

A Decade's Experience of ICM Implementation in Xiamen, P.R.China:

A path to Sustainable Development



*Xiamen International Training Centre for
Coastal Sustainable Development*

Outline

☞ Experiences of Xiamen ICM Model

☞ Beneficial Results:

Before and after ICM implementation

☞ Next Phase ICM Planning

Xiamen ICM Program Site

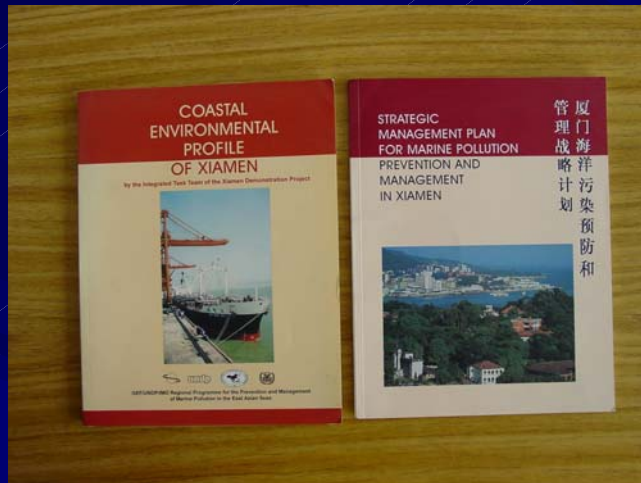


Socio-Economic Factors**Values**

<i>Length of Coastline</i>	234 km
<i>Sea Area</i>	340 km²
<i>Land Area</i>	1,516 km²
<i>Population</i>	1,213,000 (1995) 2,040,000 (2002)
<i>GNP</i>	176.3 Billion RMB(1995)
<i>GDP</i>	25.02 Billion RMB (1995) 64.83 Billion RMB (2002)
<i>GDP Average Annual Growth Rate</i>	18.3 % (1982--2002)
<i>Value of Ocean Industry</i>	11.5 Billion RMB (2000) 20 % of GDP



GEF/UNDP/IMO Xiamen Demonstration Project



I Phase ICM:1994-1998

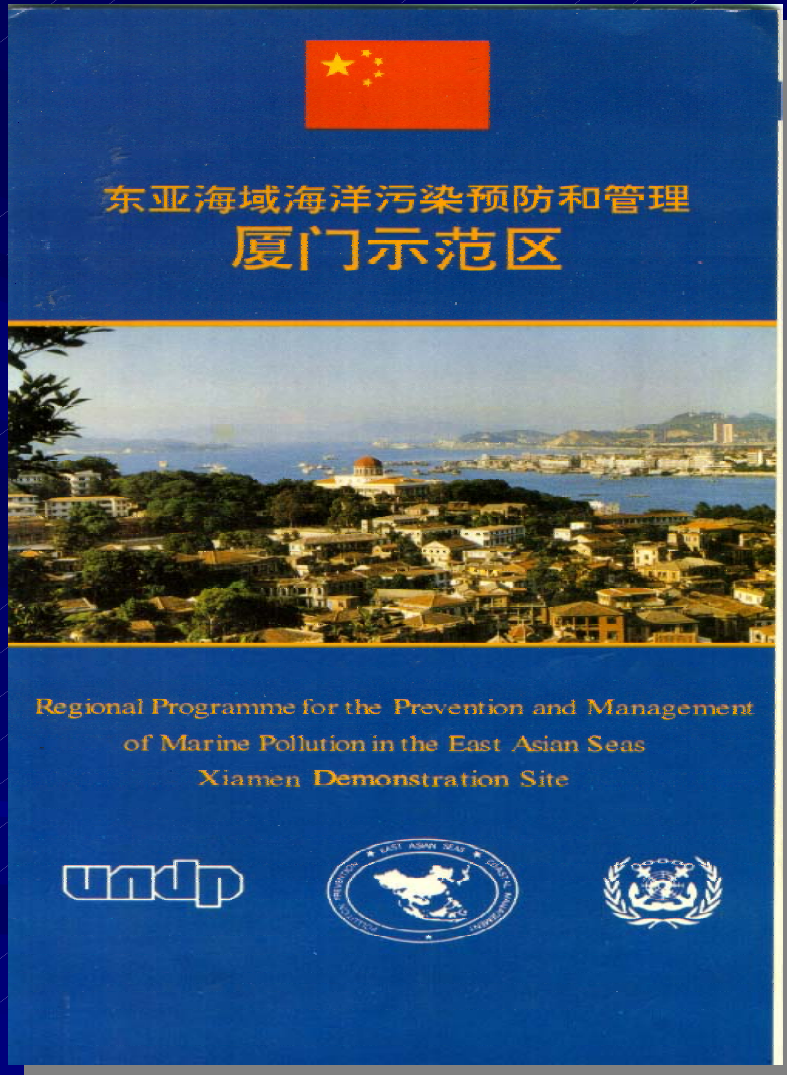
GEF/UNDP/IMO Regional Programme for the Prevention and Management of Marine Pollution in the East Asian Seas



II Phase ICM:2001-2004

GEF/UNDP/IMO Partnerships in Environmental Management for the Seas of East Asia (PEMSEA)

Xiamen Demonstration Project (1994 to 1998)



Improved environmental quality in the **River Thames** in England, **Boston Harbor** in the United States, and **Xiamen Harbor** in China show that determined, coordinated action can produce benefits even in large urban areas, where development and population pressures are concentrated

(GESAMP, April, 1998)

Xiamen ICM Model

Development of

- ☞ ICM structure, mechanisms, processes and programs
- ☞ ICM legal framework and integrate enforcement mechanism
- ☞ Scientific & technologic support system
- ☞ Public/stakeholder participation
- ☞ Sustainable financing

Coordinating Mechanism for ICM

Executive Deputy Mayor of Xiamen Municipality as chairperson, and several other Deputy Mayors as vice-chairs.

Marine Management Coordination Group of Xiamen Government

- Government Office
- Planning Commission
- Economic Commission
- Construction Commission
- Science&technology Commission
- Transportation Commission
- Structural Reform Commission
- Haicang Management Commission
- Public Security Bureau
- Finance Bureau

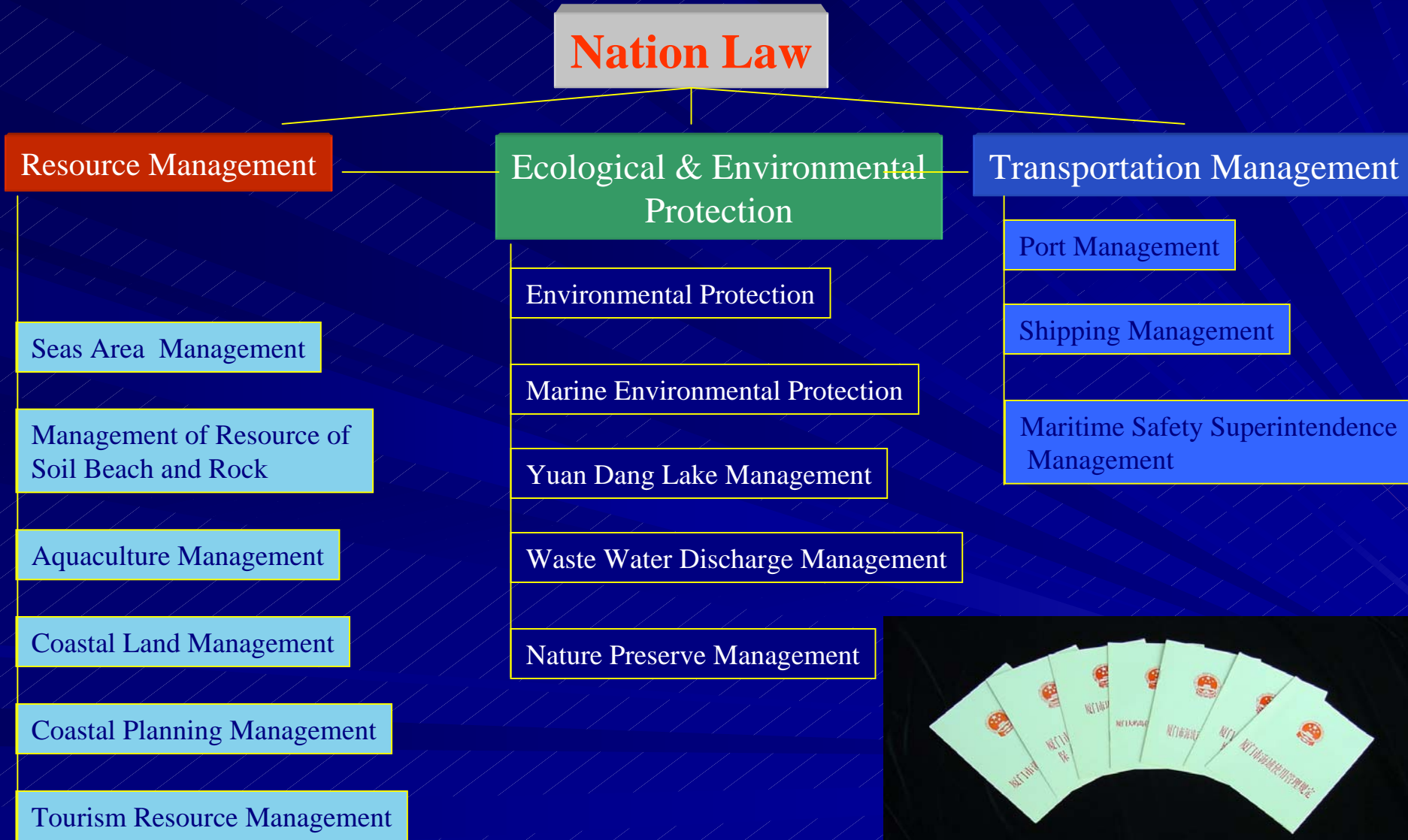
- Planning Administration Bureau
- Environmental Protection Bureau
- Fishery Administration Bureau
- Tourism Administration Bureau
- Maritime Safety Superintendence Bureau
- Port Bureau
- Legality Bureau
- Coast Defense Office
- District Government
- Land Management Bureau

Marine Management Office

Marine Experts Group

**Marine scientists
Engineers
Urban planners
Legal experts
Economists**

Legislative Framework on Coastal Management in Xiamen



Strengthen Integrated Law Enforcement

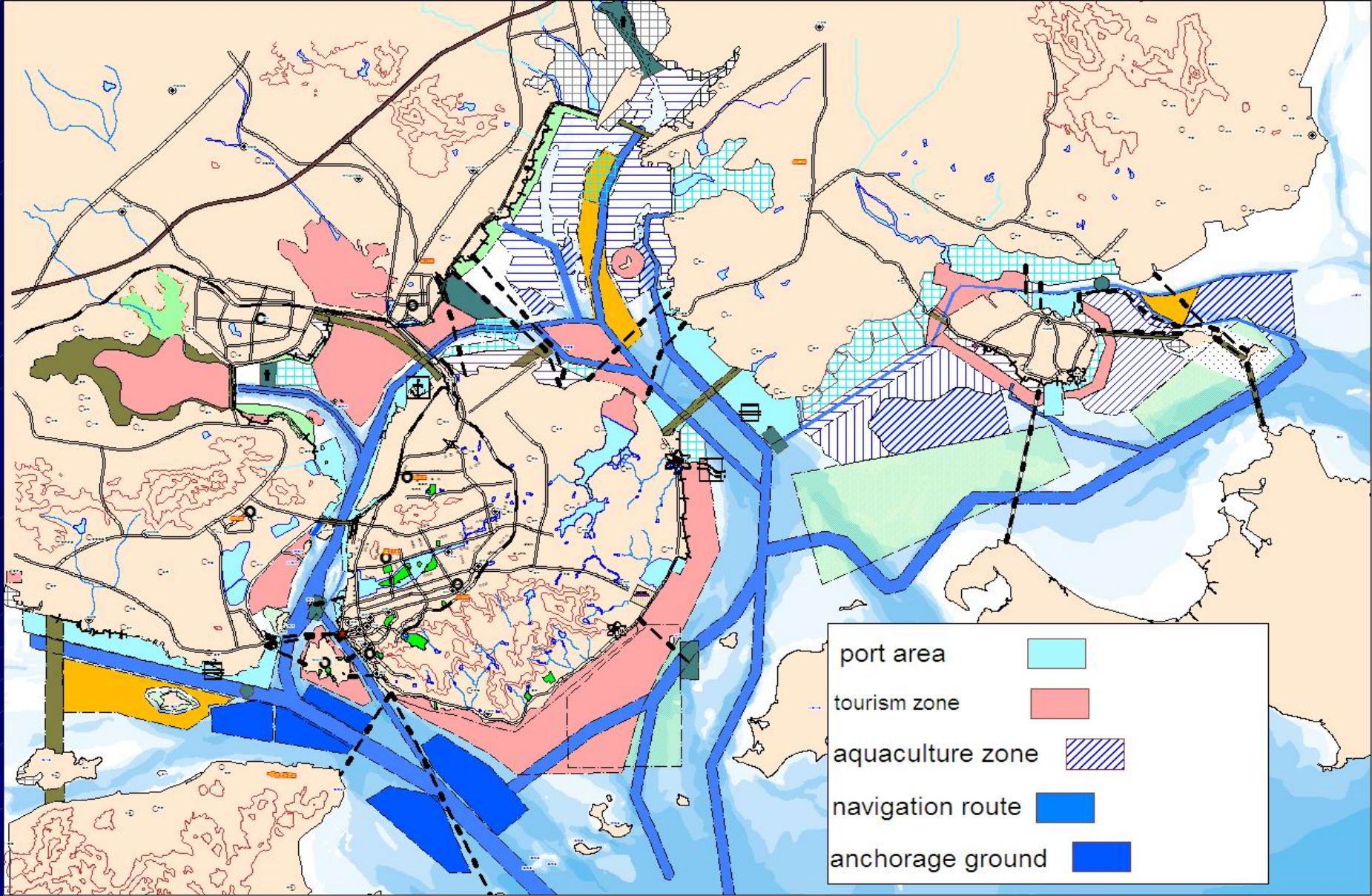
- A supervisory force was formed within the Marine Management Office
- Integrated the relevant forces, such as harbor supervisor, fishery supervisor, water police and environment supervisor



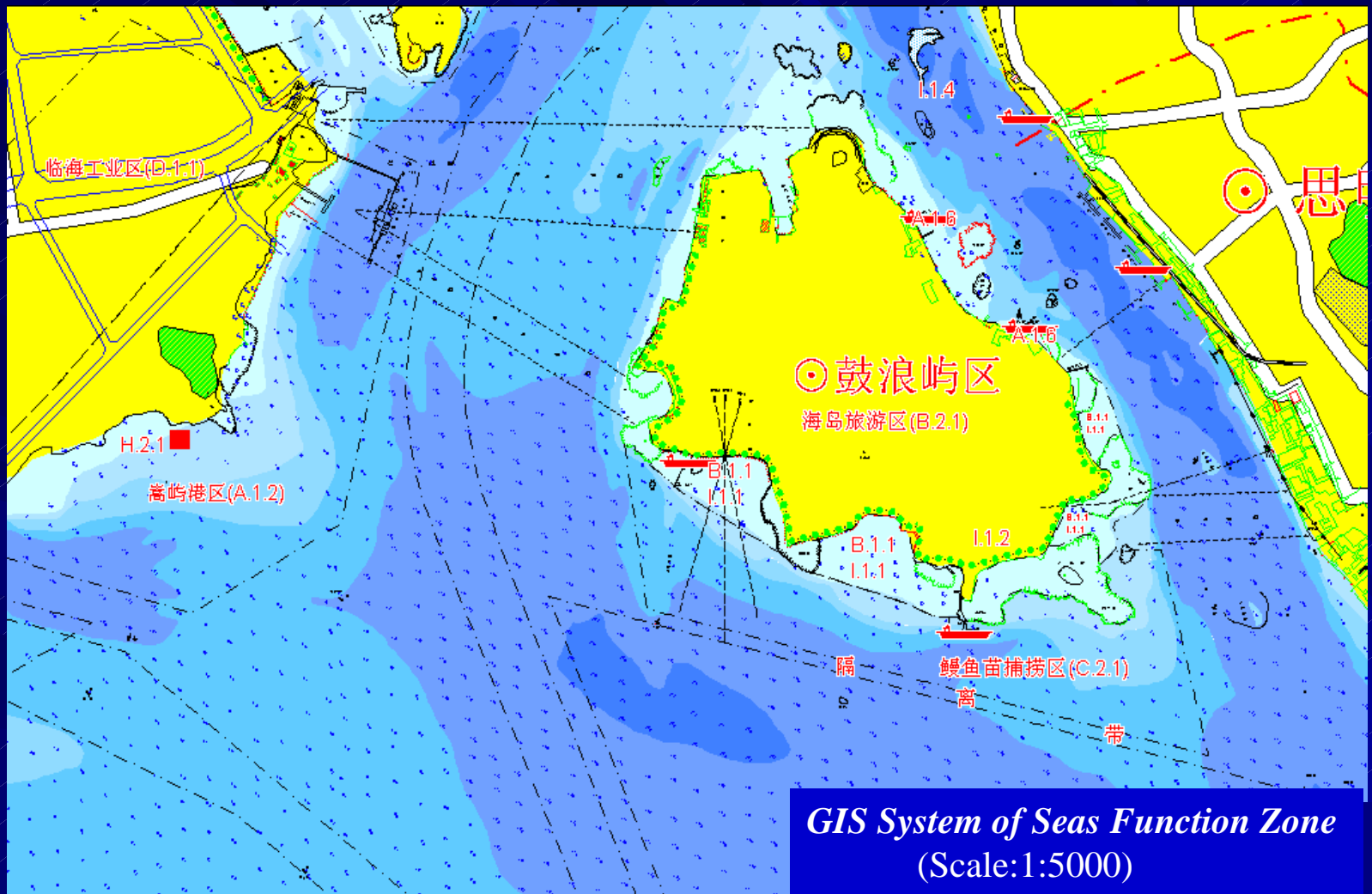
Scientific & technologic Support Mechanism

- Established a structure for long-term working relationship between the scientists and managers
- Accomplished the Marine Functional Zoning Scheme and information system, provided scientific basis to decision maker for planning and management- issues of coastal resources and environments, and for effectively minimizing adverse environmental impacts
- Organized management oriented research, to provide essential socioeconomic, scientific and technical advice to policy-makers
- Provided the best available information that will minimize costs and maximize benefits associated with a proposed development project
- Enhanced public awareness and institutional collaboration





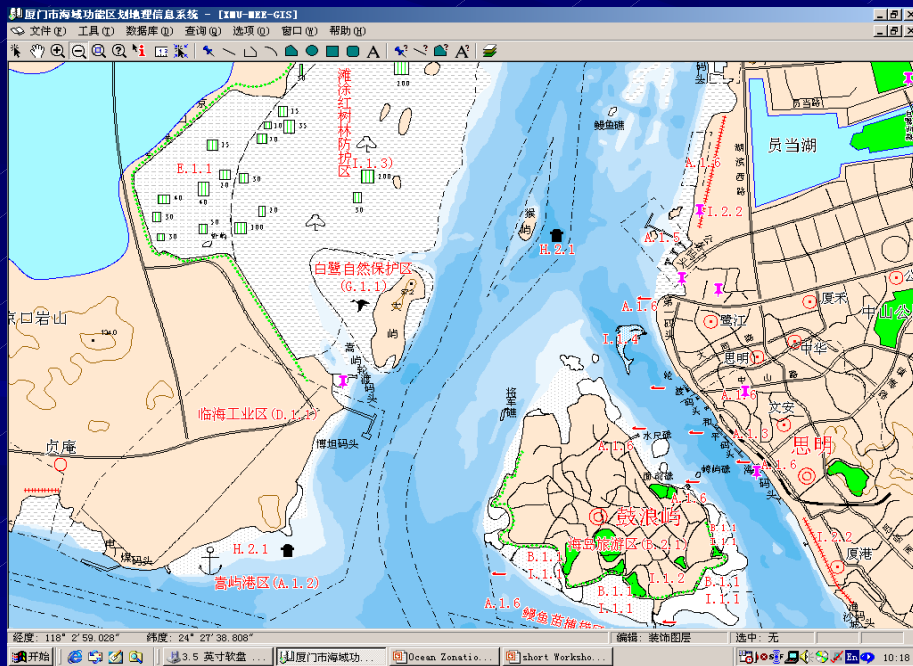
Xiamen Marine Functional Zoning Scheme
(Dominant; Compatible; Restricted Function)



In December 1997, Xiamen Municipal Government adopted the marine functional zoning scheme and issued an administrative order to 23 related agencies to implement the zoning scheme in the formulation and execution of their sectoral programs

•Geographic Information System (GIS) of Marine Functional Zonation Scheme

Establishment of GIS, Integrated application of GIS, GPS and RS, Expansion of the GIS functions and the information system of sea area use management



发展蓝色产业 建设海上厦门

——厦门海洋经济发展战略



厦门市计划委员会

Formulated Xiamen Marine Economic Development Plan

Public participation



Arbor Day March 12, 2000

1999 Zengcuoan Village Public Meeting

Mini-U summer camp
2000, 2001, 2002



Public participation



Achievement: A Decade Before and After

- ☞ Environmental quality improvement
- ☞ Habitat protection and restoration
- ☞ Reduction of multiple use conflicts
- ☞ Sustainability

Yuandang Lake Integrated Treatment Project (1989-2002)

Benefits / Costs 9.4

From the Yuandang Lake integrated treatment project, the municipal government learned lessons for not considering environmental consequences in pursuing economic growth, and also realized that a good quality environment could greatly advance city construction and socio-economic development

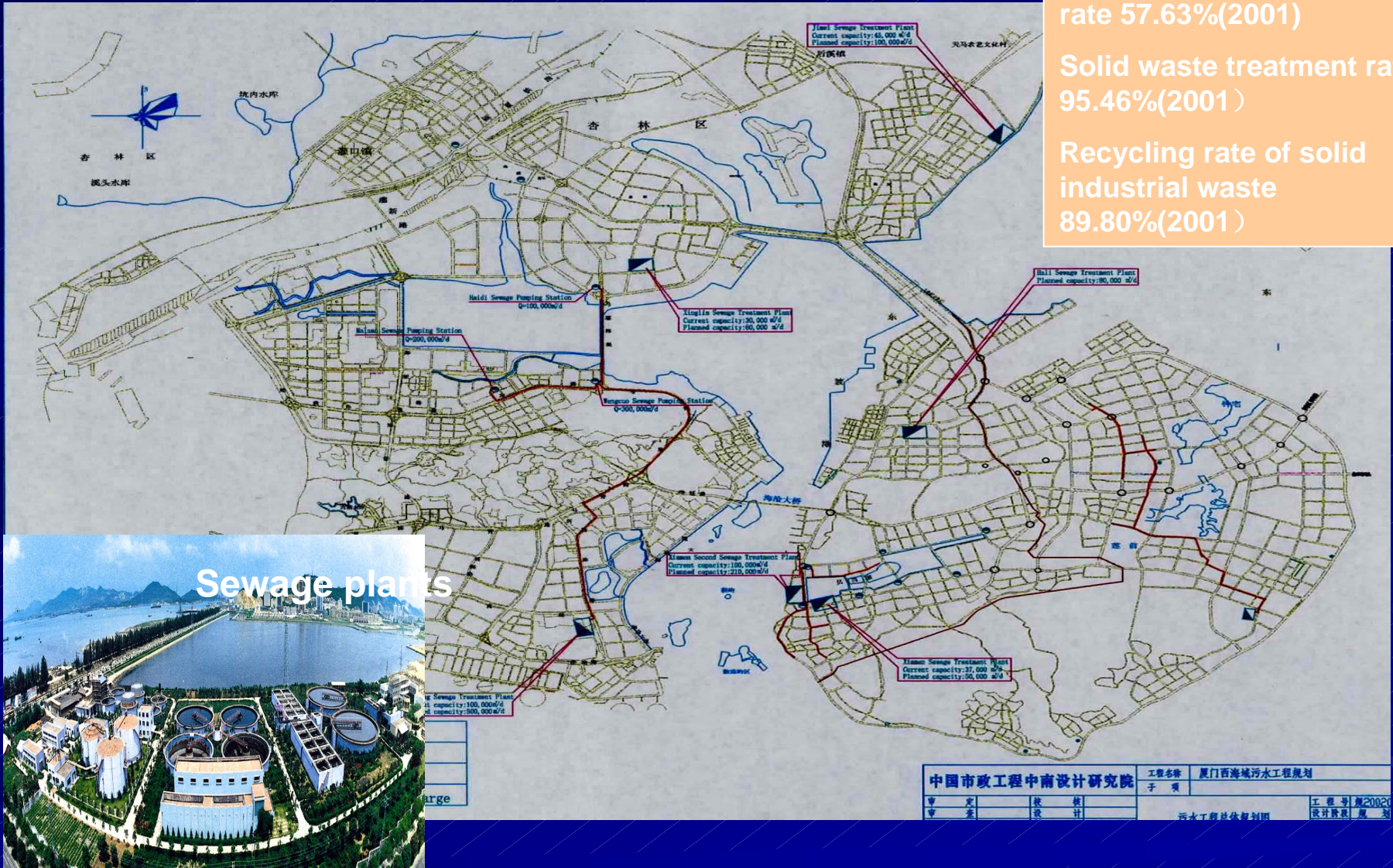


Reduce the land-based pollution discharge

Urban sewage treatment rate 57.63%(2001)

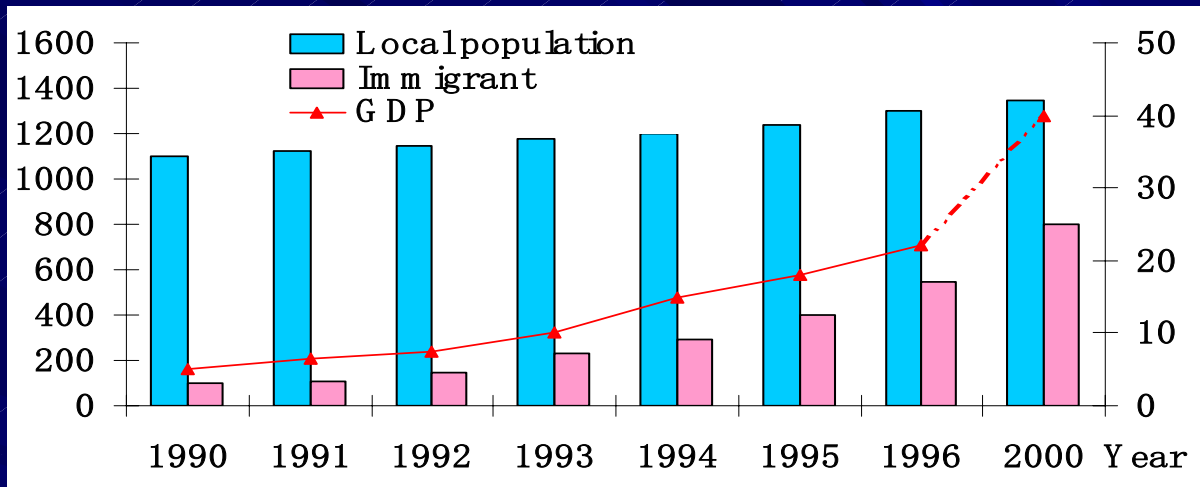
Solid waste treatment rate 95.46%(2001)

Recycling rate of solid industrial waste 89.80%(2001)

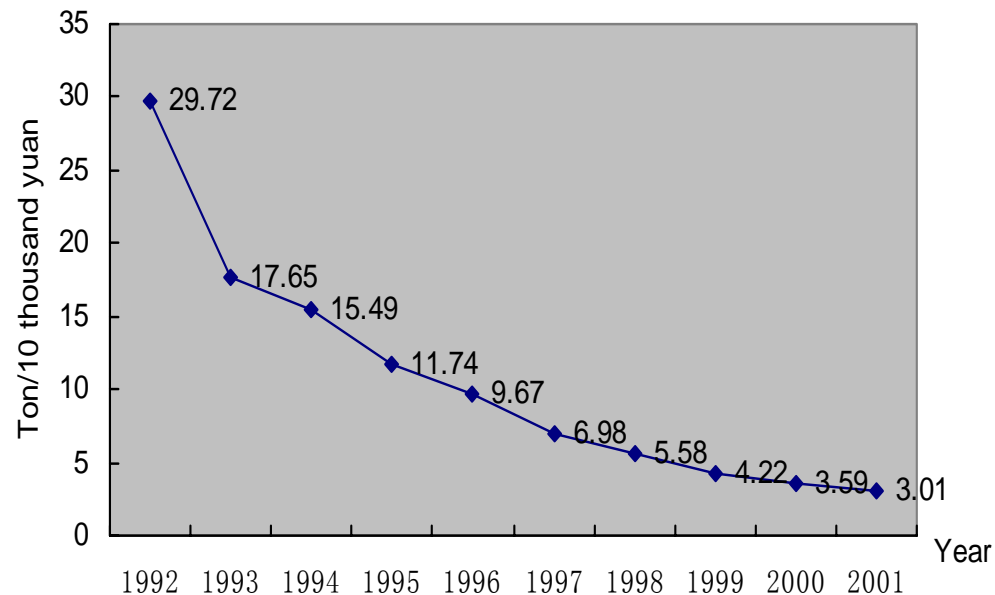


Built up 6 Waste Water Treatment Plants for waste water treatment

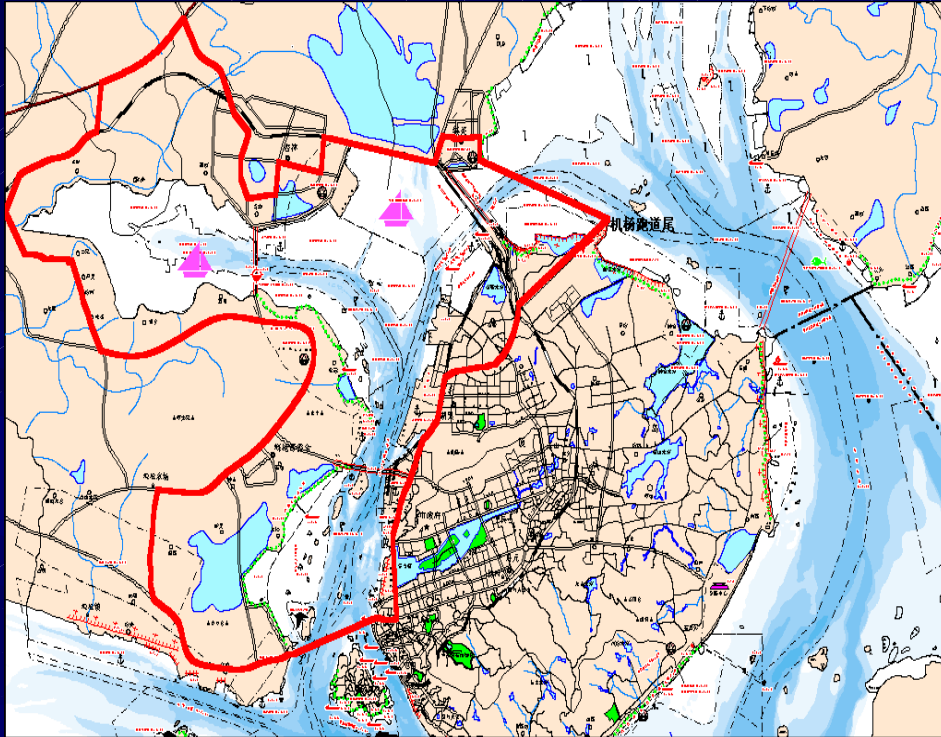
Reduce the land-based pollution discharge



Volume of Released Industrial Sewage per 10 thousand Industrial Output



Reduced the pollution induced by mariculture activities

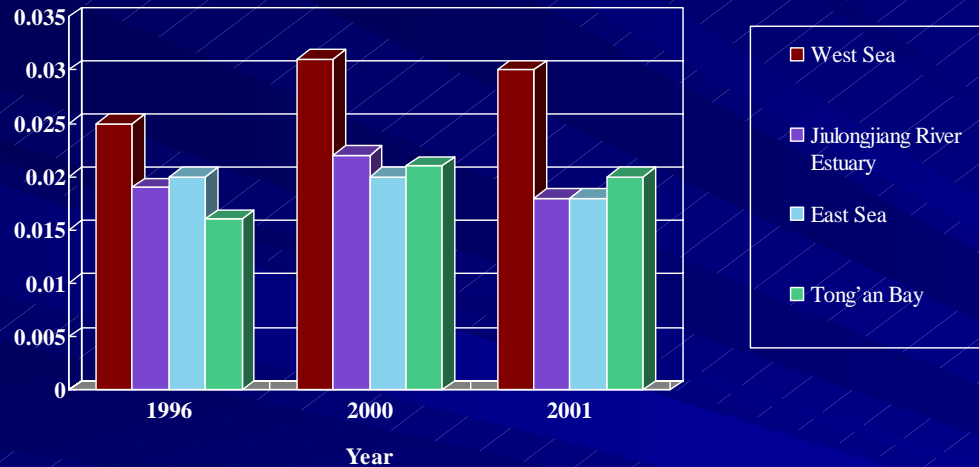


Reduce pollution from shipping

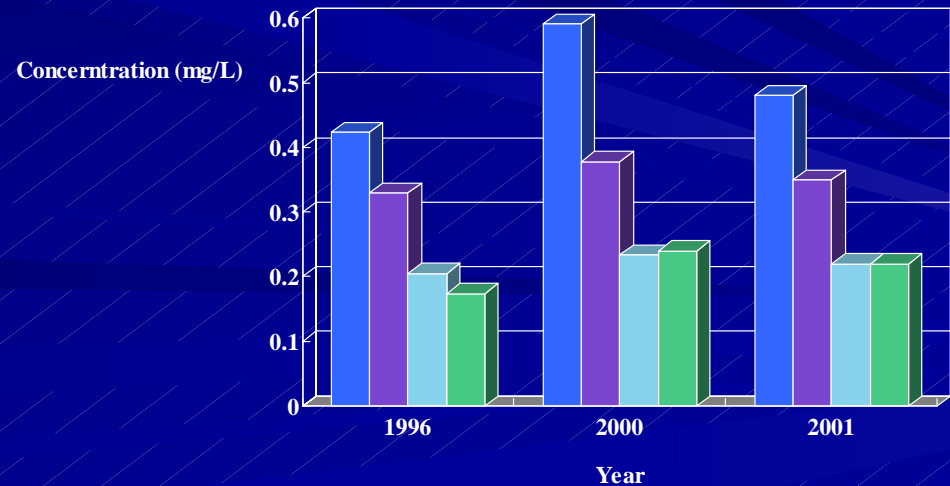


Arresting deterioration of coastal water quality despite rapid economic growth (GDP annual growth rate , in average 18.3%)

Annual Change of Activated Phosphorus



Annual Change of Inorganic Nitrogen



A State Level Marine Protected Area for Rare Marine Species



Chinese White Dolphin

Lancelet



Egret

A State Level Marine Protected Area for Rare Marine Species

Map of state level Marine Nature Reserve in Xiamen



Protecting the existing endangered mangrove ,14 hectares of mangrove have been replanted since 1994





Mangrove replantation off Qing-Jiao Village, Hai-Cang



At the same place
After more than
one year



Restoration of Marine Ecological Environment by releasing artificially hatched larvae of endangered and commercial species into the sea

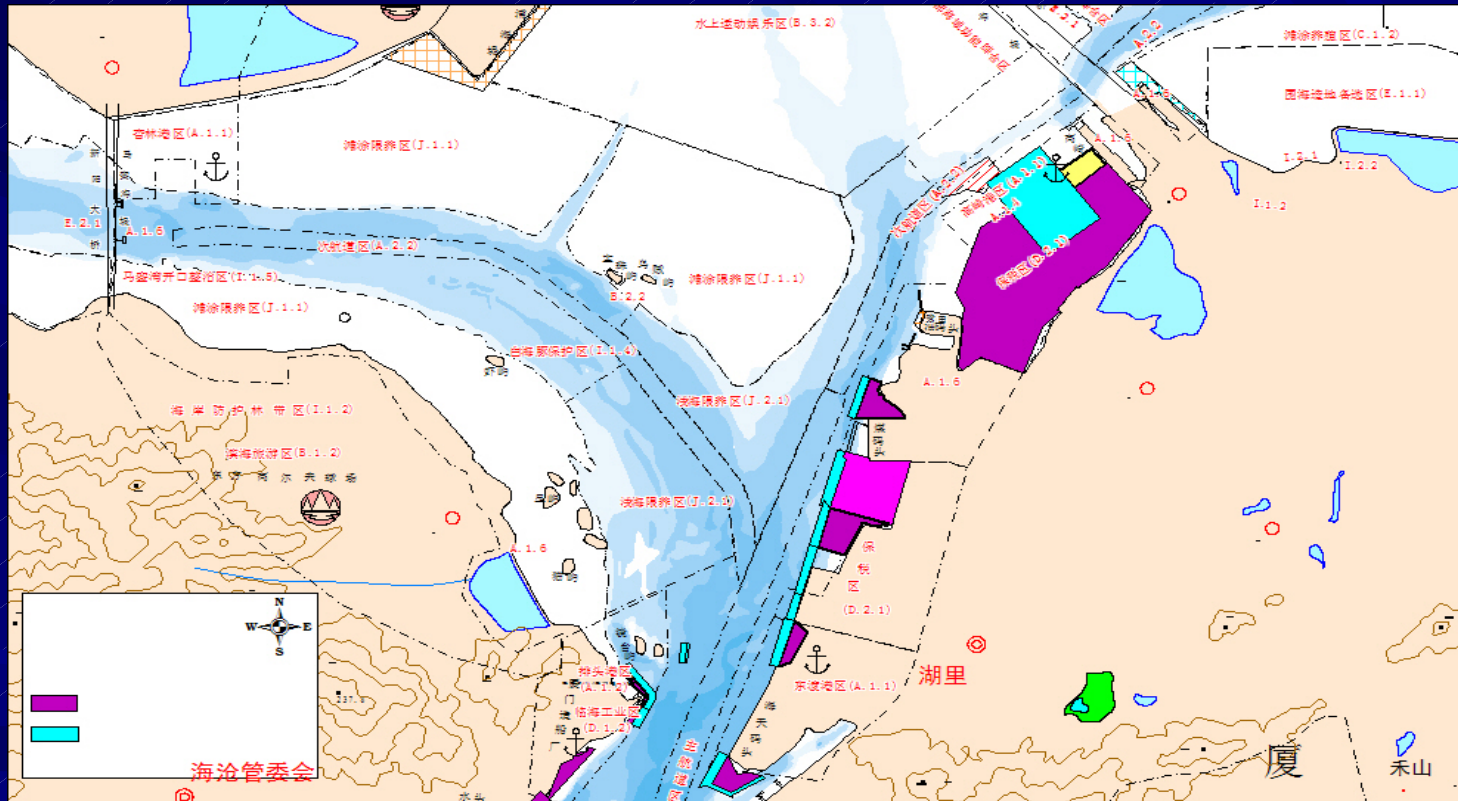


Gulangyu Island obtained ISO 14001 Certificate in 2001



Implementation of Marine Functional Zonation Scheme

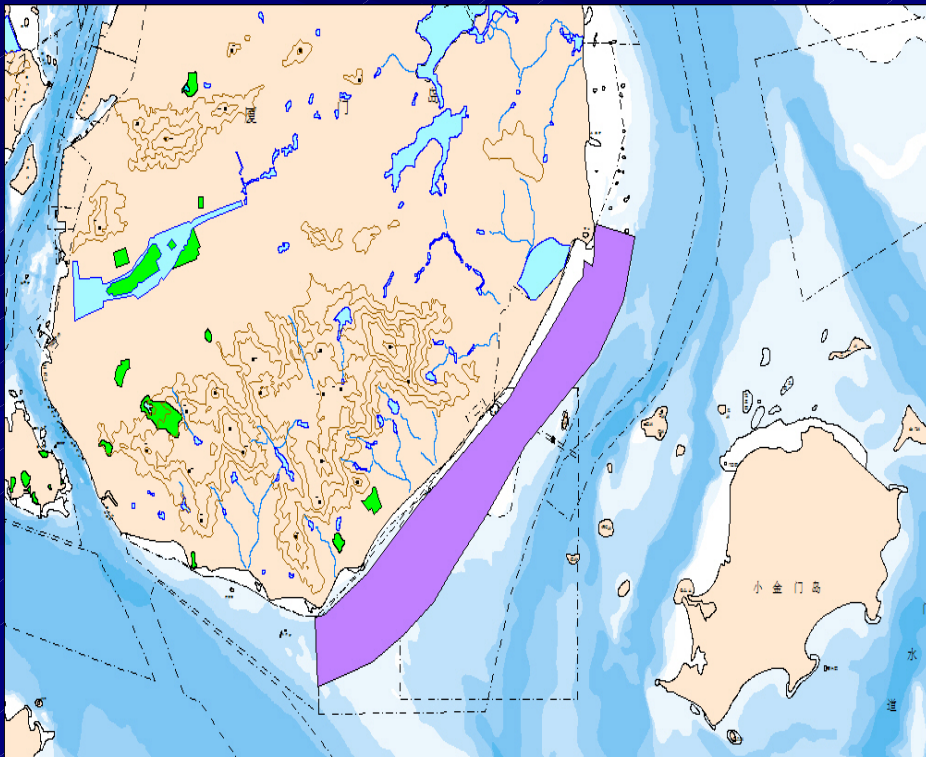
- New building projects concerning sea area use strictly follow the Marine Functional Zonation scheme



-Since 1997, all the new projects concerning sea area use are carried out in accordance with Marine Functional Zonation

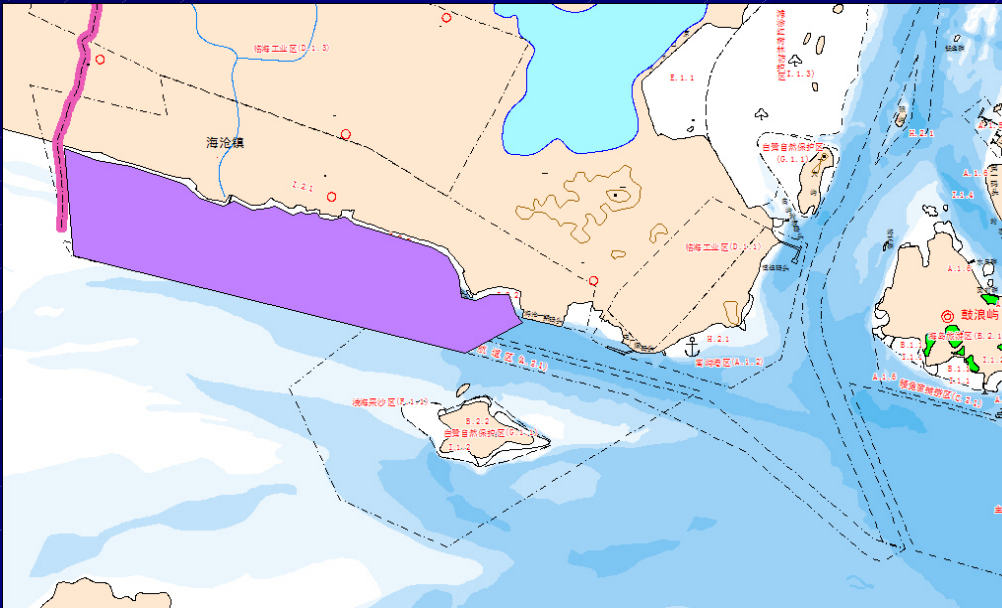
Implementation of Marine Functional Zonation Scheme

- Adjust the sea area use structure of previous projects, carry out Marine Functional Zonation Scheme
- In 1998 removed the mariculture industry out of the Eastern Sea Area and replaced it by tourism industry



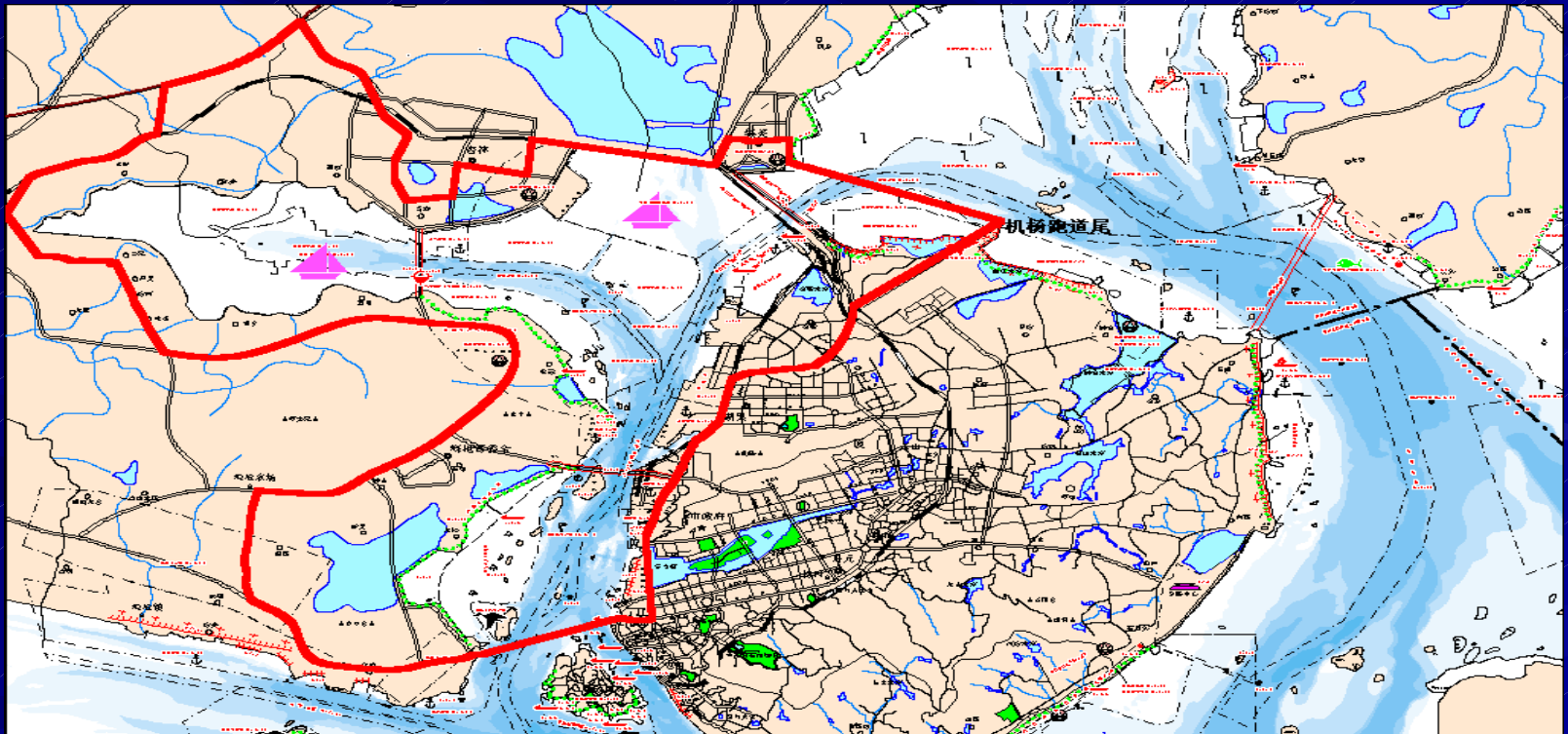
Implementation of Marine Functional Zonation Scheme

- Adjust the sea area use structure of previous projects, carry out Marine Functional Zonation Scheme
- In 1999 removed the mariculture industry out of Haichang Port Area and replaced it by development of Port Industry (2.3 million containers handled, top 30 in the world)



Implementation of Marine Functional Zonation Scheme

- Adjust the sea area use structure of previous projects, carry out Marine Functional Zonation Scheme
- In 2001-2002 removed the mariculture industry out of the Western Sea Area and replaced by tourism and port industry



Reduced Externality Costs

(Million Yuan)

	Without ICM	With ICM
Fishery loss due to Pollution	29.71	0.47
Unregulated Capturing	0.70	0.08
Siltation Costs	107.55	66.20
Sea Transportation Loss due to Fisheries	10.10	1.54
Beach Erosion	1.32	0.12
Coastal Retreat	2.11	0.54
Total	151.40	68.95

Socioeconomic Benefits of ICM (1997-2001)

	Item	Without ICM	With ICM
1. Benefits	(Million Yuan)		
	Reduction of externality costs	151.40	68.95
	Benefits of economic sectors	4055.86	6788.61
	Environmental benefits	475.07	1276.21
2. Costs			
	Present value of costs	41.79	126.79
3. Net benefits*	NPV	4337.74	7869.1

Ecological environmental Benefits of Integrated Treatment of West Sea

Benefits (10 thousand Yuan)	
Pollutant reduced	1580 per year
Value of Landscape	14763 per year
Boatable Water	6171 per year
Swimmable water	6434 per year
Real asset Value	20542 per year
Costs (10 thousand Yuan)	
Fisheries Loss	5780 per year
Management Costs	400
Loss of fisheries infrastructure	23261
Engineer Costs	7000
NPV: 5.24 billion (2001-2020)	



The names that Xiamen has obtained

“State Health City”

“State Gardening City”

*“State Model City in
Environmental Protection”*

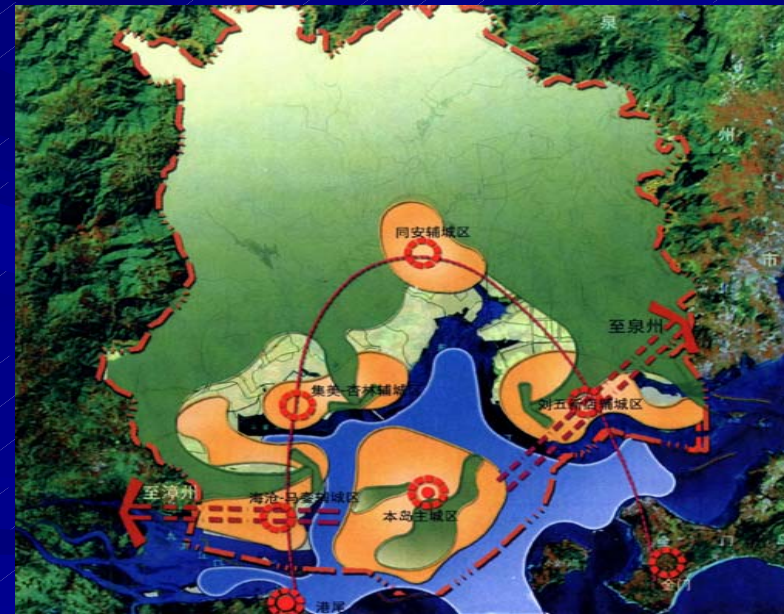
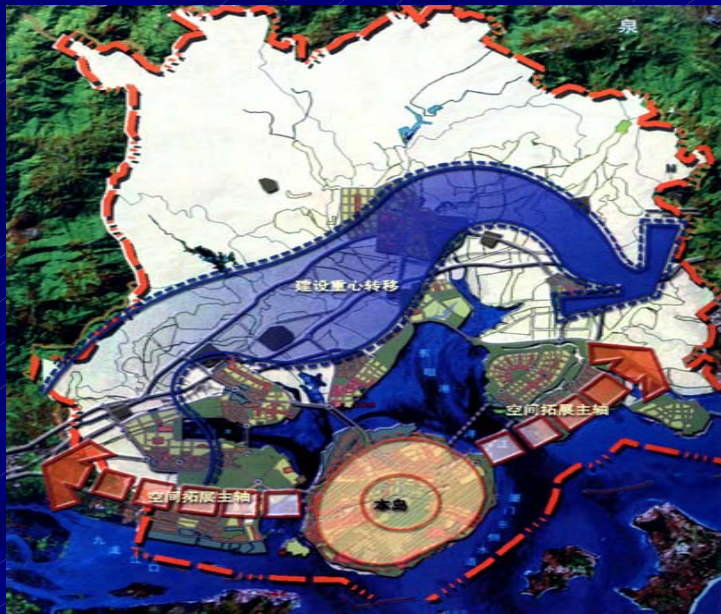
*“State Model City in
Tourism”*

*“Top Ten Inhabiting Cities
in China”*

*“United Nations Habitat
Award”*

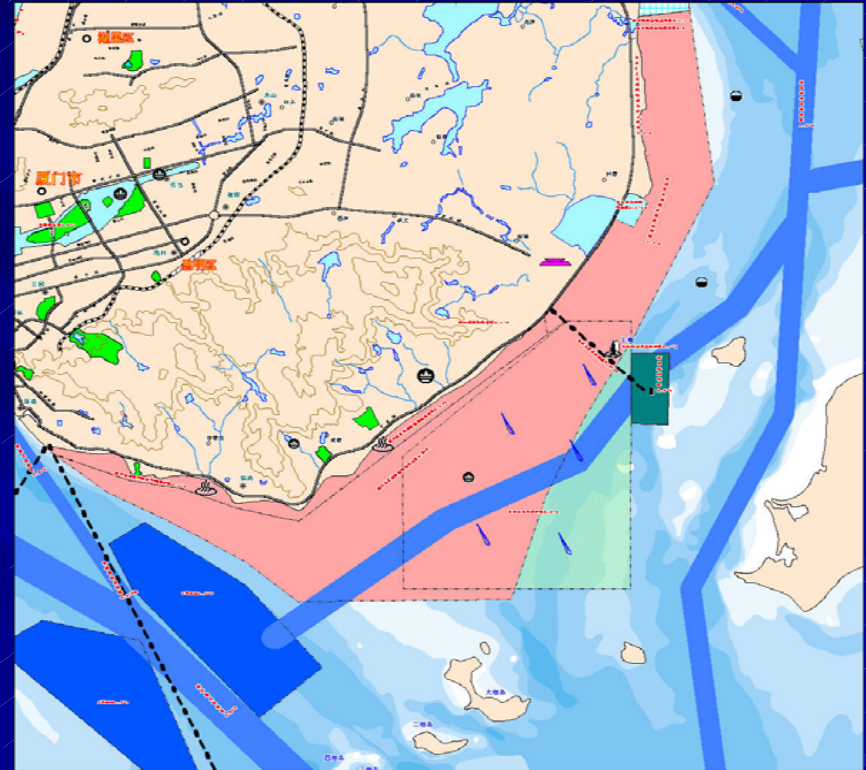
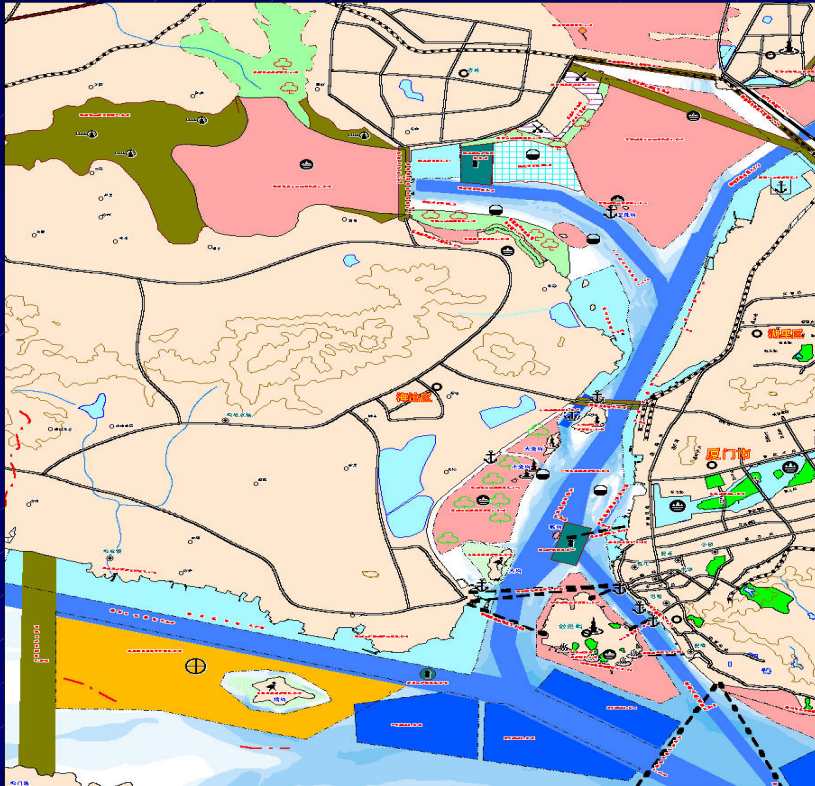
Next phase ICM planning and implementation

- Revision of Marine Functional Zonation Scheme
- The Marine Functional Zonation Scheme is revised in accordance with its working schedule and development needs (in about every 5 years)



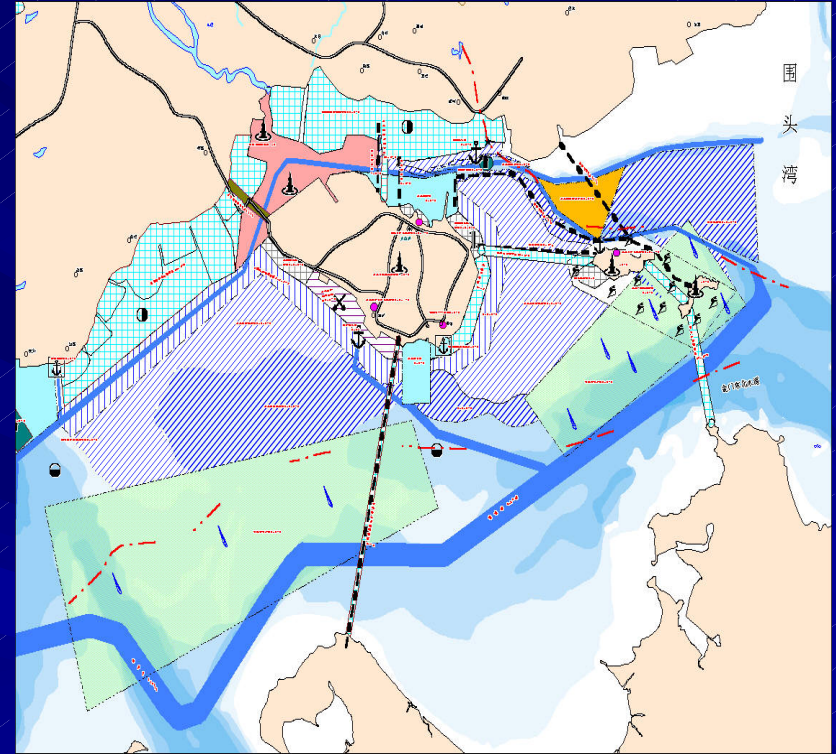
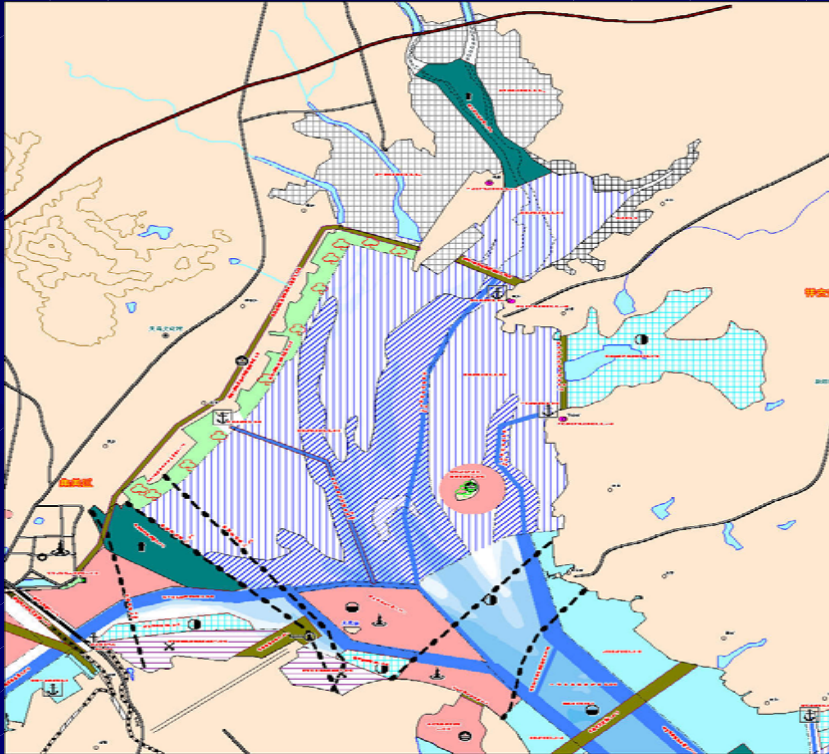
Map Illustrating Xiamen's Future Urban Development

■ The New Marine Functional Zonation Scheme had been formulated in 6,Nov,2003



The new Marine Functional Zonation Scheme in western and eastern sea area

- The New Marine Functional Zonation Scheme had been formulated in 6,Nov,2003



The new Marine Functional Zonation Scheme in Tongan Bay and Dadeng area

Next phase ICM planning and implementation

☞ Jiulong River Estuary Management Framework



Next phase ICM planning and implementation

The Strategic Plan of Second Cycle ICM programme in Xiamen

The project intends to establish an Integrated Coastal Management action plan, which includes PEMSEA demonstration project, to determine the overall objective and specific objectives of Integrated Coastal Management in Xiamen before 2010, to develop the relative projects arrangements. The action planning will be adopted as guideline for the Xiamen ICM Project before 2010.

Next phase ICM planning and implementation

ICM System ISO 14001 Certification

◆ The objectives of this project is to analyze the gap between Xiamen's existing coastal integrated management and ISO14000, to solve key technical problems for the establishment of coastal environmental management system, and to provide technical supports and management model for the establishment and implementation of coastal environmental management system.

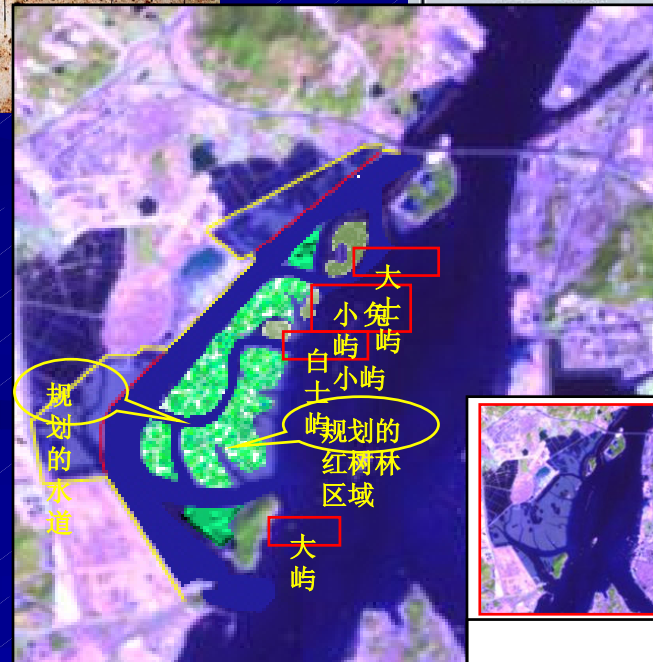
Next phase ICM planning and implementation

Marine Environment Rehabilitation of Western waters in Xiamen

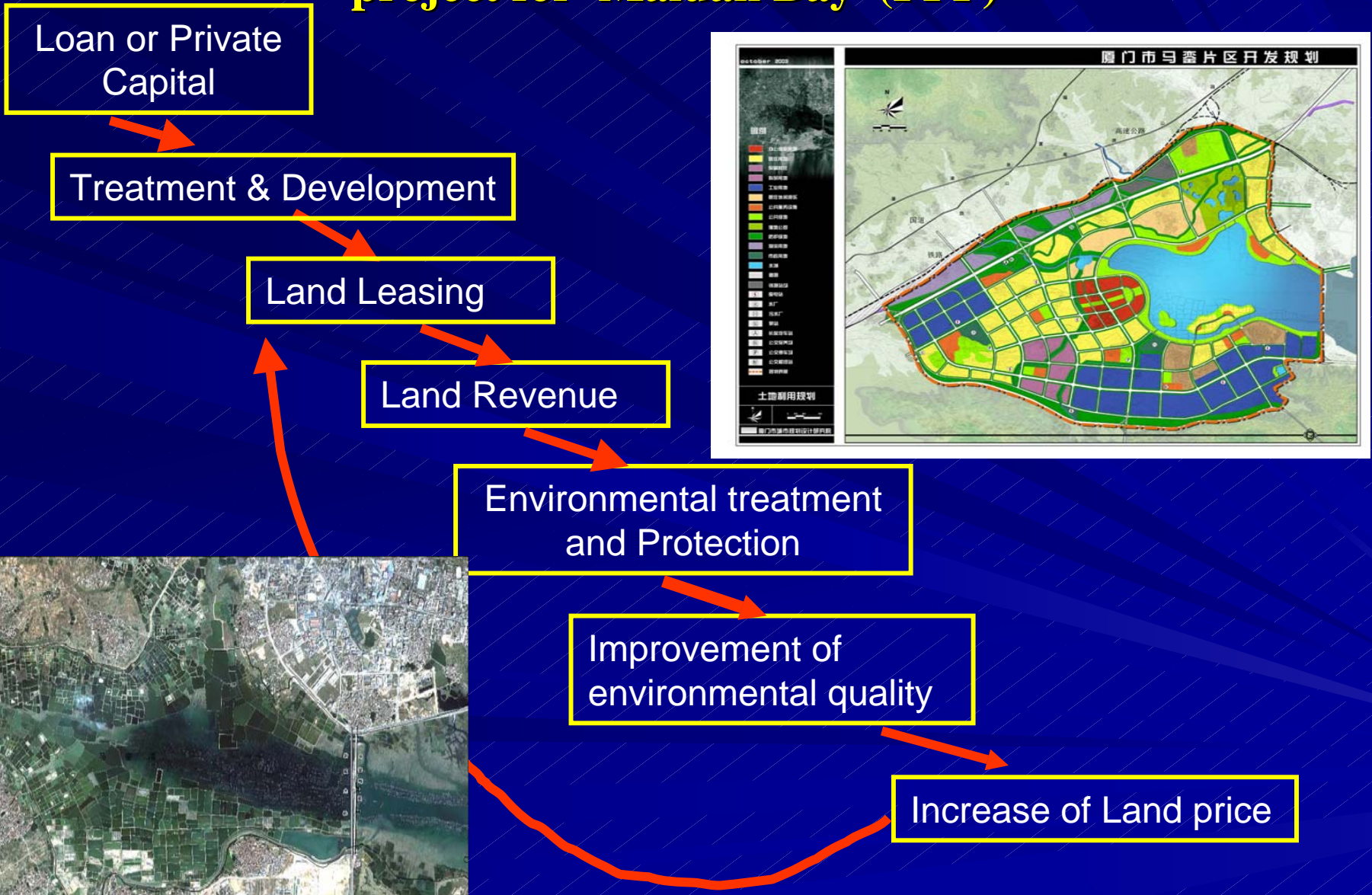
- ◆ To restore those key environment like mangrove habitat, the estuarine wetland at Xibin, the intertidal zone and swamp, the island and rock-reef (including populated island) and natural coastlines.
- ◆ To restore the biological diversity to maintain the ecological balance (including the protection of the rare species, artificial fishery enhancement and releasing artificially hatched larvae of commercial species, the artificial enhancement of shellfish spats by artificial releasing)
- ◆ To control pollution in order to improve the coastal water environment quality and to carry out the “Blue Sea Program” in order to enhance marine environment capacity.
- ◆ To establish the ecosystem supervising system.

Next phase ICM planning and implementation

Marine Environment Rehabilitation of Western waters in Xiamen



Intergrated Environmental Management and Development project for Maluan Bay (PPP)



Intergrated Environmental Management and Development project for Maluan Bay (PPP)

Overview of the Investment

Total Estimated Investment	US\$394 million
Proposed Investment Arrangements:	
Private Sector Investors:	31%
Others (ADB; Domestic Banks; Local Land Development Consortium):	69%
Proposed Partnership Arrangement:	Negotiable
Duration of Project:	8 years
Payback Period:	6 years
Financial Internal Rate of Return (after taxes):	14.78%
Source of Revenue:	Sale of land; land development

PEMSEA
INVESTMENT
OPPORTUNITY
BRIEF



Integrated Environmental Management and Development Project for Maluan Bay

Xiamen Municipal Government
Xiamen, PR China

August 2003

GEF/UNDP/IMO Regional Programme on Partnerships in
Environmental Management for the Seas of East Asia (PEMSEA)
and
Municipal Government of Xiamen

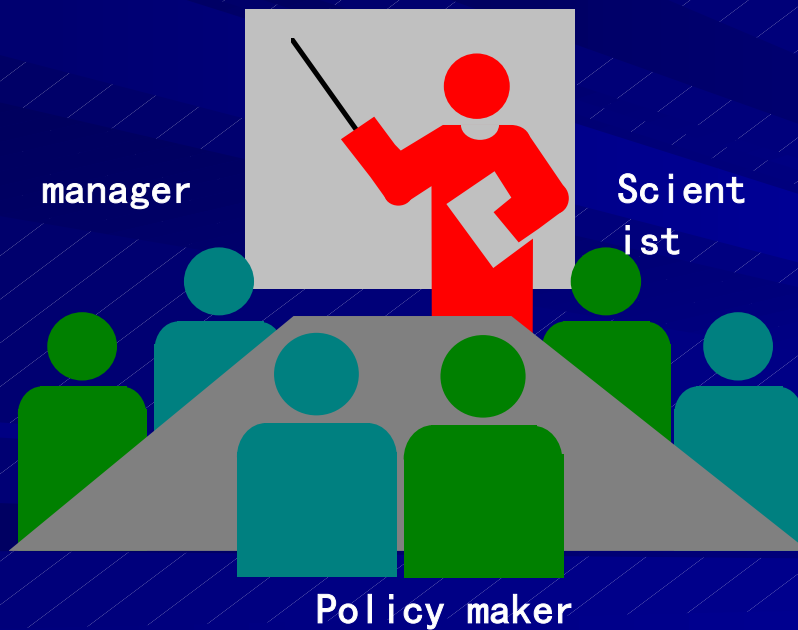


Intergrated Environmental Management and Development project for Maluan Bay (PPP)



International (Xiamen) Coastal Sustainable Development Training Centre(2001)

👉 Core staff training



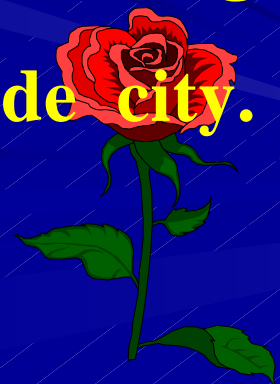
- Xiamen University
- Municipal Government
- SOA
- PEMSEA

Lessons Learned: Sustainability

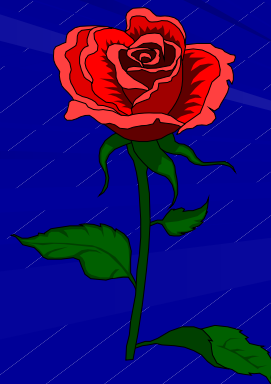
A local government level ICM program can be sustainable if:

- Program benefits the economic, social and ecological environment
- Political willingness is strong
- The management body is made part of the permanent organizational structure of the government
- Scientific basis is sound
- Public awareness is high

The past experiences and lessons have proved that marine environmental protection and ocean economic development can not only coordinate each other but also bring out the best in each other. We are determined to adhere to the road of sustainable development and further strengthen integrated coastal and ocean management work in building Xiamen into an ecologically-sound bay-wide city.



We will continue to implement the second round of the ICM Program and strengthen exchange and cooperation with the relevant international organizations and various governments in the East Asia as well as specialists of integrated coastal zone management for the enhancement of integrated coastal zone management.



Thanks!

