



Marine Functional Zoning in Xiamen, China

Case Study Summary Report

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Directorate-General for Maritime Affairs and Fisheries
Directorate A — Maritime Policy and Blue Economy
Unit A.2 — Blue Economy Sectors, Aquaculture and Maritime Spatial Planning
Contact: Valentia Mabilia
E-mail: valentina.mabilia@ec.europa.eu
European Commission
B-1049 Brussels

Executive Agency for Small and Medium-sized Enterprises (EASME)

Department A - COSME, H2020 SME and EMFF
Unit A3 EMFF
B-1210 Brussels
<http://ec.europa.eu/easme>
Contact: David Sanmiguel Esteban
E-mail: EASME-EMFF@ec.europa.eu

Lead authors: Gonçalo Carneiro¹, David Bloxsom², Qinhua Fang³

Contributions made by: Deqiang Ma³, Ji Siqu³, Yi Huang³, Wu Wenhao³, Zhu Shouqin³

¹ NIRAS Indevelop Sweden, www.niras.se

² NIRAS Consulting Ltd, www.nirasconsulting.co.uk

³ Xiamen University, www.xmu.edu.cn/en

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Nota Bene

This document is part of the "STUDY ON INTERNATIONAL BEST PRACTICES FOR CROSS-BORDER MARITIME SPATIAL PLANNING". In order to get a complete understanding of the concepts, definitions and methodology used in this document it is advised to read the main report first.

Marine Functional Zoning in Xiamen, China

Case Study Summary Report

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LIST OF ABBREVIATIONS AND ACRONYMS

EBM	Ecosystem-based Management
EC	European Commission
GEF	Global Environment Facility
ICZM	Integrated Coastal Zone Management
IMO	International Maritime Organisation
LMSU	Law on the Management of Sea Use
MEPL	Marine Environment Protection Law
MFZ	Marine Functional Zoning
MLNR	Ministry of Land and Natural Resources
MMCC	Marine Management Coordination Committee
MPP-EAS	Marine Pollution Prevention in the East Asian Sea
MSP	Maritime Spatial Planning
PEMSEA	Partnerships in Environmental Management for the Seas of East Asia
PFZ	Principal Functional Zoning
SEZ	Special Economic Zone
SOA	State Oceanographic Administration
UNDP	United Nations Development Programme

EXECUTIVE SUMMARY

This report summarises the key findings and conclusions from the Xiamen/China case study that is part of the EC-funded *Study on international best practices of cross-border maritime spatial planning*. The case study was conducted in the city of Xiamen, province of Fujian between 15 and 25 November 2016. It focused on the process and outcomes of marine functional zoning (MFZ), a hierarchical/nested planning system established in Xiamen in 1997 and nation-wide in China in 2002, which comprises planning at the national, provincial and city levels. The cross-jurisdictional dimensions studied include vertical interactions between national-, provincial- and city-level plans, and horizontal linkages between plans of neighbouring provinces or cities.

In Xiamen, as elsewhere across China, MFZ arose out of the need to organise maritime activities, whose fast and often unregulated expansion was hampering societal development and leading to severe degradation of coastal and marine environments. With only minor exceptions, government institutions as well as marine users have supported MFZ since its inception, despite the severe changes that it has meant for many of the latter. The degree of collaboration in planning across jurisdictional divisions has varied; whereas the nested system of government and MFZ ensures a high degree of vertical collaboration and sufficient coherence between national, provincial and city MFZ plans, horizontal collaboration at the provincial and city levels has been challenged by a tradition of competition for development opportunities.

MFZ in Xiamen was first developed in 1997 as a core component of the city's integrated coastal zone management (ICZM) programme supported by the PEMSEA programme (Partnerships in Environmental Management for the Seas of East Asia). Key issues at initiation of MFZ were sea use conflicts, environmental degradation and lack of coordination of legislation and management. Through a consultative process involving the different agencies responsible for activities related to the sea, and supported by different technical experts, a set of goals and management measures were developed not only for MFZ, but also for marine and coastal management more broadly. Since the adoption of the national law for MFZ, MFZ goals have been harmonised across jurisdictions. The six national goals cover primarily economic and environmental priorities, and have several associated targets, many of which are quantifiable and time-bounded. MFZ implementing agencies at each level report upwards on the achievement of the targets set for their level. MFZ has the implicit aim of being ecosystem-based, and there are indications that planning and implementing agencies increasingly base their decisions on scientific knowledge about the structure and functioning of marine and coastal ecosystems. The jurisdictional divides do constrain the degree to which MFZ can be truly ecosystem-based, though.

MFZ has a well-established legal basis, which is rooted in the national Law on the Management of Sea Use, 2001. This law was instrumental in launching MFZ nation-wide, resulting in every province and city having its MFZ in plan by the mid-2000s. The special administrative status of Xiamen allows it to pass its own laws on a number of domains that 'regular' cities may not, which enabled it to pass its own MFZ regulation in 1997, ahead of the national law. It also has one of the most well-established coastal and marine management coordination mechanisms in China, with distinct technical, political and scientific advisory bodies. According to the national MFZ legislation, lower-level plans should conform to the content of higher-level ones, which is a key aspect for ensuring vertical coherence in planning across jurisdictions. The law neither encourages nor restricts horizontal collaboration in planning. In the absence of proactive collaboration between neighbouring provinces or neighbouring cities, it is rather the oversight role played by higher-level MFZ agencies that ensures horizontal coherence at the lower levels.

The MFZ planning and implementation agencies at the three jurisdictional levels are defined in law and well-established in the entire country. Their roles and responsibilities are clear and accepted by sectorial agencies, and they are generally adequately resourced to carry out their mandate. MFZ plans have precedence over sectoral plans, but not over land use or city master plans. These have the same status as MFZ plans, which requires that spatial planning on land and at sea be harmonised in order for the respective functions to be compatible across the land-sea divide. City and provincial governments are responsible for ensuring the coherence between MFZ and land use and city plans. MFZ plans further affect land use on the coastal zone by

determining the siting of certain coastal infrastructure, land reclamation sites and areas for environmental rehabilitation. They are thereby key instruments for coastal zone management.

MFZ plans are typically elaborated only by government agencies, which are involved either through participating in inter-sectorial committees or through providing written input to the planning process. Non-governmental stakeholders are generally not involved, including representatives from the maritime sectors, which are sometimes consulted by the respective sector agency. In the specific case of Xiamen, the two most important marine users are shipping & ports and tourism, and these tend to have an influential voice in the content of the MFZ plan. Despite the limited engagement of non-governmental stakeholders, support from the public and marine users for the MFZ is generally strong, and there is ample recognition of the value of MFZ for the orderly use of the sea in Xiamen and elsewhere in China.

Implementation of MFZ has been carried out in Xiamen as part of the broader packages of ICZM measures, and has included the development of the legal and institutional framework, enforcement and monitoring, public education and awareness raising, capacity development for the agencies involved, designation of functional zones and environmental restoration. MFZ plans are adjusted periodically, generally after a comprehensive review of the process and outcomes of each planning-implementation cycle. Smaller adjustments are also done on a more ad hoc basis, when there are important developments in any of the maritime sectors. Each jurisdiction revises and adjusts its plan independently from its neighbours at the same level.

Institutional collaboration is generally good during implementation, but there is some overlap in marine environmental monitoring and occasional duplication of monitoring and surveillance efforts at sea. Compliance with plan regulations is generally high, something that a clear legal framework has been instrumental for. Political support for MFZ remains high at all three levels, and funding from the national treasury for continued planning and implementation seems to be ensured. There is ample recognition for the need of sector policies to align with the spatial plans, given the precedence of the latter.

MFZ in Xiamen has generally achieved and continues to achieve its goals, specifically in terms of ordering the use of the sea and thereby reducing conflicts between activities, enabling the development of key maritime sectors in a manner consistent with the characteristics of the environment, reducing excessive exploitation and transformation of marine and coastal environments, and reserving areas for as well rehabilitation of the environment as future uses. It is generally regarded as having had positive impacts on the socio-economic and environmental conditions of sea areas, and has been instrumental in the reduction of conflicts between marine users.

Important lessons learned from this case study include:

- Having the proper channels for conveying information to the public and target user groups about the status of the environment and associated management measures helps raising the level of knowledge of key individuals with responsibilities for the use and management of marine areas.
- In order for society to determine the direction of development, planning needs to precede investment.
- Planning that focuses on the economically most valuable and efficient uses is likely to generate the greatest gains for society.
- A planning system that enables planning on land to be coordinated with planning at sea makes it possible to optimize the siting of infrastructure and services on land necessary for activities taking place at sea and vice versa.
- A long-term vision for spatial planning enables areas to be reserved for functions or uses that are plausible but not predictable with certainty.
- Clarity in terms of the hierarchy and coordination of different plans is necessary for planning decisions to be consistent across sectors and the land-sea divide.

- A clear legal framework for planning is a pre-condition for establishing the roles and responsibilities of state and non-state institutions, defining the regulatory powers and the enforcement mechanisms of the plan, specifying the process and outputs of the plan, and defining the hierarchy of the marine plan relative to other planning instruments.

With respect to planning across jurisdictional borders, the study found that:

- In the Chinese context, having a higher-level coordinating entity with authority to revise and approve plans at lower jurisdictional levels has proven to be sufficient for ensuring an adequate level of compatibility between these plans.
- Collaboration in marine planning across city borders seems unlikely in the absence of either a higher-level body with the authority to impose cross-border cooperation on lower-level jurisdictional units, or a clear incentive for these units to go through the additional effort of joint planning. However, the hierarchical planning system has proved to be an effective mechanism to resolve cross-jurisdictional issues, which has greatly reduced the need for neighbouring cities to actively seek collaboration. When and where cities see a need to strengthen cross-border coordination, they do establish additional mechanisms for such.
- Acceptance of the plan by the public and target marine users, and conformity with its regulations does not appear to require extensive consultation and participation with stakeholders outside government, as the experience of MFZ in China seems to demonstrate. The governance context, in particular in what concerns expectations and opportunities for stakeholder engagement in public policy processes, determines the degree to which different actors should be involved in the planning process, and the usefulness of this involvement.

1. INTRODUCTION

The 'Study on international best practices for cross-border Maritime Spatial Planning' (MSP) (hereafter referred to as 'the Project') has been designed to compile and assess experiences of approaches to MSP, in order to assist the European Commission (EC) and its member states in implementing the EU MSP Directive¹. The Project's second objective involves conducting four case studies from international locations outside of Europe, to identify good practices that are relevant for the implementation of the MSP Directive, with a particular focus on cross-border cooperation. These case studies are: (i) Rhode Island/New England, (ii) China/Xiamen, (iii) the Southern Ocean and (iv) the Coral Triangle.

The Xiamen Marine Function Zoning (MFZ) case study was selected because of its long term implementation, since the mid 1990's, providing unique experience into MSP processes. Also relevant for the Project are the facts that it is generally recognised as a successful case in reducing sea-use conflicts, it is well documented, and enables a unique look into managing marine uses through a nested hierarchical approach. Specially, the implementation of MFZ at a national level, which informs provincial level MFZ and in turn informs city level MFZ.

This case study looks into the development of the MFZ for Xiamen Bay, which commenced after Xiamen was selected as the first GEF/UNDP/IMO/PEMSEA funded ICZM Demonstration Site in East Asian Seas. A major feature of the MFZ is its nested structure comprising national, provincial and city level plans, and the case study therefore also focuses on the MFZ process in Fujian province, where Xiamen is included. **The cross-jurisdictional dimension of marine planning explored in this case study thus comprises 1) the 'vertical' interaction between provincial- and city-level plans, and to a lesser extent between national- and provincial-level plans; and 2) the 'horizontal' interactions between the MFZ plan of Fujian province and those of neighbouring provinces, and between the MFZ plan of Xiamen and those of neighbouring cities of Zhangzhou and Quanzhou.**

The study has been supported by the Project's regional expert, Professor Qinhua Fang of the Coastal and Ocean Management Institute of Xiamen University and his wider research team, who facilitated access to relevant literature, set up interviews with key stakeholders and individuals involved in the development of the MFZ, and contributed to data gathering and analysis.

This document presents a summary of the Xiamen MFZ case study, presenting the key findings, conclusions and lessons learned, according to the structure of the analytical framework developed for the Project. Together with the reports for the other three case studies, it is one of the inputs to the consolidated analysis and the final report of the Project.

¹Directive 2014/89/EU of the European parliament and of the Council of 23 July 2014 establishing a framework for maritime spatial planning

2. METHODOLOGY

In order to ensure consistency in the description and assessment of the four case studies, and enable the comparison of very distinct MSP initiatives, the Project developed a common analytical framework for all four case studies (see Annex 1). In this framework, MSP attributes have been organised into eight different sections, namely: (1) Context, (2) Driver, issues and goals, (3) Overview of the MSP, (4) Scope and design of the MSP, (5) Collaboration and consultation in the MSP planning phase, (6) Features of the MSP process implementation phase, (7) Implications of the application of MSP in areas beyond national jurisdiction, and (8) Outcomes and lessons learned. Section 7 has not been included in the Xiamen MFZ case study, as the entire MFZ area falls within national jurisdiction.

Each of the MSP attributes have been investigated by means of both descriptive – termed ‘facts of the matter’ (FoM) – and assessment – termed ‘to what extent’ – questions. The data for answering both types of questions were collected through a review of literature and key informant interviews, as described below, conducted in the period October – November 2016:

a) Literature review

Peer-reviewed and grey literature, identified by the Regional Expert and through online searches was reviewed with the primary aim of answering the FoM questions in the analytical framework, as well as providing context and background information useful for conducting the field visits. The study team has not been given access to official documentation related to the MFZ plan, including plan documents, and these were therefore not included in the literature review.

b) Key informant interviews

A total of 13 interviews, involving 25 participants were conducted between 15 - 25 November 2016 in Xiamen, Fujian province. All interviews were conducted in person, with the help of a translator for all but two (see Annex 2 for the schedule of interviews).

The interviewees were selected based on their engagement in and knowledge of MFZ processes, and included:

- **City agencies:** Xiamen Fisheries and Ocean Bureau, Xiamen Tourism Bureau, Xiamen Marine Protected Areas Management Division
- **Provincial agencies:** Fujian Institute of Oceanography, Fujian Fisheries Research Institute
- **Sector representatives:** Xiamen Port Authority, local fisheries representatives, tourism operators
- **Academia:** Xiamen University

Five out of the 13 interviews were conducted with more than one participant, and all were attended by either the regional expert or members of his faculty.

A semi-structured interview format based on the analytical framework was employed to gather data, ensuring a degree of comparability across interviews, while allowing for the investigation of themes and issues specific to each particular interviewee. The interviews were all led by the case study lead, Gonçalo Carneiro, with support from David Bloxsom and Qinhua Fang.

All the participants were contacted by the regional expert and were provided with the participant information sheet and consent form as required. All the participants provided verbal consent to participate in the interviews. All interviews were summarised in writing and reviewed by all members of the project team and the regional expert. The interview summaries were not shared with the participants due to language differences. This information was then used to produce the achievement scores for the assessment questions for the case study. In addition to the interviews, the team held a short workshop with research associates and masters students of Xiamen University, gathering some initial feedback on some initial findings and reflections.

The data collected through the literature review and the interviews were used to describe and assess the attributes of the Xiamen MFZ and distil the key conclusions and lessons learned presented in this document.

3. KEY FINDINGS

3.1. Overview of MFZ in Xiamen

Xiamen is a coastal city located on the southeast coast of the Fujian Province, on the West coast of the Taiwan Strait. The administrative region of Xiamen consists of the land, islands and the sea area (Figure 1) spanning over a total terrestrial area of 1,699 km² and marine area of 390 km². The coastline stretches across 234 km (Zhenyan and Lin 2007; PEMSEA 2009).



Figure 1 - Contextual map of Xiamen administrative region

Xiamen is a densely populated city, with a population of 3.81 million. The total GDP is approximately \$47 billion² (from 2014). The main river flowing into Xiamen Bay is the Jiulong River, which has a catchment of 14,700 km² supporting a population of 3.5 million (Ma, Fang and Liao 2016)

The ICZM Demonstration Project, with the support from the Global Environmental Facility (GEF), of which Marine Functional Zoning (MFZ) was one of the key initiatives (Bermas-Atrigenio and Chua 2013), had an implementation period of 5 years, which was subsequently extended (Thia-Eng, Yu and Guoqiang 1997). The Xiamen government began to implement the MFZ scheme in 1997 (see Figure 2 for an outline of the first MFZ). By 2001, the provincial MFZ schemes of eleven coastal provinces were complete and seven were approved. In 2002 the National Marine Function Zoning Scheme was approved by the State Council.

² 327 billion RMB

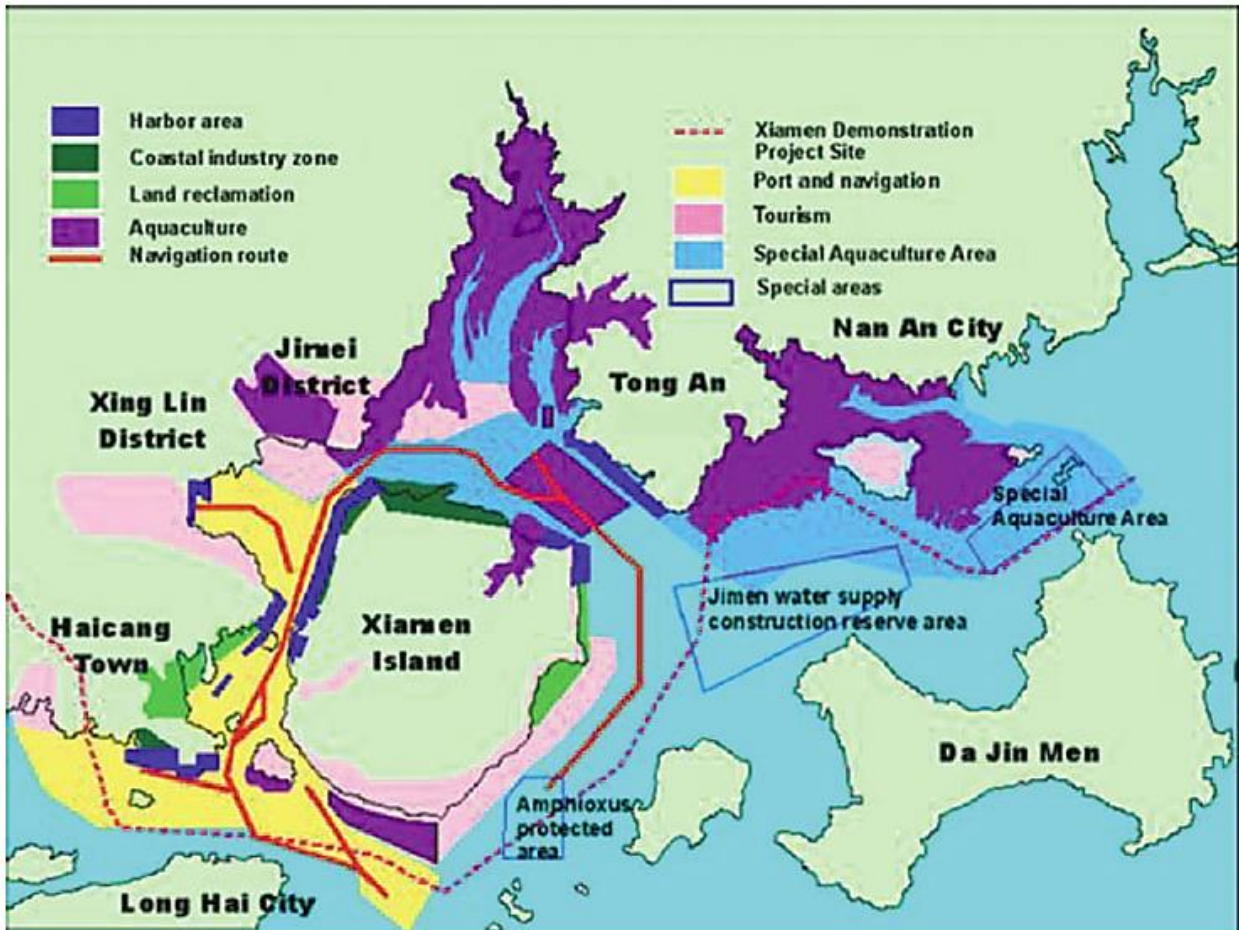


Figure 2 - MFZ as implemented in 1997

In 2001, the Law on Sea Use Management mandated a permit and user fee system. The sea user fees helped to capture some of the benefits of private maritime use for the broader society, who are the legal owners of the resource, and are allocated for sea area development, protection and management (PEMSEA 2009). The fees help incorporate into the economic and decision making process some of the opportunities lost or ill effects wrought by individual or corporate maritime use that the public has to bear (PEMSEA 2009). The user fees also provide for the administrative costs of the management system and enforcing use rights. Approximately 30% of the user fees are submitted to the national treasury while 70% are retained in the local treasury.

3.1.1. Legal basis and institutional responsibilities for MFZ

There are series of national, provincial and municipal³ laws and regulations that comprise the legal basis for MSP in Xiamen and China, as outlined below:

- **National level:** the most important laws are the Law on the Management of Sea Use 2001 (LMSU) and the Marine Environment Protection Law (MEPL). The LMSU legalized the status of MFZ in China. The MEPL sets out a program of actions for achieving marine environmental protection and sustainable use of its resources. In addition, they also include administrative regulations on the prevention and treatment of the pollution and damage to the marine environment by marine engineering construction projects, and technical guidance on Marine Functional Zoning. The SOA released the Management Regulations of Marine Functional Zoning in 2007, to regulate the zoning process and the management of MFZ.

³ **National:** limit of areas under jurisdiction of the Chinese state, i.e. EEZ and extended continental shelf, where applicable; **Provincial:** Limit of the territorial sea; **Municipal:** Defined for each city or county individually, according to the respective territorial boundaries, hence no common delimitation for all municipalities.

- **Provincial level:** Regulation of Fujian Province on Marine Environmental Protection, Regulations of Fujian Province on the Administration of Sea Areas, Coastal water environmental functional zoning of Fujian Province, Planning on Protecting the Marine Environment of Fujian Province.
- **City (municipal) level:** Provisions of Xiamen City on Protecting the Marine Environment, Provisions of Xiamen City on the Administration of Sea Areas, etc (implementation of provincial regulations).

In 2005, the Marine Management Coordination Committee (MMCC) and the joint committee for the Ocean and Fishery Bureau of the city alliance of Xiamen, Zhangzhou and Quanzhou were established to coordinate and manage the sea area of Xiamen Bay. The city alliance for the marine management of Xiamen, Zhangzhou and Quanzhou and the Platform for Joint Action to Ocean Management of Xiamen, Zhangzhou and Quanzhou were established to carry out the joint law enforcement action.

The Xiamen Government established the leadership team of marine management coordination to be in charge of decision making and addressing important issues from a coordinated approach. The mayor is the head of this leadership team, and as such, the head will be replaced every five years in line with the electoral system.

With respect to institutional collaboration and coordination, within each planning level – especially at provincial and city levels – responsible institutions with mandates related to the marine environment generally work in an independent manner, according to several literature sources (Feng *et al.* 2016; Mu *et al.* 2013; Lau 2003) and interviews conducted for this study.

In the particular case of Xiamen, which has a history of more than 20 years of implementing integrated coastal zone management – and has been widely praised for that (for example PEMSEA 2009; Islam *et al.* 2009; Hong and Xue 2006; Tsukamoto *et al.* 2008; Xue *et al.* 2004; McCleave, Xiongzhi and Huasheng 2003; Thia-Eng, Yu and Guoqiang 1997), the city government has two inter-sectorial coordination bodies for marine management. The first is the **marine management office**, which is headed by a representative of the city government office (director) and the director of the city's Fisheries and Ocean Bureau (vice-director), and includes representatives of all other bureaus with a mandate related to the marine environment, and whose main role is technical coordination between sectors. The second is the **marine management leading group**, headed by the mayor and vice-mayor, which is the political decision-making body for matter related to marine environmental management, namely the approval of MFZ plans. According to interviewees from the Xiamen Fisheries and Ocean Bureau, these structures enable an adequate level of coordination between the different sectors in the planning of the city's marine areas. The same interviewees observed that other cities are less advanced in terms of inter-sectorial coordination mechanisms, but, inspired by Xiamen's experience have started developing similar arrangements (Kong *et al.* 2015).

Assessment Question	0	1	2	3	Justification
a) To what extent have cross-border issues shaped the collaboration in this MSP from its inception?	The cross-border dimensions of this MSP were not a feature of this MSP at its inception	Cross-border features of this MSP have been present from initiation but not a central feature	Cross-border features have been one of several important features of this MSP	Cross-border collaboration has been central to the design of this MSP from the beginning	<p>The nested nature of the MFZ system means that the higher level plans pre-define most of the cross-border elements of the plans at lower levels. From the national to the provincial level, the guidance is relatively vague, and provinces therefore have some freedom to collaborate in planning border areas as they see fit. None of the interviewees contacted for this study mentioned any case where provinces actually engaged in such a collaboration. If any serious incompatibilities arise between the plans of neighbouring provinces, the State Council is expected to resolve these. However, at least with respect the first generation of MFZ plans, Feng <i>et al.</i> (2016, p.41) observe that the standards used for approving plans were unclear, which rendered the resolving of cross-border incompatibilities potentially inconsistent.</p> <p>With respect to cross-border collaboration at city level, the same authors argue that the rigidity imposed by the nested system has led some cities to modify the content of their own plans, rendering them asynchronous with those of neighbouring cities. From our interviews, asynchronies between plans at the same level do not appear to be a generalised problem; there have been cases over the years, but several interviewees were of the view that the intervention of the higher level planning bodies and the fact that these check plan compatibility before approval have ensured that such asynchronies are duly resolved. There is no indication however, neither in any of the literature consulted nor from the interviews conducted for this study, that city or provincial governments consult with their counterparts at the same level to proactively collaborate in MFZ</p>
b) To what extent are the institutions responsible for MSP planning and management working independently or collaboratively?	Planning and management of each jurisdiction's zone is conducted by that jurisdiction's institutions in an independent manner	The cross-border coordinating mechanisms define the goals and principles of this MSP that individual jurisdictions tailor to their needs; the agenda for cross-border collaborative management is limited to a few issues	Major policies and features of this MSP are negotiated by representatives of each jurisdiction convened by a cross-border coordinating institution	Planning and management is centralized and the responsibility of the lead cross-border institution	<p>Interviews conducted for this study indicated that planning institutions at the same jurisdictional level generally do not collaborate across borders. Planning departments/bureaus at different levels do collaborate, as required by the Law on the Administration of Sea Areas. There are, however, examples of cross-jurisdictional cooperation within certain sectors, when two or more cities (and maybe also provinces, although we were not given any examples of inter-province collaboration) share an interest for a particular development.</p> <p>Within each planning level – especially at provincial and city levels – sectorial management agencies generally work in an independent manner. In the particular case of Xiamen, the city government has two inter-sectorial coordination bodies for marine management. According to interviewees from the Xiamen Fisheries and Ocean Bureau, these structures enable an adequate level of coordination between the different sectors in the planning of the city's marine areas.</p>
c) To what extent has external funding	External funding has been a	Despite important	Despite some detrimental	External funding has been a	The GEF funding for the PEMSEA ICZM demonstration project was instrumental in elaborating the first MFZ plan for the city of Xiamen.

Assessment Question	0	1	2	3	Justification
<i>enabled this MSP process?</i>	<i>barrier to achieving the objectives of this MSP.</i>	<i>contribution in some areas, external funding has been generally detrimental to this MSP process.</i>	<i>effects in some areas, external funding has made an overall positive contribution to this MSP process.</i>	<i>primarily enabler of this MSP process.</i>	Since the MFZ plan was adopted by the city government, it has been entirely funded by state funds. Currently, MFZ throughout China is fully funded by government.

In summary, MFZ has a well-established legal basis, which is rooted in the national Law on the Management of Sea Use of 2001. This law was instrumental in launching MFZ nation-wide, resulting in every province and city having its MFZ in plan by the mid-2000s. The special administrative status of Xiamen allows it to pass its own laws on a number of domains that 'regular' cities may not, which enabled it to pass its own MFZ regulation in 1997, ahead of the national law. It also has one of the most well-established coastal and marine management coordination mechanisms in China, with distinct technical, political and scientific advisory bodies. According to the national MFZ legislation, lower-level plans need to conform to the content of higher-level ones, which is a key aspect for ensuring vertical coherence in planning across jurisdictions. The law neither encourages nor restricts horizontal collaboration in planning. In the absence of proactive collaboration between neighbouring provinces or neighbouring cities, it is rather the oversight role played by higher-level MFZ agencies that ensures horizontal coherence at the lower levels.

3.2. Overview of the context

3.2.1. Socio-economic development context

In 1995, the population of the entire Xiamen Municipality was 1.2 million, having increased by approximately 20% throughout the early 1990's. By 2010, the number of registered residents reached 1.8 million, 89.52% higher than the population in 1981 and this increased to 3.53 million in 2011 and 4.255 million in 2014. It is also worthy to note that, in 1996, there were 5.1 million tourists passing through Xiamen city and this number has significantly increased over the years with approximately 60 million tourists passing through Xiamen in 2015 (Yu *et al.* 2016).

Xiamen's economy, both past and present, depends heavily on its surrounding seas for natural resources, goods and services. The major human industries occurring within Xiamen, at the time of MFZ initiation, were shipping, fishing/aquaculture and tourism. In relation to these activities there was a significant volume of supporting activities such as land reclamation, sewage discharge and the installation of submarine cables and pipelines. Prior to the 1980's, the local economy was heavily reliant on agriculture and fisheries with limited industrial activities.

Since the opening of Xiamen as a Special Economic Zone (SEZ) in 1981, it has adhered to the state policy of reform and opening up, while fully utilising its regional advantages by introducing large amounts of investment from Hong Kong, Macao and Taiwan, as well as from foreign countries and overseas. Since the 1990's, the Xiamen GDP per capita increase has been dramatic (Figure 3). The primary sector's contribution to GDP decreased to just over 1%, while both the secondary and tertiary sectors contributions increased equally (Zhang and Xue 2013).

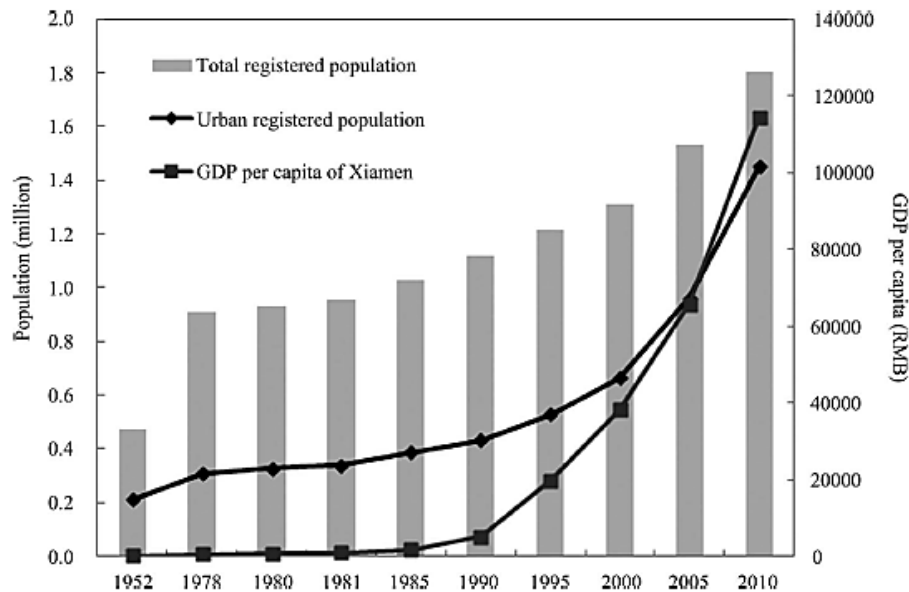


Figure 3 - GDP and population growth in Xiamen from 1952-2010 (Zhang and Xue 2013)

3.2.2. Environmental context

Prior to the 1980's, marine pollution in Xiamen from land-based sources was not a major problem, and waters in the region were generally considered clean (Peng *et al.* 2006). The economic growth of Xiamen and a history of urban spatial expansion caused an increase in land use intensity index, a decrease in ecosystem service value and significant fragmentation in the landscape pattern (Bermas-Atrigenio and Chua 2013). Xiamen's coastline changed physically leading to coastal ecosystem and resource degradation, siltation and erosion and shoreline retreat, due to the rapid increase in human activities.

In 1995, the coastal profile baseline assessment (conducted as part of the MFZ) concluded that the major coastal and environmental problems in Xiamen were habitat alteration and degradation, the deterioration of seawater and sediment quality, and the population decline of protected species (McCleave, Xiongzi and Huasheng 2003). The sea, traditionally perceived as an area of infinite resources, was thought of as a convenient dumping ground for waste. Sea-use was never included in resource-use planning and seldom formed part of the government's economic development or environmental management programmes (Thia-Eng, Yu and Guoqiang 1997). Examples of the environmental problems identified in the Western Sea in 1998, include eutrophication and algal blooms, resulting in the loss of 1,000 tons of cultured fish in cages in the Maluan Bay area (Xu *et al.* 1998; Zhang 2001) and the Yundang Lagoon, located in the centre of Xiamen (Ye *et al.* 2014).

The impacts of climate change were also noticed within the area, including sea level rise and the increase of extreme weather events such as strong typhoons, storm surge and rainstorm (Su 2011). The average sea level rise rate in the China Sea has been recorded as 3 mm per year during 1980 to 2015 (State Oceanic Administration of China 2016).

3.2.3. Governance context

Prior to the introduction of MFZ, within China and Xiamen, the legislation upon which government bureaus based operations was largely sector-oriented and operational mechanisms to harmonize development across sectors were weak (PEMSEA 2009). The implementation of legislation by corresponding central agencies at the local level often resulted in serious inter-agency conflicts (Thia-Eng, Yu and Guoqiang 1997).

Separate local government bureaus managed each of the various coastal sectors in Xiamen. In Xiamen there were 12 agencies, from the central, provincial and local governments, that were all in some way engaged in the management of coastal areas (McCleave, Xiongzi and

Huasheng 2003). There was no mechanism by which the bureaus could coordinate or implement joint planning decisions (PEMSEA 2009). Different bureaus were responsible for different sources of marine pollution, and there was little responsibility for the overall polluted state (PEMSEA 2009). This created fragmented policy, coastal use conflicts and conflicts between agencies. There was no legal framework in place that considered the interrelatedness of the coastal environment (McCleave, Xiongzi and Huasheng 2003). Institutional fragmentation and the resulting inefficiencies were two of the key issues addressed in the PEMSEA ICZM Demonstration Project.

In 1993, China clarified the (so-called) "right to use sea areas" application system. The sea use applicant obtains the certificate for the right to use sea areas through the pattern of bidding and auction according to the law. The leading agency for MFZ in China is the Department of Sea Area Management situated within the State Oceanic Administration (SOA), which is an agency subordinate to the Ministry of Land and Natural Resources (MLNR) (Lau 2003). SOA has a 40 year history demonstrating acceptance within the political hierarchy, noting that there is the tendency for newly developed agencies to be not taken seriously.

Assessment Question	0	1	2	3	Justification
a) At initiation, to what extent was there support for MSP within the relevant government institutions?	Several institutions critical to the functioning of this MSP were initially resistant to its establishment	Support for this MSP has been uneven among the institutions involved	With few exceptions the responsible institutions have supported the development and implementation of this MSP	All responsible institutions have strongly supported the formulation of this MSP from its inception	None of the interviewees mentioned any case of disagreement or lack of cooperation by any of the government departments/bureaus involved in the MFZ, irrespective of level. At the same time, there were no indications of any agency being particularly supportive of it. What appears most likely is that government institutions diligently apply decisions taken at higher political levels. This was the view expressed by the planning expert of the Fujian Institute of Fisheries Research, who noted that once the Law on Sea Use Management was passed, affected government departments/bureaus proceeded to implementation without any resistance.
b) At initiation, to what extent was there support for MSP among the different marine users/sectors?	Several marine users/sectors have strongly resisted or been sceptical of the benefits of establishing this MSP	Resistance and/or opposition to this MSP has been limited to a minority of the marine users affected	With minor exceptions, marine users have supported this MSP	All affected marine users (sectors?) have supported the development and implementation of this MSP from its inception	The maritime sectors have not been involved in the planning other than through the respective government departments/bureaus and there has been no reported opposition from any of them, as indicated by interviews with city and provincial government bureaus. At the same time, there was no mention of explicit support by the sectors. Upon consultation with fishermen in both Xiamen city and the island of Dadeng, there was some resentment at the fact that fisheries and aquaculture are no longer allowed close to Xiamen island. However, none of the fishermen interviewed knew about the MFZ, hence they did not directly blame it for the demise of their activity. As with the government departments/bureaus, sectors appeared to have accepted government decision about MFZ without any resistance worth of note.
c) At initiation, to what degree did marine users conform to the pre-existing rules within the MSP focal area?	There were no governance mechanisms (laws, user rights) or significant rules affecting the activities of users of the focal area	There were traditional and/or governmental rules, but non-conformance was common	Conformance with rules was generally good with only occasional exceptions	Rules were widely known to all users and conformance was high	Interviews with fishermen in Xiamen city and Dadeng Island gathered that small-scale fisheries remain largely unregulated and uncontrolled, other than a seasonal closure between May and August, which was praised by the fishermen interviewed as positive to curb the decline of fish stocks. Within the conservation areas in Xiamen waters specific measures apply, which, according to the Xiamen Bureau of Nature Conservation, are largely complied with. Whether or not this was the case right after these conservation areas were established was not mentioned in the interview.
d) To what extent have the historical/political contextual factors constrained cross-border collaboration?	Expressions of cross-border tensions and/or disagreements have been a major constraint on the MSP process	Historical/political tensions have been significant but largely overcome during this MSP process	Cross-border MSP collaboration has been somewhat constrained by cross-border tensions	There is a history and tradition of cross-border collaboration	According to information provided by the interviewees, the environmental and the socio-economic context do not seem to play any significant role in the desire or ability of city/council or provincial government bodies to cooperate in planning across jurisdictional borders. This does not mean, however, that there have not been any disputes between neighbouring cities/counties or provinces over the environmental and/or socio-economic impacts of certain projects, which have led neighbours to find joint solutions, either by themselves or with the involvement of higher
e) To what extent have	The socio-	The socio-economic	Apart from some	Cross-border	

Assessment Question	0	1	2	3	Justification
<i>the socio-economic contextual factors affected cross-border cooperation on MSP?</i>	<i>economic context has been a powerful factor in making cross-border cooperation towards a consistent MSP across borders very challenging</i>	<i>context has presented some challenges to cross-border cooperation, with mixed results</i>	<i>specific issues, the socio-economic context has not affected successful cross-border cooperation</i>	<i>cooperation has benefited from, or not been in any way adversely affected by the socio-economic context of the MSP area.</i>	level authorities. However, none of those two types of contextual factors appear to systematically affect cross-border coordination in marine planning. Two aspects seem particularly important for the degree of influence of historical/political factors and the governance structure on cross-jurisdictional collaboration in planning: 1) City level MFZ plans are revised by the provincial government, which checks conformance with the provincial plan, before they are approved by the province and the State Council at central level. This review mechanism was mentioned by several interviewees as key for ensuring 'coordination' between different city MFZ plans. Provincial plans in turn are reviewed and approved by the State Council, hence the latter performs the role of ensuring the coordination between the plans of neighbouring provinces. 2) This hierarchy and oversight mechanism does not ensure cross-border cooperation, in the sense of cities or provinces reaching out to their neighbours to do joint planning. None of the interviewees consulted for this study mentioned any case of such proactive coordination taking place. Instead, examples were given of disputes between neighbours – for example over volumes of land reclamation in a bay shared by two cities, or the cross-border impacts of the development of new port terminals in border areas – and how these had been (or were in the process of being) resolved through the oversight mechanism described above. It appears that the existence of such an oversight (proofing) mechanism is sufficient and largely preempts the need for additional cooperation structures or mechanisms.
<i>f) To what extent have the environmental contextual factors affected cross-border cooperation on MSP?</i>	<i>The environmental context has been a powerful factor in making cross-border cooperation towards a consistent MSP across borders very challenging</i>	<i>The environmental context has presented some challenges to cross-border cooperation, with mixed results</i>	<i>Apart from some specific issues, the environmental context has not affected successful cross-border cooperation</i>	<i>Cross-border cooperation has benefited from, or not been in any way adversely affected by the environmental context of the MSP area.</i>	Within the strongly centralized and nested form of governance, provinces and especially cities compete among each other for development opportunities, and it is rather this competition that shapes cross-jurisdictional relationships and which, in some cases, results in disputes rather than proactive cooperation. There is no legal or administrative impediment to neighbouring provinces or cities cooperating – and they effectively do in some sectors, but so far not in marine planning. The existence of an oversight mechanism at the higher level of government appears to function as a means of ensuring an adequate level of consistency of plans across jurisdictional borders.
<i>g) To what extent have governance structures of contributing countries/states/provinces been capable of facilitating cross-border collaboration on MSP-relevant matters?</i>	<i>Existing governance structures have not been capable of aligning the management of MSP-relevant matters across the border.</i>	<i>Existing governance structures have been capable of aligning management on some, but not on the most important MSP-relevant matters.</i>	<i>Existing governance structures have faced some challenges in cross-border collaboration, but have been capable of aligning the management of the most important MSP-relevant matters.</i>	<i>Existing governance structures have been capable of sharing good practices across borders or establishing a specific governance structure for the MSP area</i>	

In summary, in Xiamen, as elsewhere across China, MFZ arose out of the need to organise maritime activities, whose fast and often unregulated expansion was hampering societal development and leading to severe degradation of coastal and marine environments. With only minor exceptions, government institutions as well as marine users have supported MFZ since its inception, despite the severe changes that it has forced onto many of the latter. Collaboration in planning across jurisdictional divisions has varied; whereas the nested system of government and MFZ ensures some degree of vertical collaboration and sufficient coherence between national, provincial and city MFZ plans, horizontal collaboration at the provincial and city levels has been hampered by a tradition of competition for development opportunities.

3.3. Drivers, issues and goals

3.3.1. Drivers and issues

The marine waters play a large role in the wider touristic appeal of Xiamen as well as being an important source of food to both the local and tourist populations. Within the context described in Section 3.2, the main drivers for MFZ initiation in the city have been identified to include:

- Sea-use conflicts;
- Marine environmental deterioration; and
- Lack of coordination of legislation and regulations.

3.3.2. Main user conflicts in need of addressing

The principal motivation for Xiamen city to initiate its ICZM programme was related to the existing conflicts between different marine users, which were seen as leading to inefficiencies that constrained development, and an unacceptable degradation of the marine and coastal environment. The main conflicts have been summarised by PEMSEA (2009):

- **conflicts between fisheries and shipping**, affecting mainly the West Sea, where an excessive number of mariculture structures blocked access to the seaport and constituted a risk for navigation, at the same time as ship-based pollution impacted mariculture production;
- **conflicts between land reclamation, conservation and shipping**, with large areas reclaimed for agriculture, aquaculture ponds and later urban development causing habitat destruction – notably mangrove forests – and reducing navigable areas;
- **conflicts among waste disposal, fisheries and tourism**, with urban and industrial effluents causing severe aquatic pollution, that negatively affected fishery products and the attractiveness of Xiamen for tourists; and
- **conflicts between urban development and tourism**, due to uncontrolled mining of beach sand driven by the construction boom, which affected the touristic value of Xiamen's coast.

Comparable conflicts were known to occur in other locations in China, according to the same author and Lau (2003), and were one of the key drivers for the development of MFZ in China.

3.3.3. Goals of Marine Functional Zoning

In 1994, Xiamen was selected as a national demonstration site for the implementation of a 5-year ICZM program (Lau 2003). The GEF/UNDP/IMO Prevention and Management of Marine Pollution in the East Asian Sea (MPP-EAS) introduced ICZM to Xiamen (PEMSEA 2009). Initially the program focused on marine pollution prevention and the gradual establishment of effective coastal management institutions (Lau, 2003). The MMP-EAS advocated integration of various coastal-use sectors and coastal environmental management for holistic and sustainable development.

The goals of the MFZ scheme outlined in 1997 were to address sea use conflicts, rationally exploit and utilize marine resources and to protect and improve the marine environment. In

order to meet the new demands of social and economic development, the Xiamen government revised the MFZ scheme in 2007 and 2016, respectively (every 10 years). Accordingly, the goals of the MFZ scheme also evolved. The latest MFZ scheme, in addition to the previous goals, includes guiding the optimization of the marine economic structure and repairing and restoring coastal ecosystems. The six goals set for MFZ at the national level address both environmental and economic development aspect, but not any social development aspects in an explicit manner (Table 1).

Table 1 - The six national goals of Marine Functional Zoning (Courtesy of the Fujian Ocean Institute)

Goal	Specification and targets
Enhance the importance of sea area management in macro-control	<ul style="list-style-type: none"> • Legal, economic, administrative and technical means of sea area management is continuously improved. • The integrated control function of marine functional zoning is significantly enhanced. • The right of using sea area market mechanism is gradually perfected. • The legitimate rights and interests of national ownership and use of the sea area are effectively guaranteed
Improve the marine ecological environment and expand marine protected areas	<ul style="list-style-type: none"> • The total amount of major pollutants discharged into the sea gets under primary control. • Environmental quality of key polluted area is improved. • Marine ecological deterioration in partial sea areas is restrained. • Partially damaged marine ecosystem is initially restored. • By 2020, the total marine protected area comes up to more than 5% of China's jurisdictional sea, with inshore marine protected areas accounting for more than 11% of it.
Maintain the basic stability of fisheries and strengthen the conservation of living aquatic resources	<ul style="list-style-type: none"> • The fishermen's production and living and sea area demand of modernized fishery development are strongly guaranteed. • Important fishery areas, aquatic wildlife and aquatic germplasm resources protected areas are effectively protected. • By 2020, functional area for aquaculture is not less than 26,000 sq. km.
Control rationally the scale of land reclamation	<ul style="list-style-type: none"> • To strictly implement the reclamation annual planning system and to curb excessive growth trend of reclamation.
Retain sea areas as reserved space resources	<ul style="list-style-type: none"> • Proportion of reserve area in national coastal waters is not less than 10%. • Strictly control the development and utilization activities occupying shoreline. • By 2020, the retention rate of continental natural shoreline is not less than 35%.
Carry out improvement and restoration of the coastal zone	<ul style="list-style-type: none"> • By 2020, improvement and restoration of not less than 2000 km of coastline.

Since the implementation of the MFZ, the issue of sea use conflicts has been addressed (Chua *et al.* 2006). The aquaculture industry has been actively restricted through the reduction of allocated areas and prioritisation has been given to more economically valuable industries such as, shipping and tourism. As a consequence, aquaculture plays a reduced role driving the MSP process. The quality of the marine environment is considered to have improved and remains stable in the context of a rapid increase of population and GDP. However, marine environmental pollution is yet to be substantially reversed.

3.3.4. Process: approach to identifying drivers, issues and goals

In order to identify the driving issues behind the sector conflicts and the unsustainable use of the marine environment, the Xiamen municipal government organized an interagency coordinating mechanism. This mechanism composed of 22 government agencies led by the executive vice-mayor, supported by a Marine Management Office and advised by a Marine Experts Group (PEMSEA 2009). A multidisciplinary group composed of environmental, economic, and legal experts, as well as key government planners and managers, developed an integrated coastal profile. The profile identified a number of related issues:

- Natural factors and cross-sectoral conflicts
- Conflicts between fisheries and shipping
- Conflicts among coastal engineering, conservation and shipping
- Conflicts among waste disposal, fisheries and tourism
- Inadequate government capability to manage cross-sectoral issues and pollution
- Low environmental awareness among policymakers and the public
- Lack of a masterplan for the coastal area
- Inadequate pollution management

The MSP coordinating mechanism undertook holistic discussions on the desired direction of Xiamen's development and the sectoral bureaus forged a common strategic management plan for Marine Pollution Prevention and Management (PEMSEA 2009). The strategy called for the; establishment of an MSP system, an increase in public awareness and the development of a scientific marine functional zonation scheme (PEMSEA 2009). Table 2 outlines the approach taken to solve each identified issue.

Table 2 - The issues identified within the Xiamen Bay areas and the approaches undertaken to solve them

Issue	Approach of Xiamen MFZ
Natural factors and cross-sectoral conflicts	Based on available information and biophysical and socioeconomic characteristics, Xiamen was divided into four subsea areas: West sea, Tong'an Bay, East Sea and Dadeng Sea (PEMSEA 2009). The dominant function of the Western Sea Area was identified as port and transportation development, while the dominant function of the Eastern Sea Area was identified as tourism development. The aquaculture farms in these two areas were then transferred to Tongan Bay Area and Dadeng Sea Area. The natural characteristics and different current and potential sectoral uses of each subarea were considered to match each area with the use most likely to yield the greatest overall societal benefit. The issues of sea use conflicts were effectively addressed, thereby ensuring orderly utilization of the sea areas.
Inadequate government capability to manage cross-sectoral issues and pollution	The interagency interaction helped Xiamen's various government bureaus understand the usefulness of interagency cooperation and the need to support other sectoral bureaus for holistic development (PEMSEA 2009). Additionally, a Xiamen Marine Experts Group was formed to incorporate scientific advice into the decision making process.
Low environmental awareness among policymakers and the public	In 1994, an environmental awareness and education program was initiated, which included newspaper articles, television and radio inputs, incorporation of relevant information into school curricula, public seminars, quiz shows, ocean and environment days and an environmental hotline (PEMSEA 2009).

Issue	Approach of Xiamen MFZ
Lack of a masterplan for the coastal area	<p>A coastal environmental profile and strategic environmental management plan was developed (McCleave, Xiongzhi and Huasheng 2003), based primarily on the information gathered from the environmental profile baseline assessment (Thia-Eng, Yu and Guoqiang 1997). This assesses the causes and effects of the identified environmental problems, evaluates existing management measures and prioritises management actions (Thia-Eng, Yu and Guoqiang 1997).</p> <p>A zoning scheme was undertaken and backed by the issue of Regulations for the Management of Sea Area Use in Xiamen, which mandated the development of a marine functional zonation scheme to guide development, of which the implementation was supervised by the marine management agency (PEMSEA 2009).</p>
Inadequate pollution management	<p>In 1996 Xiamen issued the <i>Regulation on the Protection and Management of the Marine Environment</i> directing the building of wastewater treatment plants, the treatment of marine pollution and the rehabilitation of damaged marine ecosystems (PEMSEA 2009). Regulations were also issued concerning resource management,</p>

3.3.5. Ecosystem-based approach in MFZ

The degree to which MFZ actually is ecosystem-based is not entirely clear, given the unavailability of a plan document where we could identify the quality and comprehensiveness of the ecosystem data and analyses performed during the planning process. Some studies question the degree to which MFZ takes environmental aspects into account (for example Feng *et al.* 2016; Fang *et al.* 2011), and one interviewee mentioned that, at least in the case of Xiamen, most of the data and analysis were focused on the biophysical environment, from which the ecological elements of the ecosystem were inferred. It was, however, acknowledged that there is barely any knowledge about the impacts of human activities on the marine and coastal ecosystems, hence the knowledge about the functioning of the ecosystem appears to be limited.

Comments from other interviewees indicate that the understanding of the marine ecosystems is improving as more data and analyses become available, and examples of planning decisions taken based on careful studies of ecosystem structure and functioning were given by the Fujian Ocean Institute, as in the case of the protection of threatened fish species.

A limitation to applying an ecosystem-based approach to MFZ in China is that it strictly follows jurisdictional borders, which in most cases implies dividing ecosystems into many planning units that are planned separately. This is particularly evident in the case of city level MFZ, as cities have relatively small maritime jurisdictions. Their ability to plan for the entire ecosystem, or at least a significant proportion thereof is therefore diminished. Provinces, on the other hand, because their jurisdictions encompass larger portions of the coast, stand greater chances of planning larger portions of ecosystems. It is likely though that even for the smallest ecosystems along the Chinese coast – such as the Bohai Sea, in the north of China – planning at whole-ecosystem scale would require collaborative planning by several provinces, which, as discussed elsewhere in this report, is not the norm today.

Assessment Question	0	1	2	3	Justification
a) To what extent has the ecosystem based management approach been used in the design of the MSP?	The ecosystem approach had little or no influence upon the design and scope of this MSP	The ecosystem approach has informed this MSP but has not been a central feature of its design	The ecosystem approach was one of several principles incorporated in this MSP but others were equally important	The ecosystem approach has been a central feature of the design, scope and process of this MSP since its inception.	EBM is not explicitly acknowledged in the LMSU as the approach upon which MFZ should be based. It does, however, require that MFZ plans are drawn based on the environmental characteristics of the planning areas and the carrying capacity of the natural environment. Interviewees contacted for this study referred to this as MFZ needing to be 'natural resource' or 'ecologically'-oriented, i.e. based on the characteristics of the underlying resources/ecology. The degree to which MFZ actually is ecosystem-based is not entirely clear, given the unavailability of a plan document where the study team could identify the quality and comprehensiveness of the ecosystem data and analyses performed during the planning process.
b) To what extent do the MSP goals address desired social, economic and env. outcomes?	MSP goals are defined in general terms	Goals define one of the variables but not the other two	Goals define two of the variables	Goals define desired outcomes in terms of all three variables	The six goals set for MFZ at the national level address both environmental and economic development aspect, but not any social development aspects in an explicit manner.
c) To what extent have (would have) time bounded and quantitative goals enabled or constrained this MSP process?	Time bounded and quantitative goals have (would have) been a key constraint in this MSP process.	Time bounded and quantitative goals have had/would have had some minor benefits, but overall their use has/would have been detrimental to the MSP process.	Time bounded and quantitative goals (would) have posed some minor challenges, but their use would have/has been overall positive for the MSP process.	Time bounded and quantitative goals have been a key enabling factor of this MSP process.	Each of the MFZ goals has a number of targets associated, of which some are quantified in numerical terms – for example rehabilitating no less than 2,000km of coastline by 2020, whereas others only indicate the direction of change, without quantifying it – for example curbing the growth of reclaimed coastal land by 2020. A smaller number of targets are formulated in even more vague terms – for example ensuring that protected areas for different marine resources are effectively protected. The view expressed by some of the interviewees from planning agencies is that the targets have been helpful for provincial and city governments in defining the measures that would enable them to reach those targets. Because goals are determined at the central level, they impose an obligation on lower level governments to deliver on them. The obligation to report on targets set by the central level government extends to other areas of policy, so that provincial, city and county governments are familiar with the procedures associated.

In summary, MFZ in Xiamen was first developed in 1997 as a core component of the city’s ICZM programme supported by the PEMSEA programme. Key issues at initiation were sea use conflicts, environmental degradation and lack of coordination of legislation and management. Through a consultative process involving the different agencies responsible for activities related to the sea, and supported by different technical experts, a set of goals and management measures were developed not only for MFZ, but also for marine and coastal management more broadly. Since the adoption of the national law for MFZ, MFZ goals have been harmonised across jurisdictions. The six national goals cover primarily economic and environmental goals, and have several targets associated, many of which are quantifiable and time-bounded. MFZ implementing agencies at each level report upwards on the achievement of the targets set for their level. MFZ has the implicit aim of being ecosystem-based, and there are indications that planning and implementing agencies increasingly base their decisions on scientific knowledge about the structure and functioning of marine and coastal ecosystems. The jurisdictional divides do constrain the degree to which MFZ can be truly ecosystem-based, though.

3.4. Scope and design of MFZ

The seas along China’s coast are divided into three regions; the Northern Sea, the East China Sea and the South China Sea, each of which has its own regional SOA branch (Lau 2003). The National, Provincial and City level MFZ plans have different boundaries and contents (Table 3 and Figure 4). At the provincial and local level there are various agencies that oversee marine and coastal issues, however the Oceans and Fisheries Bureau of Xiamen is responsible for organizing and compiling the MFZ including establishing the expert team, authorizing specific agencies to develop aspects of the MFZ, and overseeing implementation of MFZ. The authorized agency is responsible for the technical work on developing the MFZ plan, which the Xiamen municipal government subsequently approves.

Table 3 - Different scales of MFZ implementation in China

Level	Approval authority	Boundary	Contents
National	The State Council	Internal waters, Territorial Seas, Contiguous Zone, EEZ	Identify the most important sea areas and determine their dominant function
Provincial	The State Council	From the coastline (average high tide) to the limits of the territorial sea	Divide the national marine functional zones into more specific sub-regions and determine the function of each sub-region
City/County	Provincial governments	Sea areas under corresponding jurisdiction	Divide the provincial marine functional zones into more specific functional zones if necessary

The MFZ is the fundamental basis for compiling other plans involving the ocean, as well as the basic platform for developing policies related to exploiting and utilizing the ocean and protecting the environment. Therefore, Integrated Land Use Plans, Urban and Rural Plans and Harbour Plans which include the sea area use must be in agreement with the MFZ.

In the current Chinese planning system, land-sea interactions are to be addressed also by Coastal Zone Protection and Use Plans, which were not part of this study. An interviewee remark made during this study was that the Coastal Zone Protection and Use Plans are constrained by the fact that the coastal zone is not an administrative unit for planning, and therefore these plans have been difficult to do and implement. Spatial planning in the coastal zone remains divided between land use and city master planning in its terrestrial part, and MFZ in its marine part. As described above, MFZ plays an important part in harmonising both, even if only in a relatively narrow stretch of the coast.

A more recent development is the concept of Principal Functional Zoning (PFZ). The Fujian Provincial Government developed the PFZ Planning of Fujian Province in 2012 as guidance to terrestrial development and to specify the development goals and orientation of land utilization and exploitation. In accordance with the Provincial PFZ, the Xiamen Government developed more detailed PFZ Plan for the city. The marine PFZ at a national level has been completed in 2016, and as such provincial and city level plans have yet to be completed.

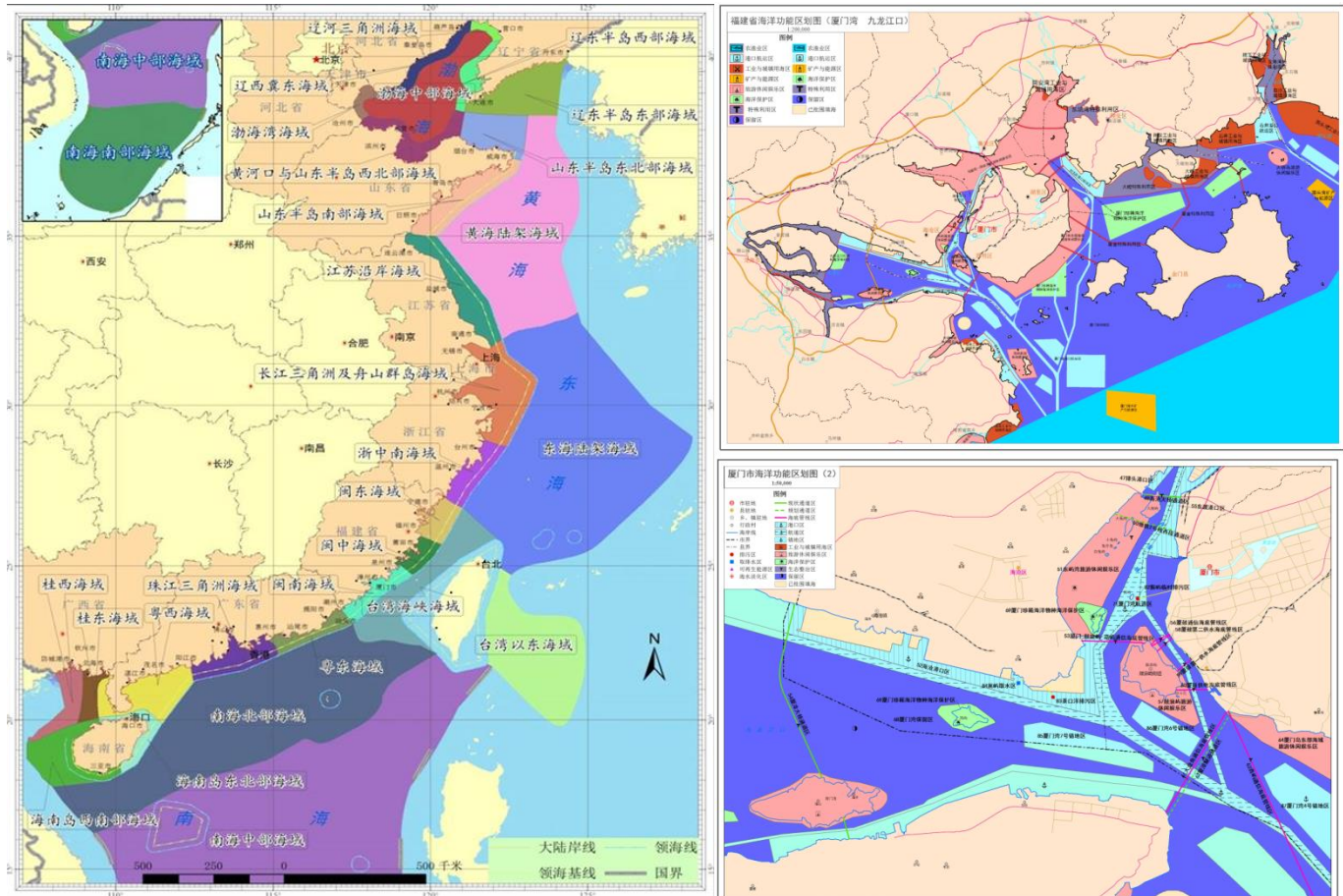


Figure 4 - Maps of national, provincial and city level MFZ plans, clockwise from left (Courtesy of the Fujian Ocean Institute).

Assessment Question	0	1	2	3	Justification
a) <i>To what extent does the MSP process have the authorities required to successfully implement the plan?</i>	<i>MSP implementing authority is as yet undefined</i>	<i>The distribution of authorities/responsibilities required for MSP implementation are being negotiated</i>	<i>The major roles and responsibilities for MSP implementation are known but some responsibilities and/or coordinating mechanisms remain unclear</i>	<i>Implementing authorities are clear and sufficient to fully implement this MSP</i>	The authorities for planning and implementing MFZ at the different levels are well established. Their roles and responsibilities are specified in the Law on the Administration of Sea Use and known to all parties involved in management and use of marine and coastal areas. According to interviewees consulted for this study, there are no major difficulties in the implementation of MFZ, hence it may be concluded that the existing implementation structure is sufficient for the aims that MFZ is expected to achieve.
b) <i>To what extent does the MSP possess the human resources required to implement the plan?</i>	<i>The necessary human resources for implementation have not yet been assigned</i>	<i>Staffing for MSP implementation is inadequate</i>	<i>Staffing for implementation is present in some institutions but not others</i>	<i>Sufficient human resources are in place to fully implement this MSP</i>	Feng <i>et al</i> (2016) refer to earlier studies that pointed at insufficient capacity of government authorities to properly enforce the first generation of MFZ plans. In particular, they point at the inability of permitting authorities to control the utilisation of the areas zoned, and at a practice of “freely permitt[ing] [organisations] to select sites for marine resource utilisation” (p.41). Such shortages appear to have been largely resolved, at least in the case of Xiamen city and Fujian province, which according to interviewees contacted for this study, possess the necessary human, technical and financial resources for implementing the plans. Whether or not this is the case more generally in other parts of China is not something this study has been able to investigate, but there are no accounts of human resources being a limiting factor in the implementation of the current MFZ plans.
c) <i>To what extent has there been coordination of planning between land and sea in this MSP?</i>	<i>Connections between land and sea processes and issues have not been addressed in the planning.</i>	<i>Connection between land and sea have been recognized but addressing them is not within the scope of this MSP</i>	<i>Connections between the land and sea have been recognized and some are addressed by the policies and regulations of this MSP</i>	<i>The major interconnections between land and sea processes and issues have been recognized and addressed</i>	According to Chinese law, MFZ plans have the same status / hierarchical position as land use and city master plans, with the important consequence that the types of occupation planned on land need to be made compatible with the function of the marine zone. In the example provided by the Xiamen Fisheries and Ocean Bureau, areas on land adjacent to a tourism functional zone at sea cannot be occupied by industry or any other development that is incompatible with tourism. In this way, MFZ constrains the planning on land. Moreover, MFZ includes ‘functions’ such as port areas, areas for land reclamation (for agriculture, industry or urban development) and areas for environmental rehabilitation (for example of coastal mangrove forests), which renders it an instrument for planning of certain coastal lands. Furthermore, some MFZ plans also designate areas for disposal of sewage or treated waters at sea, and plan some internal waters, such as Wuyuan lagoon in Xiamen, which again indicates a degree of consideration of land-based activities in the planning of the sea. On the other hand, it is not clear to which extent MFZ plans attempt to coordinate the siting and management of activities at sea with the land use or city development plans in adjacent terrestrial areas.

Assessment Question	0	1	2	3	Justification
					<p>According to Fang <i>et al.</i> (2013, p.665), this aspect has been given insufficient attention, resulting in MFZ plans paying insufficient attention to important effects on the marine environment of developments taking place on land. <i>(see text above).</i></p>

In summary, the MFZ planning and implementation agencies at the three jurisdictional levels are defined in law and well-established in the entire country. Their roles and responsibilities are clear and accepted by sectorial agencies, and they are generally adequately resourced to carry out their mandate. MFZ plans have precedence over sectorial plans, but not over land use or city master plans. These have the same status as MFZ plans, which requires that spatial planning on land and at sea be harmonised in order for the respective functions to be compatible across the land-sea divide. City and provincial governments are responsible for ensuring coherence between MFZ and land use and city plans. MFZ plans further affect land use on the coastal zone by determining the siting of certain coastal infrastructure, land reclamation sites and areas for environmental rehabilitation. MFZ plans are therefore key instruments for coastal zone management.

3.5. Collaboration and consultation in the planning phase

3.5.1. Engagement of governmental agencies in MFZ

The local government (Xiamen Municipal Government) is the managing body with which any final decisions lie, although the decision making process is implemented through meetings with various departments/agencies (McCleave, Xiongzhi and Huasheng 2003). As indicated in Section 3.3.4, an interagency Executive Committee (Marine Management Coordination Committee) was established and chaired by the Executive Vice-Mayor (Zhang et al. 2006). The Executive Committee was composed of representatives from 22 agencies who met periodically to provide policy advice, review progress and consider recommendations (Thia-Eng, Yu and Guoqiang 1997). Committee members included the heads of departments and agencies for city construction, science, environmental protection and fisheries. The MMCC was a temporary body during the Xiamen Demonstration Project, that was made permanent when the demonstration project formally ended in 1999. The significance of these government actions is the creation of an institutional and authoritative mechanism that can effectively address the cross-agency management issues related to the utilization of sea-space and marine resources. Coordination was facilitated through strict compliance of project designs. The preparation of project proposals followed a standard format that emphasized cross-project integration and a clear and logical framework.

During the process of compiling the MFZ, only governmental stakeholders were asked to provide comments on the draft of MFZ. Stakeholders were informed of MFZ activities but not involved in decision making (McCleave, Xiongzhi and Huasheng 2003). Certain governmental stakeholders were involved through the integrated task teams. These stakeholders include:

- The Municipal Development and Reform Commission
- The Municipal Planning Commission
- The Environmental Protection Bureau
- The Municipal Transportation Bureau
- The Port Authority
- The Maritime Bureau
- The Land Management Bureau
- The Construction Bureau
- The Water Conservancy Bureau
- The Tourism Bureau
- The Municipal Gardens Bureau
- The District Government
- The corresponding provincial departments and military sectors

Consistent with principles of sound marine planning and management, the Xiamen Municipal Government created in 1996 the Xiamen Marine Experts Group, comprising of marine scientists, legal expert and economists, with the aim of integrating science into policy-making and management. The responsibility of the Xiamen Marine Experts Group is to organize experts to consult and investigate works on marine planning, marine development and management. The following were accomplished:

- Enactment of the MFZ scheme
- Completion of a comprehensive marine economics development plan

- Establishment of a marine environmental protection network
- Improvement of financial mechanism for management-oriented scientific research
- Operation of the Xiamen Coastal Sustainable Development Training Centre

There was no participation of stakeholders outside government during the consultation stage of the MFZ process. Public participation in policy development and implementation was a new concept to Chinese central and local policymakers, at the time (Lau 2003). Stakeholders in China, especially NGOs and trade unions, are rarely acting independently of the party or government. The power of businesses is dependent on their size and the discretion of local policymakers, who are often involved in their management. NGOs, trade unions and businesses represent tools of the government and do not yet reflect an independent stakeholder input.

3.5.2. User groups' support for MFZ

Current user groups are primarily maritime transport operators and recreational tourism operators (both industries are the dominant sectors in Xiamen), and to a lesser extent fishermen (including mariculture farmers). Planning for small scale recreational activities is still ongoing, because the government wants to ensure its safety; at the same time, the study team observed recreational sailing and paddling activities taking place in nearshore waters. This suggests that such activities – which is one of the core aims of MFZ – is very promising but a revised permit system is in urgent demand.

The study team did not meet with representatives of the maritime transport sector, and hence cannot conclude on their level of support for the MFZ plan. However, this plan has been largely protective of shipping activities by reserving areas for navigation, anchoring and port activities and exempting maritime transport operators from the sea use fees. Therefore, it is unlikely that it is perceived as detrimental to the sector. The speed restriction imposed on all vessels by the measures to protect the Chinese white dolphin that have been incorporated into the MFZ plan are, according to the Xiamen Port Authority, well accepted by shipping companies using the area.

With respect to the fisheries sector, despite the fact that MFZ has strongly contributed to removing fishing and especially mariculture from Xiamen's nearshore waters, at present there does not seem to be any opposition to or even resentment against MFZ. The situation might have been different in the earlier plans, according to PEMSEA (2009). With one exception, the fishermen contacted for this study did not know the MFZ plan, and therefore any disapproval they might have of government plans and how these affect fishing, such disapproval is not of MFZ specifically. On the whole, this user group might be said to have a rather neutral opinion about the MFZ plan.

Assessment Question	0	1	2	3	Justification
a) To what extent was the design process and schedule made explicit to all parties in the initial phase of the MSP process?	The procedures and schedule evolved over time and changed significantly as the planning process matured	While the design process proceeded as expected there were some unexpected issues that delayed or interrupted the schedule	With minor exceptions the design process unfolded as anticipated	The procedures and schedule for consultation have been widely known from the initiation of this MSP and they have been followed	(Grade unknown) Since no interviews could be conducted with individuals who had been involved in the initial phase of MFZ, it is not possible to answer this question with certainty. Moreover, the study team was not provided any documentation containing the initial schedule of the MFZ process at the different levels, nor any assessment of how those processes were carried out in practice. There was no mention in interviews of lack of clarity or understanding of those processes being a significant constraint to MFZ planning or implementation.
b) To what extent do the affected user groups and the public understand and support the MSP process goals and strategies?	Those affected, and the public have a range of impressions on the goals and procedures of the MSP, some of them contradictory	Well informed support for the MSP is present in either the user groups or the public, but not both	With some exceptions, there is a good understanding and support for the goals and strategies of the MSP	There is strong support among both user groups and the public for the goals and procedures of this MSP	It is not known to what extent the public is aware of, understands and supports MFZ. In a city such as Xiamen, with a sizeable maritime economy, an important coastal tourism sector, one of the oldest marine science academia in China and a tradition of government engaging in marine and coastal management, it is not unlikely that public awareness about the value of orderly and properly managed seas is higher than the average for other parts of mainland China. However, whether or not there is understanding among the public of what MFZ is and does is more difficult to estimate. (see text above)
c) To what extent were stakeholders involved in designing and shaping the MSP process, incl. its cross-border elements? (governmental, non-governmental and the public)	[Governmental/Non-governmental/public] stakeholders were not involved in the design process	[Governmental/Non-governmental/public] stakeholders and the public were informed of the development of this MSP but were not contributors to its design	[Governmental/Non-governmental/public] stakeholders were invited to comment; their suggestion and/or concerns were acted upon in some instances but not others	[Governmental/Non-governmental/public] stakeholders were active participants in the planning process and significantly shaped the resulting plan	The only parties involved in the MFZ process are the planning authorities, and indirectly the maritime sector departments and bureaus. These are generally involved only through submitting their own sectoral plans to the MFZ authority for inclusion in the MFZ plan proposal, and then providing feedback to this proposal before it is finalised. In some instances, such as Xiamen city, there are inter-sectorial coordination mechanisms whereby maritime sector participate in planning, incl. MFZ. Representatives from the activities and sectors affected by the MFZ plans have not participated or even been consulted directly for the MFZ process. According to some interviewees – e.g. from Xiamen Port Authority, the Fujian Fisheries Research Institute and the Fujian Ocean Institute – such representatives may in some cases be consulted by the respective sector department/bureau during the elaboration of the plan for that sector, which then feeds into the MFZ plan. With respect to the involvement of the public, although interviewees from the Fujian Fisheries Research Institute and the Xiamen Fisheries and Ocean Bureau indicated that there has been public consultation in the elaboration of MFZ plans, Fang <i>et al</i> (2013) mention that “the public, including local communities have not been fully involved”, and that “stakeholders, especially the public, usually are only informed after the MFZ scheme has been completed, rather than being involved at the earlier stage.” (p.666). Similar statements are found in Lau (2003), and were supported by the views of most other interviewees contacted for this study, including the fishermen. Consultation with the public is, according to the Bureau, a statutory step in MFZ in Xiamen, but it is unclear to which extent it has

Assessment Question	0	1	2	3	Justification
d) <i>To what extent were barriers to cross-border collaboration resolved?</i>	<i>Cross-border collaboration remains a major challenge</i>	<i>Some significant barriers to cross-border collaboration have been resolved but others persist</i>	<i>The major barriers to cross-border collaboration have been resolved but minor difficulties remain</i>	<i>All significant barriers to cross-border collaboration have been resolved</i>	<p>been carried out and influenced the plan.</p> <p>Disputes between neighbouring cities or provinces with respect to the planning of sea areas are infrequent, and when they occur, are resolved through either 1) higher level authorities 'imposing' a given solution or 2) neighbours negotiating a solution, typically with the mediation of higher level authorities. The views expressed by interviewees of the Fujian Ocean Institute is that these processes have been effective in resolving any cross-border incompatibilities in planning that have arisen so far. They also observed that most cross-border disputes involve larger projects, and their negotiation generally involves the intervention of politicians. Issues of political power and influence between the city and provincial levels therefore play an important role in resolving barriers to cross-border collaboration.</p> <p>Barriers to collaboration across the city-provincial levels do not appear to constitute a problem worthy of note. The nested planning system is a mature one with the necessary mechanisms to address any issues that may arise between plans of different hierarchical levels.</p>
e) <i>To what extent are there significant differences in the type and quality of information available for the jurisdictional zones?</i>	<i>There are major differences in the quality and scope of information for the different jurisdictional zones</i>	<i>Significant differences in the quality of information on the different jurisdictional zones are limited to a few topics</i>	<i>While there are differences in the scope and quality of information this is not seen as a major constraint on the formulation of this MSP</i>	<i>The quality and scope of information for each jurisdictional zone is similar</i>	<p>The study team has not been provided any documentation with the background information used in the MFZ of Xiamen and neighbouring cities, or of Fujian and neighbouring provinces. Based on input from interviewees from the Fujian Ocean Institute and the Fujian Fisheries Research Institute, all city and provincial planning agencies in China have comparable resources for producing the studies necessary for planning, and use the same type of data with the same quality standards. This being the case, no significant differences in type and quality of information for MFZ are to be expected across jurisdictional borders</p>

In summary, MFZ plans are typically elaborated only by government agencies, which are involved either through participating in inter-sectorial committees or through providing written input to the planning process. Non-governmental stakeholders are generally not involved, including representatives from the maritime sectors, which are sometimes consulted by the respective sector agency. In the specific case of Xiamen, the two most important marine users are shipping & ports and tourism, and these tend to have an influential voice in the content of the MFZ plan. Despite the limited engagement of non-governmental stakeholders, support from the public and marine users for the MFZ is generally strong, and there is ample recognition of the value of MFZ for the orderly use of the sea in Xiamen and elsewhere in China.

3.6. Features of the implementation phase

3.6.1. Resource use: Good practices advocated and changes after implementation

The main implementation actions include:

- Establishment of a marine management and coordination mechanism
- Harmonization of national legislation
- Integrated law enforcement
- Integrated marine pollution monitoring
- Public awareness campaign
- ICZM training
- Designation of functional zones
- A series of ecological restoration projects such as dredging activities, dyke opening, mangrove planting
- Removing mariculture activities and restricting fishing activities
- Developing laws and regulations related to ocean management
- Exploiting coastal tourism resources

The Xiamen Fisheries and Oceans Bureau implements marine environmental monitoring every year (e.g. since 2007, the incidents of eutrophication and algal bloom have been monitored).

During the initial phase of implementation, five criteria were agreed upon as a measure to evaluate the success of the project over a period of 5 years (Thia-Eng, Yu and Guoqiang 1997). These are:

- Establishment of an ICZM mechanism
- Establishment of a proper legislative system for coastal and marine management
- The improvement of marine environmental conditions
- Establishment of a monitoring and assessment system
- Establishment of an information and training mechanism

Not all five were fully achieved, but significant progress was made specifically in the following (Thia-Eng, Yu and Guoqiang 1997):

- Establishment of a function marine management and coordination mechanism
- Improvement of the local legislation
- The formulation of an integrated marine pollution monitoring program
- Initiation of an ICZM training programme for information dissemination

- Human capacity development.

Table 4 outlines indicators that were reported on further as a measure of change.

Table 4 - Indicators that were reported on as a measure of change

Indicator	Explanation
Perception and attitude	Difficult to quantify, although essential to document. The project was initially perceived as a scientific research programme, coordinated through the Science and Technology Commission. The perception change of policy makers and many others led to the establishment of the MMCO, the creation of a more proactive environmental policy, a consensus to enact local ordinances to harmonize with national legislative measures, the adoption of a management-oriented and interdisciplinary research, and the adoption of integrated planning and management.
Proactive environmental policy	The development policy of the municipal government has provided economic development directions and goals. This has enabled the integration of marine environmental management in the SEMP to promote a proactive environmental policy, and has allowed the reactive management of strategies to correct adverse environmental impacts.
Organizational arrangement	The establishment of MMCO marked a major organizational change in the history of the management of the marine area in Xiamen. In the past, there was no single organization or interagency consultative mechanism for resolving use-conflicts, to address adverse environmental problems, or to execute proactive environmental management programmes. MMCO now has the necessary mandate and legal authority to coordinate with concerned agencies on the use and management of the marine areas.
Management approach	The acceptance of an integrated management approach is a major change from the conventional management regime that is manifested through a series of management actions involving policy, planning, legislation, law enforcement, monitoring and research.
Research	Most researchers in Xiamen had little or no experience in undertaking interdisciplinary, management-oriented research. Although a multidisciplinary team was established, most research proposals showed little or no coordination with each other. There were even difficulties in the use of a log-framework. It took a considerable amount of time through lectures, open discussions and exercises before such management-oriented research was accepted and implemented. The change from the conventional research approach to a management-solving approach was finally realized.

3.6.2. Adaptive MFZ implementation

According to the Xiamen Fisheries and Ocean Bureau, evaluations of the MFZ plan have been conducted as part of both revision processes, focusing on 1) implementation performance; 2) degree of conformance with the prescribed sea uses; and 3) degree to which the functions have been realised, which the study team interprets as the assessment of changes in utilisation of the area by the different users (functions). There was no indication by the interviewees of a set of indicators used for periodic monitoring of plan implementation.

MFZ plans may also be adjusted following important developments in any of the sectors it is designed to regulate. In the case of Xiamen, the energy and transport sectors are particularly important for the development of the city, and therefore changes in their respective plans may prompt a revision of the MFZ scheme. While such a possibility could be praised as an indication of adaptive management in a society undergoing rapid development – especially because the statutory period for revision of the plans is 10 years – authors such as Fang *et al* (2013) have a more critical view, maintaining that systematic plan monitoring and evaluation is often neglected and in turn MFZ “revision is mainly pushed by the driving forces of the rapid economic development.”

Assessment Question	0	1	2	3	Justification
Impacts on the behaviour of institutions					
a) <i>To what extent are implementing institutions collaborating effectively to implement the MSP process?</i>	<i>There is some MSP collaboration but this is no more than the methods employed by institutions before MSP initiation</i>	<i>More integrated forms of MSP planning and decision making are apparent but there are still some conflicts or inefficiencies</i>	<i>MSP collaboration and integrated planning between institutions are generally good but issues arise from time to time</i>	<i>There is effective cross-border collaboration between implementing institutions to ensure that management is integrated throughout the MSP area</i>	<p>Vertical collaboration between MFZ implementing institutions (i.e. city to province to national) is generally good and has been efficient in ensuring that MFZ plans are consistent across and within the three jurisdictional levels. The mechanisms for vertical consultation, negotiation and oversight seem to be well-established and functioning properly, and seem to be sufficient to deal with occasional disputes and inconsistencies between MFZ plans.</p> <p>Horizontal collaboration (i.e. city to city and province to province) is much less common, as discussed earlier, and there do not seem to be any formal mechanisms for MFZ implementing agencies at the same jurisdictional level to collaborate in implementation. As explained earlier, oversight mechanisms at higher administrative levels play therefore a key role in ensuring cross-jurisdictional consistency. In the particular case of Xiamen, the local Fisheries and Ocean Bureau mentioned that a dialogue has been initiated with neighbouring cities of Zhangzhou and Quanzhou around the issue of MFZ and the potential benefits of sharing experiences and efforts.</p>
b) <i>To what extent are MSP policies, procedures and regulations being enforced?</i>	<i>Enforcement is weak and non-compliance with rules is widespread</i>	<i>Enforcement is uneven; some rules are enforced more effectively than others and enforcement targets some groups more than others</i>	<i>Enforcement is generally effective but there are notable exceptions</i>	<i>Enforcement is effective and compliance is high throughout the MSP area</i>	<p>According to the Xiamen Fisheries and Ocean Bureau, the plan and its regulations are being adequately implemented. Other interviewees also observed that there are no significant concerns with enforcement of the MFZ and other plans related to the marine environment. With respect to enforcement of the MFZ plan, interviewees from both the Fujian Fisheries Research Institute and the Xiamen Fisheries and Ocean Bureau mentioned that there is a mechanism for citizens to report to the Bureau any cases of non-conformance with the MFZ plan and its regulations. They claimed this is possible because citizens are well aware of the plan and its importance for the proper management of Xiamen's marine waters</p>
c) <i>To what extent is the MSP's legal framework, and other laws and regulations that apply within the MSP area (including international law), contributing to achieving the goals of this MSP?</i>	<i>The existing legal framework has had a largely detrimental effect, and constrained progress towards the MSP goals in important ways.</i>	<i>The legal framework has enabled some progress towards the goals of the MSP, but important gaps remain to be addressed.</i>	<i>The legal framework has constrained some achievements of the MSP, but is has supported important developments towards its goals.</i>	<i>The legal framework has been a key contributing factor for the success of this MSP. Outstanding gaps are being addressed.</i>	<p>A strong legal basis was considered by interviewees as a key factor of the success of MFZ, notably for 1) clarifying the roles and responsibilities of government agencies at all levels; 2) instructing these agencies on what actions needed to be taken, setting a schedule for their completion, and defining processes for reporting and review; 3) defining the position of MFZ plans in relation to other plans, notably sector and land use plans; and 4) giving MFZ plans the status of enforceable regulations that any user of marine areas must comply with. One representative of the Xiamen Fisheries and Ocean Bureau was keen to highlight that the first step in as well the Xiamen as the national MFZ processes was the passing of a law, which enabled the remaining steps to be initiated. International law does not seem to play any significant role in the MFZ process, other than defining the jurisdiction and the sovereign rights of</p>

Assessment Question	0	1	2	3	Justification
					China for elaborating the national-level MFZ plan. None of the interviewees contacted for this study, who represented city and provincial governments, made any reference to international law.
d) <i>To what extent are the MSP regulations and management measures consistent across the border and do they enable coordinated cross-border/multi-national implementation of the plan?</i>	<i>MSP regulations and management measures are inconsistent across the borders and this presents considerable challenges to implementing the plan</i>	<i>Some efforts have been made to standardize cross-border regulations and management measures for some sectors but not all</i>	<i>Efforts have been made to standardize regulations and management measures across all sectors involved, but there are still inconsistencies between their implementation across borders</i>	<i>Regulations and management measures are consistent throughout the MSP area and implementation is well coordinated</i>	<p>(Grade unknown)</p> <p>The study team could not compare the regulations and management measures of MFZ or sector plans, and therefore cannot conclude on the extent to which they are consistent. With respect to the specific case of MFZ plans, because all provincial and city plans follow the same national law, there should not be any significant variations in the regulations and management measures between different cities or provinces. Despite this fact, because there is no cross-border implementation, the consistency of regulations and management measures across borders is not a determining factor to enable coordinated cross-border implementation.</p>
e) <i>To what extent has having a monitoring programme/M&E framework across borders affected MSP cooperation?</i>	<i>The monitoring/M&E framework (or lack thereof) has not facilitated or has actively challenged the implementation of the cross-border MSP plan</i>	<i>The monitoring /M&E has caused some major issues; some of which have been overcome and others which still need addressing.</i>	<i>In parts, the monitoring/M&E has been a successful means of establishing cooperative and cross border MSP</i>	<i>The monitoring/M&E has been well established and is a notable area of success in terms of cross-border MSP.</i>	The M&E framework is, in line with the hierarchical MFZ system, a nested one, in which the objectives and targets set at the national level are transposed into objectives and targets at the provincial level, and these into objectives and targets at the city level. Plans at the different levels are therefore bound by and contribute to a common set of objectives, and report achievements at their level that then feed into the level above. Evaluation and review of the plans at the different levels takes place at the same time to ensure consistency. On the whole, the M&E system appears to be designed in such a way as to reinforce the vertical coherence of the planning system and ensure consistency across jurisdictional borders.
f) <i>To what extent is the MSP process practicing adaptive management by using monitoring results to shape future management decisions?</i>	<i>No systematic monitoring is in place and there is little or no visible adjustment of management practices</i>	<i>Indicator results are used to adjust management practices in either social, economic or environmental ways but not in more than one</i>	<i>Adaptive management is practiced and has produced some significant adjustments to the MSP process</i>	<i>Adaptive management is widely practiced and good practices are shared across borders</i>	<p>Because the study team did not have access to the different revisions of the MFZ plan, it has not been possible to assess the changes eventually introduced by the two revisions carried out so far.</p> <p>There was no indication by the interviewees of a set of indicators that is used for periodic monitoring of plan implementation. The situation therefore seems to be one where 1) there is no periodic monitoring based on set indicators; 2) a systematic evaluation is conducted prior to any statutory plan revision; and 3) the plans are adjusted following important changes to critical development sectors or maritime functions.</p> <p><i>(see text above)</i></p>
g) <i>To what extent is support within the political structure at the national level being</i>	<i>Political support at national levels is weak</i>	<i>Political leaders recognize the MSP process but public statements supporting the</i>	<i>Political support is strong, well-informed and frequently expressed but this</i>	<i>There is clear political support for the MSP plan across the borders</i>	Support for integrated coastal and marine management from the Xiamen city government has been strong since the early 1990s, when MFZ was employed as a core element of the city's ICZM efforts. Because the sea is seen by the city government as a central feature of the attractiveness and competitive position of Xiamen, it is likely that the

Assessment Question	0	1	2	3	Justification
<i>maintained?</i>		<i>process are rare</i>	<i>is not consistent across borders</i>		political commitment for MFZ as part of a packages of measures for integrated marine and coastal management will remain strong. Political support for MFZ at the provincial and national levels is believed to be strong and stable.
h) <i>To what extent is there integrated management of sectors within the country zones of the MSP?</i>	<i>The management of sectors occurs in silos with little or no consideration of interactions and interdependencies</i>	<i>There are some examples where management strategies are linked between sectors but overall management is done mostly sector by sector</i>	<i>There is integration between the management strategies of most sectors, and work is underway for integrating the outstanding sectors</i>	<i>Sectoral management strategies are integrated across all sectors in the country zones</i>	<p>It was not entirely clear from the interviews conducted for this study if sector authorities other than the Xiamen Fisheries and Ocean Bureau are also responsible for enforcing any plan regulations that are specific to their sector – for example whether or not the port authority has any role in enforcing the water quality standards set for designated port areas, or the maritime administration in enforcing the speed restrictions for vessels. Whichever the case, the feedback from interviewees contacted for this study is that the different institutions collaborate adequately in implementation.</p> <p>Whether or not this is the case in other cities could not be investigated in this study. Authors such as Feng <i>et al.</i> (2016), Mu <i>et al.</i> (2013) and Lau (2003) argue that institutions with mandates related to the marine environment generally work in an independent manner. The view of a representative of the Xiamen Fisheries and Ocean Bureau is that Xiamen, has been a pioneer in ICZM and is more advanced than other cities, but that these are catching up and adopting inter-sectorial coordination mechanisms.</p> <p>With respect to the licensing of activities at sea, procedures are still fragmented between different agencies, according to several interviewees. Although the Xiamen Fisheries and Ocean Bureau retains the exclusive right to license the use of the sea, there are several other permits that need to be obtained. This is not done in a coordinated manner and contradictory decisions may be taken by the different permitting authorities. According to interviewees and as described by Lau (2003), this is part of the Chinese culture of public administration, which however shows signs of transitioning to more integrated procedures.</p>
i) <i>To what extent is there evidence of implementation/management coordination between land and sea?</i>	<i>There is no coordination between the MSP and terrestrial coastal planning;</i>	<i>There is some coordination between terrestrial and marine planning but major issues remain unresolved</i>	<i>There are many examples of coordination between terrestrial and marine planning;</i>	<i>There is coordinated and adaptive management of the land-sea linkage and all land-based sources of threat/damage have been successfully addressed</i>	<p>(Grade unknown)</p> <p>The study team was unable to meet with institutions responsible for land use or city master plans, and could therefore not assess the degree to which the implementation of such plans was coordinated with that of MFZ plans. From interviews with government organisations involved in MFZ and marine sector management, it appears that the organisations implementing MFZ do not play any role in the implementation of plans on land. This is consistent with the fact that MFZ implementing bureaus have exclusive responsibility for the permitting of activities at sea and enforcement of MFZ regulations, but not others. Sector authorities such as port and maritime authorities enforce plans and regulations that have both land and sea components, but do this within the boundaries of their sectorial mandate, not a broader coordination of land and sea use</p>

Assessment Question	0	1	2	3	Justification
					management. In brief, if there is any such coordination, it may be performed by policy making bodies in the city and provincial governments. However, the study team could not investigate if those bodies have such a role in coordinating land and sea use plan implementation.
Impacts upon financial investments					
a) To what extent are necessary investments in infrastructure being made?	Infrastructure investments are minimal and necessary infrastructure is missing or inadequate	Infrastructure investments have begun but are not consistent across borders	Infrastructure required by the MSP process is in place but maintenance is poor; there is uneven distribution of investment across borders	Infrastructure required by the MSP process is in place and well maintained throughout the MSP area	(Grade unknown) This issue was not discussed specifically, and the study team was not given any reference to investments in infrastructure being made in conjunction with the implementation of the MFZ plan. There are several investments being made by sectors using the planned areas, but it is not clear to which extent these relate to the MFZ or if – which is more likely – they are related to the plans for developing those sectors. Noteworthy examples are the large investments in transport infrastructure, namely the port and new international airport in Dadeng Island, both involving large areas of land reclamation. Similarly, there have been large investments for rehabilitating marine and coastal environments – notably the opening of the causeway that separated the West Sea from Tong’an Bay – but it is not clear whether these are linked to the MFZ plan or other environmental management initiatives. Because the study team was not able to visit other cities, it is not possible to conclude on the respective levels of investments related to MFZ.
b) To what extent is the funding of this MSP sustainable over the long term?	The sustainability of funding is a major unresolved issue	Funding for the short term is adequate but long-term funding mechanisms are not in place	Some long-term funding mechanisms are in place but their outcomes or sustainability are uncertain;	Short term and long-term sustainable funding mechanisms are in place and secure throughout the MSP area	Although this issue was not discussed specifically, because MFZ is implemented according to a national law, it is assumed that the national government will continue to finance the implementation of MFZ at the different levels. Moreover, the sea use fees is a well-established system that is contributing to financing implementation, and this is expected to remain so as long as the law is in force.
c) To what extent is cross-border collaboration on MSP factored into the budget or funding mechanisms?	Cross-border collaboration only minimally factored in to budget or funding mechanisms	Cross-border collaboration has been considered in the budget but funds are insufficient	Funds have been allocated to cross-border collaboration but not consistently across the borders	All collaborating jurisdictions have allocated sufficient and funds for collaboration across borders	Cross-jurisdictional (vertical) consistency is one of the determinants of the MFZ system, and hence is an integral part of the budget decisions affecting MFZ. However, it is not budgeted separately from other elements of MFZ.
Impacts on the behaviour of user groups and businesses					
a) To what extent are the good practices called for by the	Good practices advocated by the MSP have not	There are a few instances where MSP good	Some good practices are consistently	All MSP process good practices are being applied by	(Grade unknown) No mention of any good practices advocated by the MFZ has been made by any of the interviewees. Since the study team was not given access

Assessment Question	0	1	2	3	Justification
<i>MSP process being adopted by target groups?</i>	<i>been adopted by target groups</i>	<i>practices have been adopted but most are not operational</i>	<i>practiced, but others are not</i>	<i>target groups</i>	to any MFZ plan documents, it has not been possible to investigate this issue further
<i>b) To what extent are destructive forms of resource use being reduced?</i>	<i>Several destructive resource uses of concern to the MSP process continue unabated</i>	<i>Resource users are aware of destructive practices but efforts to change behaviour are mixed</i>	<i>With some important exceptions, user groups have ceased destructive practices of concern</i>	<i>Destructive resource use practices have been eliminated</i>	<p>In Xiamen the main concern appears to have been the abatement of unregulated uses and the countering of a very fragmented management regime, rather than reducing destructive practices.</p> <p>The most noxious activities impacting on Xiamen’s marine environment have been aquaculture and fisheries, land reclamation, waste disposal and agriculture in the catchment of the rivers discharging into Xiamen Bay, notably the Jiulong River (cf. Thia-Eng, Yu and Guoqiang 1997; Xue <i>et al.</i> 2004; PEMSEA 2009; Zhang and Xue 2013). Except for the latter, which remains largely unsolved today, the other activities have been subject to much stricter control since the mid-1990s, in part through MFZ. Aquaculture and fisheries areas were greatly reduced through MFZ, and the few areas left were moved to the Eastern Sea, thus greatly reducing their overall impact. One fishermen interviewed for this study mentioned that dynamite fishing occurred in Xiamen in the past, but that such practice has been abandoned. The influence of MFZ on this transition is not possible to assess.</p> <p>Land reclamation, while still ongoing, has been regulated much more strictly through MFZ, which, at least in the case of Fujian province, has adopted a very stringent approach to new land reclamation areas. With respect to waste disposal at sea, in particular sewage and industrial discharges, improved treatment and disposal systems have been built over the last two decades. MFZ was used for the siting of discharge points at sea, in locations that would be less detrimental for the environment and other uses.</p> <p>These changes, which only in part can be attributed to MFZ, are the result of the enforcement of regulations rather than the ‘adoption of good practices’ by target user groups. One may therefore speak of adoption, but rather by virtue of the enforcement of regulations than voluntarism.</p>
<i>c) To what extent are conflicts among user groups being reduced?</i>	<i>User conflicts are widespread and have not been reduced</i>	<i>Number and severity of user conflicts appears to be declining</i>	<i>Decline in important user conflicts has been documented</i>	<i>Major use conflicts have been resolved</i>	<p>The principal motivation for Xiamen city’s engagement with ICZM – of which MFZ was a core component - were the many conflicts between the different users of a limited maritime area.</p> <p>When inquired about the key benefits of MFZ, interviewees from all government agencies contacted for this study mentioned the resolution of conflicts between the different users. The separation of these users into designated functional zones – whereby one user/function is awarded priority, and in many cases exclusivity in the use of a given zone – has been the key process for resolving existing conflicts and avoiding future ones, and thereby attain an orderly sea. (see text above)</p>

In summary, implementation of MFZ has been carried out in Xiamen as part of the broader packages of ICZM measures, and has included the development of the legal and institutional framework, enforcement and monitoring, public education and awareness raising, capacity development for the agencies involved, designation of functional zones and environmental restoration. MFZ plans are adjusted periodically, generally after a comprehensive review of the process and outcomes of each planning-implementation cycle. Smaller adjustments are also done on a more ad hoc basis, when there are important developments in any of the maritime sectors. Each jurisdiction revises and adjusts its plan independently from its neighbours at the same level.

Institutional collaboration is generally good during implementation, but there are some inconsistencies in licensing processes and duplication of monitoring and surveillance efforts at sea. Compliance with plan regulations is generally high, to which the clear legal framework has been instrumental. Political support for MFZ remains high at all three levels, and funding from the national treasury for continued planning and implementation seems to be ensured. There is ample recognition for the need of sector policies to align with the spatial plans, given the precedence of the latter.

4. OUTCOMES AND LESSONS LEARNED

4.1. Achievement of planned goals and impacts of MFZ

In the absence of the plan document, reports from earlier evaluations and monitoring results, it is not possible for the study team to provide a robust answer to the question of goal achievement. However, the views expressed by the interviewees contacted for this study all suggested that MFZ in Xiamen city and Fujian province has fulfilled its goals. In particular it has led to ordering the use of the sea and thereby reducing conflicts between activities, enabling the development of key maritime sectors in a manner consistent with the characteristics of the environment. It has also contributed to reducing excessive exploitation and transformation of marine and coastal environments, and reserving areas for as well rehabilitation of the environment as unforeseen future uses.

According to interviewees from the Xiamen Fisheries and Ocean Bureau, the national MFZ targets have been transposed to the provincial and city levels and are used in reporting to the national level. Whether and how this is done was not possible for the study team to assess, given lack of access to plan documentation.

4.1.1. Impacts on socio-economic conditions

With respect to the impact of MFZ on the sustainability of social and economic conditions, because the study team could not access any documentation relative to the monitoring and evaluation of MFZ plan, this estimate is based exclusively on the views of interviewees and on the English language literature. Without exception, all interviewees were of the opinion that MFZ has made a very positive contribution to ordering the use of Xiamen's marine areas, which enabled the resolution of most conflicts between users and consequently the flourishing of the prioritised sectors for development (ports & shipping, and tourism) and the reversing of environmental degradation (see below). The very rapid development of the Xiamen port and merchant shipping would not have been possible without resolving the conflicts with mariculture over space in the Western Sea (cf. for example PEMSEA (2009)). Similarly, the Eastern Sea and the east coast of Xiamen Island would not have gained the tourism potential they have today had fisheries and mariculture been displaced from the area (cf. for example Zhang and Xue (2013)). Comparable benefits have been identified for other locations in China already during the implementation of the first generation MFZ plans (cf. Li (2006)).

While the growth and sustainability of the shipping & port and tourism sectors have clearly benefitted from MFZ, fisheries and mariculture could be regarded as losers. Indeed, MFZ has not only recognised but also formalised the demise of fishing and aquaculture activities in Xiamen Bay. In the process of the city's rapid urbanisation and industrialisation and the strong competition for the use of its seas, both investments and political focus shifted to the economically most efficient maritime sectors, namely shipping and tourism. Moreover, as observed earlier water quality in Xiamen Bay was too low for mariculture, which further constrained its sustainability and growth prospects. Recognising the declining trend in fisheries and mariculture, MFZ was used to formalise the prioritisation of the most economically profitable sectors, such that areas for fisheries and mariculture in Xiamen waters have been progressively reduced. Whether or not fishermen are better or worse off today than 20-30 years ago is an unresolved matter. The demise of fishing activities have forced many to switch to other jobs, which in many cases has led to improved living conditions. In other cases there have not been any noticeable changes. However, such eventual effects on livelihoods cannot be attributed to MFZ alone, since as described above MFZ was but one piece in a much larger puzzle of profound socio-economic transformation.

4.1.2. Impacts on ecosystem goods and services and on biodiversity

The issue of how cumulative impacts on the marine ecosystem have been addressed by MFZ was not discussed specifically, and there was no mention of assessment of cumulative impacts by any of the interviewees. Xue *et al.* (2004) suggest that having the inter-sectorial coordination bodies established – notably the Marine Management Office and the Marine Expert

Group – indicates that cumulative impacts are being assessed and managed. While indeed the role of these organs is to deliberate on the interactions between the different maritime sectors, and between these and the marine and coastal environment, it was not clear from the interviews how this is being done, and to which extent cumulative impacts are successfully managed.

With respect to the impacts on ecosystem goods and services and on biodiversity, one needs to keep in mind that MFZ primarily addresses the spatial distribution of activities at sea. At the same time a large number of other measures and initiatives have been taking place that more directly address the status of the marine and coastal environment, and therefore have a clearer effect on ecosystem goods and services and biodiversity, in Xiamen as well as elsewhere in China. MFZ's main contribution has therefore been in terms of regulating – and, for selected sectors, improving – access to the resources, rather than enhancing their condition.

From the interviews conducted for this study and some literature (cf. PEMSEA (2009); Zhang and Xue (2013)), indirect contributions of MFZ to sustaining or improving the condition of ecosystems include:

- Eliminating or greatly reducing human pressure on certain areas designated as areas of no-use and areas for tourism and recreation, where only low-impact uses are permitted.
- Rehabilitation of habitats, for example in areas designated for mangrove replanting, and conservation of protected species in conservation areas that have been incorporated into the MFZ plan.
- Preservation of the few remaining stretches of natural coastline through a stricter control of land reclamation projects.
- Reduction in the amount of pollutants from activities at sea, notably mariculture, shipping and port operations, in the case of the former through the displacement of the sector to areas outside Xiamen Bay, and of the latter through the application of water quality standards to designated port areas.

The magnitude of the impacts indicated above was not possible to assess due to the lack of access to environmental monitoring and evaluation data.

Despite remarkable improvements in the environmental conditions of the city and Xiamen Bay, which can partly be attributed to MFZ, Xiamen is still faced with the challenge of improving seawater quality. Excessive pollutant inflow is largely attributed to the non-point sources from Jiulong River and other catchments, whereas outflow is hampered by the relatively low rate of water circulation in the semi-enclosed Xiamen Bay.

4.1.3. Impacts on sea use conflicts

The principal motivation for Xiamen city's investment in an ICZM programme was related to the many conflicts between the different users of a limited maritime area, which was seen as leading to inefficiencies that constrained development, and an unacceptable degradation of the marine and coastal environment. These are described in Section 3.3.2.

When asked about the key benefits of MFZ, interviewees from all government agencies contacted for this study mentioned the resolution of conflicts between the different users. The separation of these users into designated functional zones – whereby one user/function is awarded priority, and in many cases exclusivity in the use of a given zone – has been the key process for resolving existing conflicts and avoiding future ones, and thereby attain an orderly sea.

4.1.4. Impacts of cross-border coordination

Consistency and equality of use across borders: Because provincial plans determine the basic content and zoning scheme of city MFZ plans, and because these are approved by provincial authorities after verification of their compatibility, city MFZ plans are considered to be largely consistent across borders. Examples were given by interviewees of situations where

disputes exist, but the existing mechanisms are considered sufficient to deal with these. As such, cross-border collaboration in MFZ does not really exist, and the consistency observed between different plans at the same jurisdiction level is a result of the hierarchical relationship between plans and the associated revision and approval mechanisms, as described above.

Sharing of good practices across borders: Sharing of good practices takes place between the national, provincial and city planning levels as part of the plan review and approval processes. Issues concerning plan development and implementation are reviewed on those occasions, and the outcomes of this review constitute input in the plan updating process.

Barriers to cross-border collaboration and coordination: Horizontal cross-border collaboration – i.e. between planning agencies at the same administrative level (city-city, or province-province) has not been incentivised in the current legal regime for MFZ. Although the national MFZ law does not formally prohibit such cooperation, the fact that it puts in place a system for checking and resolving disputes between agencies and inconsistencies between plans renders 'horizontal' coordination mechanisms unnecessary. There are no formal barriers to collaboration and coordination across jurisdictional borders in MFZ.

4.2. Lessons learned

4.2.1. Lessons learned about MFZ in general

According to the interviewees contacted for this study, important lessons learned from developing and implementing MFZ in Xiamen include:

- Having the proper **channels for conveying information** to the public and target user groups about the status of the environment and associated management measures helps raising the level of knowledge of key individuals with responsibilities for the use and management of marine areas. It is also important for building the awareness of the public about the need to conserve and adequately manage the marine environment. This latter aspect is particularly important if the public is to play an active role in enforcing marine management measures, notably through identification and reporting of illegal activities.
- In order for society to determine the direction of development, **planning needs to precede investment**; in other words, governments must ensure that planning comes first and is the determinant of investments, not the opposite. This is a precondition for development not to be determined by individual investment proposals in an uncoordinated manner.
- **Planning that focuses on the economically most valuable and efficient uses is likely to generate the greatest gains for society.** In Xiamen, and elsewhere in China, those uses have been the main determinants of planning and be given precedence over less important functions in planning decisions. The resulting view is that planning should be conducted with the aim of maximising the efficiency of use of marine spaces.
- **A planning system that enables planning on land to be coordinated with planning at sea makes it possible to optimize the siting of infrastructure and services** on land necessary for activities taking place at sea and vice versa. Shipping and port development are a prime example, where large expanses of land are necessary for port infrastructure, without which the development of shipping is not possible. Similarly, investments on tourism infrastructure on land is only meaningful if adjacent sea areas are reserved and kept in good condition for tourists to enjoy. Ensuring this coordination as early as possible allows planning authorities to keep as many planning options open as possible.
- **A long-term vision for spatial planning enables areas to be reserved for functions or uses that are plausible but not predictable with certainty.** An example was the decision taken to reserve the south-eastern shores of Xiang'an county for port development at a time when the tense relationship with Taiwan did not allow

vessels to transit the channel north of Kinmen Island, which provides the shortest route to the Xiang'an port area. The relationship with Taiwan has since improved, the port has been constructed and vessels transit the channel north of Kinmen Island (cf. Figure 5).



Figure 5 - Map of the sea area north of Kinmen Island and the Xiang'an port area (red circle)

- **Clarity in terms of the hierarchy and coordination of different plans** is necessary for planning decisions to be consistent across sectors and the land-sea divide. In the context of jurisdictions with complex planning systems and multiple and overlapping plans, marine spatial planning could be regarded as a process for coordinating the different plans.
- **A clear legal framework for planning is a pre-condition for establishing the roles and responsibilities of state and non-state institutions**, defining the regulatory powers and the enforcement mechanisms of the plan, specifying the process and outputs of the plan, and defining the hierarchy of the marine plan relative to other planning instruments.

4.3. Lessons learned about cross-jurisdictional collaboration in marine planning

The view of the study team is that the main learnings of this case with respect to cross-jurisdictional marine planning are:

- In the Chinese context having a higher-level coordinating entity with authority to revise and approve plans at lower jurisdictional levels has proven to be sufficient for ensuring an adequate level of compatibility between these plans. This is largely the experience of MFZ in China, and it has rendered proactive city-city or province-province cooperation largely unnecessary. This type of horizontal cooperation has taken place and continues to take place when there are cross-border issues that justify it.
- Collaboration in marine planning across city borders seems unlikely in the absence of either a higher-level body with the authority to impose cross-border cooperation on lower-level jurisdictional units, or a clear incentive for these units to go through the additional effort of joint planning. In the Xiamen/China MFZ study authorities at higher-level exert the function of controllers and in some instances mediators of disputes between plans in border areas, but have so far not been active promoters of collaborative planning. However, as observed above the hierarchical planning system has proved to be an effective mechanism to resolve cross-jurisdictional issues, which has greatly reduced the need for neighbouring cities to actively seek collaboration. As the Xiamen case shows, when and where cities see a need to strengthen cross-border coordination, they do establish additional mechanisms, such as the three-cities alliance between Xiamen, Zhangzhou and Quanzhou.

- Acceptance of the plan by the public and target marine users, and conformity with its regulations does not appear to require extensive consultation and participation with stakeholders outside government, as the experience of MFZ in China seems to demonstrate. This is naturally a function of the nature of the governance system, of the expectations of stakeholders relative to participating in the process, and of the capacity of government to enforce the plan in the absence of buy-in from stakeholders, in particular marine users. In the MFZ system, the process by which planning agencies consult (often extensively) with sector agencies seems to ensure sufficient input and buy-in from marine users and operators to the plan. In other jurisdictions this does not suffice, and sectoral representatives outside government demand direct engagement in the planning process, not through stage agency representative. The degree of involvement of the different interests in the planning process and the usefulness and effectiveness of consultation processes are strongly determined by the context in which the planning takes place.

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ANNEX 1 – ANALYTICAL FRAMEWORK (ABRIDGED VERSION)

Facts of the matter	Analytical questions ('To what extent...')
1. Context for this MSP process	
<p><u>Social</u>: major activities, number of people (incl. spatial distr.), poverty <u>Economic</u>: Major goods and services, gross value of activities and resources <u>Environmental</u>: Environmental status, CC effect (current and future) <u>Governance</u>: Mgmt & regulatory systems, institutional setup (before & after)</p>	<ul style="list-style-type: none"> - have <u>different factors</u> constrained cross-border collaboration: <u>historical/political, socio-economic, environmental</u>? - was there <u>support for MSP</u> at govt. institutions, at initiation? - did marine users <u>conform to existing regulations</u>, at initiation? - have governance structures <u>facilitated cross-border collaboration</u> on relevant issues?
2. Drivers, issues and goals	
<p><u>Issues and drivers</u>: identification, changes and spatial distribution (incl. map) <u>Ecosystem services</u>: identification and spatial distribution (incl. map) <u>Goals</u>: identification, changes over time, time-bounded & quantitative <u>Process</u>: approach to identifying drivers, issues and goals</p>	<ul style="list-style-type: none"> - has <u>EBM been used</u> in the design of the MSP? - do goals address <u>social, economic and environmental outcomes</u>? - have <u>time-bounded & quantitative goals</u> enabled or constrained the MSP?
3. Overview of this MSP	
<p><u>Introduction</u>: description and map (incl. size) <u>Timing</u>: Start of the process, and time spent in each phase; transition from planning to formal adoption and implementation <u>Funding</u>: Sources , total and current annual funding, user-fees contribution <u>Legal basis</u> Mechanisms for <u>cross-border data exchange</u> <u>Leadership</u>: 'champions' and leadership changes over time</p>	<ul style="list-style-type: none"> - has <u>external funding</u> enabled this MSP? - have <u>cross-border issues</u> shaped the collaboration in this MSP? - are responsible institutions <u>working collaboratively</u> or independently?
4. Scope and design of this MSP	
<p><u>Institutions</u>: structure, resource mgmt. responsibilities, MSP authority <u>Land-sea</u>: linkages re. resource mgmt. measures <u>Adaptive mgmt.</u>: yes/no, how (pilot, neighbouring cases)</p>	<ul style="list-style-type: none"> - does the MSP have <u>the required authorities</u> for successful implementation? - does the MSP have the <u>human resources</u> necessary for implementation? - has there been <u>coordination of planning between land and sea</u>?
5. Collaboration and consultation in the MSP planning phase	
<p><u>Stakeholders</u>: identification (govt., non-govt.) <u>Process</u>: mechanism for consultation, participation & collaboration, communication plan <u>Cross-border</u>: mechanisms for cooperation, major barriers</p>	<ul style="list-style-type: none"> - were the different stakeholders involved in designing and shaping the MSP? - was the design and schedule made explicit to all stakeholders, in initial phase? - do affected user groups understand and support MSP goals and strategies? - are there significant differences in type and quality of information in the different country zones? - have stakeholders engaged in planning the cross-border process? - were barriers to cross-border collaboration resolved?

Facts of the matter	Analytical questions ('To what extent...')
6. Features of the MSP implementation phase	
<p><u>MSP institutions</u>: differences planned vs. actual</p> <p><u>Resource use</u>: Good practices advocated, changes (formal, informal) after implementation</p> <p><u>M&E</u>: environ./economic/social indicators and their use</p>	<ul style="list-style-type: none"> - are institutions collaborating effectively in implementation? - is political support for the MSP being maintained? - is the long-term funding sustainable? - is cross-border collaboration factored into budget/funding mechanisms? - are regulations & mgmt. measures consistent across border, and enable coordinated cross-border implementation? - is sector management integrated within the country zones? - are policies, procedures and regulations being enforced? - are the good practices being adopted by target user groups? - are destructive forms of resource use being reduced? - are conflicts between user groups being reduced? - is the MSP practicing adaptive mgmt. (based on monitoring results)? - has having a cross-border M&E framework affected cooperation? - is there (evidence of) management coordination between land and sea? - are necessary investments in infrastructure being made?
7. Application of MSP in the high seas	
<p><u>Key features</u>: Issues & drivers, proportion beyond natl. jurisdiction, seabed & water column</p> <p><u>Stakeholders</u>: 'third-country' stakeholders affected</p> <p><u>Institutions</u>: agreements necessary for MSP implementation, agreement with internatl. ABNJ law</p> <p><u>Resource use regime</u>: decision-making process, establishment & enforcement of mgmt. measures, coverage</p>	<ul style="list-style-type: none"> - are the mgmt. measures <u>consistent between parties</u>, and enable coordinated implementation? - are the main stakeholders and third-country <u>resource users adhering to the plan</u>?
8. Outcomes and lessons learned	
<p><u>Overall</u>:</p> <ul style="list-style-type: none"> - Major lessons of potential usefulness to other MSP initiatives? <p><u>Cross-border</u>:</p> <ul style="list-style-type: none"> - How have cross-border collaborations contributed to consistent and equitable resource use? - What have been the key barriers to cross-border collaboration? - What are the major lessons on cross-border collaboration emerging from this MSP? 	<ul style="list-style-type: none"> - has the MSP fulfilled its stated goals? - are cumulative impacts (across time & space) being successfully managed? - has the MSP impacted on the sustainability of social and economic conditions? - are the flows of ecosystem goods and services being sustained within the MSP? - is the MSP having an impact on biodiversity? - is there consistent and equitable use of marine space across borders? - is there successful cross-border sharing of good practices within the MSP process?

ANNEX 2 – LIST OF PARTICIPANTS AND SCHEDULE

Date	Location	Time	Interviewee	Position	Relevance for the case study
16/11/16	Coastal field tour	9:00-16:00	N/A	N/A	Coastal field tour to understand development context
17/11/16	Management Division of Xiamen Marine Protected Area	9:00-11:00	Four interviewees who requested anonymity	Interviewees requested anonymity	Conservation planning
	Shapowei Shelter Port site visit	11:00-14:00	N/A	N/A	History of the Shapowei port development and planning
	Daring Duck and tourist	pm	Three anonymous interviewees	Local facility managers	Coastal recreational activities
18/11/16	Xiamen Port Authority	9:00	Ms. Zhang Liwei	General Engineer	Integrated port planning MFZ and port planning
	Fujian Fisheries Institute	pm	Five interviewees who requested anonymity	Interviewees requested anonymity	MFZ in Fujian Province
19/11/16	Hecuo Village	am	Fishermen and fish vendors, anonymous	N/A	Fishing and fish sale practices
	Xiangshan Marina	am	Manager of sailboat rental	N/A	Recreational marine activities
20/11/16					
21/11/16	International Master Program of Marine Affairs, Xiamen University	9:00-11:30	N/A	N/A	Lecture: Marine Spatial Planning in Europe: Current and Future
	Xiamen University	11:30-13:30	Prof. Zhang Luoping	Professor emeritus	Interview, Xiamen MFZ experience
	Dadeng Island			Tourist guide, former fishermen	Visit to coastal areas, incl. sites of large scale land reclamation
22/11/16	Fujian Ocean Institute		Yang Shunliang Luo Meixue Hu Dengjin Tu Zhenshun Ren Yuesen Kong Hao	Vice Director (Yang) Division Head (Luo) Position of other interviewees not known	MFZ development in Fujian Province
23/11/16	Xiamen Tourism Bureau	9:30	Su Weijun	Director of Resources Planning Division	Tourism sector planning

Date	Location	Time	Interviewee	Position	Relevance for the case study
24/11/16	N/A				
25/11/16	Xiamen Ocean and Fisheries Bureau	15:00	Three interviewees who requested anonymity	Interviewees requested anonymity	MFZ development in Xiamen city

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