


ICM: concept, method and application for achieving sustainable coastal development
統合沿岸管理—沿岸の持続可能な開発を達成するための概念・手法及び応用

Lecture series (2008, Japan)


1. ICM: Relevance, concept and sustainable coastal development framework (SCDF) (June 19).
 統合沿岸管理: 関連性・概念および沿岸の持続可能な開発枠組み (6月19日)
2. The ICM cycle, ICM code and State of Coasts Reporting (June 26)
 統合沿岸管理サイクル・統合沿岸管理コードおよび沿岸状態の報告 (6月26日)
3. ICM: Information gathering, analysis and use (July 3)
 統合沿岸管理: 情報収集・分析および利用 (7月3日)
4. ICM application, case studies and scaling up (July 10).
 統合沿岸管理応用および拡大化 (7月10日)



Partnerships in Environmental Management
in the Seas of East Asia

Contents (内容)

- Application of ICM : pollution, biodiversity, fisheries, climate change
- Case studies in East Asia
- Policy, scientific, financial, legislative and capacity support for ICM scaling up
- Conclusion and recommendations



Partnerships in Environmental Management
in the Seas of East Asia

Application of ICM (統合沿岸管理の応用)

Implementation of key international conventions using ICM (1)
統合沿岸管理関連の重要国際条約の実施

- a) Fisheries ---FAO Code of Conduct for Responsible Fisheries (article 10 integrate fishery management within ICM framework) design to reduce fishing threats from overexploitation, destructive fishing activities and illegal fishing;
- b) Biodiversity—CBD endorse ICM as an effective planning and management framework especially in managing MPAs and its networks
- c) Land-based pollution---GPA proposed linking pollution management within ICM framework;



Partnerships in Environmental Management
in the Seas of East Asia

Application of ICM (統合沿岸管理の応用)

Implementation of key international conventions using ICM (2)
統合沿岸管理関連の重要国際条約の実施

- d) Climate Change ---IPCC recommends adaptation to long-term climate change using ICM as the appropriate mechanism
- e) Coastal hazard management---Yokohama Strategy and Plan, the Hyogo Framework and the Cairo Principles all suggested the use of an integrated coastal management framework;
- f) Water resource management--WSSD plan of Action stresses the need for reconciling competing use through setting up the Framework for Action on Water and Sanitation.



Partnerships in Environmental Management
in the Seas of East Asia

Application of ICM (統合沿岸管理の応用)

The Irony of applying integrated management
統合管理の応用の皮肉

- a) Most international conventions (agenda 21,WSSD, biodiversity, GPA,Climate Change..) recognised the importance of "integrated planning and management" but treatment of the issues still focus on sectoral approach (due to priorities, scale and operation eg. conservation, fisheries, pollution), this tends to dilute or negate the value and impact of integrated management.
- b) International lobby for resources tends to put integration lower priority;
- c) On the other hand, multiple use issues at the local level cannot be handled by one sector only and need to be resolved through integration and coordination—a long way to go!



Partnerships in Environmental Management
in the Seas of East Asia

Common grounds among ICM and related coastal management initiatives
統合沿岸管理および関連沿岸管理イニシアチブの間の共通点

Parallelism

- a) Subscribe to principles of sustainable development
 - i) adopt ecosystem management approach
 - ii) risk assessment /risk management;
 - iii) adaptive management
 - iv) poverty eradication
 - v) advocate for policy and functional integration
- b) Recognise the interlink and complexity of coastal issues, need collective efforts and partnerships.
- c) See the value for science-based management decisions



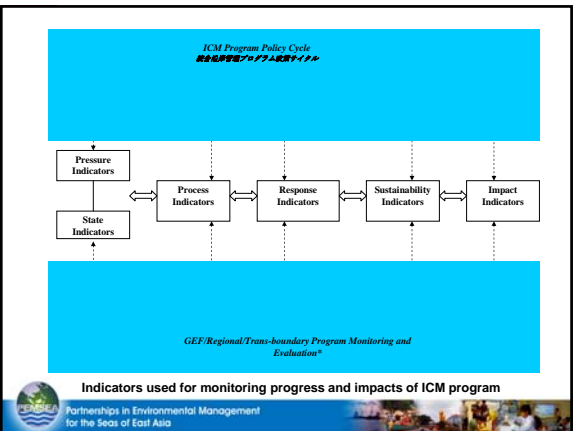
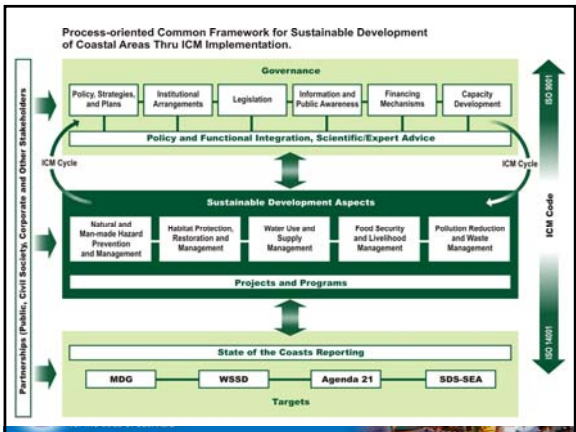
Partnerships in Environmental Management
in the Seas of East Asia

Strengthening the synergy among ICM and related programs

統合沿岸管理および関連プログラムの間の相乗効果の強化

SCDF Promotes Synergy

- a) SCD framework can enable the collective implementation of international conventions especially at local level;
- b) Synergise parallelism and add value to implementation and impacts
- c) Adopt (i) long-term comprehensive and cost-effective solutions instead of short-term, ad hoc and costly operation; (ii) exercise caution given natural vulnerability and ecosystem management uncertainties (iii) resort to proactive rather than reactive measures, (iv) combine "hard" and "soft" solution;
- c) Ensure coordinated and integrated approach to implement comprehensive coastal programs;
- d) Collective effort to create an "informed public"



Case study
ケーススタディ

Xiamen: Working Model for Integrated Coastal Management (ICM) in the East Asian Seas

Socio-Economic Factors	Values
Length of Coastline	234 km
Sea Area	390 km ²
Land Area	1,569 km ²
Population	2,400,000 (2006)
Population (RMB)	25.0 Billion (1995) 50.1 Billion (2000) 88.3 Billion (2004) 116.2 Billion (2006)
Value of Ocean Industry (RMB)	23.2 Billion (2006) (20% of GDP)

Partnerships in Environmental Management for the Seas of East Asia

ICM program implementation (1994-2008)

統合沿岸管理プログラム実施

- 1994-1999 First Cycle
 - Setting up governance framework (institutional arrangement, building policy reform, setting up inter-agency committee, public awareness, capacity building, profiling, strategic environmental management plan, institutionalization of expert group; surveys and studies (functional zoning schemes, Yandang Lake lagoon, port management..etc); exposure of local leaders to new concept of coastal management through meetings and workshops, setting up performance indicators
- 1999-2007 Second Cycle
 - Implementation of strategic action plans: pollution and habitat management; operationalizing interagency committee, implementation of zoning schemes and evaluation of results; strengthening political commitment and buy-ins; realizing some outcomes; integrate ICM program into government economic agenda; institutionalizing interagency committee and redefining role of the management office; capacity development, involving in regional activities
- 2007----- Third Cycle
 - Application of the SCDF and the action plans; ecosystem management emphasis; functional and geographical scaling up; new initiatives, internalizing ICM into government program; ICM certification and recognition; national training and research center in coastal and marine management, national and regional ICM networking and regularization of the World Ocean Week.

Partnerships in Environmental Management for the Seas of East Asia



Policy Reforms and Legislation, Xiamen 政策改革・法律（廈門）

Year	Development and Utilization	Year	Environmental Protection
1994	Regulations on Land Management	1992	Measures on the Management of Lancelot Nature Protected Area
1996	Regulations on City Planning	1994	Regulations on Environmental Protection
1995	Regulation on Management of Sand, Soil and Stone	1995	Measures on the Management of Nature Protected Area for White Egret in Dayu Island
1995	Regulation on Management of Waterway Transportation	1995	Public Notice in the Reinforcement of Management of Sea Eel Fishing in the Sea Areas Around Xiamen
1995	Public Notice on Removal of Households Engaged in Aquaculture from the Location of the New Shipyard	1996	Regulation on the Protection and Management of the Marine Environment
1996	Regulation on the Use and Management in the Shallow Seas and Intertidal Zones	1996	Measures on the Management of Yuandang Lake Region
1996	Regulation on the Use and Management of Sea Area Uses	1997	Regulation on the Management of Nature Protected Areas for Chinese White Dolphin
1997	Measures on Management of Charging Sea Area Uses		
1998	Regulations on the Coastline Planning and Management		

Partnerships in Environmental Management for the Seas of East Asia

Institutional Arrangement: Integrated law enforcement 制度的取り決め：法の統合執行

established a supervision team for law enforcement and supervision

established a joint supervision mechanism among Xiamen, Quanzhou and Zhangzhou

Partnerships in Environmental Management for the Seas of East Asia

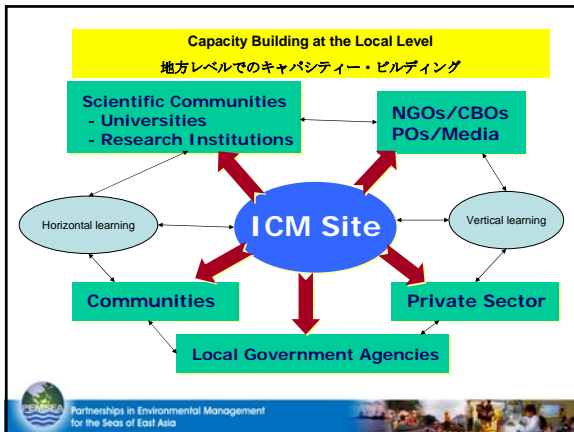
Public Awareness - Community Involvement and Mobilization 社会の関与—地域社会参加および動員

Beach clean up

Incorporating environment related theme in school program

Stakeholders consultation

Partnerships in Environmental Management for the Seas of East Asia



- ### Development and implementation of coastal and marine programs 沿岸・海洋プログラムの開発・実施
- In order to maintain the health of marine ecosystem, Xiamen has developed a series of action plans:
- ❖ Xiamen Marine Functional Zoning Scheme
 - ❖ Marine Environmental Protection Planning
 - ❖ Xiamen Program on the Treatment of Tidal Flat and the Construction of Shelter Forest
 - ❖ Xiamen Wetland Conservation Plan
 - ❖ Program on the Transplanting of Mangrove Trees
 - ❖ Xiamen Planning on the Construction of National Nature Reserves for Rare Marine Species
 - ❖ Xiamen Planning on the Protection and Exploitation of Uninhabited Islands
 - ❖ Xiamen Planning on the Control of Uninhabited Islands
- Partnerships in Environmental Management for the Seas of East Asia

Xiamen Marine Functional Zoning Scheme 廈門の有効な海洋ゾーン構想

●Established in 1997
Intensified the protection of marine environment, wetland, coastlines and biodiversity by designating various use functions to different sea area.

●Revised in 2003
Further emphasized the interaction between the city master plan and sea uses, more rational control over the strength of coastal development and sea use structure, and nature reservation and ecological capacity building

Total Management

Reducing the impacts of natural and man-made disasters (自然災害・人災の影響を和らげる)

Red tide

Oil spill

Typhoon

Storm surge

Partnerships in Environmental Management for the Seas of East Asia

Setting up pre-warning system and emergency response mechanism 警告システム・緊急対応メカニズムの構築

Since 2005, Xiamen Municipality has developed such programs as follows:

- Program for Prevention and Mitigation of Red Tide Disasters;
- Program for Emergency Response against Storm Surges
- Program for Response against typhoon

Partnerships in Environmental Management for the Seas of East Asia

Developing emergency response mechanism against pollution from vessels (海洋汚染対策の緊急対応メカニズムの開発)

Regular exercises of emergency response against oil spill at sea

Partnerships in Environmental Management for the Seas of East Asia

Reducing the impacts of various typhoons by establishing pre-warning system and emergency mechanism 警告システム・緊急対応メカニズムの構築によって台風の影響を和らげる

Impact of typhoon "Peal" on Xiamen coast

In 2005, the municipality has developed a program for preparedness against typhoon in the fishery industry and formed a complete emergency response mechanism against typhoon.

Partnerships in Environmental Management for the Seas of East Asia

Habitat Conservation & Restoration 生息環境保護・修復

Established habitat rehabilitation plans :

- Program on the Treatment of Tidal Flat and the Construction of Shelter Forest
- Xiamen Wetland Conservation Plan
- Program on the Transplanting of Mangrove Trees
- Creating a coastal forest system as buffer zone for protection of coastal wetland and coastlines.

Partnerships in Environmental Management for the Seas of East Asia

● **Establishing National Nature Reserves for Rare Marine Species**

● **Protection and Exploitation of Uninhabited Islands**

Partnerships in Environmental Management for the Seas of East Asia

Restoring biodiversity (生物多様性の回復)

● studies of biodiversity in Xiamen Bay;
 ● Launched the campaign "Maintaining marine biodiversity through rehabilitating marine ecological chains" by releasing seedlings into the sea such as horseshoe crab and lancelet

for the Seas of East Asia

Strengthening the control over land-based pollution 陸上起因汚染管理

- To intensify sewage treatment and reduce the total pollution load discharged into the sea.
- To turn sewage into a resource by its re-use.
- To effectively control the pollution from marine and coast projects
- To intensify monitoring over marine ecological environments.

By taking the measures to control and monitor pollution discharge into the sea, the marine environment of Xiamen has been protected in the course of rapid economic development

Partnerships in Environmental Management for the Seas of East Asia

Intensify sewage treatment and reduce the total pollution load discharged into the sea (下水処理の強化・海洋汚染の減少)

04年厦门市污水处理厂和污水排放口分布图

- Number of sewage treatment plants (2004) : 8
- Design treatment capability: 687,000 tons per day
- Actual treatment quantity: 480,000 tons per day
- Treatment rate: 78.6%

for the Seas of East Asia

Cleaning of Yundang Lagoon for upgrading water quality 水質の向上のためのユンダン湖の清掃活動

Yundang lake of 1980's

Today's Yundang lake

Partnerships in Environmental Management for the Seas of East Asia

Pollution Reduction in Yangdang lagoon (ユンダン湖の汚染削減)

Yundang Lagoon Rehabilitation

Partnerships in Environmental Management for the Seas of East Asia

Turned sewage into a resource by its re-use (廃水再利用)

Xiamen Municipal Government has been active in the trial projects wastewater recycling while encouraging the industrial enterprises to recycle waste water and to reduce waste water to "zero-discharge".

The recycle and reuse of sewage water is not only good for saving fresh water, but also plays an important role in reducing pollution discharge into the sea.

Preventing and eliminating alien species (外来種の防止・除去する)

Ballast water

Water hyacinth

Ruby grass

Strengthen port control and management of the ballast water;
Improve control measures on introduced species and seedlings for aquaculture;
Eliminate harmful alien species.

Effectively Implement EIA to control pollution from marine and coast projects (海洋・沿岸汚染防止のために環境影響評価を効果的に実施するプロジェクト)

environmental impact assessment

Whether consistent with related programs and will do no harm to the marine environment

Yes ↓ Censor No ↓ Veto

Be authorized by relevant authorities

Be allowed

Strictly abiding the environmental protection and safety precautions stated in the EIA reports

Be supervised in the whole process

Check and accept

Intensified monitoring to track changes of marine ecological environment (海洋生態学的环境変化の監視)

Monitoring stations in Xiamen

Emergency monitoring

YSI automated online monitoring

Socio-economic Benefits of ICM 統合沿岸管理の社会経済的利益

Annual Values	Without ICM (in million RMB)	With ICM (in million RMB)
<i>(discount rate: 4.5%)</i>		
Economic Sectors	893.37	4,496.34
Environmental Services	42.12	358.98
Direct Nature Services		142.60
Less: Externalities Cost	29.06	25.88
Total	906.43	4,972.03
Less: ICM Program Cost		8.34
TOTAL NET BENEFITS	906.43	4,963.69

PEMSEA (2006) A Perspective of socioeconomic and cost benefits of Integrated Coastal Management: The Case of Xiamen, PR China. PEMSEA, 132 PP.

New Initiative: Integrated management of the Maluan Bay 新たな計画：マルアン湾の統合管理

Future of the Maluan Bay after renovation

New Initiative: Solving transboundary environmental issues in the Jiulong River Basin through inter-municipality cooperation (新たな計画：協力を通してジウロン河川流域の境界環境問題の解決)

Establish city-alliance with Quanzhou and Zhangzhou in 2003



Jiulong River Basin is regarded as the major causes of marine environmental pollution and port sedimentation in Xiamen waters

- The reduction of COD: 235,137 tons
- The reduction of total phosphates 7,073 tons
- The reduction of ammonia nitrogen: 13,829 tons



Lessons learned from Xiamen ICM 廈門の統合沿岸管理で学んだ教訓

- ICM approach and methods are workable especially in coastal areas with complex management problems;
- The socioeconomic, ecological and political benefits far exceed the costs especially if addressed through sectoral means
- ICM can be sustained through local and national budgets
- Interagency cooperation is feasible
- Political will and leadership are very essential
- Interagency coordinating committee is an important factor in ICM program development and implementation.

ICM Scaling Up 統合沿岸管理の拡大化

ICM Working Model

- Batangai
- Xiamen

ICM Demonstration

- Bai
- Chonburi
- Danang
- Nampho
- Port Klang
- Sihanoukville

ICM Parallel Replication

- Batam
- Shikama
- Sukabumi
- Cavite
- Quanzhou
- 10 sites in China
- 3 sites in Bali

ICM Scaling-Up

- 20% of Regional Coastline by 2015

Better Coastal Governance through Stronger Local Alliance

From demonstration, replication to scaling up デモから複製・拡大化へ

2 + 6 + 18

ICM Working Model

- Batangai
- Xiamen

ICM Parallel Replication

- Batam
- Shikama
- Sukabumi
- Cavite
- Quanzhou
- 10 sites in China
- 3 sites in Bali

ICM Scaling-Up

- 20% of Regional Coastline by 2015

Integration and Coordination 統合沿岸管理の拡大化：準地域的な統合・協調を築く

Chesapeake Bay

Bohai Sea

Gulf of Thailand

Jakarta Bay

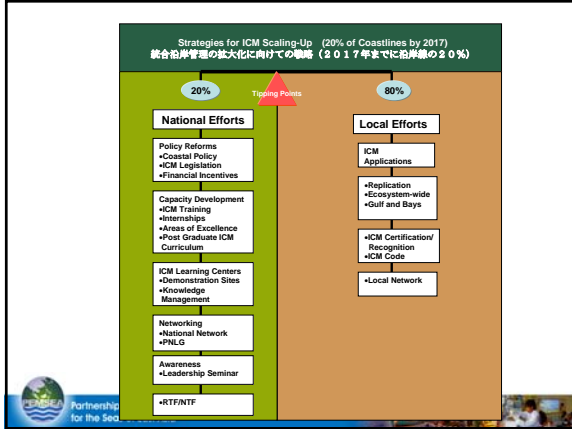
Manila Bay

Seto Inland Sea

Masan-Chinhhae Bay

ICM Scaling UP 統合沿岸管理の拡大化


- EAS target: 20% of coastline in 10 years
- 80/20 principle of the Law of the Few (Gladwell, 2000)
- National / Regional policy, strategies and legislation facilitate scaling up:
 - US model –legislation and incentives
 - Indonesia –ICM legislation
 - EU Directives on ICZM—policy and technical advice
 - East Asian Seas ---SDS-SEA
- Demonstration and replications
- Geographical and functional scaling up



Conclusions and Recommendations (1)

結論・提案 (1)


1. The concept of ICM is well defined with clear sustainable development principles, targets, priority, implementation approach and methodology provided through the SCDF and the ICM cycle
2. Capacity development is the key to ICM successes
3. National coastal/ ocean policy and institutional coordinating arrangements strengthen ICM practices
4. Codification of ICM allows standardization of ICM practices
5. ICM facilitates implementation of international instruments and agreements



Conclusions and Recommendations (2)

結論・提案 (2)

6. ICM requires long-term and consistent implementation. Monitoring, documenting and reporting is absolutely essential to take stock of progress
7. Interagency, multisectoral cooperation and partnerships can be facilitated by political will and strong national and local leadership
8. Regional and national networks of ICM practices ensure sustainable coastal development and scaling up
9. The impact of ICM diminishes when it functions as a sector
10. Stepwise, incremental approach through ICMS implementation is the way to achieve sustainable development




Thank you

