has been the basis of the economy, ecology and culture on Chongming.

For a long time, soil on the original sandbanks of Chongming was salty and thus not arable. Instead, it was suitable for growing reeds and producing salt. Extensive reed marshes on the tidal flats had long been the main source of income for the inhabitants of Chongming (Zhengde Chongming County Chorography, 1520).[73] A historical account that focuses on the years 1234 to 1264 in the Yuan Dynasty shows that two big imperial manors on Chongming - the Jianghuai Yongfeng Zhuang and Jiangzhe Baocheng Zhuang - paid a high amount in reed taxes that accounted for the

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[72] "Suzhou Chronical · Evolution · Chongming County" (Suzhou Fuzhi · Yange · Chongming Xian); "Wanli Chongming County Chorography · Evolution", 1605; "Essentials of Historical Geography · Suzhou Chongming Old Town" (Dushi Fangyu jiyao · Suzhoufu Chongmingxian Chongming Jiucheng).

[73] During the imperial past, salt industries were monopolized by imperial court. Common people thus relies heavily on reeds sale for living.

vast majority of Chongming's total tax revenue (Mao et al., 2016). It is evidenced that reed harvesting and processing are the important constituent parts of Chongming economy during this time period.

As the course of the Yangtze River kept changing, soil on Chongming gradually desalinated and allowed moderate development of agriculture. Although crop production was rising, reeds remained important for Chongming residents.[74] In the Qing Dynasty (1636–1912), local reeds harvest in the autumn and winter were called "Firewood Season" (Chaixun).[75] Besides collecting wild-growing reeds, local people gradually started planting them (the activity of planting reeds is locally known as Zhongjing) in order to accelerate the desalination and to consolidate the mudflats and facilitate subsequent crop cultivation.[76] Most of the land on Chongming was transformed from grass flats to reeds marshes, and eventually to fields that were fit for growing crops and for construction (Song, 2005). In this respect, reeds not only contributed directly to local economies but also indirectly led to the development of agriculture on Chongming Island.

Besides bringing economic value, reeds also shaped construction, living and culture on Chongming for a long time. Due to the saline soil and scarce material resources, reeds had long been the raw materials for building and craftsmanship. Dried reeds (locally known as Luchai) were woven or piled up to construct the walls, roofs and fences of the relatively simple thatched huts. Even during the era of fierce reclamation in the Maoist period (see

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[74] Zhengde Chongming County Chorography 1520. Chapter 3 – Customs. Dried reeds trading, together with Cloth dyeing and garlic planting, supplement crop industries in constructing local economy.

[75] Yongzheng Chongming County Chorography, 1727. Chapter 4, Customs.

[76] Kangxi Chongming County Chorography, 1684; and Minguo Chongming County Chorography, 1924.

Chapter Five), reed-thatched huts played a significant role in supporting the everyday living of the reclamation workers. Far away from home, reclamation workers were camped on the frontline shore. They cut down reeds from coastal marshes to build a shed (locally called "Huan Dong She") and lay down reeds or straws to make their beds (Figure 20). As reclamations were often conducted in the wintertime due to the low tides, reclamation participants burned reeds to ward off the cold, and to warm up the frozen soil so as to build up the dykes (Xu, 2009; Chongming County Chorography Compilation Committee, 1989). In the documentary "Green Land Rising from the Sea" ("Hai Shanghai Sheng Lv Dao"), which recorded the reclamation history of Chongming, people who have experienced the reclamation period recalled the arduous life living with reeds. They affectionately called their precarious thatched sheds the "Family of Reeds" (Lu Wei Shi Jia)[77].

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[77] Documentary "Green Land Rising from the Sea" (Hai Shang Sheng Lv Dao). Online: http://shanghaistory.kankanews.com/movie/jingcaijiemushipin/162.html (accessed 27 March 2019)

Figure 20. Model of "Huan Dong She" – a thatched shed made of reeds

Source: the author (photo taken in Chongming Museum on 15 November 2017).

Besides being an essential material for local construction, reeds were also made into various objects of daily life, such as mats, brooms, dustpans, curtains, and even shoes,[78] and into toys for kids, such as Yaozi (kites), Ludi (reed flutes) and Luye laba (reed leaves trumpets), reed windmills, frogs, birds, and boats (Xu and Wu, 2007). During the period of the Republic of China, these products became an additional source of income for the Chongming people and were sold outside of the island.[79] Beyond that, remainders of cut-off reeds were a preferred cattle feed, especially along the ditches of the island.

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[78] Reed mat making has been recorded in Zhengde Chongming County Chorography, 1520. Chapter 3 – Customs.

[79] Chongming County Chorography Draft, 1960.

Reeds also played a major role in folk customs and in local festivals.[80] For example, a reed torch was essential for a major ritual ceremony on Chongming, "Guan Tiancai" that took place in the evening of the Spring Lantern Festival on the fifteenth day of the first lunar month. During the ceremony, young men or women would dance, swing the ignited reed torch around their farmlands and chant their wishes for prosperity in the New Year. To make a reed torch, local peasants usually wrapped dried reeds around a reed rod and tied them with a straw rope. In the summer, reed leaves would be carefully collected to make Zongzi, the food for the Dragon Boat Festival on the fifth day of the fifth lunar month. Reeds even played a role in traditional funeral customs. In the past, lands on Chongming were extremely unstable due to constant erosion through the tides, making it difficult to practice the traditional Chinese ground burial custom. Therefore, cremation has had a long tradition on Chongming.[81] Often, local people used reed mats to cover the deceased for cremation. This tradition continued even when burials gradually replaced cremation as the Island lands became more stabilized – poor people who could not afford proper coffins still used reed mats to cover the deceased before they buried them in the ground. Even today, some local people still keep the tradition of weaving reed items (such as miniature houses, luxury cars, and electrical appliances) and burning them as offerings for deceased family members.

As an essential part of local daily life, reed plays a role in various folk ballads, legends and proverbs. Through their long history of coexistence and the plant's strong attachment to local culture, reed became a symbol of the spirit of local people on Chongming. As a popular proverb says: "Dang li lu qing bu pa feng, pao tan ren bu pa qiong", which means fishermen are not

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[80] Sources about Chongming traditional folk customs are gathered from Minguo Chongming County Chorography 1924, Chapter 4; Xu and Wu, 2007; and Xu, 2009.

[81] Zhengde Chongming County Chorography, 1520. Chapter 3, Custom.

afraid of poverty, just like reeds in the marshes will never yield to the wind. Reed symbolized the strong will and indomitable vitality of Chongming islanders. However, along with the disappearance of reeds on the island (as discussed below), traditional customs began to wither away as well.

6.2.2 Disappearing reeds during eco-development

There is no explicit record about the reeds' retreat on Chongming. On the contrary, in the local promotion and campaign, reeds become the image ambassador of the eco-island. Browsing through blogs, notes and guides of Chongming tourism, vast wetlands with flocks of migratory birds and stretches of reed marshes are the most commonly shown images. These wetland sceneries, together with other artificial landscapes, such as the lush Dongping Forest Park, the golden rape flower sea, the purple lavender gardens, and the green paddy fields, portray Chongming into a rural, pastoral, and natural Shangri-la that is just one-hour drive from the bustling central Shanghai. It is crowned as the "fairy tales in tourists' dreams". Today, the renowned "eco" brand of Chongming has attracted tourists who are seeking a getaway from the boisterous and busy city life. Among numerous attractions on the island, the Dongtan Wetland Park and the Xisha Wetland Park are the most popular tourist destinations. The vast expanse of planted reed marshes in these two constructed wetland parks position tourists within a wild and natural atmosphere. They are also popular as a setting for Chinese movies and TV sets, depicting scenes of romance and pristine rural nature.[82] However, what seems like a "natural" wetland landscape is nothing of the sort. Only the local communities on the island are bemoaning the disappearing reeds on the Island and the transformation of the local environment.

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[82] For example, "My Splendid Life" (*Wo De Can Lan Ren Sheng*) (2011), "Boss & Me" (*Shan Shan Lai Le*) (2014), "Promise of Migratory Birds" (*Shi Wu Nian Deng Dai Hou Niao*) (2016), and "Negotiator" (Tan Pan Guan) (2017).

Indeed, the disappearance of reeds can hardly be noticed by an outsider (like me). It was not until a walk-along interview with a local farmer to the Xisha Wetland Park on Chongming in November 2017 that I came to be attentive to this native plant. In the late afternoon of a warm winter day, I met a local resident on Chongming who I have known from an online local forum. Learning my intention to understand the environment of Chongming, she advised to visit the Xisha Wetland Park, where she depicted as "the only place that is relatively natural and primitive on the island".[83] Arriving the park and entering from the timber front gate, we walked through a wooden plank path flanked by dense cedar trees standing on the damp mud. Whilst strolling through the winding paths, inadvertently I found myself falling into the arms of a vast field of golden reeds. The reeds were much taller than me, and I could not see through them to find the edges even standing on my tiptoes. But when there came a gust of wind, the sound of the reeds waves told the broadness of the reeds sea. I had never seen or experienced such spectacular scenery, and I was amazed by the grandeur and beauty of it. The local farmer also raised her cell phone, trying to capture this gorgeous view. She told me that it has been a long time since her last visit to the Xisha wetland, and it was still stunningly beautiful as in her memory. As we kept walking into the marshes towards the coast, she suddenly murmured, "*in the past, reeds were all over Chongming. But now, we can only see them in the wetland parks*". Her tone was one of sorrow. Later that day, she shared with me a lot of her childhood stories, accompanying by reeds, muds, streams, and all planktons and fishes in the rivers. "*reeds were the natives (tu zhu) of Chongming, and the best memories of my childhood*", she explained, "*but now they were gone.*"[84]

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[83] Interview with a local farmer on 15 November 2017 in Mandarin, translated by the author.

[84] Interview with a local farmer on 15 November 2017 in Mandarin, translated by the author.

The delight bloomed on her face when describing reeds in her young age, and her dejected expression when speaking of the disappearance of reeds on nowadays Chongming, convinced me that reed is, or at least, was, of great significance for her and for the local people on Chongming. This has been evidenced by many interviews with indigenous farmers as they inadvertently mentioned reeds when describing environmental changes on Chongming.

Coastal reeds "encroached" by land

Firstly, coastal reeds have suffered from habitat loss as wetlands have been gradually encroached during reclamation. For a long history, reeds growing in the coast of Chongming serve as green buffers protecting shores, and as prime habitats harbouring aquatic and avian creatures. Before the PRC, coastal reeds were also an important economic source for local residents on Chongming as it is recorded that reeds tax as well as the crafts based on reeds accounted for a significant part of the local economy.[85] Nevertheless, as discussed in Chapter Five, since late 1950s, large-scale reclamations of coastal wetlands have been carried out on Chongming for various development needs – the agriculture development during Maoist period, urban development in post reform era, and the later eco-development since the turn of the century. The enduring reclamations have led to pronounced shrinking and destruction of coastal wetlands on Chongming. Reeds did not escape this damage and have gradually disappeared together with their wetland habitats.[86]

In their natural state, coastal wetland evolution would follow a process of deposition, siltation, maturing and ageing. As a result, subtidal areas

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[85] Chongming County Chorography Draft, 1960.
[86] Interviews with local elderly people from November 2016 to September 2018.

would gradually turn into intertidal and supratidal zones and eventually become lands (Yuan et al., 2002). Along with the natural process, reeds growing in the upper part of the inter-tidal zone and supratidal zone also evolve, extending further into the sea with their wetlands habitats. However, this natural process was deeply disturbed or even completely destroyed by unbridled human actions that not only reclaimed the supratidal zones, but also the intertidal and subtidal areas. Such imprudent reclamation caused irreversible damage of the natural growth cycle of wetlands and to their fauna and flora, leading to a degradation of coastal reeds on Chongming (Xie et al. 2004; Song, 2005). Local residents pointed out the significant transformation on natural environment induced by extensive reclamations. A typical comment is:

"In the past, the shore of the Chongming Island was covered with reed marshes. We often went there to collect reeds and go fishing and catching shrimp. But now most of the shore areas have been reclaimed and dykes have been built. Reed marshes have become land."[87]

Nowadays, although Chongming Water Bureau still regularly carries out reeds planting in the coastal area as part of the dam protection project (in the past, reed plantation implemented by local government was mainly for promoting siltation for accelerating the reclamation[88]), it has negligible (if any) contribution to restoring the wetlands system and the reeds communities that were destroyed during the reclamation. Figure 21 and 22 below typify the coastal landscape in current Chongming, with concrete

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[87] Quote from a local village elder during a focus group meeting on 31 March 2018. Original quote in Chongming dialect, translated into Mandarin by a local resident, and further translated into English by the author.
[88] Chongming County Water Affairs Bureau, 1987. Chapter 2: Section 4 – Siltation Promotion (cu yu), p51.

dams facing the sea or a small area of enclosed plantation acts as "the buffer zone". The so-called "natural" wetlands with lush reed marshes and other wetlands plants, which symbolized Chongming and flaunted by the governments, are only confined in the two artificial wetlands parks – Dongtan and Xisha Wetlands Parks (see Figure 19).

Figure 21. The dyke on the north coast of Chongming Island

Source: the author (photo taken on 10 September 2018).

Figure 22. Coastal area of southwestern Chongming (near the Xisha Wetland Park)

Source: the author (photo taken on 14 September 2018).

Inland reeds erased in river regulations

Reeds growing in the inland of Chongming were mostly fortunate to escape the catastrophic destruction through coastal reclamation. Instead, however, they fell victim to the "cleansing" actions of various river regulation projects enacted in the wake of the eco-development. Naturally, the riverbanks were overgrown with reeds, which provide substantial ecological services such as purify water quality, conserve soil and protect river slope, and mediate micro-climate. Local people for a long history took care of the reed ecology by the rivers (e.g. conducting annual harvest) to ensure the healthy growth of reeds in the next year and to maintain the river course (see Section 5.3.1). Nevertheless, accompany with the movement of eco-development is the strong intervention from the state on the local river management. Guided by the EM ideology that advocates technocratic and engineering solutions to manage environment and natural resources, local cadres implement projects that concreted riverbanks and

modernize/urbanize the river landscapes (see Section 5.3.2). Reeds, whose ecological functioning were appreciated by both the local community and the authority in the past,[89] were now deemed as weeds to be removed from the riverside.

A series of river regulations has been carried out (see Table 9). Despite their intention to treat water pollution and to improve water quality, these operations had severe adverse effects on the ground – reeds growing along hundreds and thousands of rivers and ditches on Chongming were gradually diminished. Photos provided by a local resident recorded a village ditch before and after the river rectification and evidenced the destructive results (Figure 23): with the marked visual change came the disappearance of reeds and the destruction of the stream's original ecology.

Figure 23. A village ditch on Chongming before and after the river regulation project

Source: A local resident of Hongqiao Village on Chongming.

After more than a decade's rectification, nearly all rivers and ditches on Chongming have been cemented and elaborately trimmed, changing the island's river landscape and ecology and eradicating reeds on the riverbanks.

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[89] It is recorded that in the 1970s and 1980s, under the guidance of Chongming county government, local communes were planting reeds as one of the major measures to protect river banks from collapsing (Chongming County Chorography Compilation Committee, 1989).

Xu Gang, a renowned Chinese contemporary writer born in Chongming in 1945, has lamented the water quality change on Chongming:

"What makes Chongming people distraught is the change of the surface water quality on the Island. From the mid-to-late 1980s, due to the pollution of pesticides, fertilizers, and township enterprises, the clean ditches with drinkable water that were surrounded by reeds in my memory, no longer exist... In the 'Ten-Thousands Rivers Regulation Operation' ... The two sides of the rivers and ditches were flattened, and there are no reeds to be seen any more. We must understand that reed is the symbolic plant of Chongming Island for more than a thousand years. Its rich and developed root system can not only stabilize the ditch, but also play a role in purifying the water. So, why?" (Xu, 2009: 67)[90]

Such sadness, lament and query were echoed by many local people during the field surveys. Other typical comments included:

"In the past, the river in front of our house was very clean. Every family went there to wash rice, vegetables, and sometimes clothes. At that time, the riverbanks were covered by reeds, and crabs and fishes were abundant in the river. So, in summer, children were playing in the river, swimming and trying to catch fishes or crabs. Now, the river is not as clean as it used to be, and no one uses it anymore."[91]

From once prosperity to now nearly disappearance, the vicissitude of this highly productive native plant mirrors the environmental transformation on Chongming during the development process. Along with

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[90] Original texts are in Chinese, translated by the author.

[91] Interview with a local farmer on 29 August 2017 in Mandarin, translated by the author.

the disappearing reeds, the ecological damage caused by eco-development on Chongming also includes degradation of environment, destruction of local landscape and the loss of biodiversity (as can be seen from previous discussions on unitary tree planting throughout Chongming and the dramatic decrease of migratory birds in Dongtan and Beihu areas in Chapter Five). Two indigenous elderly farmers reflected on the situation:

"Before the Eco-Island construction, the Island was scattered with patches of bamboo forests and mulberry trees. You can hear the cries of birds and the hum of insects everywhere. There were reeds by the rivers. The water was very clean, and had a variety of creatures such as fish, shrimp, crabs and eels. That was the natural beauty of our home, but unfortunately it does not exist anymore."[92]

"Neat, it is very neat everywhere – this is the main feature of Chongming now. Even the flowers and trees by the river and the road are neatly organized. But does neat means beautiful or ecological? Not necessarily… As in the past when every household manages their section of the river and the road, growing different flowers, vegetables and trees, it was very beautiful and ecological to me, and you could collect fruits and vegetables from them. Children loved to play in the river, but now it is no longer possible to do so."[93]

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[92] On-line interview with a local farmer on 13 February 2017 in Mandarin, translated by the author.

[93] Quote from a local village elder during a focus group meeting on 31 March 2018. Original quote in Mandarin, translated by the author.

Worthy to note here is that although nearly all local residents interviewed recognize the deteriorating river landscape on Chongming along with the eco-development, not all share the condemnation against the governmental policies and actions. Detail discussion of the divergent perceptions to the eco-development is provided in Section 6.4. The main argument is that as the state's increasing intervention in local environmental governance and management that brings unearned economic benefits, imposes ideological exhortation, and detaches people from their living environment, local people's discontents are suppressed or resolved, which further aggravate the environmental deterioration on Chongming.

6.3 Socio-economic impacts of eco-development on Chongming: local economic dilemma and intensifying social injustice

Whilst the detrimental environmental outcomes of eco-development on Chongming are evident (especially for people who have lived on the island for a long period time), the socio-economic results are also devastating. Rather like environmental investment, social-economic investment has been a top-down agenda item with few measures taken to address local people's needs and issues. Consequently, Chongming is beset by numerous social-economic problems, including stagnant local economy, outmigration and an ageing population, and the decline of people's living standards.

As mentioned in previous chapters, Chongming has long been a traditional agricultural island with the first industry as its mainstay economy. Generations of Chongming people are dependent on the land (and wetlands) for their livelihoods. It was not until the 'Reform and Opening Up' that the gradual development of Township and Village Enterprises (TVEs) enabled industrial development on the island. During this period, the majority of Chongming people worked on their lands, state farms, and TVEs – their lives were closely attached to the island. Nevertheless, this intimate relationship

between human and land/environment has been broken along with the eco-development movement at the turn of the century.

First of all, factories on the island have been shut down due to the stringent and nearly impossible to meet environmental requirements: in total, more than 1,000 factories have been closed over 15 years (the total number of factories of Chongming County has declined from 1531 in 1990 to 529 in 2004 and has continued to decrease) (Chongming Statistics Bureau, 2017). In the meantime, the green industries proposed in the eco-island plan (i.e. high-tech and knowledge-based industries and international forum business industry) have been slowly progressed on the island (see section 4.4.2 in Chapter Four). Consequently, Chongming is continuously suffering from labour outmigration. Due to the mass closure of industrial enterprises and the absence of alternative industries, employment is reducing significantly on Chongming; the number of industrial workers decreased from 161,547 in 1990 to 58,066 in 2004 (Chongming Statistics Bureau, 2017), and is continuously declining. As more and more of the working-age population leave the Island to seek work in central Shanghai or other cities, the number of "Elders Living Alone" is growing (Chongming County Government, 2017). The ageing problem is becoming more severe as the population above 60 years old on Chongming has surpassed 0.21 million, taking up 32.6% of the registered population in 2015; and it is expected to exceed 0.25 million in 2020, occupying 38% of the total population (ibid.). Out-migration and the ageing population not only pose a series of social problems and challenges, but also effect prospects for future economic development and people's well-being.

Due to the shortage of alternative employment, most of the remaining residents are still engaged in farming. Their household income and living standards remain relatively low. This is even more prominent for those households whose homestead and farmland have been expropriated or transferred for construction or forest land. At first, relocated farmers were promised a new apartment in the eco-city/eco-town built on their original

homestead or collective lands, but they had to make up for some price differences based on market value of the new apartment unit. It is noted that the compensation paid to local farmers for the demolition of their houses can just merely cover the cost of a new apartment (Sze, 2015). Moreover, in some cases, it took several years before the completion of the new residences for displaced residents to move in. As an indigenous farmer in Chenjia Town shared:

> "We have waited for seven years before the delivery of the apartment used for compensation for housing demolition. Until last year [in 2017], we have been renting houses from another peasant household in other villages on Chongming. There is nothing good about land exploitation and house demolition, not as many other people think. Although the government compensated a department in multi-storey residence, we still prefer our own house – our previous house, with two floors and a big garden and backyard. But the whole village has been demolished for building the eco-city."[94]

Similar circumstances have been described by other affected residents online, one of whom even refers to the transitional experience as "homeless" (wu jia ke gui) time.[95] Moreover, along with the resettlement, indigenous farmers' household registration status (the "hukou") has changed from rural to urban. Although it potentially grants the residents much coveted rights in employment, schooling, medical treatments, and other social welfare provisions, it also induces higher living costs – water, electricity, garbage collection, and apartment management fees, which

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[94] Interview with a local farmer in Chenjia Town on 13 September 2018 in Mandarin, translated by the author.
[95] Residents online forum discussion in 2016. See http://tieba.baidu.com/p/4667029757 (accessed on 4 May 2019).

further burden relocated farmers. Many villagers find that their net expenditures have risen, rather than fallen. Meanwhile, being uprooted from their traditional ways of living in agriculture and fishery, and without the skills or knowledge to find and secure non-agricultural jobs, many affected peasants are caught in the plight of no land to farm and no position in which to work. In the meantime, without the rural household registration, they can no longer rely on subsistence farming or the subsidies and free services entitled to members of collective farms in China (Chang, 2019). Without other sources of income, some have tried to grow vegetables on whatever small land parcels they can find inside the communities. During the field survey, a vast area of idle land covered by reeds near the Yu-An Community was discovered, in which the majority of former farmers were resettled. Here, people were seen cultivating the land (Figure 24) and a female elaborated:

> "I am living in that building (pointing to a multi-storey residential building behind). Our farmlands have been bought by the government and all villagers ware moved in the Yu-An Community. Since I do not have a job and have nothing else to do, and I found this land has been vacant for a long time, I am thinking to grow some vegetables, so we do not need to buy from the market."[96]

The land is a planned construction site for the International Forum Business District (Figure 5), and the words of this former farmer show the dilemmas of the relocated peasants on Chongming. Even if the Eco-island plan was successfully implemented, there may be a mismatch between the proposed industries – focusing on high-tech and data management– and

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[96] Interview with a local resident on 23 March 2018 in Mandarin, translated by the author.

the skills and knowledge of local residents (Cai, 2016). This could cause severe financial difficulties for local people and social stability concerns. Currently, besides cultivating marginal lands for growing vegetables and fruits, some relocated farmers sought seasonal part-time farm jobs in nearby villages that have not yet been relocated or in several eco-farms managed by people from outside of Chongming; some struggle to continue their traditional livelihoods like fishing in forbidden fishing zones (such as the offshore area and the newly-reclaimed land that has not yet been developed) (see Figure 25). Others found no other option but to sell their resettlement units in order to afford to live (Chang, 2019). Many of these units ended up in the hands of investors from Shanghai who aim to speculate on the housing prices once more desired features in the communities are completed.

Figure 24. Residents in Chenjia Town cultivate temporarily idle construction land for growing vegetables.

Source: the author (photo taken on 26 March 2018).

Figure 25. An elderly villager heading towards the shore for fishing.
Source: the author (photo taken on 25 March 2018).

While villages were removed, gated communities of opulent villas and high-rise or multi-storey modern residences have mushroomed along the shore and in the central development area of Chenjia Town and Chengqiao Town (Figure 26 & 27). Besides a small portion of relocated villagers, most of the homebuyers are from outside of Chongming who have either made an investment or a holiday property purchase. Therefore, although these luxurious properties were quickly sold out, they are left largely unoccupied.[97] In contrast to the struggling rural villages and residents who remain hidden from public debates, an elite group seems to arouse more attention on the Eco-Island development. This skewed approach to social issues can also be seen in the opening of the tunnel-bridge, which stretches to the planned key development zone of Chenjia Town in the east of the Island where most of the real-estate projects are located, and consequently

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[97] Interview with a gatekeeper of a luxurious villa community in Chenjia Town on 26 March 2018.

accentuates the marginalization of the western old town area where most of the residents live. The uneven distribution of costs and benefits to different stakeholder groups reflects what is often called environmental, ecological, or green gentrification, in which urban greening or eco-development may be positive for some (e.g. economic elites in Shanghai) but negative for others (e.g. dispossessed Chongming farmers) (Dooling, 2009). As the urban-rural income gap in Chongming is continuously expanding (Chongming Statistics Bureau, 2017), the social injustice of eco-island construction is increasingly striking.

Figure 26. Newly-built villas in Chenjia Town near the Dongtan Nature Reserve

Source: the author (photo taken on 26 March 2018)

Figure 27. Newly-built modern residences in central Chenjia Town

Source: the author (photo taken on 31 March 2018)

6.4   The influence on local perceptions

The influence of the state-led eco-development on Chongming is compounded by its effects on altering the perceptions of local people. During the field investigation, whilst a number of local farmers interviewed severely condemn the eco-development measures enforced by the state that affect the local environment and their livelihoods (see interview quotes in Section 6.2 and 6.3), there are also a group of local residents who are indifferent to the environmental degradation (although they recognize the environmental issues) and a few even praise the eco-development policies for bringing them unearned income (such as land transfer payment and eco-development subsidies).

Delving into the variety of perceptions possessed by local residents on Chongming shows that perceptual change and variations occur in three ways. Firstly, economic benefits come to outweigh traditional beliefs and practices in decision-making, and to alter the latter. It is pointed out by Tilt (2010) that villagers' concerns about environment were grounded less in abstractions about aesthetics and harmony and more in a sense that relates

to their economic livelihoods. This is evident in the behaviours of "river cleaners" in implementing local government's river regulation projects. While the interviewed former "river cleaner" explained using herbicides to clean the riverbanks in order to meet the job requirements (as enforced by the local state) to secure a full salary (see Section 5.3.2 in Chapter Five), he later confessed, "the river water quality was much better before the river regulation… reeds can help to purify water, but we are actually the 'reed killers'."[98] Similarly, incentivised by the economic benefits (namely the rent paid to the households who have transferred their contracted lands), local farmers widely embrace the land transfer proposal suggested by local cadres and some farmers even actively seek for the government to transfer their lands,[99] although many of them acknowledge the destructive environmental impacts of unitary tree planting enforced by the government on transferred lands. As can be seen, the economic benefits provided by eco-developments bribe many local residents, making them team up with the state actors and developers to implement eco-measures that do more harm than good to local environment.

A second factor leading to some farmers' perceptual and behaviour change is attributed to the government's ideological exhortation. As has discussed in Section 5.2.3, during land acquisition and land transfer process, resentful farmers who were ordered to relocate in short notice were exhorted and "educated" by governmental officials and local journalists about the significance and benefits of promoting eco-development on Chongming; and farmers who are firstly reluctant to transfer their lands were admonished by village cadres about the difficulty in operating their

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[98] Interview with a local "river cleaner" who was hired by the Chongming Water Authority from 2007 to 2009 to conduct river cleaning and maintenance on 12 September 2018 in Mandarin, translated by the author.

[99] Interview with local farmers in 2018, and also see a governmental news http://www.sohu.com/a/81618815_388427 (accessed on 6 May 2019).

lands if they do not cooperate. More broadly, to facilitate the implementation of eco-development on Chongming, the government has literally written its own understanding of ''ecology'' on the landscape (also see Chang, 2019). Along many roads leading to central towns on Chongming, for example, the government has erected billboards every 10-15 km, which carry slogans about eco-development work. These slogans focus on ecological construction and resettlement, such as:

Engage in ecological construction and promote the Chongming economy (gao hao shengtai jianshe, zhenxing Chongming jingji).

To live in eco-communities and enjoy a wonderful life (zhu shengtai xiaoqu, xiang meihao shenghuo).

This rhetoric has had a deep impact on local perceptions. Some farmers, especially those who have gained financial benefit from eco-development, now have come to equate ecology with ''green'' (both on the landscape and in their pockets – namely financially), namely planting more trees, and equate "eco-island" with urbanized and modernized island. [100] The state's efforts seem to be winning out: some local farmers now see the demolishment of local rural houses and the relocation of farmers to centralized modern residences as the prerequisite for eco-island development, and they especially hope that their own houses be expropriated by the government so that they can receive substantial compensation fees. For instance, an indigenous farmer expressed:

"The development of an eco-island is to demolish the village, and resettle the peasants in the city, and then plant as many trees as

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[100] Interviews with local farmers from 2016 to 2018.

possible. I think one day my house will also be demolished, and I will use the compensation money to rent an apartment in central Shanghai near my son's apartment."[101]

Such narrative is alike the official accounts of eco-development that emphasize modernization and the increase of green coverage. As can be seen, as state policies become internalized in local perceptions, it becomes easier for the government to extract a measure of local conformity to its views of environmental change and policy (see Tsui, 1996).

The third factor is the gradual divorce between people and nature on Chongming. As the state-led eco-development gradually takes over the traditional role played by local people in operating and maintaining the environment, this has resulted in peoples' emotional detachment from the nature, and eventually affects their environmental behaviours. For example, river regulations diffused over rivers of all sizes on Chongming gradually nationalize water resource and institutionalize its management on the island. Shifting from collective efforts to government-led river governance, the destructive and adverse effects quickly become apparent. Besides the destruction of a river's natural state due to the concreting of riverbanks and canalizing of waterways, field surveys on Chongming Island also discovered many "forgotten" rivers and ditches where it seems that villagers recognize their traditional maintenance role has been diminished and their efforts have not been replaced by local government workers. In these places, water is stagnant and smells (Figure 28). Ironically, local officials argue that one of the problems of current river management on Chongming is the limited participation of local inhabitants, which officials attribute to villager's weak awareness of environmental sanitation (Wang et al., 2014). However, it is believed that when the government took over the river conservancy works

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[101] Quote from a local village elder during a focus group meeting on 12 September 2018. Original quote in Mandarin, translated by the author.

and deprived people of their original responsibilities, rights and powers, local people naturally regarded river management as governmental work, which they have no right or duty (or even the courage) to interfere in. Gradually, people even lose the initiatives in managing the environment in their own property. Figure 29 shows a drainage ditch surrounding a farmer's house left untended. Political ecologists argue that the state's disproportionate and overwhelming influence in environmental interventions often lead to unintended and even pernicious socio-environmental results (Bryant and Bailey, 1997; Neumann, 2005; Peet et al., 2001; Robbins, 2012). The case of the transformation of Chongming environmental governance vividly illustrates the detrimental consequences that can arise when community-led environmental governance, that draws upon and reproduces local expertise, is replaced by a top-down perspective that relies on external professional knowledge and delivery practices and fails to sufficiently recognize the sensitivity of the local environment.

Figure 28. A "forgotten" ditch on Chongming

Source: the author (photo taken on 29 March 2018).

Figure 29. An untended drainage ditch surrounding a farmer's house (marked in red box).

Source: the author (photo taken on 13 September 2018).

As can be seen, local farmers' changing perceptions on local environment and their passive responses towards eco-development policies that are enforced by the state have exacerbated the environmental destruction on the island. Meanwhile, the inseparability of government policies and local perceptions speaks of the close relationship between politics and local knowledge. As Tilt (2010) argues, local farmers' expressions of environmental awareness must be read alongside the broader political and economic changes that were taking place in the locality. The case of Chongming supports this argument.

6.5   Conclusion

This chapter examines Chongming eco-development's effects on local environment and community and how local community respond (or not respond) to eco-development. With its focus on the interplay between people, place and environment, a PE framework gives voices to local people and brings in a historical dimension that traces the environmental transformation on Chongming over time. It thus enables a detailed and on-the-ground analysis of the eco-development effects that might never be shown in official reports (see Chapter Four).

First, this chapter examines the environmental outcomes of eco-development through the prism of an indigenous plant: reeds. Reed is a highly-productive native wetland plant that has thrived on Chongming since the island was formed, but has been gradually disappearing in the past decades. By reconstructing, studying and analysing the transformation of Chongming Island's reed ecology throughout the history, it enables a critical examination of the destructive effects of current eco-development practices on Chongming. The gradual disappearance of reeds vividly shows that the state-led eco-development's lack of attention to local ecological realities and characteristics has caused major ecological disruption on Chongming. Second, as the eco-development of Chongming is shaped by the Shanghai Municipal Government to fit the city's overall development needs, the well-being of the local community received negligible concern. Consequently, eco-development on Chongming caused numerous social-economic problems, including stagnant local economy, outmigration and an ageing population, and the decline of people's living standards. Even worse, eco-developments enforced on Chongming also have substantial impacts on altering local people's perceptions towards the environment and thus further influences their responses to the eco-development enforced on the island. This has occurred in three ways: (1) the economic benefits provided by the state outweigh traditional beliefs and practices in environmental management, and thus alter the latter; (2) the government's

ideological exhortation defuses much local discontent and gradually effects local perceptions; and (3) state intervention in local environmental resource management gradually detaches people from their living environment, and thus disrupts local traditional culture that is intimate to nature and environment. Consequently, during the eco-development process, there is no effective local resistance that can counteract the state's top-down construction measures, and local communities and people remain largely silent and some even team up with the state actors in effecting environmental changes, although they are aware of the environmental destructions outcomes of the eco-development. Such perception changes in local people have further induced behaviour changes in managing local environment, and thus exacerbated the environmental destruction on the island.

Chapter Seven: Conclusion

7.1 Introduction

Since the 2000's, debates have abounded about the coming "urban age" (Brenner and Schmid, 2014) and, more broadly, about the role of cities and urbanization in contributing to planetary changes in the human-induced era of the Anthropocene (Rademacher, 2015). In addressing the pressing challenges of climate change, resource depletion and degrading environment, sustainable development idea has diffused into the urban planning and development realm, and quickly becomes the common development theme of cities across the world. Initiated by the central state and fuelled by the increasingly heightened national policy of ecological civilization construction, eco-city and alike urban ecological developments have been initiated and practiced in China in an experimental effort to create a sustainable pathway for a harmonious relationship between humans and nature. Previous studies of Chinese eco-development have highlighted many issues, both with policy and with the outcomes. Due to the dominant role of local state in shaping eco-development practices in China, concerns over the formulation and operation of eco-development are popular among urban sustainability researchers. The underlying rationale and the driving factors (Chien, 2013; Pow and Neo, 2013; Joss and Molella, 2013), various modes of governance and framework (De Jong et al., 2016; Joss et al., 2015), detailed planning and design (De Jong et al., 2013a and 2013b); and influences of knowledge transfer or policy mobility (Chang, 2017; Hult, 2015; Pow and Neo, 2015) have all been previously explored, but few researchers have probed the self-adjustment and evolution of an individual eco-development project over time. Meanwhile, in sharp contrast to its idealistic goal and the glamorous rhetoric, studies have shown that state-led and EM-guided Chinese eco-developments have overemphasized on economic pursuit and have a negative impact on local communities and

ecologies (e.g. Chien, 2013; Caprotti, 2014a; Caprotti et al., 2015; Pow and Neo, 2015). Nevertheless, the on-the-ground practices and effects in terms of environment, society and economy of Chinese eco-developments have seldom been examined in depth and from a local point of view. Whether Chinese eco-development can live up to its promise in achieving urban sustainability remains unknown and has been constantly under debate. This thesis has been designed to contribute to these gaps in knowledge by providing an up-to-date theoretically informed and critical on-the-ground assessment of eco-development in China through a case study of Chongming Eco-Island.

Through the theoretical lens of ecological modernization (EM) and political ecology (PE), this research aims at examining a Chinese eco-development project as a whole from design, through delivery and then to how it impacts on local environment and communities. Integrating the theoretical and methodological insights of EM and PE provides an appropriate conceptual framework to examine the local dynamics and complexities of Chinese eco-development from both top-down state-focused and bottom-up locality-concerned perspectives. Being attentive to scale (both spatial and temporal) and power dynamics, this research brings to the fore both state actors and non-state actors' voices and knowledge to examine three explicit research questions, namely: (1) how is urban eco-development interpreted by state actors in China through the contents of policies and plans; (2) what are the on-the-ground practices and (ecological and socio-economic) effects of eco-developments in China? (3) how do non-state actors perceive and respond to local eco-development in China? The main empirical findings are summarised in the Section 7.3.

In terms of methodology, this study builds its findings on a case study of Chongming Eco-Island in Shanghai, China. A single case study is a suitable and reliable strategy to collect in-depth information regarding manifold aspects of eco-development planning and practices, and to deal with interrelations between a wide range of factors. Chongming Eco-Island (as

well as its precursor – the Dongtan Eco-City) was selected for three major reasons. First is its representativeness of Chinese state-led eco-development, so an understanding of Chongming, to some extent, contributes to the achievement of a deep insight into eco-development in China. The second reason relates to its general positive reputation among various eco-developments at home and abroad: whilst most of the Chinese eco-projects are noted to lay particular stress on singular dimension (e.g. technological innovations) or two, Chongming Eco-Island has been recognized as promoting a more integrated sustainability vision and planning approach (Joss et al., 2011). This makes it an ideal case for a critical examination of current Chinese eco-developments. Third is due to its existing complex social structure, the abundant ecological resources, and the rich historic and cultural contents, which endow it with both political and ecological value, and thus make Chongming an apt setting for a critical analysis of the changing human-nature relationships over time and the environmental and socio-economic consequences of eco-developments. For data collection in this research, mixed qualitative methods are adopted for data collection, including archival research, in-depth semi-structured interviews with both state and non-state actors, focus group meetings with local communities on Chongming, and on-site observation and documentation.

In this conclusion chapter, the value and complementary role of the theoretical lenses of both EM and PE are first reflected. This is followed by a summary of the empirical findings of the research elaborated in previous chapters, which are organised in line with the three key research questions of this research. This chapter then moves to discuss the broader implications of this research in summarising the main challenges of eco-development in general and providing specific recommendations for Chongming and China. It concludes with a brief discussion of the potential avenues for future empirical research and theoretical examination.

7.2 An integrative approach in studying Chinese eco-development

This research integrates the empirical and methodological insights from EM and PE to theorise the planning and practices of eco-development on Chongming. Whilst the case study of Chongming has demonstrated the fruitfulness of an integrative approach in studying Chinese eco-development, it also offers broader implications about the future direction of research on eco-developments in China and more broadly, local environmental governance, politically, socially and ecologically.

Firstly, this thesis has shown that an integrative approach enables a holistic and in-depth understanding of the shaping and reshaping of eco-development planning and practices. An EM approach often lays particular emphasis on the capabilities, rationale and actions of state (and the state's partners) in promoting eco-development through institutionalized programme. This is crucial in dissecting the formation and implementation of Chinese eco-development considering its relatively authoritarian governance manner. However, a PE perspective that draws attention to uneven power from different scales underlying the political-economic dynamics of eco-development provides complementary views. Therefore, by combining the insights of EM and PE, a multitude of state activities has been investigated, including policy and planning where, for example, a Chinese version of EM (Zhang et al., 2007) is influential in strategic thinking on the future of the Island as evidenced in its master plans (see Chapter Four); to the shifting perspectives of Shanghai Municipal Government on the ways in which it may utilise Chongming Island as a resource for the megacity (e.g. from a site of food production to a greenfield for urban development, and to place of landscape consumption) (see both Chapter Four and the discussion of land governance change in Section 5.2 of Chapter Five). As can be seen, much of the planning of the future of Chongming Island is taking place off the Island, in the offices of land use planners in Shanghai and engineers and in corporations (such as

Arup in designing the Dongtan Eco-City and SOM in planning the Chongming Eco-Island). By integrating a multiscale analysis, this research unravels Shanghai city's intention in shaping the so-called eco-development on Chongming. The city too is working at a multi-scale level to manage its own policy tensions. For example, national policy demands that cities pay more attention to green land. Working across the whole spatial planning area, including Chongming, allows the city government to meet this policy goal. Protecting green land on Chongming enables the city to offset this against further land intensification in its central area. Therefore, it is argued that although local spaces clearly matter, they need to be contextualized within a multi-scalar approach that reveals the broader regional, national and even global dynamics that influence local environmental changes. An integrative approach enables an understanding of the deep and complex ways in which the dynamics of unequal social and political power affect ecological or urban systems and the local eco-development.

Secondly, this research has successfully drawn out the competing interpretations of eco-development that can come from an EM focus on strategic policy and planning initiatives, and a PE informed perspective that explores individual and community perceptions of eco-development. While the former is more positive about managing the environment and of promoting change, the latter provides a more critical account of what change means in practice. The challenges of top-down governance and increasingly marked discrepancies in interpretations of the environment are starkly revealed as the research moves from policy elites to those who live with the environment and experience the changes. Judgements on the successes or failures of eco-developments therefore need to be much more nuanced. The complex nature of eco-developments means that researchers need to be more sensitive to alternative and competing perspectives when designing projects and in interpreting results.

Thirdly, whilst EM often takes an ahistorical view of environmental issues that highlight contemporary actions and results, PE provides an

historical account of the relationship between people and place and how that has shaped their environment. The novel nature of much eco-development means that time horizons are necessarily shortened. What this research has shown, though, is that the development story for a particular place does have deeper roots and researchers need to be sensitive to those. With a diachronic focus, this research brings a temporal perspective into contemporary eco-development studies. It enables a critical and longitudinal evaluation of the effect of eco-initiatives on local environment and society, as can be seen from the analysis of changing land and water governance (see Chapter Five), as well as the disappearing reeds on Chongming (see Chapter Six). Moreover, it also shows that the study of an individual eco-development project needs to understand the places that are being researched.

7.3 Eco-developments on Chongming: empirical findings

This section reflects upon what the empirical findings mean for the three main research questions introduced in the beginning of the thesis.

(1) How is urban eco-development interpreted by local governments and state actors in China?

To address this question, this research has examined the state's design of eco-development on Chongming based on the analysis of the various relevant governmental documents and interviews with key informants and state actors, including cadres from different sectors of different levels of governments, planning experts, involved enterprises, and academic researchers who act as the consultants for Chongming policy-making and planning process. Tracing the eco-development course of Chongming (both the Dongtan Eco-City and the Chongming Eco-Island), it is found that throughout more than a decade of development, the leading planning principle of Chongming has undergone several changes, featuring a growing

emphasis on ecological remediation and conservation (see Chapter Four). In the 2000's, Chinese development is featured as fervent urbanization with awakening environment awareness. Accordingly, the city of Shanghai endeavoured to promote urban-rural integration through centralized development in the city's suburb, whilst advocating a green development pathway. Consequently, the Dongtan Eco-City and the subsequent Chongming Eco-Island initiatives followed the centralization ideology and employed a weak form of EM that promoted economic development whilst addressing environmental challenges. Thus, eco-developments on Chongming in this stage are featured as a pro-growth urbanization development with a green branding. Since the late 2000's, the country has gradually shifted its policy focus from growth alone to sustainable development and raises the construction of "ecological civilization" to a prominent national policy. In response, Shanghai adjusts its urban development strategy to practice a "negative growth" that strictly constrains the population and construction scale of the city. At the same time, it promotes ecological construction with an emphasis on conserving and building the city's environmental assets (such as wetlands and forests). Accordingly, along with the introduction of the first environmental KPIs in 2010, Chongming Eco-Island has increasingly focused on ecological construction through landscape regulation and green land creation. Judging from the policies and plans alone, Chongming eco-development is experiencing positive changes from previous pro-growth ideology to an ecology-centric one.

Meanwhile, official accounts of the achievements and effects of the eco-development as shown in the governmental assessment documents and state actors' narratives have painted a gratifying image of Chongming, and shed light on the state's interpretation of eco-development on Chongming. In terms of the environment, both the governmental evaluation reports and state actors praise the environmental measures adopted in the Eco-Island construction whose achievements have been shown in the

delightful statistics of the indicators, such as the rapidly increasing sewage treatment rate and forest coverage rate. According to the official accounts, Chongming has served as a model of environmental protection and construction within a hyper-urbanized metropolitan region (worthy to note here is that such positive view is in striking contrast with the perception of local indigenous people and the researcher's on-site observation). In terms of the economy, there is a sharp division between governmental written documents and key state actors' descriptions and explanations. According to many interviewed governmental officials, planners and scholars, both Dongtan Eco-City and the initial Chongming Eco-Island plan that promised to boost local economy through green industries has failed. Stated reasons include the initial faulty pro-growth planning and design that had negligible considerations of the local environmental context, as well as the policy swings of the municipal government of Shanghai due to the changing political leaderships and the adjustment of the city's overall development strategy to meet the central state's new demands. As there is a growing emphasis on ecological conservation and construction, local economy is deemed as the trade-off of the ecological conservation and construction. Nevertheless, despite the stagnant economy of Chongming, official evaluation reports still largely affirm the economic strategy and achievement of Chongming. In terms of the social dimension, an examination of the governmental documents and reports affirmed that social issues and how they interact with the economy and environment were the most neglected dimension in official accounts on Chongming eco-development. Interviews with key state actors further revealed that Chongming eco-development inherently lacks concern over the local communities and people. This is due to two major reasons, namely: 1) Chongming eco-developments are initiated to target domestic and international elites and the upper-middle class living in the central city of Shanghai – local farmers and indigenous residents are thus not being considered during the policy-making and planning process; and 2) the

planning mechanism adopted to plan and affect eco-development is based on urban setting and is thus inappropriate for the rural Chongming. Social sustainability concerns are largely absent on Chongming eco-development.

A thorough analysis of the planning evolution, detailed design, and assessment mechanism of Chongming eco-development reveals the specific context of China's socio-political climate and the unique features of Chongming eco-development practices – marked by a strong municipal state, exclusion of local concerns and limited public engagement, a vaguely-defined and constantly changing vision, and an indicator-driven planning mechanism. To begin with, as it has been shown that the shaping and reshaping of Chongming eco-development is largely subject to the city of Shanghai's evolving development needs, the strong executive power and capacity of the Shanghai municipal government is also demonstrated through the strict enforcement and swift execution of policies and plans of Chongming eco-development. Meanwhile, due to the dominant municipal state, there is an almost complete absence of civic participation in the policy-making and planning of Chongming eco-development; the process is resolutely top-down. In addition, a significant problem identified in the Chongming Eco-Island concerns the lack of a clear vision of what makes an "eco-island". Initially, the Dongtan Eco-City wholeheartedly embraced Arup's (a UK-based transnational engineering and design corporation) proposal in building an eco-city from scratch, which has little consideration of the local environmental reality. The following Chongming Eco-Island scheme, although locally-driven and independent, adopted a narrow view of ecology, which equated ecological construction with increasing vegetation cover and regulating local natural environment. The absence of a vision of the future Chongming has resulted in the volatile policy and has created room for various interpretations and translations that allow different interests involved in the eco-development. Finally, guided by the EM ideology, measures employed to construct the eco-island are led by explicit indicator systems. The success or failure of eco-construction has

been simplified to whether or not the listed quantitative targets on the plan have been achieved. These governance and planning features, whilst underscoring current eco-development on Chongming, have also shaped the on-the-ground practices and effects as examined in the following research question.

(2) **What are the on-the-ground practices and (ecological and socio-economic) effects of eco-developments in China?**

To answer this question, this research examines the detailed implementation measures of Chongming eco-developments with a specific focus on the changing land and water governance, and further delves into how the eco-development impacts on the local environment (through the prism of a non-human species – reeds on Chongming) and community. Firstly, based on both historical and contemporary records, governmental and folk archives, as well as state actors' accounts and local residents' narratives, this research has interrogated, how over time there have been transformations in land and water practices and governance on Chongming. As shown, relations between local people and place are increasingly being broken as state actors progressively intervene in managing the environment and resources of Chongming through the eco-development process. Eco-development that draws on external expertise and values urban aesthetics and technological and engineering solutions simultaneously marginalizes local knowledge and breaks the traditional people-nature interaction on Chongming.

In terms of land resource management, the exploitation of local lands (either coastal reclaimed lands or traditional farmlands and local people's homestead in the inland of Chongming) from local community and people has demonstrated how Shanghai-made eco-development materialized on the ground that seizes local natural resources and dispossesses local community and people. In the coastal area, the massive wetlands reclamations serving industrialization and urbanization needs since the late

1950's continue during the eco-development process. Despite various justifications given, the indiscriminate reclamations of coastal wetlands serve the development needs of Shanghai through land creation for sustaining economic development, for compensating the farmland loss in central Shanghai, or for reserving for future development needs. Perhaps the only significant change to previous reclamation activities is that lands reclaimed from the sea are now under direct control and management of the city of Shanghai, detaching from the local communities as well as the local authority of Chongming. Consequently, a number of "ecological enclaves" have been created, undermining local socio-economic interests and posing threats to local environmental integrity.

Besides the failure to curb exploitation of the coastal wetlands, it is found that eco-developments have also triggered a substantial reshuffle of the land ownership and use rights on Chongming. Guided by policies and plans that emphasize concentrated urban development and green lands creation, massive land acquisition and transfer has been performed on Chongming. Farmers' homestead and agricultural lands were expropriated or transferred for addressing various eco-development needs, including infrastructure construction, urban development, and tree plantation. The extensive land ownership and management changes have been constantly detaching local peasants from their lands, and significantly transformed the long-established human-land relationship by dramatically changing local landscape and local lives. This process not only undercuts the interests of local farmers, but also results in unintended and adverse ecological effects (e.g. biodiversity loss due to the replacement of high-quality farmlands with single-species woodlands).

Similar to land governance, water management on Chongming has experienced a shift from collective efforts to exclusive state intervention. Along with the Eco-Island construction process, a series of river regulation projects was practiced on Chongming to meet the mandate target set up in eco-development plans and policies. Guided by EM methods, these projects

employ engineering measures, replacing the natural river banks with concrete retaining walls; local residents who were employed by local authorities as "river cleaners", cleaned and maintained the riverbanks by utilizing herbicides to meet the requirements of their job tasks. As can be seen, on-the-ground eco-development measures adopt the EM principles, which include emphasizing scientific and technical perspectives, especially of engineers and landscape designers, and largely exclude local context; an emphasis on resource efficiency (e.g. in water flow) and urban aesthetics (e.g. in landscape design) (Pow, 2018); and the use of technology and techniques to manage the environment (e.g. straightening rivers). It has thus introduced notions of environmental management that are urban, modern, aesthetic and clean and draw on external expertise that further marginalize local knowledge.

An in-depth examination of the changing environmental governance on Chongming disclosed that as state-led and EM-guided eco-development implemented on the ground, both local people (as well as their ecological practices) and local ecology are undermined. The detrimental environmental impacts have been vividly shown in the disappearance of a native and productive wetland plant on Chongming – reeds (see Section 6.2 in Chapter Six), which demonstrate a sharp contrast with the official celebratory assessment of eco-development. Meanwhile, a critical evaluation of the effects of Chongming Eco-Island from a local perspective has also shown that the promises of EM (i.e. boosting the local economy through green industries and achieving win-win sustainable socio-economic outcomes with environmental development) have not been fulfilled. On the contrary, guided by these promises and the assumptions on which they are based, the eco-development generates adverse results for the local community (e.g. economic stagnation and exacerbating social problems). Through the analysis of the changing environmental governance and the effects of eco-development on local ecology and community, local community and individuals' responses and perceptions have also partly

shown, which is delved into in greater depth in addressing the following final research question.

(3) How do non-state actors perceive and respond to local eco-development in China?

To answer this question, this research mainly draws from a PE framework that highlights how power relations influence the access, control, and management of resources (Peet and Watts, 1996, Bryant, 1998). It is argued that power involves the ability of an actor within a social relation to carry out his or her own will despite resistance from others; to set the agenda or prevent the discussion of controversial issues; and to shape others' perceptions and preferences in ways that cause them to act contrary to their own interests (Hoque et al., 2017). As shown in the case of Chongming, the strong municipal government in managing the environment on Chongming has excluded not only the local community but also their concerns and interests in the decision-making process. Community concerns about the nature of development are voiced but have only very limited opportunities in which to be heard. Moreover, the government also attempts to impart its understanding of eco-development to the local people, while economic benefits induced from eco-developments and the divorce between local people and nature also affect local population's attitudes toward eco-development. Consequently, during the eco-development process, there is no effective local resistance emerging that can counteract the state's top-down construction measures. Local communities and people remain largely silent and some even team up with the state actors in effecting destructive environmental changes, although they are aware of the environmental destructive outcomes of the eco-development. The negative coping methods as well as perception changes of local people have exacerbated the environmental destruction on the island.

In summary, this thesis explores the planning, practices, and effects of Chongming Eco-Island (and Dongtan Eco-City) and reveals the problematic nature of state-led, EM-guided eco-development in China. The empirical findings have shown the paradox of ecological destruction and socio-economic disruption through eco-development, which was caused by the disconnection and incompatibility between state's design and local realities, and between external desire and expertise and traditional environmental knowledge and practices. The following section further discusses the broader implications of this research regarding its methodological contribution in proposing an integrative approach in studying Chinese eco-development, and suggestions of plausible solutions and policy recommendations to help to promote a more ecologically friendly and socially just form of development on Chongming and China.

7.4   Challenges for eco-developments

Drawing together the empirical findings of this research, at least three major sets of challenges for eco-developments can be identified. These issues, although being drawn from the eco-development practices in China, more specifically, from Chongming Eco-Island, inform the understanding and rethinking of urban sustainable developments in other parts of the world.

The first focuses on the crafting of *visions* to guide current and future deployments of the eco-development concept aimed at catalysing urban sustainability transitions. A crucial question here concerns the overall vision of what an eco-city, an eco-district, or an eco-island like Chongming should look like and how it might operate. It is noted that guiding visions should serve the role of providing stable benchmarks so as to maintain a degree of consistency during transition or development processes (Rapoport, 2015), or be actively structured to evolve in response to changes in sustainability imperatives and the emergence of new technologies and social and market

practices. However, this research further argues that it is equally important to concern and reflect on the historical, cultural, social, and economic contexts in which eco-development are formulated and implemented. As shown in the case of Chongming, an eco-island blueprint that is designed by external actors with little local knowledge and values involved, undermines the long-established human-nature relationships and generates the opposite effects in local environment, economy and society. A further consideration for the elaboration of guiding visions is the existence and the role of people. With the preoccupations with the "hardware" (such as the physical infrastructure and energy and material flows) and the "software" (such as the information and data networks) of cities in current urban sustainability developments (Xie et al., 2019b), questions are raised about: to what extent do such visions unintentionally or otherwise risk treating urban citizens entirely as dependent variables, whose primary (or sole) function is to adapt to the changing environment and to adopt the paternalistically-defined lifestyle stimuli provided by redesigned sustainability-minded urban forms; and can these visions genuinely incorporate volition, dissent and social practices that fall outside the orthodox ideas and mechanisms? These questions entail close examination of the roles played by the residents in effecting eco-development. A final set of issues under this theme concerns the procedural dimensions of guiding visions, in particular: who, exactly, are the guides creating the visions; whose visions and preferences are being promoted and relegated; how can processes of vision-making be made accountable; and how are (or might) alternative visions be incorporated into the wider notions of urban sustainability transitions? Addressing these questions is crucial in understanding the rationale and formation of an eco-development practice, and inform further debate on social and environmental justice during the process of eco-developments.

The second set of challenges focuses attention on the nature of the implementation *processes* used to translate eco-development visions into

built realities. A first set of questions here relates to the nature of eco-development agendas: do (or should) they incorporate *transformative* objectives involving the deliberate, holistic and fundamental reconfiguration of the goals, functions and forms of urban systems compared with the pursuit of more incremental *transitional* approaches based around iterative reflection on sustainability goals, how problems are framed, and how responses are developed (Markard et al., 2012)? The approaches adopted are likely to be influenced by a host of discursive, institutional and material factors (for example, transformational ambitions may be more practical for new-build cities compared with retrofits in existing urban areas, whereas the notion of eco-experiments implies a less predetermined approach), but the question is nevertheless central to the types of planning approaches established. Do eco-development visions axiomatically require more directive, or at least advocacy-based planning, or can they be achieved through more collaborative and dialogue-based approaches? The deliberation of these questions needs to take into consideration of the geographical dimensions of eco-development transitions. As Hansen and Coenen (2015) point out, sustainability transitions are not pervasive; they happen in particular places that have their own political, cultural, economic, social and physical conditions and context. Probing the nature and implications of these geographical materialities in terms of their place-based specificities and inter-scalar properties and relations forms a crucial element of understanding the opportunities and obstacles to embedding and diffusing eco-development ideas and practices. As shown in the case of Chongming in China, although both Dongtan Eco-City and Chongming Eco-Island were evoked as a new phase of development, one that took ecology seriously, and which represented a daring new approach for the Chinese urban development, in practice, their development processes largely followed the traditional and incumbent urban planning mechanisms. Does the authoritarian political structure inhibit innovations in governance and planning that are essential

for the eco-development? Whether more radical and large-scale changes in urban planning, technology and social innovations that go well beyond traditional policy approaches can deliver ideal outcomes of eco-development? These questions deserve further debate and exploration.

The final set of challenges relates to the more operational practicalities of the making and remaking of eco-development. Cities, as holding vast reserves of social, intellectual and financial capital, are renowned for their complexities. Different social groups within the city with different interests often have competing perceptions towards resources, environment, as well as changes. The critical question here is how to understand and further manage these contesting pressures while still making real progress on urban eco-development. Different planning approaches might to some extent reconcile some conflicts; however, planning or muddling through the human and political dimensions of eco-development requires an astute appreciation of the various actors operating within urban environments – their preferences, motivations and network relations, the specific power relations and politics of urban sustainability in different contexts, and political strategies and tactics that might be used to build support for, and/or counter opposition to, different types of eco-development initiatives. As shown in the case of Chongming, as the government has successfully influenced the perceptions of local residents, and as state policies become internalized in local behaviours, it becomes easier for the government to extract a measure of local conformity to its views of environmental change and policy. Without the participation of local knowledge and values, the environmental results are counteractive.

7.5   Policy recommendations for Chongming and China

Reflecting upon the "action" debates of political ecology (see Section 2.4.2 of Chapter Two), this thesis also seeks to address a practical question: can a PE research like this thesis do more than providing a critical

commentary on current eco-development in China? It is difficult to imagine policy makers discarding the practical EM framework and wholeheartedly embracing the insights derived from a PE understanding of Chongming Island. Nevertheless, PE may, over time, inform current EM-dominated environmental policy. This is because while credible alternative narratives can be maintained environmentally unsympathetic, developments will continue to be questioned. Despite the top-down approach to policy making and delivery and the reluctance to listen to local voices there is considerable learning that can take place within Chinese government on the nature of development as, for example, shown by the shifting focus from urbanization and economic growth to a more eco-centric development on Chongming (see Chapter Four). Moreover, the silo-based nature of much Chinese policy-making means that there is an ongoing search for new ideas and approaches to gain an administrative competitive advantage (as is well illustrated by the rapid adoption of new development opportunities afforded by titles such as eco-city, low carbon city and sponge city). Given China's increasing need to promote urban sustainable development and to protect the natural environment, it is hoped that the other side of the story presented by a PE perspective can inform the Chinese state to face up to the challenges and work towards achieving a more sustainable environment.

In an attempt to broach the subject, this research offers three suggestions applicable to both Chongming Island and Chinese eco-development. First, a fundamental rethink of ecological development is called for, working within local ecological context and constraints. For such an alternative vision of environmental management to occur, an expanded discursive space has to be opened up (Jiang, 2006), extending beyond the anthropogenic view of nature and the modernist pursuit of economic growth and ecological enhancement that favoured quantifiable indicators and technocratic engineering measures. A more locally-relevant participatory and adaptive practice should be promoted and incorporated in

eco-developments. Instead of imposing official and external understandings of the environment on the local people, the government has to encourage diverse views and to incorporate such diversity in state policies and planning. Thus, it is imperative to build real intellectual bridges between local grassroots, environmental historians, ecologists, urban planners, and policy makers for solving the grim realities of current eco-developments and promoting a more locally concerned, environmentally-friendly and socially just eco-development.

Second, eco-development should involve governance and institutional reform, which can promote a new planning approach that can match top-down and bottom-up processes, empowering people and allowing their participation in policy articulation and incorporating their own knowledge of environmental management, instead of seeing them as policy recipients. Here, though, lies the challenge. Political ecology points to the limited power of marginal groups. This tends to foreclose discussion of alternative futures because the power to realize alternative development trajectories lies in the hands of those who already have power. Consultation or participation exercises are likely to simply reproduce existing power relationships and thus whose knowledge is regarded as legitimate. Therefore, there needs to be more attention paid to the extent to which local people can create and maintain their own political space in which they seek to shape their future, and to actively explore aggressive governance and institutional innovation to effectively involve non-state actors in the policy-making process.

Lastly, the evaluation of political performance has to consider long-term environmental impacts instead of short-term gains in meeting quantifiable targets. In recent years, the central government has been heightening the salience of environmental protection and sustainable development, as shown in the incorporation of environmental performance into its cadre assessment system, and gradually increased its weight. Nevertheless, as shown in the Chongming case, ambitious environmental targets (e.g. the

high forest coverage rate of Chongming Eco-Island) that are insufficiently attentive to local ecological conditions propel local cadres to resort to most efficient solutions that can generate rapid and visible effects (e.g. planting unitary-species tress), but simultaneously harm local ecology and community, and thus undermine environmental and social sustainability. Therefore, along with a governance and institutional reform to involve non-state actors in designing and planning eco-development, the fundamental administrative mechanism of eco-development – the top-down political evaluative mechanisms – needs to be revised to value long-term environmental sustainability rather than short-term gain.

7.6   Future research directions

This thesis offers distinct insight of an eco-development project in China that contributes to a myriad of urban sustainability studies, but precisely how eco-developments will evolve, how they will transform China's variegated urban and regional landscape over time, and with what effects, both in terms of environment and social justice, remain open questions deserving of further exploration.

In Chongming, along with the introduction of the new Master Plan in 2018, eco-developments are still in an exploration and formative stage that subject to constant changes. As such, the research that informs this thesis constitutes only a part of the story, which covers the development process and the transformation of Chongming in the past and in the present, and attempts to elucidate the complex, dynamic and multi-scalar set of political-economic, social and ecological relations and processes shaping environmental governance and policy change, as well as ecological planning and development practices on Chongming and in the City of Shanghai. Over the coming decade, there is considerable potential to explore the ways in which the eco-developments on Chongming continue to evolve in relation to on-going political economic restructuring and governance reform

(especially after the reform of the Party and state institutions in 2018),[102] and transform the socio-ecological landscapes at different scales – at local district, urban, and regional levels. Meanwhile, equally important to know is the perceptual change of key stakeholders of eco-developments (both the state actors such as planners and policy-makers and the local grassroots), as it is crucial to understand the planning and practices of eco-developments on the ground.

In particular, a comprehensive, longer term study of the impacts of policy mobility (and the politics of expertise) in shaping eco-developments in China would help to more clearly establish the relationship between knowledge and power in affecting environmental and social-economic changes. Although previous studies have pointed out the significant influences of international corporations, such as Arup and SOM, in designing and planning eco-developments on Chongming in the early stage (Chang and Sheppard, 2013; Den Hartog, 2017), continuous researches on what knowledge and expertise is valued and consulted in the ever-changing policy-making process and more in-depth examination of the roles of different actors, such as NGOs and academic researchers, would help to trace and expound the eco-development in Chongming and in China.

Moreover, the case of Chongming also unravels its close interlinks with the City of Shanghai, which makes the issues of spatial justice surface and calls for further inquiries. The increasing need for green land of Shanghai to meet the national environmental policy demands determines the focuses of eco-developments on Chongming that put stringent control on urban development and construction and wildly promote afforestation, which simultaneously jeopardise the local original rural ecology and compromise

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[102] See: http://english.qstheory.cn/2018-03/05/c_1122488218.htm (accessed on 24 September 2019).

the local economy. Therefore, it is argued that studies of the sustainability of eco-developments should recognize the attendant territorial/spatial inequality that one region's or the city's overall achievement might be at the cost of the other region.

Finally, given that urban sustainable development has been widely adopted in municipalities across China, a comparative study of urban sustainability-inspired eco-development plans and projects in different urban and provincial contexts would offer considerable insight into the progressive potential and limitations of eco-developments. To what extent have different municipalities in China have incorporated eco-development in their overall urban and environmental governance? What eco-ideas have been emphasized in different projects? What measures have been taken to martialize their eco-ideas? And what factors influence the shaping and reshaping of different eco-projects? These questions await further explorations.

Appendix One: Information Sent to Interviewees

Using the following template, a letter was sent to interviewees following their agreement to participate. The letter and interview information were tailored to individual participants.

The University of Nottingham | 宁波诺丁汉大学

UNITED KINGDOM · CHINA · MALAYSIA

The University of Nottingham Ningbo China
199 Taikang East Road, University Park,
Ningbo 31500, China

受访同意书

_____：

　　您好！首先感谢您同意参与本人博士研究课题的访谈。在访谈之前，有一些关于本研究的详细内容及您的权利需要先与您说明。请您仔细阅读以下资料，并签署本同意书。

- **研究人员**：谢林君（博士生）　　**所属机构**：宁波诺丁汉大学建筑与建筑环境学院
- **研究导师**：May Tan-Mullins 教授，宁波诺丁汉大学国际关系与国际事务学院（邮件 May.Tan-Mullins@nottingham.edu.cn）；Ali Cheshmehzangi 博士，宁波诺丁汉大学建筑与建筑环境学院(邮件：Ali.Cheshmehzangi@nottingham.edu.cn)；Tim Heath 教授，英国诺丁汉大学建筑与建筑环境学院(Tim.heath@nottingham.ac.uk)．
- **研究课题**：中国生态建设的规划与实践：以上海崇明生态岛为例
- **研究目的**：研究和评估崇明生态建设的政策与规划、实施措施及效果和影响。
- **主要研究内容**：
  1. 搜集不同专家对崇明生态建设发展的看法和意见；
  2. 搜集与崇明及崇明生态建设发展相关的政策、规划、具体措施和评估等相关资料；
  3. 实地考察崇明的生态岛建设并与不同利益相关者访谈。
- **主要接受访问的内容**：崇明生态建设的情况和访问者对生态环境及崇明生态建设政策措施的看法。

　　本次访谈所需时间大约四十分钟到一个小时，在访谈过程中，为避免信息遗漏及为了之后的转录和分析，本人将对访谈进行录音。如您**不愿意**访问时进行录音，还请您明确告知。
　　本研究的访谈内容作为学术研究之用，本人不会将您的资料、录音及访谈的内容或过程告知第三者或其他机构。所有调查资料将被妥善保存。在研究论文中，您的身份可由匿名或化名代替；您若提到第三个人的名字，此第三者也将用匿名或化名称呼，以确保您的隐私。
　　本研究经宁波诺丁汉大学研究伦理委员会批准。本次访谈是自愿性的，在访问过程中，您随时有权利要求退出此研究。如您对此研究的内容有任何疑问，欢迎向本人提出或联络本人的研究导师。若您同意以上内容，请您签下您的名字。感谢您的参与！

<div align="right">

宁波诺丁汉大学博士研究生　谢林君
邮件：Linjun.xie@nottingham.edu.cn
电话：XXXXXXXXXX

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我阅读过上述的说明，也清楚了解相关的细节与我的权力，我愿意接受访问。本同意书正本两份分别由受访者与研究者存留。

受访者签名：　　　　　　　　　　　　　日期：
研究者签名：　　　　　　　　　　　　　日期：

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Appendix Two: Fieldwork Details

Dates	Duration of stay (days)	Site visits	Main purposes of field work	Interviews
25-27 November 2016	3	1. Chongming Planning Exhibition Hall 2. Two eco-farms: Pu & Su Farm and Rosa Grange Farm in Meiyuan Village 3. Yingdong Eco-Village 4. Chenjia Town & Dongtan Area 5. SIIC Rui Ci Garden (a senior housing complex in Dongtan area)	- To study the initial plan of Chongming Eco-Island; - to investigate grassroots movement by eco-farmers; - to observe and "read" the current construction of Chenjia Town-Dongtan area of Chongming	- Eco-farmers (4); - Village cadres (2); - Informal interviews with indigenous residents and several tourists
21-24 December 2016	4	1. Hongqiao CBD's low-carbon transportation hub; 2. Anting New Town	- To investigate different eco-development projects in Shanghai to understand the broader context and to help the analysis of eco-developments on Chongming.	- Interviews were conducted with office workers, shop owners, residents, real estate agents, developers and architects in Hongqiao and Anting
13-15 April 2017	2	1. Tongji University 2. Dongtan Wetland 3. Chenjia Town centre 4. Shanghai Wisdom Island Data Industrial Park (SWIDIP)	- To conduct interview with planners and scholars who have been involved in the planning and research of Chongming to understand the	- Planners (2); - Scholars (2); - Representatives of Chongming local enterprises (2); - Informal

				evolvement of Chongming eco-development; - to conduct interviews with representatives of SWIDIP to investigate the construction of SWIDIP	interviews with indigenous residents and several tourists
9-10 June 2017	2	1. Shanghai Pudong Smart City Research Institute 2. Chongming Planning and Exhibition Hall 3. Yingdong Village		- To attend a symposium on Shanghai smart-city and eco-city development (participants include research institutes, governmental agencies, and ecological enterprises); - to conduct an extensive visit of two key sites of Chongming with two lead supervisors (May Tan-Mullins and Ali Cheshmehzangi) and Smart Eco-city project researchers (Martin de Jong and Li Yu) to discuss the planning and development of Chongming along the on-site observation	- Planners (3)

29-30 August 2017	2	1. Chinese Academy of Sciences Shanghai Branch 2. Shanghai Urban Planning Exhibition Hall 3. Shanghai Library	- To conduct in-depth interviews with planners and scholars about the formulation, changes, and implementation of policies and plans of Chongming; - to investigate the (environmental) history of Chongming	- Planners (2); - Scholars (3)
12-17 November 2017	6	1. Chenjia Town area: (1) large-scale residential community – Yu Hong Jia Yuan; (2) Chenjia Town Community Cultural Centre; (3) Shanghai Chongming Sports Training Base Construction Site; (4) Qianshao Farm 2. Chengqiao Town (1) Chengqiao South Gate (2) Chengqiao new town area 3. Chongming Comprehensive Utilization of Solid Waste Disposal Centre (SMI environment) and Chongming New Energy Ecological Science Museum 4. North Lake (Beihu) Area 5. Shanghai Yangtze River Standardized Aquaculture Farm 6. Qianwei Ecology Village	- To observe local people's daily living on Chongming; - to conduct in-depth interviews with indigenous farmers on Chongming; - to record (via photography) the construction of Chongming Eco-Island (especially in key construction projects sites); - to investigate the energy planning and development under the Chongming Eco-island scheme; - to conduct in-depth interviews with Chongming cadres to investigate the planning and development of Chongming Eco-Island, especially the land	- Chongming District cadres (2); - Township cadres (4); - Indigenous residents on Chongming (12); - Migrant workers (2); - Informal interviews with many local residents and tourists.

		7. Jianken Village 8. Lvdi Long Island residential community[103] 9. A private manor built by a Shanghai resident 10. Yingzhou Park 11. Chongming Museum and Chongming Academy 12. Shanghai Bright Changjiang Modern Agriculture CO., LTD 13. Dongping Town Ecological Corridor Construction Site (along with a town cadre) 14. Dongping Farm (a municipal state-owned farm built on reclaimed land in 1960s) 15. Xisha Wetland Park 16. Jianshe Town (1) market; (2) town centre; (3) Community Cultural Activities Centre; (4) Hongqiao Village	and water governance; - to conduct interviews with local township cadre to investigate the implementation and effects of Chongming eco-development	
23-31 March 2018	9	1. Hengsha Island: (1) central town; (2) eastern tip - reclamation construction site 2. Changxing Island	- to conduct aerial survey of the landscape of Chongming - to investigate eco-development	- wetland ecology scholar (1) - Indigenous residents on Chongming

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[103] Lvdi Long Island residential community is located in the north of Chongming Island, under the jurisdiction of Qidong City of Jiangsu Province.

		3. Nanhui Wetland in Lingang New City, Nanhui District, Shanghai[104] 4. Chengqiao Old Town 5. Chongming Archives Centre 6. Chongming Ecological Science and Technology Hall 7. Chongming Library 8. North Lake (Beihu) Area 9. Yangtze River Delta Estuary Wetland Station[105] 10. Xisha national Wetland Park 11. Lvhua Town 12. World Estuary Sandbars Water Culture Exhibition Hall 13. Hongqiao Village in Jianshe Town	on two surrounding islands – Hengsha and Changxing islands; - to investigate the reclamation activities in Nanhui Wetland in Nanhui District in Shanghai to investigate the wetland governance on Chongming; - to consult historical documentation of Chongming, especially on land and water governance, local culture and customs, and the environmental history of reeds; - to conduct in-depth interviews with ecologists/scholars based on Chongming - to conduct focus group meeting with indigenous farmers	(8); - Informal interviews with residents on Hengsha Island and Changxing Island; - focus group meeting with four indigenous farmers in Hongqiao Village
8-17 September	10	1. Chenjia Town new district & Shanghai Wisdom Island	- To conduct aerial survey of key development sites	- Representatives of local enterprise

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[104] The purpose of visiting Nanhui Wetland is to investigate the wetland status and reclamation activities in other Shanghai coastal wetlands.

[105] Yangtze River Delta Estuary Wetland Station is designed to provide research, monitoring, education, popular science and training related to wetland science. Main research areas are: 1) biodiversity in wetlands: 2) structure and function of wetland ecosystems, and 3) wetland restoration and management.

2018	Data Industrial Park	of Chongming	(1);
	2. Weekly open-air market in northern Chongming	- to conduct follow-up interviews on key issues with local cadres and key informants	- Indigenous residents on Chongming (12)
	3. Jiangnan Sanmin Cultural Village	- to conduct focus group meetings with local villagers	- Two focus group meetings with five villagers and seven villagers respectively
	4. Morning market in Bang Town		
	5. Chengqiao Town		
	6. Hongqiao Village community room	- to conduct in-depth interviews with indigenous residents on Chongming while reside and dine with one household	- Informal interviews with many local residents and tourists
	7. Shanghai Gaoze Xiangyuan Ecological Agriculture Co., Ltd.		

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