Marine Policy

Challenges in developing China's marine protected area system

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Abstract: Since the 1980s, there have been continuous increases in the coverage of marine protected areas (MPAs) in China, and a total of 158 MPAs have been declared. The MPA system in China is characterized by (1) decentralised designation and management with reduced control from the central government; (2) a dominance of de jure fully protected MPAs that are often implemented as de facto multiple-use areas; and (3) a lack of objective evaluation processes. To improve China's MPA system requires an appropriate integration of fully protected and multiple-use MPAs, and an approach that balances the advantages of top-down and bottom-up approaches.

Key words: Marine Protected Areas, China, governance, decentralisation, protected area management category

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1. Introduction

Marine protected areas (MPAs) play a key role in biodiversity conservation and the sustainable utilization of marine resources. This is strongly underlined by the international attention they have received. The 2002 World Summit on Sustainable Development called for a representative global network of MPAs by 2012 [1], and the 2010 Biodiversity Target established under the Convention on Biological Diversity (CBD) urged member states to effectively conserve at least 10% of each ecological region, including marine environments [2]. The Fifth World Parks Congress recommended the designation of extensive MPA networks that protect 20–30% of each marine habitat by 2012 [3].

However, the progress in developing MPA systems worldwide has been relatively slow. An analysis of a global MPA database shows that only 1.5% of the world's seas under national jurisdiction have been designated as MPAs, and only 0.2% have been protected within 'no-take' marine reserves [4]. According to this analysis, meeting even the most modest international MPA target will be postponed by several decades [4]. Furthermore, many designated MPA sites have low management effectiveness [5, 6]. The development of adequate and functional MPA systems has been a global challenge.

Coastal and marine ecosystems in China are of high biogeographic and socio-economic importance. China's coastline stretches across 18,000 km from temperate and subtropical into tropical zones [7]. Four large marine ecosystems (LMEs) are found in China: the Yellow Sea, the East China Sea, the Kuroshio Current, and the South China Sea. With three million square kilometer of marine area and 6500 islands under its jurisdiction, the country hosts an exceptional marine biodiversity comprising about 20,300 recorded species, including 12,000 species of marine fauna [7]. The rich coastal and marine resources in turn support important industries such as fishing, maritime shipping, and oil and gas explorations, which jointly contribute to over 10% of China's overall GDP and are growing at an annual rate of 15% [8].

However, coastal and marine ecosystems in China are facing increasing threats. With a population of 1.3 billion (20% of world total), and an annual GDP growth rate exceeding 10% [9], achieved partly through a programme of market liberalisation, the pressures on China's ecosystems and natural resources are unprecedented. The coastal regions have been the main arena for China's economic rise, attracting large volumes of labor and capital investments. Representing only 14% of the national land area, coastal provinces support over 40% of China's population and contribute to over 60% of the nation's total GDP [9]. Rapid economic development and urbanization in the coastal regions have led to the disappearance of 50% of the area of coastal wetlands, 70% of mangroves, and 80% of coral reefs since the 1950s [10].

Against this background, this paper reviews the designation, management, governance, and evaluation of China's MPA system. The key characteristics of China's MPA system and the challenges to its development will be discussed, as well as lessons learned from China's experience on how the challenges can be addressed.

2. Designation of MPAs in China

Since the 1980s, there has been a rapid increase in the number and area of MPAs in China (Fig. 1). A total of 158 MPAs have been designated, covering 3.77 million hectares of coastal and marine

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areas, or 1.26% of the total marine area under China's jurisdiction (Table 1). According to the significance of their biodiversity, MPAs can be designated at national (Table 2) and local levels.

There has been no systematic planning of MPAs at a national scale in China; therefore the selection of MPAs is often the responsibility of lower level governments [11]. For national MPAs, candidate sites and their boundaries are proposed by provincial governments, evaluated by a special protected-area committee consisting of scientists and representatives from relevant national government agencies, and submitted to the State Council (for marine nature reserves—MNRs) or the State Oceanic Administration (SOA; for marine special protected areas—MSPAs) for final approval and declaration. Locally designated MPAs are nominated, evaluated, and declared by local governments.

This bottom-up selection process enables rapid conservation responses in some MPAs, such as the Dalian Seal and the Hepu Dugong Marine Nature Reserves, where extensive coastal and sea areas were included within the boundaries of the MPAs to ensure the timely and adequate protection of the focus species, when their ecology and distribution were not yet well understood. However, the lack of systematic planning processes has been of major scientific concern; with ad-hoc, decentralised planning leading to the selection of unsuitable areas and the exclusion of ecologically important areas from the MPA system [11,12]. Local governments in China often perceive the development of protected areas as a symbol of administrative achievement and a potential source of tourism income. As a result, important decisions such as the zoning and configuration of protected areas are regularly driven by local socio-economic interests rather than by strategic objectives; and rigorous scientific assessments are triggered only when a local government wants to upgrade a locally designated MPA to a national rank [13].

3. Management of MPAs in China

There are two broad categories of MPAs in China: no-take marine nature reserves and multiple-use marine special protected areas (Table 1). Compared to MNRs, the establishment of MSPAs has been a recent development, with the first MSPA declared in 2002. No-take MNRs currently account for 94.4% of the total area of China's MPA system, which differs strongly from the global situation, where no-take zones constitute only a tiny fraction of the global MPA system [4].

The Chinese government has issued various policies and regulations that provide for the establishment and management of MPAs, namely the Regulations on Nature Reserves (1994), the Rule of Marine Nature Reserves (1996), and the Interim Rule of Marine Special Protected Areas (2005). Based on these national provisions, the management of MPAs follows a zoning scheme. MNRs are usually divided into core, buffer, and experimental zones, the core zones being no-entry areas with exceptions for patrolling and monitoring. In the buffer zones, authorized scientific research and educational activities are permitted, while in the experimental zones, activities compatible with nature conservation such as tourism may be conducted. The zoning of MNRs hence bears similarity to the biosphere reserve zoning scheme [14]. MSPAs are multiple-use areas managed for the sustainable use of coastal and marine resources, and may include no-take, ecological restoration, sustainable resource use, and other zones. Fishing, mariculture, and certain industrial activities are allowed in specific zones within MSPAs.

The dominance of fully protected MNRs in the MPA system reflects the perceived policy need to protect biodiversity in China. Fully protected MNRs represent a precautionary approach, which

counters the risks of overexploitation resulting from scientific uncertainty concerning the limits to sustainability in the marine environment [15]. However, it has been a huge challenge to enforce MNRs in China because of the massive conflict between conservation and economic development, as well as insufficient investment on the enforcement of MPAs.

The policy choice of establishing large areas of fully protected MPAs in densely populated and heavily used areas of China has partly ignored the social contexts of conservation. The resident population size within a MPA in China typically ranges from a few thousand to over 10,000 (Qiu and McManus, unpublished data); in some MPAs it approaches 100,000, and local communities often rely heavily on coastal and marine resources for their livelihoods [16]. Coastal areas in China are home to some six million fishermen, including three million artisanal fishermen [17]. In addition, with China's rapid transition to a modern market economy, the degradation of habitats and overexploitation of natural resources due to the expanding industries, urbanization and growing market demand have become the main drivers behind the constantly rising pressure on protected areas in China [18]. Activities such as reclamation, pollution, sand mining and oil extraction within and adjacent to the MPAs have resulted in large-scale, often irreversible, changes to coastal and marine ecosystems [19]. The multiplicity and scale of the threats render it an extremely difficult task to enforce MPAs in China.

The lack of funding and human resources is another major obstacle for adequate enforcement of MPAs [11]. It was reported that protected-area funding in China was US$52.7 per square kilometer in 1999, much lower than the average of US$157 per square kilometer in developing countries estimated by the World Conservation Monitoring Centre in 1995 [20]. Furthermore, a large proportion of MPAs, particularly locally designated MPAs, do not have management bodies and can easily become ‘paper parks’ due to lack of enforcement. For example, in the coastal province of Fujian, 43% of MPAs do not have a management body and staff to carry out routine enforcement tasks [21]. Overall, the investment on China's MPA system has been extremely limited considering the relatively strict regulations and the huge difficulties for enforcement.

As a result of great user pressure and lack of enforcement capacity, the zoning schemes are often poorly recognized and implemented in protected areas in China [22]. Most *de jure* MNRs are implemented as *de facto* multiple-use areas, and certain levels of fishing and industrial activities are usually tolerated within them, although which and how much of such activities are tolerated is often a political decision and varies from case to case.

4. Governance of the MPA system in China

As in many other countries, protected areas were initially designated and managed centrally in China. In the early 1990s the central government nonetheless enacted statutory procedures to encourage the involvement of local governments at county, municipal, and provincial levels [23]. Currently, the MPA system in China is governed under a three-tier structure operating at national, local (provincial/municipal/county), and site levels (Fig. 2). The State Council is the top policy- and decision-making body. The Ministry of Environmental Protection oversees the development and management of the overall protected-area system in China, while the State Oceanic Administration is officially charged with the overall planning and supervision of the MPA system.

Under the current governance structure, the central government is mainly responsible for the development of policies, regulatory frameworks, plans, and technical guidelines relevant to the

overall MPA network. It also provides limited funds to cover the cost of infrastructures in newly established national MPAs. Local governments are mainly responsible for the selection of candidate sites, providing personnel and funds for the daily management and enforcement of individual MPAs and ensuring that the various national provisions related to MPAs are implemented within their jurisdictions. This allocation of authority and responsibilities means that although the central government sets out the objectives, targets, and regulations for the overall MPA system, it has devolved very limited financial and technical resources for the implementation of the MPA system. Local governments, therefore, often have greater responsibilities for and influences on the actual design and performance of MPAs in China [16].

However, the delegation of management authority to lower tier governments has not led to an increase in public participation in the development of the MPA system. The concepts of new governance approaches, such as the collaborative management of protected areas, have been introduced to and advocated in China, but their success has been very limited [24]. While methods and procedures for public participation have been established in some new environmental regulations in China, such as the Law on Environmental Impact Assessment (2003), they have yet to be incorporated into protected-area regulations. The public are not well informed about the function and performance of protected areas in China. A nation-wide survey in 2005 showed that only 18.1% of the 4,120,517 people surveyed believed that protected areas helped to improve environmental quality [25]. Further more, insufficient public consultation in MPA decision-making potentially escalates people–park conflicts. For example, in the Binzhou Shellfish Bank and Wetlands Marine Nature Reserve, local enterprise owners have appealed to the National People's Congress for a more open and transparent designation and management process, in order to safeguard the rights of affected communities and reduce the conflicts between conservation and local development needs [26].

The administrative decentralisation of MPA management has both benefits and costs for conservation in China. It has greatly increased the incentives of local governments in establishing and managing MPAs and broadened the channels through which MPAs can be designated and funded. Locally designated MPAs now contribute to over 75% of the number and 35% of the total area of the MPA system (Table 1), while the bulk of protected-area funding in China now comes from local governments [23]. However, the devolution of management authority to lower tier governments has repeatedly resulted in negative environmental impacts. As promotions of local government officials in China are strongly linked to their performance in the economic sector, the short-term local economic and political gains often outweigh the long-term benefits of environmental protection [27]. Reclamation in the land owned by local governments has led to large-scale destruction of coastal wetlands in some MPAs [28, 29]. In the Yancheng Rare Birds MNR, listed both as a Ramsar Wetland of International Importance and a UNESCO Man and Biosphere reserve, reclamation has destroyed over 117,412 ha of natural wetlands [30]. To increase the incentives and cooperation from local governments for nature conservation remains to be one of the greatest challenges for the development of the MPA system in China.

5. Monitoring and evaluation of MPAs in China

There are very few MPAs in China that have a long-term monitoring programme. However, since 2004, 18 ecological monitoring areas covering some MPAs have been established by the SOA to monitor the status of representative and fragile inshore ecosystems. These provide some indications on the status of ecosystems within some MPAs and the main threats they face.

According to the 2007 monitoring data, most surveyed coral reef, mangrove, and sea- grass ecosystems in southern China remain healthy, while estuary and gulf ecosystems in heavily industrialized areas score low on the status of ecosystem health. Key threats to inshore ecosystems and MPAs include land-based pollution, mariculture, reclamation, and overexploitation [19].

However, the ecological monitoring data do not provide any insight into the management effectiveness of MPAs in China, as the monitoring does not separate areas inside MPAs from those outside the boundaries of MPAs. In an attempt to close this gap, the SOA organized a self-evaluation on the management effectiveness of 27 MPAs in China. The results showed that, while most selected MPAs were able to meet their management objectives, national MPAs had much higher effectiveness than local ones. Designed as a self-evaluation process, the results represent the self-reflections of MPA managers, rather than the outcomes from an independent and objective evaluation process. In particular, it gives no information on the status and trends of species and habitats protected within the selected MPAs. The results nevertheless revealed several common problems in MPA management, including insufficient funding, particularly in locally designated MPAs, and the lack of long-term and systematic management planning, monitoring, and well-trained personnel [31].

6. Challenges and lessons learned in developing China's MPA system

The MPA system in China is characterized by (1) the decentralised designation processes; (2) the dominance of *de jure* fully protected MPAs but are often implemented as *de facto* multiple-use areas that allow certain levels of resource exploitation; (3) a focus of responsibilities on local governments, with little actual control of exploitation from the central government and limited public participation; and (4) the lack of independent and objective monitoring and evaluation processes. The conservation efforts have led to the rapid and continuous growth in the number and area of fully protected MPAs in China. However, there are still major challenges to be overcome if MPAs are to fully realize their potential in biodiversity conservation and ensuring the sustainability of China's seas.

6.1. The balance between highly protected and multiple-use MPAs

The objectives and levels of protection specified for protected areas have become a key area of debate in both scientific and policy circles. While protected areas were traditionally set aside for protection and recreation, a paradigm shift towards more people-centred and less restrictive approaches has occurred, at least in some parts of the world [32]. In the marine environment, the coverage of multiple-use MPAs has far exceeded fully protected no-take MPAs [4]. Furthermore, there are also concerns over the proliferation of protected areas managed primarily for purposes other than biodiversity conservation, as such people-centred approaches often ignore the findings of conservation biology and even undermine the creation of conservation-focused protected areas [33].

China's experience demonstrates that in complex conflicts between conservation and development, the ‘one size fits all’ approach, which heavily relies on one particular category of MPAs, may not be the best solution, and that more comprehensive and balanced management frameworks are needed. The creation of *de jure* fully protected, but poorly enforced MPAs is counterproductive to conservation efforts [20,23] whilst providing a veneer of apparent protection. On the other hand, multiple-use MPAs managed solely for resource use purposes are insufficient for the needs of

conservation especially when economic development is generally given an overwhelming priority. Therefore, going to any of these two extremes in the full spectrum of protected-area management approaches may hinder the progress of conservation.

To determine the appropriate balance between fully protected and multiple-use areas in a MPA system is a difficult task [34], and often requires careful considerations of both scientific and socio-economic interests. The MPA systems in some countries, such as the United States and Australia, are designed to achieve diverse objectives, including biodiversity conservation, protection of cultural heritage, and enhancing the sustainable use of resources, and comprise of sites of varying degrees of protection [35,36]. Systematic national planning based on biogeographic information enables the fulfillment of important ecological criteria in the design of a national MPA system, such as representativeness, adequacy, and connectivity [37,38,39]. In addition to meeting nature conservation needs, addressing socio-economic issues at the early stages of MPA planning can help to increase public support and compliance, which are essential for successful management of MPAs. Key lessons from successful zoning in the Great Barrier Reef Marine Park include the introduction of traditional use zones for indigenous communities, in addition to fully protected no-take zones for the maintenance of biodiversity and ecosystem processes [40]. China is in the process of drafting a new protected-area law, with one of the objectives being providing an overarching legal framework for different types of managed areas (e.g. national reserves, national parks, heritage areas, and sustainable resource use areas) [41], which may present opportunities to review the current MPA system and adjust the proportion between existing and future MPAs designed for different purposes.

6.2. Decentralisation and the role of state in MPA governance

Over the past decade, there have been substantial changes in protected-area governance towards wider participation from more stakeholders and local communities [42]. However, it remains a question as to what constitutes an appropriate balance of power in MPA governance. Top-down, centralised approaches raise the risks of imposition, potentially producing local resistance and resulting in the further deterioration of ecosystems. On the other hand, bottom-up, decentralised approaches raise the risks of parochialism, in which local resource exploitation and economic development objectives often override strategic nature conservation objectives [43].

China's experience demonstrates that the role of the state is critical in ensuring successful decentralisation in MPA management. In a developing country like China, the accountability and capacity of local governments are typically low [44], and the degree to which local governments adhere to the principles of nature conservation is also questionable [45]. In addition, local communities in developing countries often have limited experiences of public decision making [45], this being particularly true in a country like China with a long-standing tradition of top-down governance. In such a context, seeking a balance of power in MPA governance is not about weakening the role of the state—by contrast, the state needs to play active roles in certain areas, such as building competent and accountable local institutions, ensuring quality standards, and establishing statutory procedures for public participation in decision making [44,46].

Successful natural resource and protected-area management often requires mutually supportive central and local institutions and nested governance structures with links across different hierarchical levels from global to local, which combine strategic directions with mechanisms for local actions [47]. This is, in essence, what the recommendation to combine top-down and bottom-up approaches to managing MPAs [48] means. For example, Gibson and Warren [49] suggest a two-tier structure for MPA legislation, operating at both national and local levels.

Detailed local regulations, often tailored to the contexts of individual MPAs, can supplement the often oversimplified and vague national legislation and reduce the difficulties for enforcement as locally devised rules are more adaptable to local situations. A second factor for ensuring successful decentralisation is accompanying the devolution of management responsibility with sufficient financial, technical, and other resources [45]. Nested provision of financial and other resources can greatly enhance the incentive and capacity of local governments for biodiversity conservation in China [13]. However, there is no reason to expect that local authorities will not convert natural wealth into financial wealth; therefore empowering local governments with more power and resources needs to be coupled with the establishment of minimum environmental standards [45], e.g. strategic MPA targets in terms of the number and conservation standards for different categories, which define the limits of local discretionary actions.

Finally, the main drive for and benefit of decentralised management of protected areas is the empowerment of local communities [45]. Although there are still major cultural and institutional obstacles towards effective public participation in policy- and decision-making processes in China [50], MPAs can serve as testing grounds for new governing styles in the same way as they do for improving ecological theories of marine conservation [51]. In particular, experiences in other countries have shown the importance of dedicated conservation NGOs in facilitating public participation and mediating people–park conflicts in MPA initiatives [52, 53]. Over the past three decades, China has seen an emerging civil society and both the number and influence of environmental NGOs are increasing [54]. Government alone cannot handle the complex people–park conflicts, and encouraging the active involvement of environment NGOs can help to facilitate genuine bottom-up participation in MPA initiatives in China [24].

7. Conclusion

The conservation efforts taken in the development of China's MPA system, characterized by decentralised designations, an emphasis on *de jure* fully protected MPAs, the devolution of management responsibility to local governments, and the lack of objective evaluations, have enabled rapid and continuous increases in the number and area of fully protected MPAs on paper. However, many MPAs in China suffer from a low management effectiveness, resulting from limited stakeholder involvement, insufficient investment, and major conflicts between conservation objectives and socio-economic and political interests. The present MPA framework in China arguably has the disadvantages of decentralisation, i.e. design and enforcement left to local governments prone to economic development pressures and not bound by strategic MPA objectives, without the advantages of bottom-up approaches, i.e. promotion of stakeholder participation, cooperation, and innovation. China's experience demonstrates the need for a balance between fully protected and multiple-use MPAs, and between top-down and bottom-up approaches. Whilst the shift to a more-balanced approach, aiming at increasing the management effectiveness of the MPA system, must face the particular challenges raised by a growing population and related pressures for rapid economic development, coupled with a lack of historical experience with public participation in governance decisions, it is argued that these challenges must be addressed if China's MPAs are to achieve their marine biodiversity conservation obligations.

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Qiu W, Wang B, Jones PJS and Axmacher JC (2009) Challenges in developing China's marine protected area system. *Marine Policy* **33**(4): 599-605. doi:10.1016/j.marpol.2008.12.005

Table 1. Total number and area of marine nature reserves (MNR) and marine special protected areas (MSPA) in China by August 2008.

	MNR (no take)	MSPA (multiple use)	MPA (MNR + MSPA)
Total number of sites	146	12	158
--Number of sites designated at the national level	32	7	39
--Number of sites designated at the local level	114	5	119
Total area (million ha)	3.56	0.21	3.77
--Area of sites designated at the national level	2.29	0.13	2.42
--Area of sites designated at the local level	1.27	0.08	1.35
Average size of individual sites (million ha)	0.024	0.018	0.024
--Average area of sites designated at the national level	0.072	0.018	0.063
--Average area of sites designated at the local level	0.011	0.016	0.011
Percentage of China's total marine area (%)	1.19	0.07	1.26

Qiu W, Wang B, Jones PJS and Axmacher JC (2009) Challenges in developing China's marine protected area system. *Marine Policy* **33**(4): 599-605. doi:10.1016/j.marpol.2008.12.005

Table 2. National marine nature reserves (MNR) in China (by August 2008).

No.	Name	Area (ha)	Main Conservation Targets	Year of establishment	International designation
1	Coastal Wetlands of Yalujian Estuary	108,057	Coastal wetlands and habitats for migratory birds	1997	
2	Shedao (Snake) Island & Laotieshan	17,073	Chinese pit viper (*Gloydius shedaoensis*) and habitats for migratory birds	1980	
3	Dalian Seal (*Phoca largha*)	909,000	Spotted seal (*Phoca largha*) and it's habitats	1997	Ramsar site
4	Chengshantou	1350	Special coastal geomorphological features and seascape, relics, and fossil	2001	
5	Shuangtaizi Estuary and Water Birds	80,000	Red-crowned crane (*Grus japonensis*), Saunders's gull (*Larus saundersi*), and their habitats, coastal wetlands	1988	Ramsar site
6	Tianjin Paleo-Coast & Wetlands	99,000	Shellfish bank, oyster beds, paleo-coast relics, and coastal wetlands	1992	

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7	Changli Golden Beach	30,000	Coastal sandy beach, lagoon, wetlands, and nearshore ecosystem	1990	
8	Binzhou Shellfish Bank & Wetlands	80,480	Shellfish bank, paleo-coast relics, coastal wetlands, and migratory birds	2006	
9	Changdao Island	5300	Migratory birds and island ecosystem	1988	
10	Yellow River Delta	153,000	Coastal wetlands and migratory birds	1992	
11	Rongchen Wild Swan	10,500	Wild swan and other wildlife	2007	
12	Yancheng Rare Birds	453,000	Red-crowned crane (*Grus japonensis*), rare birds, and coastal wetlands	1992	Ramsar site, and UNESCO Man and Biosphere reserve
13	Dafeng *Elaphurus davidianus*	2667	Pere David's deer (*Elaphurus davidianus*) and coastal wetlands	1997	Ramsar site
14	Chongming Island Eastern Coast	24,155	Migratory birds and coastal wetlands	2005	Ramsar site
15	Shanghai Jiuduansha Island	42,020	Migratory birds and coastal wetlands	2005	
16	Nanjiliedao Archipelago	19,600	Islands and other marine ecosystems, shellfish, and seaweeds	1990	UNESCO Man and Biosphere reserve
17	Paleo-Forest Relics of	3100	Relics of paleo-forest and oyster beds,	1992	

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	Shenhuwan Bay		coastal geomorphological feature, and seascape		
18	Xiamen Rare Marine Species	33,088	Chinese white dolphin (*Sousa chinensis*), fin fish (*Branchiostoma belcheri*), and little egret (*Egretta garzetta*)	2000	
19	Zhangjiang Mangrove Estuary	2360	Mangrove and coastal wetlands	2003	
20	Huidonggang Sea Turtle	800	Sea turtle and their nesting sites	1992	Ramsar site
21	Neilingdingdao Island & Futian.	815	Mangrove, birds, and rhesus monkey	1988	
22	Pearl River Estuary Chinese White Dolphin	46,000	Chinese white dolphin *(Sousa chinensis)* and its habitats	1991	
23	Zhanjiang Mangrove	20,279	Mangrove ecosystem	2003	Ramsar site
24	Xuwen Coral Reefs	1333	Coral reefs	1997	
25	Shankou Mangrove	8000	Mangrove ecosystem	1990	Ramsar site, and UNESCO Man and Biosphere reserve
26	Hepu Dugong	35,000	Dugong and marine ecosystem	1992	

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27	Beilunhe Estuary	30,000	Mangrove ecosystem	2000	Ramsar site
28	Dongzhaigang Mangrove	3337	Mangrove ecosystem	1986	Ramsar site
29	Dazhoudao Islands Marine Ecosystem	7000	German's swiftlet (*Collocalia germani*) and its habitats, island ecosystem	1990	
30	Sanya Coral Reefs	4000	Coral reefs	1990	UNESCO Man and Biosphere reserve
31	Tongguling	4400	Coral reefs, tropical seasonal forests and associated wildlife	2003	
32	Leizhou Rare Marine Life	46,865	Rare marine species	2008	

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Fig. 1. Growth in the total number and area of MPAs in China.

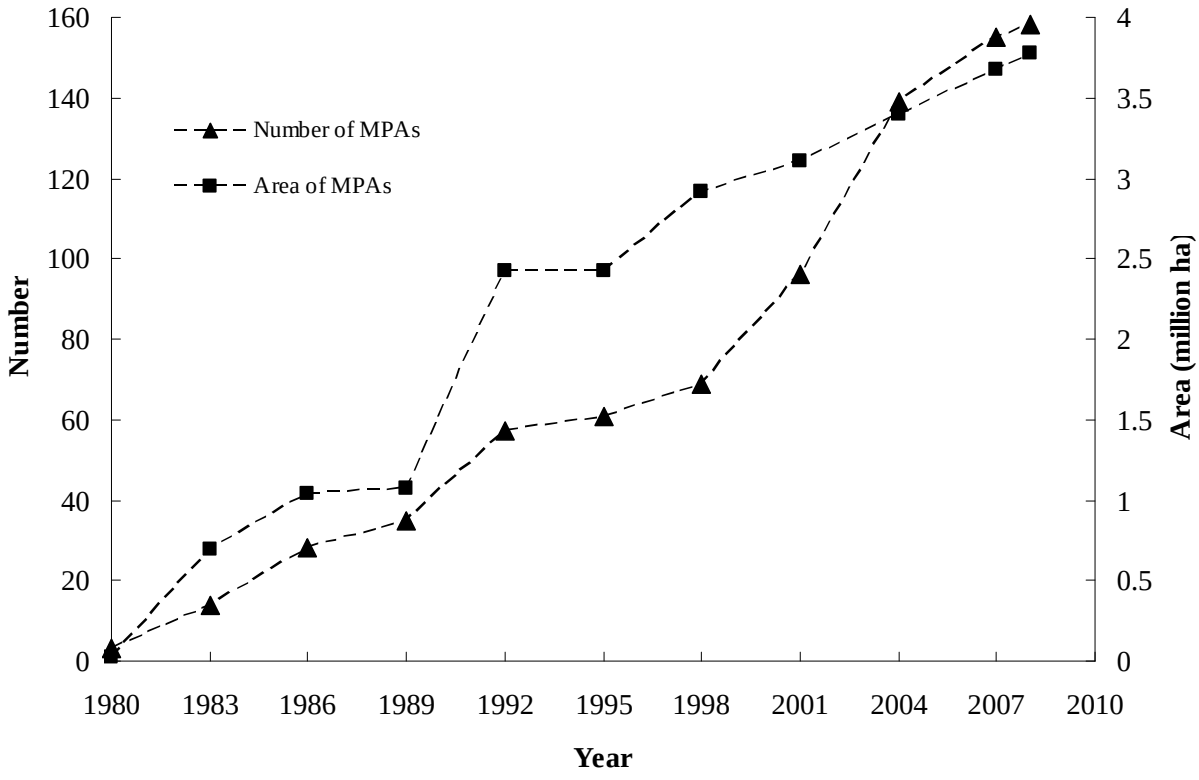
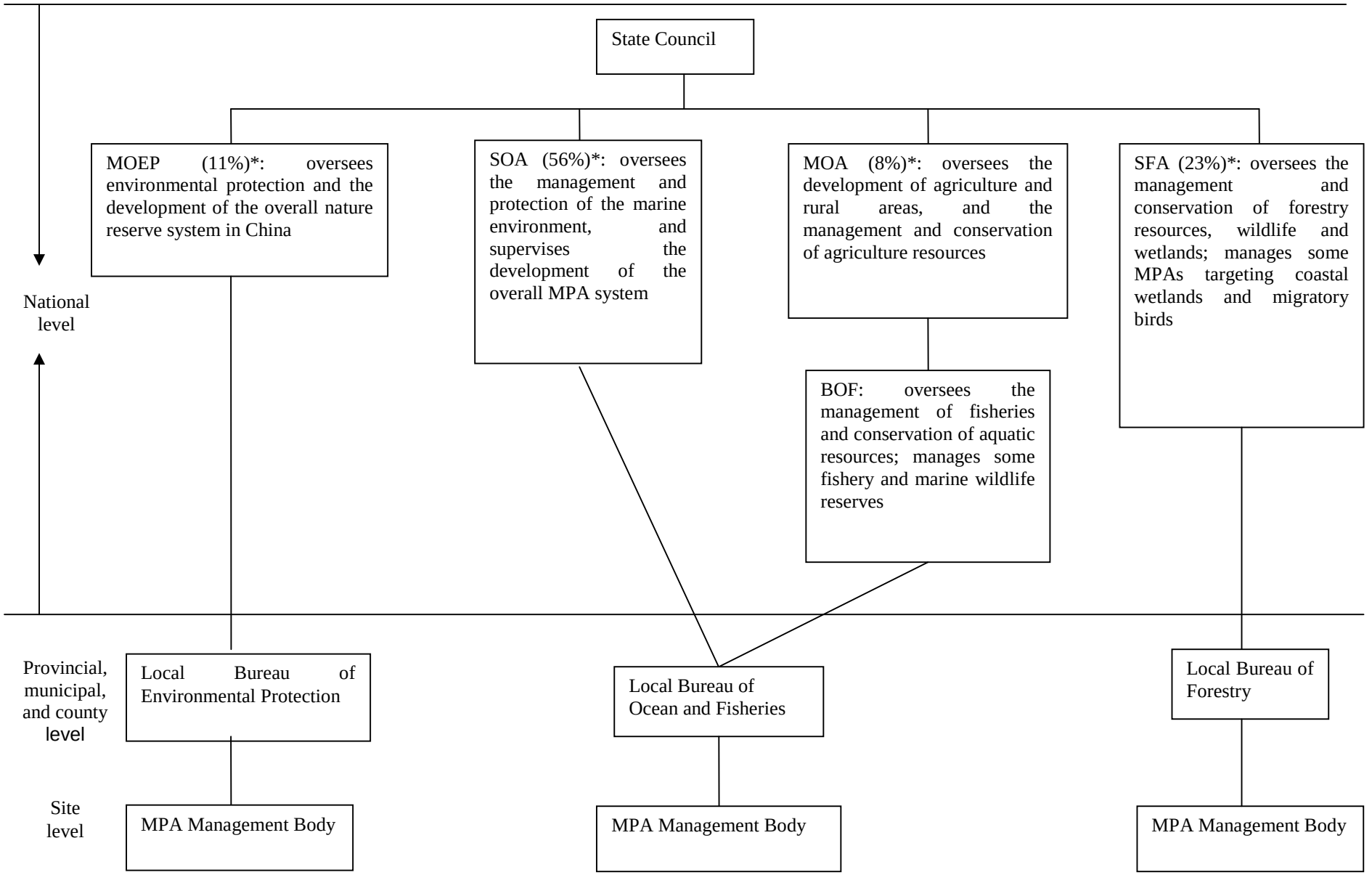


Fig. 2. Administrative structure of MPAs in China. MOEP, Ministry of Environmental Protection; SOA, State Oceanic Administration; MOA, Ministry of Agriculture; SFA, State Forestry Administration; BOF, Bureau of Fisheries. * The percentage (in terms of number) of the MPAs managed by each agency.


State Council
MOEP (11%)*: oversees environmental protection and the development of the overall nature reserve system in China
SOA (56%)*: oversees the management and protection of the marine environment, and supervises the development of the overall MPA system
MOA (8%)*: oversees the development of agriculture and rural areas, and the management and conservation of agriculture resources
SFA (23%)*: oversees the management and conservation of forestry resources, wildlife and wetlands; manages some MPAs targeting coastal wetlands and migratory birds
National level
BOF: oversees the management of fisheries and conservation of aquatic resources; manages some fishery and marine wildlife reserves
Provincial, municipal, and county level
Local Bureau of Environmental Protection
Local Bureau of Ocean and Fisheries
Local Bureau of Forestry
Site level
MPA Management Body
MPA Management Body
MPA Management Body