

## 2.5 2nd seminar in SKP

### **2nd Seminar for Provincial Natural Resources and Environmental Quality Management Plan in SKP**

March 12, 2008  
Provincial Environmental Office in AYP  
Office of Natural Resources and Environment  
Policy and Planning (ONEP/MNRE)  
JICA Study Team  
for the Study on Supporting System for Administrations on  
Natural Resources and Environmental Management in the  
Kingdom of Thailand

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### **Agenda**

1. Framework of PEQMP
2. Selection of Priority Issues
3. Explanation of Current Situation, Issues, and Measures on Priority Issues
4. Priority Projects in PEQMP

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### **Contents of PEQMP**

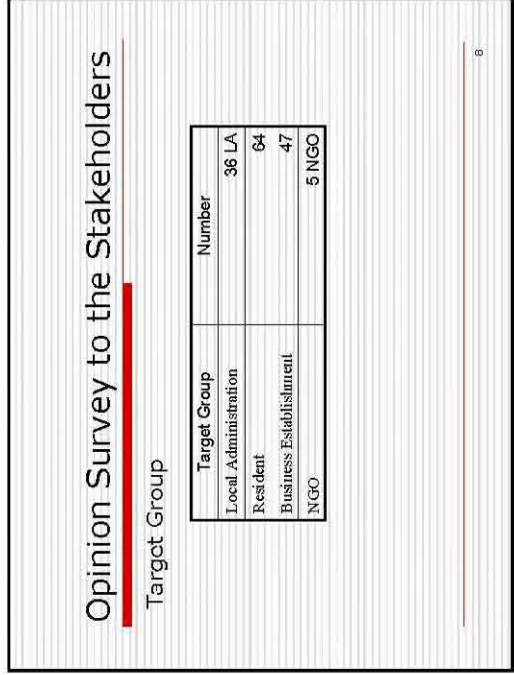
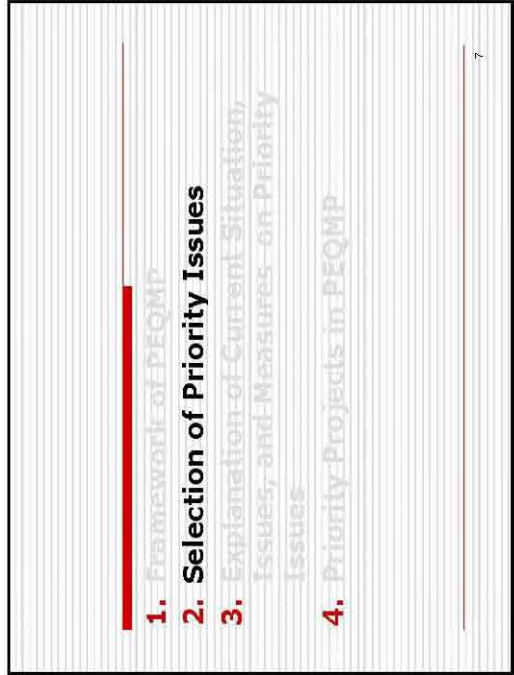
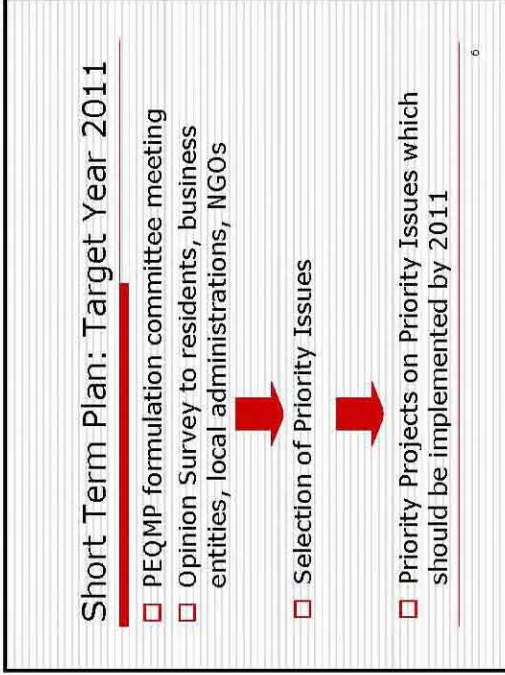
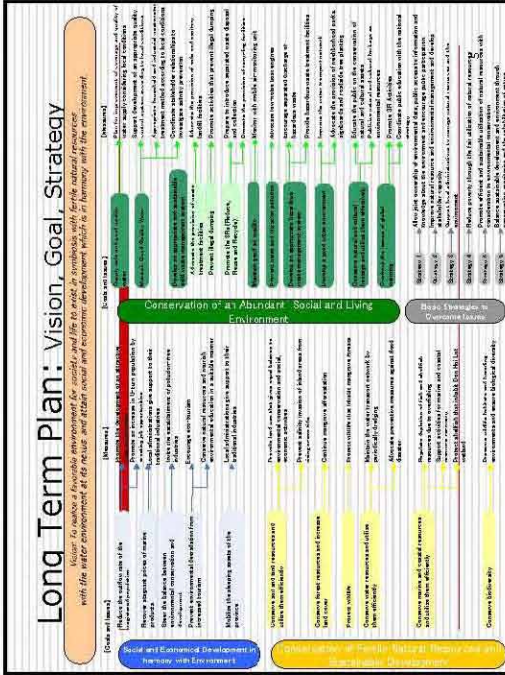
1. Situation of Natural Resources and Environment
2. Impact Analysis
3. Issues
4. Measures to be taken
  - Long Term Plan
  - Short Term Plan

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### **1. Framework of PEQMP**

2. Selection of Priority Issues
3. Explanation of Current Situation, Issues, and Measures on Priority Issues
4. Priority Projects in PEQMP

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## Problems of NREM

Group	Most Serious Problem	Reply Rate (%)	Second Serious Problem	Reply Rate (%)
L.A	Marine/Coastal/Fishery Resources	38.9	Solid Waste Management	27.8
Residents	Marine/Coastal/Fishery Resources	25.0	Global Warming	23.4
Business Establishment	Marine/Coastal/Fishery Resources	25.5	Global Warming	17.0
NGO	Marine/Coastal/Fishery Resources	100.0	• Solid Waste Management • Water Quality	80.0 80.0

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## Reasons for Selecting Most Serious Problems

Most Serious Problem	Item	Reason
Marine/Coastal/Fishery Resources	<ul style="list-style-type: none"> <li>Disordered and illegal fishing methods</li> <li>Decrease of fishery resources</li> <li>Over-harvesting of Razor clam</li> <li>Coastal erosion</li> <li>Too many tourists</li> </ul>	<ul style="list-style-type: none"> <li>Extreme decrease of fishery resources and less income for fishermen</li> <li>Extreme reduction of Razor clam</li> <li>Loss of land</li> <li>Deterioration of natural environment</li> </ul>

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## Reasons Selecting Second Serious Problem

Second Serious Problem	Item	Reason
Solid Waste Management	<ul style="list-style-type: none"> <li>Improper treatment of huge amount of solid waste.</li> <li>Improper management of transfer station by private company</li> <li>Dumping waste into waterway</li> <li>Rise in temperature</li> </ul>	<ul style="list-style-type: none"> <li>Occurrence of serious environmental problem</li> <li>obstacles to fishery</li> </ul>
Global Warming		<ul style="list-style-type: none"> <li>Averse impact on agriculture</li> <li>Decrease of fishery resources</li> <li>Change of season</li> <li>Influence on Health</li> </ul>
Water Quality	<ul style="list-style-type: none"> <li>Polluted water flowing from neighbouring provinces</li> <li>Polluted water flowing from fishery ponds</li> </ul>	<ul style="list-style-type: none"> <li>Decrease of fishery resources</li> <li>Averse impact on agricultural land</li> </ul>

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## Priority Examined in SWOT Analysis

- The PEQMP-KPI Formulation Committee was held at the SKP Conference Room on the 2 of July 2007 chaired by the Governor
- SWOT Analysis was conducted with 70 relevant participants directed by a moderator from Mahidol University

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## Priority Issues on Natural Resources in SKP discussed in SWOT Analysis Meeting

Priority	Problem	Suggestion for Measurement and Solution
1	Amount of aquatic animals is decreasing	<ul style="list-style-type: none"> <li>• Build habitat (or sea turtle, critical) coral</li> <li>• Release freshwater aquatic species into natural water sources</li> <li>• Encourage people and fishermen to participate in protection (e.g. support creation of fishermen voluntary network in all areas)</li> </ul>
2	Deteriorated soil	<ul style="list-style-type: none"> <li>• Reduce the use of chemical fertilizer</li> <li>• Promote the use of biological organic fertilizer</li> <li>• Provide knowledge on soil conservation</li> </ul>
3	Water Monitor lizard call villages' network	<ul style="list-style-type: none"> <li>• To have response list office for solving water monitor in control area</li> <li>• Propose the responsible office to change law on water monitor as preserved animal</li> </ul>
4	Lack of water for farms to use, unsuitable and agriculture	<ul style="list-style-type: none"> <li>• Expand water supply to cover whole area</li> <li>• Repair/maintain water supply system</li> <li>• Build a new water preservation bank (e.g. water control facility, etc.) gathering water from all sources in order to operate properly and deal with area needs</li> <li>• Advise on homestead, the development and sense of identity</li> <li>• Promote a strong economy</li> </ul>
5	Land area is too sparse	

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## Priority Issues on Environment in SKP discussed in SWOT Analysis Meeting

Priority	Problem	Suggestion for Measurement and Solution
1	Unrecycled waste	<ul style="list-style-type: none"> <li>• Promote waste separation</li> <li>• Reduce waste generation</li> <li>• Increase capacity of collection and disposal</li> </ul>
2	Wastewater	<ul style="list-style-type: none"> <li>• Construct proper wastewater treatment system for the area</li> <li>• Create awareness so people do not pollute natural water sources with waste and night soil</li> </ul>
3	No waste disposal site	<ul style="list-style-type: none"> <li>• Building acceptance among local people</li> <li>• Provide quality management by government</li> </ul>
4	Household hazardous wastes	<ul style="list-style-type: none"> <li>• Promote waste separation</li> <li>• Provide guideline in integrated disposal system</li> </ul>
5	Unordered advertising billboards	<ul style="list-style-type: none"> <li>• Strict and serious enforcement of law</li> <li>• Survey on advertising billboards in the province</li> </ul>
6	Noise loudness is over standard	<ul style="list-style-type: none"> <li>• Set standards for boat engines used for tourism</li> <li>• Change engines of tourist boats to be within noise standards</li> </ul>
7	Infectious waste from hospitals/clinics	<ul style="list-style-type: none"> <li>• Collect and dispose waste properly</li> </ul>

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## Examination of Priority

- Since natural resources and environmental management consists of many sectors, it is quite **difficult to give priority** to numerous projects in different sectors
- Furthermore, a **huge amount of money has to be invested** in each project for each sector.
- Therefore, **sufficient survey, research and planning** should be conducted in each sector fast.
- The priority among projects should be decided **after the master plans of each sector** with quantitative analysis is studied made and looked at thoroughly in comparison.

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## Selection of Priority Programme

- **Sector Improvement**
  1. Conservation and Rehabilitation of Aquatic Resources
  2. Appropriate and Sustainable SWM
  3. Safe and Qualified Water Supply
  4. Water Quality Preservation in Public Water Bodies
- **Strengthen Provincial NREM**
  1. Strengthening Linkage between Central/Local Administration on NREM
  2. Supporting Plan for Improvement of Administration Capacity of Central/Local Government on NREM

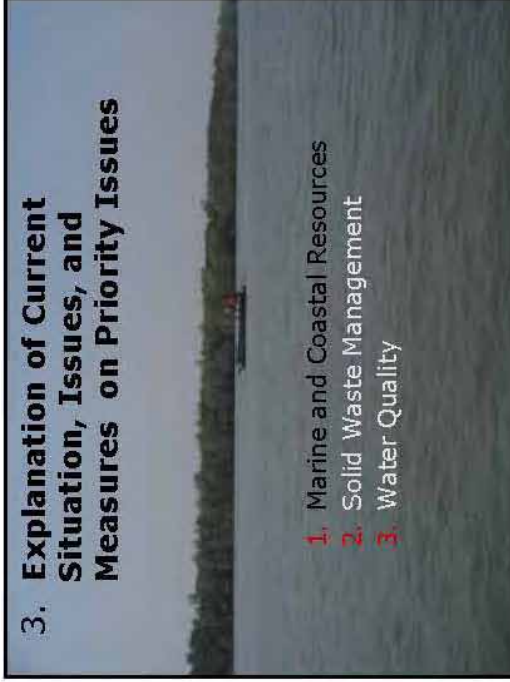
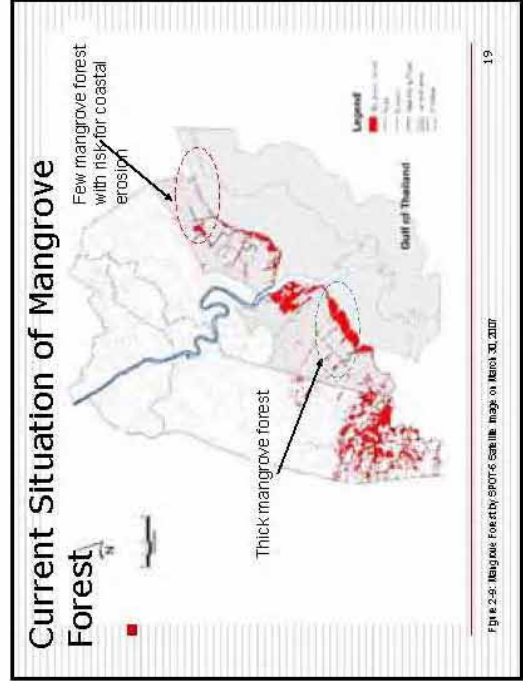
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**1. Framework of PEQMP**  
**2. Selection of Priority Issues**  
**3. Explanation of Current Situation, Issues, and Measures on Priority Issues**  
**4. Priority Projects in PEQMP**

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**3. Explanation of Current Situation, Issues, and Measures on Priority Issues**

1. Marine and Coastal Resources
2. Solid Waste Management
3. Water Quality

**Change of Mangrove Forest Area**

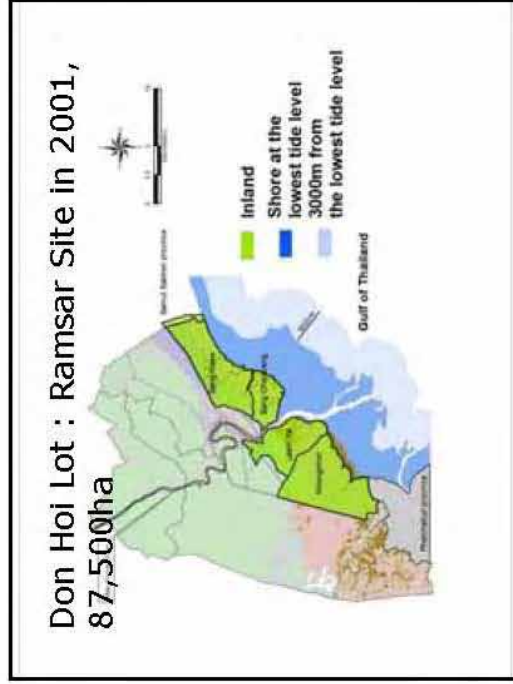
Land use	March 30, 1988		January 2, 1997		February 15, 2007	
	Area Km2	%	Area Km2	%	Area Km2	%
Urban and built up land	12.09	2.93	21.85	5.33	22.14	5.37
Agricultural Land	235.08	56.97	220.48	53.75	223.98	54.37
Aquaculture Area	95.38	23.11	104.32	25.43	100.6	24.42
Mangrove Forest	34.20	8.29	23.15	5.64	26.97	6.55
Water body	9.84	2.38	9.87	2.41	12.64	3.07
Wetland	8.77	2.13	14.93	3.64	6.2	1.50
Salt flats	17.30	4.19	15.61	3.81	19.45	4.72
Total	412.66	100	410.21	100.00	411.98	100

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### Mangrove Forest on New Mud flat Areas within Klong Khon Subdistrict, Muang District

Year	Area (km <sup>2</sup> )	Area (Rai)	% of Total Area
2002	3.68	2,300	0.88
2003	3.75	2,343	0.90
2004	3.83	2,393	0.92
2005	3.91	2,443	0.94
2006	3.99	2,491	0.96

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### Don Hoi Lot and Razor Clam

Don Hoi Lot



Razor Clam



The mudflat beach is the home to razor clams (*Solen regularis*) which are rarely found in other areas along the Gulf of Thailand so it is considered a very unique place.

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### Don Hoi Lot and Birds

*Ardeola cinnerea*



*Halicetus leucurus*



*Sterna albifrons*



*Ardeola spectiosa*



In Don Hoi Lot and nearby mangrove forest areas, at least 18 species of birds such as sea birds and mangrove birds are found.

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## Don Hoi Lot and Ecological Study



Don Hoi Lot is a suitable place for ecological study. Many schools visit the area for field trips, taxonomy data collection, ecology and evolution studies.

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## Result of Opinion Survey on Marine and Coastal Resources

Target Group	Not Serious	Not Very Serious	Some What Serious	Very Serious	Can't Choose	No Response	Total
LAs	53%	11%	14%	22%	0%	0%	100%
Resident	41%	3%	23%	14%	19%	0%	100%
BE	40%	19%	19%	11%	11%	0%	100%
NGO	0%	20%	20%	60%	11%	0%	100%

According to the opinion survey, 37% of the residents, 36% of LAs, 30% of the business establishments and 80% of NGO replied that the problems with marine and coastal resources are "Some what serious" or "Very serious"

Source: JICA, 2005 in 2007

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## Impact

- GPP of whole province is increased, but fishery in 2005 decreased to half of 2001 figures as shown in following table.

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## Change of GPP in each sector

	2001	2002	2003	2004	2005
1 Manufacturing	1,960	1,793	1,936	2,136	2,330
2 Agricultural/Hunting/Forestry	415	535	714	625	964
3 Education	760	785	778	832	928
4 Public/Social/Personal Services	668	889	800	915	902
5 Logistics/Warehouse/Communication	616	614	633	737	764
6 Public Administration	577	449	506	566	615
7 Health and Social Works	485	515	483	540	612
8 Financial	413	443	427	466	597
9 Construction	173	278	310	441	471
10 Real Estate	368	385	396	396	391
11 Fishery	658	367	334	347	356
12 Electricity/Cas/Ingrigation	226	234	246	259	265
13 Hotel/Restaurants	75	92	110	121	128
14 Quarry and Mining	61	106	59	66	71
15 Private Household/Employee	9	10	11	13	13
Total	9,872	9,722	10,351	11,502	12,489

## Catch of Fish

Type of Marine Fish	Unit: Kg		
	2004	2005	2006
Mullet	162,330	191,841	113,512
Flower Crab	425,645	385,376	116,622
Ridged Venus Clam	4,173,670	3,531,191	3,369,776
Blood Cockle	1,546,132	2,044,553	622,589
Razer Shell	94,772	95,241	132,960
Mysid	495,138	428,594	308,818
Prawn and Fish from Stow net	21,126	22,601	19,664
Undulated Surf Clam	745,600	1,944,000	1,620,000
Jellyfish	1,176,000	896,000	848,000
<b>Total</b>	<b>8,840,313</b>	<b>9,339,366</b>	<b>7,151,940</b>

Source: Provincial Fishery Office

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- All of four target groups of the opinion survey pointed out that the most serious problem of NREM in SKP is "Marine and Coastal Resources".

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## Issues

- Due to improper fishing methods and over fishing, the number of fish and shells has declined
- Tidal erosion of seashore
- Conservation of shellfish inhabiting Don Hoi Lot wetland
- Preservation of Ramsar Convention wetland site
- Conservation of mangrove forest

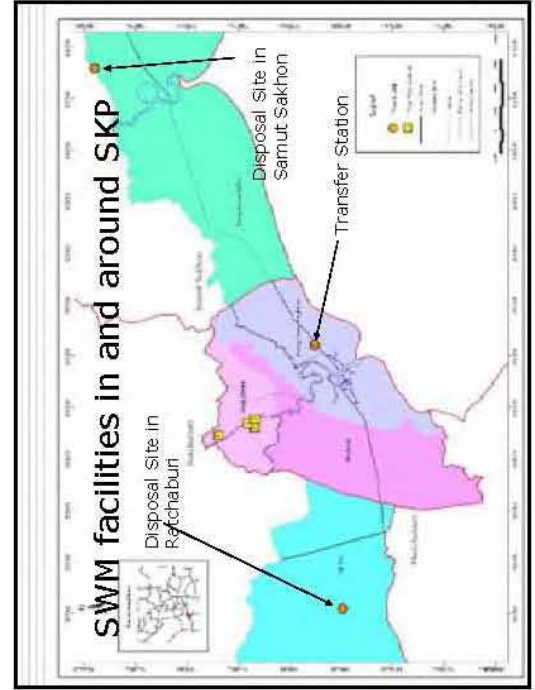
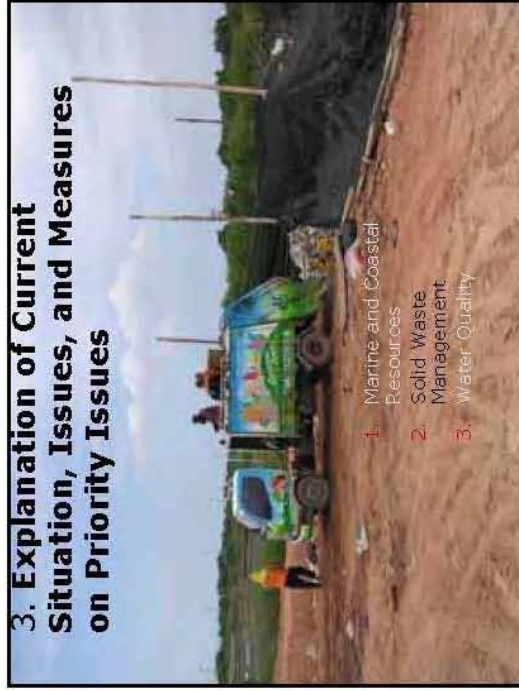
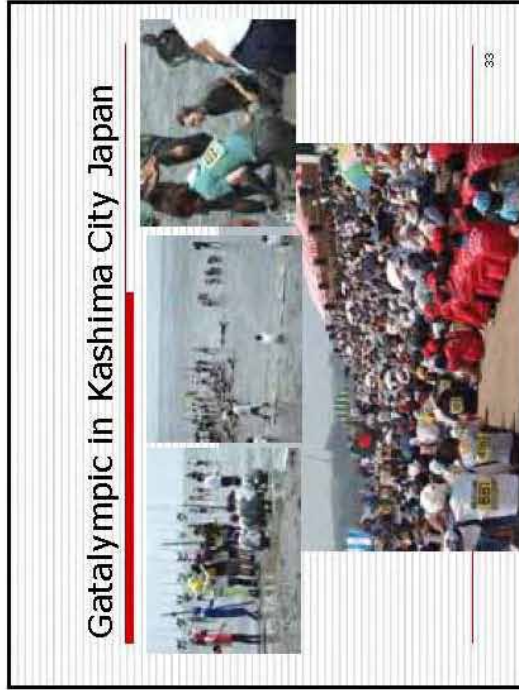
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## Measures

- Research and development of proper fishing method to prevent over fishing and guidance of proper fishing method
- Mangrove afforestation and study on coastal erosion mechanism
- Clarification and conservation of Ramsar Convention wetland area
- Provide opportunities for local people to become familiar with wetlands, such as through annual games (e.g. "Gatalympics" event played on mudflats in Kashima City, Japan)
- Enforcement to the illegal fishermen by Local Administration should be enhanced
- Support the development of voluntary network between fishermen and encourage them to be involved for conservation activities of marine and coastal resources
- Educate local people about importance and role of mangrove forests in achieving environmental conservation

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### West Generation Amount

Item	Unit	Tessaban	Oronbor	Total
Waste Generation	(t/day)	41.3	75.9*1	117.2
Population in 2005	(Person)	43,184	151,884	195,068
Waste Generation Rate	(kg/day/pers on)	0.956	0.500	0.601

\*1: estimated from waste generation rate.

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## Waste Collection Rate

Item	Tessaban		Orbitor		Total	
	Ton/day	%	Ton/day	%	Ton/day	%
Waste Generation	41.3		75.9		117.2	
Waste Collection	38.5	93%	61.5	81%	100	85.3%
Uncollected Waste	2.8	7%	14.4	19%	17.2	14.7%

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## Transfer Station in Tambon Bang Keaw



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## Closed Final Disposal Site

- ❑ There is one final disposal site, which is now closed, in Tambon Ladjai in Amphoe Mueang
- ❑ This disposal site has an area of 60 rai and was constructed in 1997 using the subsidy Environmental Fund of MOSTE (former MNRE)
- ❑ Operation of the disposal site was stopped in 2001 due to protest from neighboring residents.

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## Closed Disposal Site in Tambon Ladjai



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Disposal Site in Ratchaburi

### Result of Opinion Survey

Target Group	Not Serious	Not Very Serious	Some What Serious	Very Serious	Can't Choose	No Response	Total
LAs	14%	31%	28%	28%	0%	0%	100%
Resident	50%	23%	23%	3%	0%	0%	100%
BE	51%	13%	23%	11%	2%	0%	100%

According to the interviews in the JICA study, 73% of the residents, and 64% of business entities replied that problems with waste management are "Not serious at all" or "Not very serious". On the contrary, 56% of the LAs replied that the problems with waste management are "Very serious" or "Somewhat serious".

Source: JICA/INHA, 2009

### Specific Aspects and Reason why Solid Waste is very serious problem

Target Group	What aspects	Reasons why very serious
LAs	Tons of garbage are not managed properly	Caused serious environmental problems
	Individual contractor dose not manage the transfer station properly.	Caused serious environmental problems
Residents	Dump garbage into canals	Caused water pollution
	Tons of garbage are not managed properly	Caused serious environmental problems
BE	Dump garbage into canals	Caused water pollution
	Tons of garbage are not managed properly	Caused serious environmental problems

### Future Generation Amount

Year	Population		Generation amount of Municipal Waste		
	Tessabani	Orboritor	Tessabani ton/day	Orboritor ton/day	Total ton/day
2005	43,184	151,864	41.3	75.9	117.2
2006	42,486	149,759	40.6	74.9	115.5
2007	41,862	147,560	40.0	73.8	113.8
2008	41,238	145,361	39.4	72.7	112.1
2009	40,614	143,162	38.8	71.6	110.4
2010	39,991	140,962	38.2	70.5	108.7
2011	39,367	138,763	37.6	69.4	107.0