

Institutional Mechanisms for Integrating River Basin Management and Integrated Coastal Management: Xiamen/Jiulong River Experience

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Key Message

- An appropriate institutional arrangement is needed to integrate river basin and coastal management and to facilitate effective policy and interagency coordination across administrative borders. It can facilitate the resolution of use conflicts and address management challenges arising from upstream-downstream ecological, social, and economic interactions.
- Despite the importance of expanding integrated coastal management (ICM) coverage to include river basins, the process takes time due to challenges of transboundary implementation, and the different sectors and administrative units beyond the usual “ICM actors”. These sectors and units have various mandates and interests, which need to be identified, discussed and resolved in the governance and management development process.

Abstract

Integrating river basin concerns into ICM is a long and difficult but necessary process for effective protection of ecosystem integrity. Examples in the region are limited even in countries where ICM implementation has reached a level of maturity. In the case of Xiamen, PR China, the urgency of environmental concerns brought by pollution from upstream discharges drove efforts for collaboration between upstream and downstream municipalities. While the coastal and river basin management programs were being implemented separately, both included representation from the three local governments (i.e., Xiamen, Zhangzhou, and Longyan) facilitating discussions among decisionmakers across administrative boundaries. The Jiulong River Watershed – Xiamen Bay Ecosystem-based Management Strategic Action Plan identified concrete efforts at resolving transboundary



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environmental issues by improving capacity for management and coordination. Institutional arrangements evolved over time and their effectiveness was dependent on the political will and capacity to adapt and take advantage of emerging socioeconomic initiatives and political dynamics.

Background

The United Nations Development Programme (UNDP) defines institutional arrangements as the “policies, systems, and processes that organizations use to legislate, plan and manage their activities efficiently and to effectively coordinate with others in order to fulfill their mandate (UNDP, 2016).”

Institutional arrangements for ICM implementation are usually one of the first initiatives of an ICM program. In the course of implementation and with greater political acceptance, the institutional arrangement gains legal recognition or gradually becomes embedded in the operations of the local government. The arrangement is largely dependent on the political and legal conditions, the readiness of institutions to collaborate, available capacity resources, and the urgency of required actions.

Experiences in setting up an interagency, multisectoral mechanism in PEMSEA ICM sites indicate various challenges such as:

- legal processes that must be overcome and political buy-in to establish the mechanism;
- the overlapping, sometimes conflicting interests and mandates of government agencies and nongovernment groups and stakeholders who are supposed to represent the different sectors;
- absence of an urgent, unifying concern that must be addressed; and
- limited resources to maintain collaborative activities.

Setting up and strengthening an institutional arrangement becomes even more daunting when river basin concerns are brought into the discussion. River basins, watersheds, and coastal areas transcend administrative boundaries. The absence of a mandated “overseer” or a regional body that can coordinate ecosystem-based initiatives usually impedes the realization of an effective transboundary management program

In contrast to PEMSEA’s rich capability in ICM implementation (Chua, 2006), experience in the incorporating river basin concerns into ICM remains limited. This is due to the complexity of socioeconomic, ecological, political, and legal issues (Box 1). Only a few countries have made progress in linking the management of river basins and coastal areas through a formal institutional mechanism. Lessons can be learned from the ICM program in Xiamen, which evolved beyond focusing on coastal and marine management to include river basin issues. The Xiamen experience also shows that the process is complex but important for sustainable management of coastal areas.

Box 1. Integrating river basin concerns into ICM: socioeconomic and environmental considerations.

Integrating river basin concerns into ICM is especially crucial in Asia with the rapid urban expansion in coastal areas, resulting in increased competition for coastal space and resources. Asia is home to 60% of the world’s population but has only 37% of freshwater resources available. Urban population is expected to increase by 60% by 2025, putting more pressure to already dwindling water resources. Water management in coastal areas is important as 80% of the coastal pollution comes from land-based sources (Clausen, 2009).

Approach and Methodology

The demonstration period: Institutional set-up and management framework for ICM

Socioeconomic, political, and environmental forces shape institutional arrangements. The inclusion of river basin management in Xiamen's ICM program constituted the above factors together with regional economic cooperation and legal developments. Understanding how these factors influenced changes to the institutional mechanism can guide ICM implementation elsewhere to transform similar challenges into opportunities.

From 1994 to 1997, the Xiamen Municipal government implemented ICM to address resources use conflicts and environmental issues with support from the GEF/UNDP/IMO Regional Programme for the Prevention and Management of Marine Pollution in the East Asian Seas (MPP-EAS). Several initiatives were implemented under the ICM program to improve legislation, enforcement, coordination, scientific support, and public participation. A major achievement was establishing an interagency Coordinating Committee that provided policy guidance and advice on implementation of ICM initiatives (PEMSEA, 2006). The committee was initially composed of 22 representatives from local government agencies, including planning, finance, marine affairs, land use, environment, fisheries, port operations, and tourism. The mechanism was supported by an interdisciplinary experts group that provided scientific and technical support for implementation (Figure 1) and the Marine Management Division (MMD), which functioned as the lead agency and ICM Project Management Office.

The first phase of ICM implementation focused mainly on addressing problems within the administrative boundaries of Xiamen. While it proved to be effective in solving pollution problems and multiple use conflicts within its boundaries, the marine environmental quality did not improve significantly due to pollution from the Jiulong River watershed.

In the second phase of ICM implementation (1999–2007), the mechanism was updated with a streamlined membership of 14 to promote efficiency (Figure 2). The coordinating office was lodged with the Oceans and Fishery Bureau (OFB). The committee eventually evolved as the Marine Management Steering Group (MMSG), a high-level interagency committee, headed by the Xiamen mayor as Chair and four vice mayors as deputy chairs (Chua, 2006, 2008; PEMSEA, 2006). An additional feature of the MMSG was the inclusion of the chief executives of the six districts in Xiamen to enhance coordination.

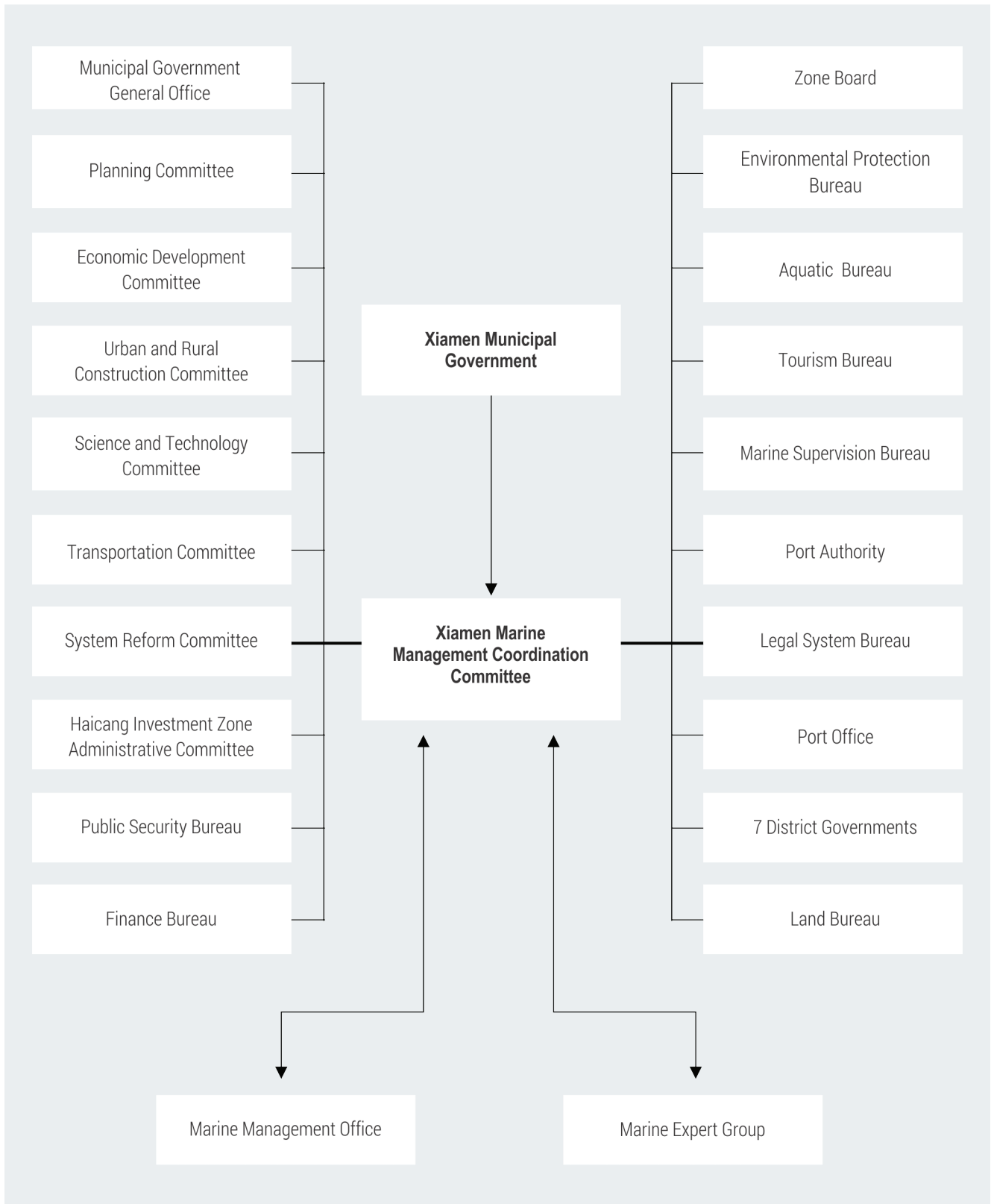
Parallel initiative: the Jiulong River Watershed Project (JRWP)

Parallel to the ICM implementation, the Fujian provincial government started the implementation of JRWP in 1999 to solve pollution issues in the watershed. The JRWP included all the administrative units along the Jiulong River watershed. At the start of implementation, the Leading Group for Integrated Management of JRWP was established and led by the deputy secretary general of the provincial government and the section chief of related provincial government agencies. The deputy mayors of Xiamen, Zhangzhou, and Longyan Municipalities served as members.

Scaling up period: Incorporating river basin initiatives under the ICM program

In its second cycle of implementation, the ICM Strategic Action Plan of 2005 incorporated specific actions to address pollution coming from Jiulongjiang (or Jiulong River). This cycle included the development of a management framework for the Jiulong River to address the transboundary issues of pollution together with the neighboring cities of Longyan and Zhangzhou (PEMSEA, 2007a; Zhou, et al., 2009).

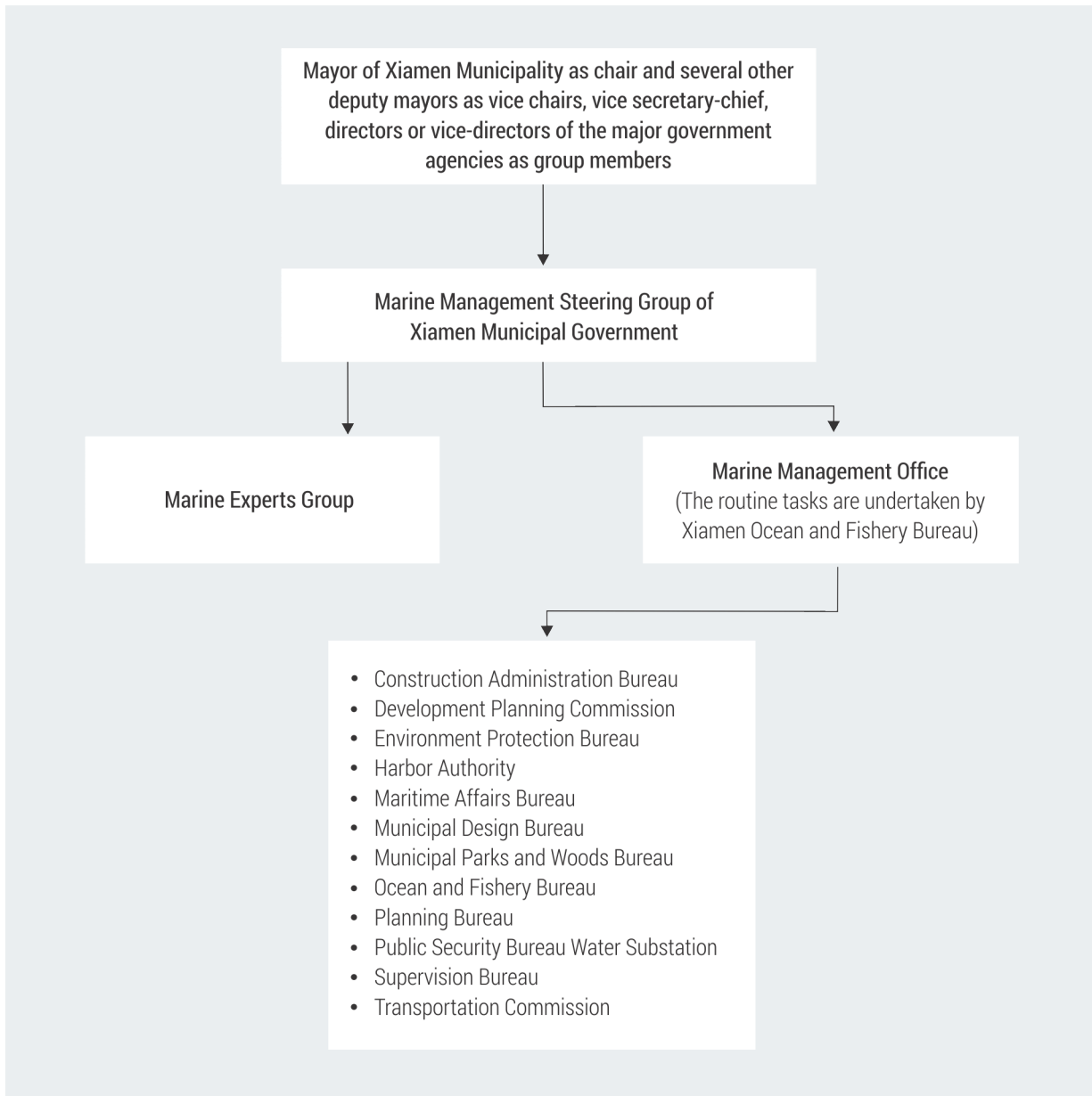
Figure 1. Xiamen Integrated Coordinating Board prior to 2002 (PEMSEA, 2006).



The Strategic Action Plan provided explicit targets on Jiulong River as indicated by its key strategies of:

- strengthening the ICM program and coordinating mechanism;
- establishing a regional coordinating mechanism and integrated land and coastal area management mechanism;
- creating an integrated Jiulong River management Coordinating Committee among Xiamen, Zhangzhou, and Longyan;
- establishing an integrated Jiulong River Management Action Plan; and
- setting up an integrated Jiulong River Management financial mechanism.

Figure 2. The streamlined coordinating mechanism for Xiamen ICM in 2002 (PEMSEA, 2006).



The JRWP Management and Joint Commission for River Basin

The five-year plan (2001-2005) for JRWP included a target on water quality for the West Xiamen Bay. By 2007, the leading group eventually evolved to be the JRWP Joint Commission on Integrated Management. The commission was chaired by the deputy governor, and members comprised deputy directors of provincial government agencies and deputy mayors of Xiamen, Zhangzhou, and Longyan (Figure 3). Each municipality subsequently established a leading group on watershed management chaired by the deputy mayor and supported by the Environmental Protection Bureau (Peng, et al., 2013).

Driving forces for integrating river basin management with ICM

Environmental impetus: Coastal and river basin interconnectivity. Xiamen implemented ICM since 1994 to address marine pollution and reduce use-conflicts in its coastal areas. Despite its achievements on ICM implementation, pollution and sedimentation from upstream sources transported by the Jiulong River were the two major environmental issues affecting Xiamen seas, which prompted a more conscious effort to incorporate river basin management into the ICM program (PEMSEA, 2006). Other impacts were:

- Agricultural nonpoint source pollution constituted 44% and 22% of total nitrogen and total phosphorus loading, respectively, to the Jiulong River. Livestock contributed 21% and 46%, respectively, of the total nitrogen and total phosphorus (XOFB, et al., 2012); and
- The Jiulong River discharged about 6.36 million tons of sediment annually and contributed to COD (53%), total nitrogen (70%), and total phosphorus (73%) loadings to Xiamen Bay (PEMSEA, 2006).

Despite the problems of pollution and sedimentation, Jiulong River was also very important to Xiamen by providing 80% of its freshwater supply. Incorporating

the Jiulong River basin into the Xiamen ICM was therefore a logical socioeconomic and environmental consideration.

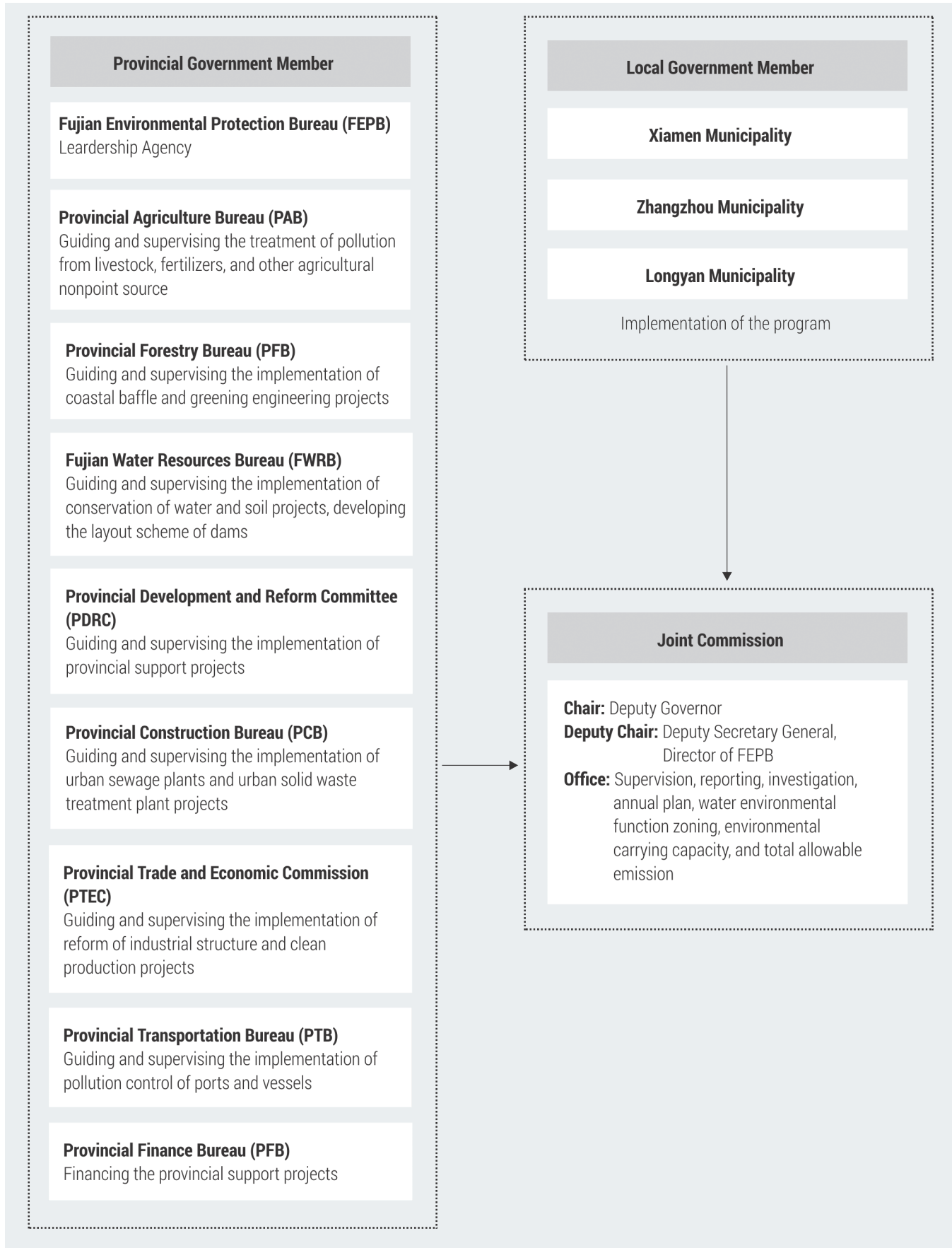
Economic cooperation can spill over to environmental protection. A City Alliance initiative established in 2004 by Xiamen, Quanzhou, and Zhangzhou was mainly focused on regional economic development (PEMSEA, 2007a, 2007b; Zhou, et al., 2009). It later expanded to cover environmental issues. The initiative focused on six key areas:

- city planning and construction;
- regional road system development;
- harbor development and distribution of coastline utilization;
- regional infrastructure construction;
- ecological conservation and environmental protection; and
- tourism development.

Longyan City, which is located upstream of Jiulong River, joined the alliance in 2006. Also, the approval of the West Taiwan Strait Economic Zone in 2009 provided strong support for the incorporation of the integrated Jiulong River and Xiamen Bay management plan into the state economic development strategy.

Policy and legal imperatives. An effective institutional mechanism is premised on and backed by policies and laws. The inclusion of river basin concerns with ICM is supported by decisions that strengthen the incorporation. In 2012, a Joint Decision on strengthening Jiulong River basin water environment protection was made by the Standing Committee of the People's Congress of Xiamen, Zhangzhou, and Longyan. Three municipalities formed a consensus to establish an intergovernmental coordination and management mechanism for mutual assistance, study, formulating responses on protection, and pursuing the common objectives of protecting the Jiulong River basin. A followup Zhangzhou Consensus was reached in 2014 to improve the joint cooperation mechanism and to strengthen the role of the three cities on water environment protection.

Figure 3. Joint Commission of Jiulongjiang River Watershed Integrated Management (Peng, et al., 2013).



Results

Improved awareness of ecosystem-based management at policy and decisionmaking level.

While the Xiamen ICM and JRWP were two separate initiatives, concrete efforts were undertaken and policies developed to integrate river basin management and ICM. The development of Jiulong River and Xiamen Bay Ecosystem-based Management Strategic Action Plan (JXSAP) aimed to promote an ecosystem-based management framework covering the three municipalities of Xiamen, Longyan, and Zhangzhou. The JXSAP identified environmental problems and strategies for dealing with the issues with the primary objective of enhancing the management and sustainable use of the Jiulong River and Xiamen Bay by improving the coordination between upstream and downstream cities (XOFB, et al., 2012).

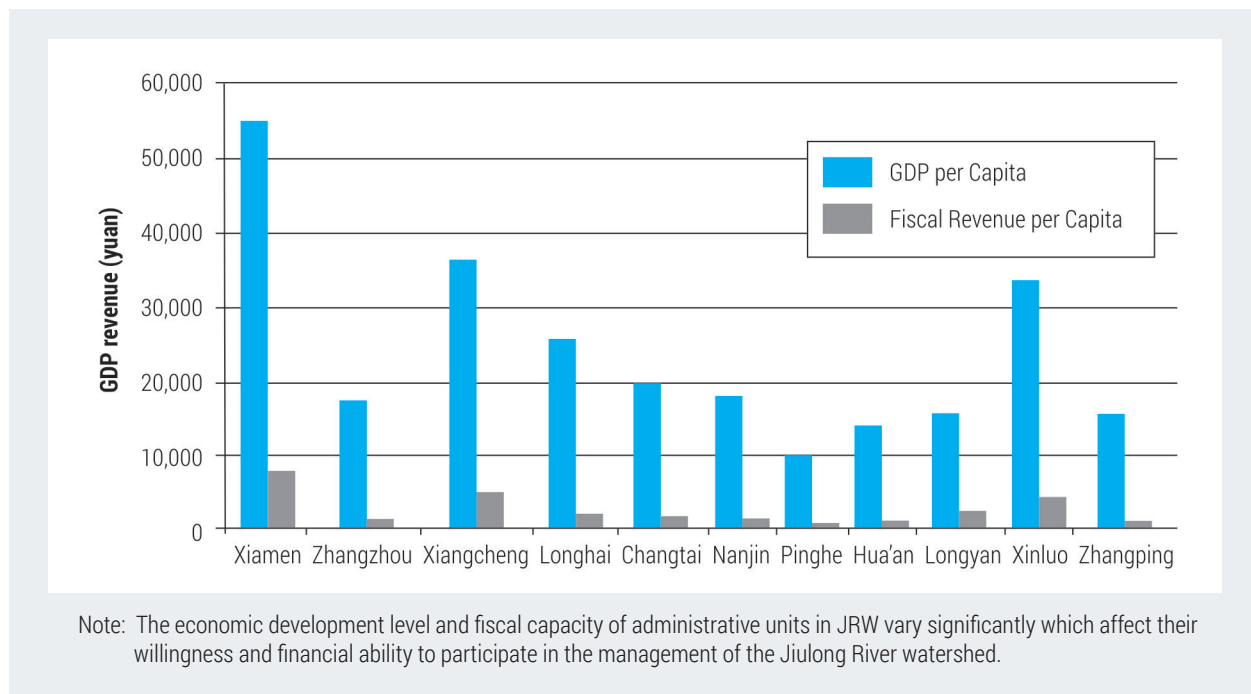
At the level of the Jiulong River Basin Management Program, the coordinating capacity of the Joint Commission for River Basin, which included Xiamen as a member and under the leadership of the Deputy Governor, provided a venue for

discussion, consultations, and coordination of policy, plans, and implementation programs among the three administrative units.

Cleaning upstream with downstream support: Ecological compensation mechanism.

Perhaps one of the biggest achievements on the upstream and downstream collaboration was the establishment of the ecological compensation scheme which provided a subsidy for upstream municipalities of Zhangzhou and Longyan to abate pollution. The municipalities were at different economic levels, with downstream Xiamen having the highest GDP (Figure 4) and benefiting considerably from improved water quality provided in the Jiulong River. An ecological compensation scheme was established in 2003. Under the scheme, Xiamen Municipality and the Fujian Provincial Environmental Protection Board (EPB) provided an annual subsidy of RMB 18M (US\$ 2.2M) (i.e., RMB 10M [US\$ 1.2M] from Xiamen and RMB 8M [US\$ 1M] from EPB) to address pollution concerns in the upstream municipalities.

Figure 4. GDP and fiscal revenue per capita of Jiulong River watershed (JRW) (2007) (Peng, et al., 2013).



Lessons Learned

Integrating ICM with river basin management allows wider application of ICM in promoting sustainable water resource use and management upstream. It is a gradual, difficult and long process but a necessary step to maintain ecological integrity. As ICM matures, its geographical coverage is often expanded to include upstream areas, including river basins and watersheds and the ecological, social, and economic interconnectivity of rivers and oceans.

In the case of Xiamen ICM and Jiulong River Watershed Project, complementary initiatives were started in the 1990s to address issues of upstream pollution by improving institutional mechanisms and the development of an integrated strategy. While significant progress was made to include river basin concerns, it was still far from being able to achieve an “embedded” river basin-coastal area institutional mechanism. This challenge arose from the complexity of ecological interaction but also from the complex political and institutional dynamics. Cooperation and collaboration were difficult given the different interests of the individual and institutions which were the primary actors. However, there were parallel economic and legal developments outside the usual efforts of both programs that contributed to the integration of ICM and river basin initiatives. Economic cooperation was the more binding and compelling reason that drove interest and support for environmental cooperation over time.

Institutional mechanisms evolve through time, adapting to the changing socio-political dynamics. Such dynamics occur over time for both the Xiamen ICM and Jiulong River Basin Watershed Management Programs. An effective evolved mechanism does not mean that there are no challenges in implementation. Financial constraints, unclear targets, and progress in achieving targets were concerns that needed discussion, consensus, and decisionmaking.

Ecosystem-based management of river basin and coasts can be achieved through a gradual, systematic, integrative, and coordinated approach applying the concepts and working methodologies of ICM and integrated river basin management. As demonstrated in the Xiamen-Jiulong examples, management of the entire ecosystem, from watershed to coast, took years of effort of provincial and municipal governments to address key challenges. The process involved continual review of the process made, and the experiences and lessons arising from local government initiatives.

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