

Marine Debris Management : Case of Korea

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I. Case Study : Damage Caused by Marine Debris

❑ Accident of Passenger Ship M/V Seo-Hae Ferry

➤ Vessel Particular

110G/T, Eng : 500HP, Age : 4 years,

Max. onboard persons ; 221(passenger : 207, crew : 14)

➤ Accident details

- 10/10/1993, just off West coast of Korea, 362 onboard (passenger 141 overload)
- wind 5.5m/sec, wave 2m, current 0.46knots
- Capsized and sunken
- 292 death toll, 70 saved



❑ Accident of Passenger Ship M/V Seo-Hae Ferry

➤ Cause of the accident

- News reports before refloatation : overload
- MAIA report after refloatation : overload & derelict fishing ropes
- Nylon rope(10mm diameter) coiled both shafts and right side propeller, vessel suddenly turned right side and capsized



❑ Maritime Accident Caused by Marine Debris

➤ Marine accidents (Jung. 1999)

	eng.trouble	disaster	operation delay	propeller damage	sub total	total accident	ratio(%)
1996	7	1	41	18	67	661	10.1
1997	6	12	33	18	69	840	8.2
1998	2	9	37	20	68	772	8.8
total	15	22	111	56	204	2,273	9.0

➤ Loss of fishery production (Questionnaire & interview by KRISO, 1999)

- Loss of the production : 10~30%
(fishes : 10~20%)
(shellfish & seaweed : 20~30%)



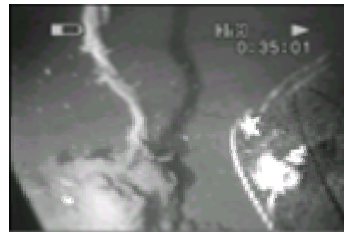
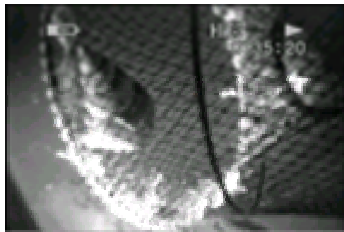
❑ Ghost Fishing

➤ Where : Ool-Jin, East Coast

Depth : 350m

➤ Problems : Derelict fishing gears make another derelict fishing gear

➤ Pic. 1, 2, 3, 4, : 10/8/2003, Ooljin



II. Marine Debris Management Policy at a Local Level - Case of Incheon City -

□ Marine Debris Statistics Surveyed

- **Period : 4/23/2001-12/26/2001**
- **Geographical Scope : Incheon Coastal Area, 500,000ha**
- **Purpose**
 - How much from River Han?
 - How much budget needed to collect deposited marine debris?
- **Deposited Marine Debris :**
 - 194,000m³ or 97,000ton
 - Most : derelict fishing gear
 - Part : land based marine debris



❑ Marine Debris Statistics Surveyed

➤ from River Han per year :

	TTL	vinyl& plastic	net	bottle	rubber	styrofoam	woods	etc
input (m³)	191,273	52,059	16,971	3,375	6,633	8,001	96,135	8,099
ratio (%)	100	27.2	8.9	1.8	3.5	4.2	50.3	4.2

❑ MOU for Fund Raising between Incheon, Seoul, Kyungki Province

➤ Budget allocation by Population & Q'ty of Marine Debris

Incheon	Seoul	Kyungki	total
50.2%	22.8%	27.0%	100%
1st phase	('01-'02)	3.5biWon	USD 2.9mi
2nd phase	('02)	5.0biWon	USD 4.2mi
	('03)	5.0biWon	USD 4.2mi
	('04)	5.0biWon	USD 4.2mi
	('05)	5.0biWon	USD 4.2mi
	('06)	5.0biWon	USD 4.2mi
total		28.5biWon	USD 23.9mi

❑ Subsidy for Marine Debris Management

➤ Coastal Cleanup Subsidy

- Reciver: Local Government
- Year 2002 : 0.8biWon
- Year 2003 : 1.3biWon

➤ Incentive Program

- Fishermen who collect marine debris during fishing operation
- Objects : Derelict Fishing Gear including other ship based marine debris
- Purchasing Subsidy : 6,000Won/40ℓ(bag)



- 2002 : 380m³(212ton)

(unit : milWon)

- 2003 : 882m³(264ton)

(unit : milWon)

- Cost reduction effects : 9.8~17.6 times

Subdy : 6,000Won/40ℓ

Gov't Collection : 58,000~105,800/40 ℓ

- Pic. 1, 2, 3, 4, 5, 6





❑ Collection by Floating Fence in Rainy Seasons

- Where : mouth of River Han
- Fleet : 1 barge, 1 tugboat, 1 assistant vessel, 2 cleaning vessels, 1 crane
- 2002 : 162 tons, 743miWon
- 2003 : 284 tons, 1,485miWon
- Pic 1. 2, 3, 4, 5, 6





❑ Collection by Deposited Marine Debris

- Quantity estimated : 190,000m³(97,000ton)
- Fleet : 1 barge, 1 tugboat, 1 crane, 3 fishing vessels, 1 cleaning vessel, 1 assistant vessel

year	cost	area	collection
2002	1,561miWon	3,646m ³	1,713ton
2003	1,600miWon	1,734m ³	867ton

- Pic 1, 2, 3, 4, 5, 6





III. Marine Debris Management Policy at the National Level

❑ Collection of Marine Debris

➤ Allocation of the Budget for Marine Debris Management

project	allocation	Implementing organization	remark
collection of deposited marine debris	central govt 100%	private company	
R&D	central govt 100%	research institute	
multi-purpose vessel operation	central govt 100%		owned & operated by central govt
styrofoam volume reduction system	central govt 80%	local governments	
collection of deposit derelict fishing gear	central govt 80% local govt 20%	local governments	

➤ **Survey of Deposited Marine Debris**

- 1999~2000
- 146 areas : ports, fishing ports, etc

➤ **Scheduled surveys**

- 2003~2007
- Major fishing area and areas within EEZ



❑ Collection of Deposited Marine Debris

- Where : commerical ports and major fishing ports(1999~).
from 2002:
 - Major fishing grounds(Yellow Sea : blue crab fishing ground,
East Sea : king crab fishing ground)
 - Derelict fishing gear
- Commercial ports and major fishing ports will be completed
by 2005
from 2004 : EEZ will be included
- Results :

	total	1999	2000	2001	2002
quantity(ton)	34,735	1,135	12,687	10,798	10,112
cost(biWon)	28.5	0.5	10.0	9.0	9.0

➤ **Collection of Floating Marine Debris**

- Where : commercial ports and fishing ports
- By 28 cleaning vessels

➤ **Dredging of Aquaculture Areas**

- When : 1986~2001
- How much : 140,628miWon, 272,349 tons of sediments



❑ Incentive Program

- Fishermen who collect Marine Debris during Fishing Operation
- Where : beyond 12miles from coastal line
 - '03 : Vessels registered in Busan, Yeosoo, Mokpo→'04: 12 ports
 - '03 : beyond 12miles from coast→'04: within/beyond 12miles
- Objects : Derelict Fishing Gear including other ship based marine debris except food
- Purchasing Subsidy : 4,000W/40ℓ(bag) = 13~14kg
- Fund raising
 - MOMAF : 80%, Local Govt : 20%



IV. Public Outreach Programs

□ Training workshops

- Eight workshops from 2001 to 2003
- 30~50 NGO leaders, volunteers, government officials and researchers
- Topics covered
 - Scientific understanding of marine environment and pollutants
 - International trend in marine environmental management
 - National policies and strategies for marine environmental conservation



❑ Training workshops

- Education and public information program to raise public awareness
- Results of monitoring marine debris and their policy implications
- Establishment of a partnership organizations among local stakeholders, governments, and researches
- International Coastal Cleanup site captains training



□ National Monitoring on Marine Debris

- Twenty three NGOs participated**
- Monthly monitoring from Aug. 2000 to Dec. 2001;
Monthly or seasonal since 2002 at twenty coastal sites**
- Identification of and measurement of quantity
collected in weight and number**



❑ National Marine Debris Monitoring

- Site location and beach marks
- Standardized amount of debris cleaned at twenty sites

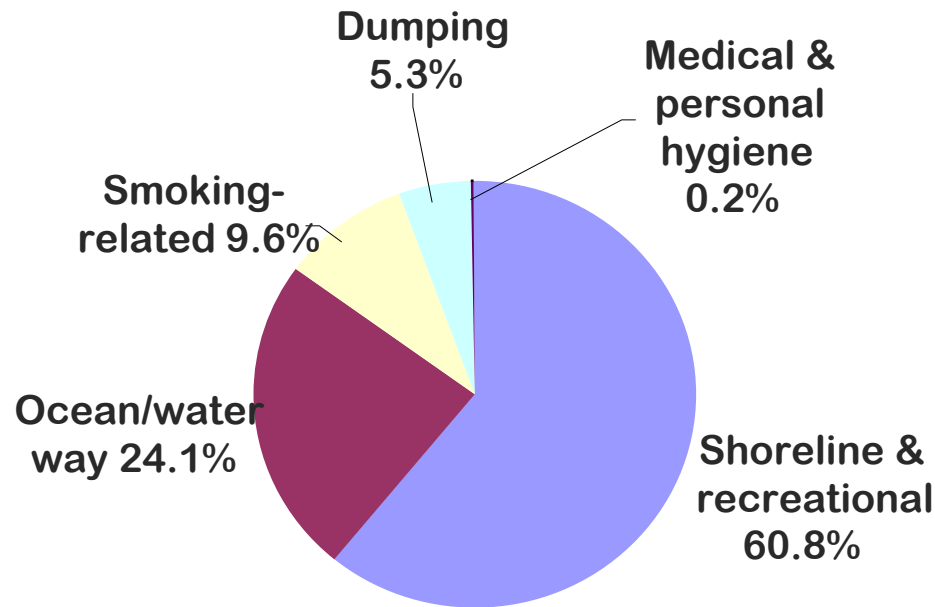
- 91ton/km²/yr



❑ Result of National Monitoring on Marine Debris

➤ Source of Marine Debris in Korea

(2002 International Coastal Cleanup Result)



❑ Development of Education and Public Relations Materials

- Booklet, posters, and leaflets on marine debris
- Manual on marine debris monitoring

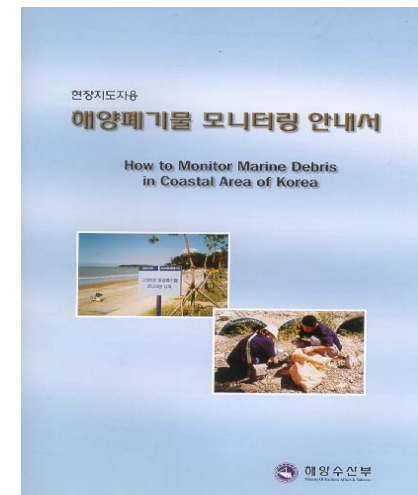


해양폐기물교육자료집



깨끗한 바다가 좋아요

해양수산부
한국해양수산개발원



❑ Development of Education and Public Relations Materials

- ‘Educational Kit on Marine Debris’ with VCR tape and VCD
- Educator’s Guidebook for Marine Environmental Education for K 3~6 grades



❑ Development of Education and Public Relations Materials

- NGOs in coastal areas**
- Local agencies of MOMAF and MOE(Ministry of Education & Human Resources Development)**
- Organizations related to marine and fisheries**
- School teachers**



□ Participation in the ICC since 2001

- Twenty two NGOs, 1,750 people in 2001**
- Twenty NGOs, 1,600 people in 2002**
- Sixteen NGOs, 1,260 people in 2003**
- Participatory program to raise public awareness in cooperation with NGOs, the national government, and a research institute**
- NGOs monitoring beach debris - Key role in carrying out the event**



V. R&D for Marine Debris Management

❑ Search & Collection of Derelict Fishing Gear in Deep Sea

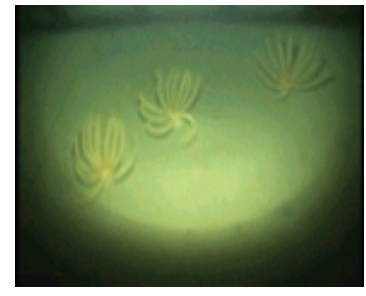
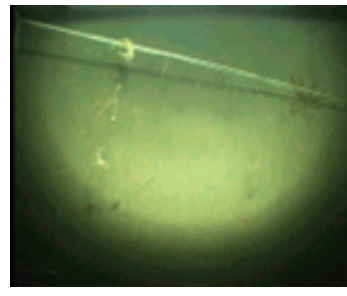
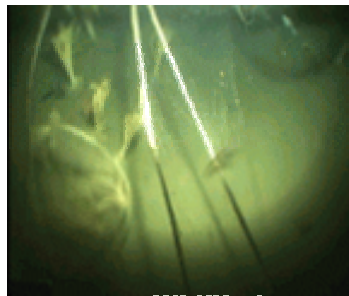
➤ Developed photographing system in deep sea

- Nov. 2002, tested in 250m
- pic. 1. Photographing System, 2002
- pic. 2. Photographing System, 2003



❑ Search & Collection of Derelict Fishing Gear in Deep Sea

- Aug. 2003, surveyed in 100m, Jeju Island Sea
- Oct. 2003, surveyed in 500m, East Sea
- pic. 1, 2, 3, 4 : 10/8/2003, Ooljin, 350m



➤ Developed Collection Equipement of Delrelict Fishing Gear in Deep Sea

- pic. 1. Collection Equipment
- Pic. 2. Collection of Derelict Fishing Gear



❑ Styrofoam Volume Reduction System(SVRS)

- Reduction of styrofoam wastes
- Reuse or fuel for incinerators
- Capacity : 100kg/hr



➤ 2002 : 1 site(Nam Hae)

2003 : 4 site(Tong Yong, Geo Jae, Yeo Soo)

2004 : 6 site(Plan)

2005 : 9 site (Plan)

2006 : 10 site (Plan), pic. 1, 2, 3, 4, 5

➤ Many local governments want to operate SVRS in their coastal region



Thank you for your listening

