



UNEP



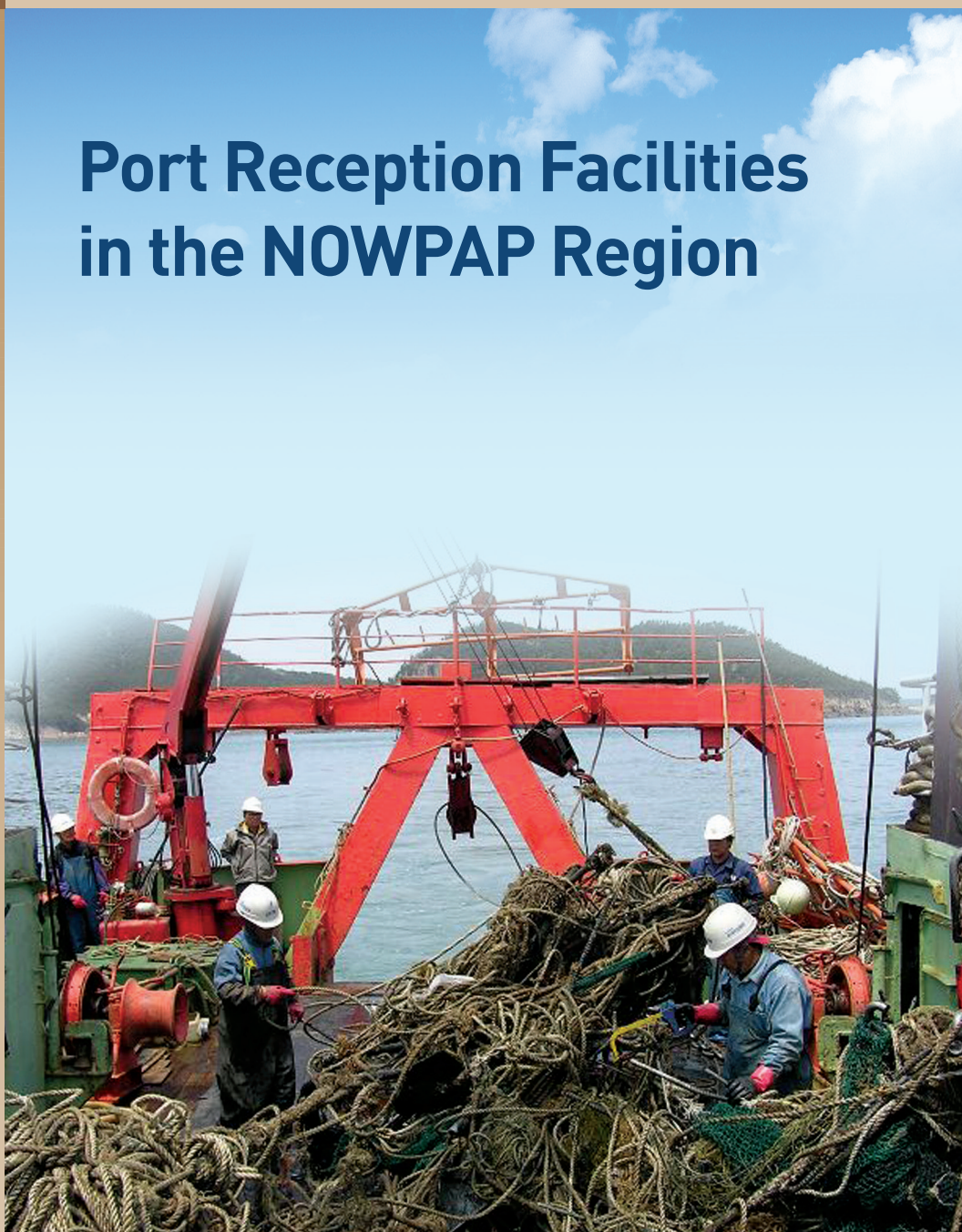
IMO

# NOWPAP MERRAC

Northwest Pacific Action Plan  
Marine Environmental Emergency Preparedness and Response  
Regional Activity Centre

P.O. Box 23, Yuseong, Daejeon 305-600, Republic of Korea  
(c/o MOERI/KORDI)  
Tel: (+82-42) 866-3638, Fax: (+82-42) 866-3698  
E-mail: [nowpap@moeri.re.kr](mailto:nowpap@moeri.re.kr)  
Website: <http://merrac.nowpap.org>

## Port Reception Facilities in the NOWPAP Region



Regional  
Seas





UNEP



IMO

# NOWPAP MERRAC

---

Northwest Pacific Action Plan  
Marine Environmental Emergency Preparedness and Response  
Regional Activity Centre

P.O. Box 23, Yuseong, Daejeon 305-600, Republic of Korea  
(c/o MOERI/KORDI)  
Tel: (+82-42) 866-3638, Fax: (+82-42) 866-3698  
E-mail: [nowpap@moeri.re.kr](mailto:nowpap@moeri.re.kr)  
Website: <http://merrac.nowpap.org>

## Port Reception Facilities in the NOWPAP Region

The document was prepared by the Marine Environmental Emergency Preparedness and Response Regional Activity Centre of the Northwest Pacific Action Plan (NOWPAP MERRAC) as part of the Regional Action Plan on Marine Litter Activity (RAP MALI), which was approved for 2008-2009 biennium at the Twelfth NOWPAP Intergovernmental Meeting (Xiamen, China, October 2007), as the next phase of Marine Litter Activity (MALITA) for 2006-2007. The document was developed by MERRAC (Dr. Seong-Gil KANG, Dr. Jeong-Hwan OH and Ms. Hyon-Jeong Noh) based on the Regional Report on Sea-based Marine Litter in the NOWPAP Region with technical support of MERRAC Focal Points, Marine Litter Focal Points, NOWPAP Regional Coordinating Unit (RCU), and IMO. The document was circulated to NOWPAP member states, RCU, and IMO, and then revised according to the comments that were received.

ISBN 978-89-93604-01-6

Copyright © NOWPAP MERRAC 2009

All rights reserved.

No part of this publication may, for sales purposes, be reproduced, stored in a retrieval system or transmitted in any form or by any means, electronic, electrostatic, magnetic tape, mechanical, photocopying or otherwise, without prior permission in writing from the  
NOWPAP MERRAC

Published in 2009  
by NOWPAP MERRAC  
P.O.Box 23, Yuseong, Daejeon 305-600, Republic of Korea  
(c/o MOERI/KORDI)

For bibliographical purposes, this document may be cited as:  
Port Reception Facilities in the NOWPAP Region, MERRAC, 2009.

# Table of Contents

<b>Chapter 1. Introduction .....</b>	<b>1</b>
<b>Chapter 2. Port Reception Facilities in the NOWPAP Region .....</b>	<b>3</b>
2.1. People's Republic of China .....	3
2.2. Japan .....	4
2.3. Republic of Korea .....	4
2.4. Russian Federation .....	5
<b>Chapter 3. Case studies for management of garbage collection in the     NOWPAP Region .....</b>	<b>15</b>
3.1. Floating Receptacles for Marine Litter .....	15
3.2. Buyback program for entangled marine litter .....	20
3.3. Recycling ship-generated litter campaign .....	27



## Chapter 1. Introduction

Because of its non-biodegradable characteristics, marine litter remains in the marine environment over many years. It has been recognized that marine litter causes many social, economical and environmental damage in NOWPAP region. Abandoned, lost and derelict fishing nets, lines, pots and traps may continue to catch marine species indefinitely, namely “ghost fishing”, and destroy the marine ecosystem. Derelict fishing ropes and nets pose a navigational hazard to fishing and recreational boats by entanglement of their propellers or engine breakdown. Marine litter also destroys the aesthetic value of the shoreline, and tourism and leisure industry have been affected.

The adequate port reception facilities are important to prevent marine litter from being disposed at sea. In order not to marine litter be discarded into the sea, it is necessary to manage that discharge of marine litter to the port reception facilities by the effective provision. According to the national reports, all NOWPAP member states have made efforts to provide adequate reception facilities at ports and marinas in compliance with Annex V of MALPOL Convention.

Efficient port-related and ship-related waste management is one of the most important environmental issues with which coastal states are faced. The NOWPAP member states agreed that there is a need for efficient management of the sea-based marine litter resulting significant environmental and economic losses. The NOWPAP member states have been undertaken to ensure the provision of adequate reception facilities at ports and terminals for garbage without causing undue delay to ships, and according to the needs of the ships using them based on Regulation 7 of MARPOL 73/78 Annex V.

Building waste reception and collection facilities is closely related to the London Convention which prohibits dumping to the ocean. In order that ports can ensure that facilities are commensurate with the quantities and variety of wastes likely to be delivered ashore, the NOWPAP member states need to improve port reception facilities as well as a port waste management procedure or plan to process the marine wastes.

Internationally and regionally, the International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocol of 1978 (hereinafter

referred to as MARPOL 73/78) provides an international framework on port reception facilities for ship-generated waste and cargo residues. The Northwest Pacific Action Plan (NOWPAP) member states – People’s Republic of China, Japan, Republic of Korea and Russia Federation – developed Marine Litter Activity (MALITA) and Regional Action Plan on Marine Litter (RAP MALI) to implement and enforce of the MARPOL 73/78.

IMO has developed and maintained Global Integrated Shipping Information System (GISIS) website (<http://gigis.imo.org/Public/>). GISIS is the subsidiary data system of IMO regarding some specific field of information’s which can be avail quickly to save the time. In GISIS web site, it is also available data on the available port reception facilities for the reception of ship-generated waste. The Port Reception Facility (PRF) module contains information on the available port reception facilities for the delivery of the ship-generated waste, as provided by the competent authorities of the IMO Member States.

The PRF database has been set up with the following objectives:

- to disseminate the current information on port reception facilities to the maritime community on a global basis through the Internet;
- to establish a web-based method for the regular updating of the information; and
- to facilitate user-friendly searches through the database.

These guidelines are designated to assist local organization, local governments and the member states by providing the information on port collection facilities which is submitted by NOWPAP member states and provided by data of IMO GISIS.



## Chapter 2. Port Reception Facilities in the NOWPAP Region

### 2.1. People's Republic of China

For the purpose of collecting and disposal of the garbage from ships effectively, more stringent legislation and regulations on port reception facilities have been established in China. For instance, in the Marine Environment Protection Law of the People's Republic of China, it is regulated that port, dock, load-unload berth and ship recycling facilities must have adequate reception facilities in place for collecting and disposal of the pollutant and marine litter from ships, and keep all these facilities in good condition.

Over the last 30 years, China has established relevant facilities for ship generated marine litter. Many ports in China have installed garbage treatment facilities which are equipped with garbage reception vehicles and ships (Table 1).

**Table 1.** Quantities of reception facilities built in NOWPAP region in China

Number of the reception facilities	Receptions Equipments		Disposal facilities	Capability of depositing (M <sup>3</sup> /H)
	Vehicle	Boat		
88	185	12	15	740

According to statistics in 2005, ports under the jurisdiction of Shandong Maritime Safety Administration (MSA) received more than 10,000 tons of garbage from ships. Also every newly built port has submitted the report on the evaluation of the environment effect of the reception facilities, which includes the status of the collecting and disposal of marine litter.

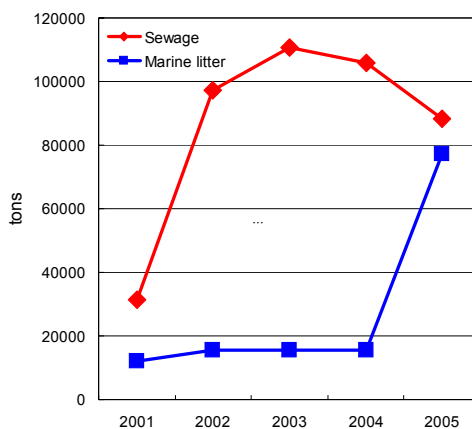


Figure 1. Estimated reception and disposal quantities in China.

The following chart showed below is the patterns of estimated marine litter collected from ships in China within the NOWPAP region (Figure 1). After collecting, marine litter is disposed through the reception facilities of the ports.

According to the IMO GISIS, total 151 Port Reception Facilities are registered in 47 ports of China national wide. The location of port reception facilities are shown in Figure 2. Most of Port Reception Facilities in China are available for 24 hours a day, 7 days per week. Estimated disposal quantities in China is about 16,000 m<sup>3</sup> or above as of September 2009. Annex 1-1 provides a list of port reception facilities in China.

## **2.2. Japan**

Ship-generated wastes are collected, transported and treated in a proper way under the related internal laws by treatment companies entrusted by ship owners. An audit under “Voluntary IMO Member State Audit Scheme” was conducted in Japan from 19 to 26 February 2007. At the audit, no improprieties were reported as to the status of port reception facilities in Japan on the basis of MARPOL Convention Annex V, and it was confirmed that measures taken for garbage reception based on the internal laws are appropriate and in compliance with MARPOL Convention requirements. It was highly evaluated in general that Japanese maritime administrations are fulfilling obligations on the basis of international conventions in a comprehensive and effective way as a flag, port and coastal state. The location of port reception facilities are shown in Figure 2.

## **2.3. Republic of Korea**

It was required national infrastructure for marine litter collection and treatment; therefore, the Korean Government enacted the “Marine Environment Management Law”, as a legal basis, for systematic preservation of the marine environment, management and sustainable use of marine resources. Based on the “Marine Environment Management Law”, the Korean Government regulates the general collection and treatment of marine litter.

For the garbage collection from vessels and convey to the facilities are treated by registered company in Korea under the Marine Environment Management

Law. Port Reception Facilities has been expanded its role from the basic treatment for sterilization of the ship-related waste oil, cargo fixed, painting to removing waste, garbage collection and treatment. In addition, maritime pollution prevention manager is in each vessel along the Marine Environment Management Law, and he records and keeps Garbage Record Book for marine pollution prevention. The operation of transfer or discharge of garbage and oil waste is under the supervision of the manager. About 80 Port Reception Facilities will be registered on IMO GISIS for garbage collection from vessels in South Korea. The location of port reception facilities are shown in Figure 2.

## **2.4. Russian Federation**

In Russia, the system of managing waste generated aboard ships has been designed in compliance with MARPOL Convention requirements. Reception of marine litter from ships and collection from harbour water surface is conducted by specialized ships. There are no restrictions as to litter reception. The procedure for notifying about intention to discharge shipboard wastes is as follows: an application should be lodged at the Port Environment Protection Service to be then forwarded to the appropriate agency. Services rendered are charged according to “Rates of charges on Ships in RF Sea Commercial Ports.” Where specialized ships are not available shipboard wastes are received by collection trucks alongside. Annex 1-2 provides a list of agencies engaged in receiving waste and the availability of skimmers and litter collection facilities in ports of Russian sector in the NOWPAP region.

33 port reception facilities for garbage are registered on the IMO GISIS in across the Russian Federation, and the four ports are corresponding to the NOWPAP region. Except the information registered in IMO GISIS, other four ports had been reported for the operation. Most of Port Reception Facilities in Russia are available for 24 hours a day, 7 days per week. Estimated disposal quantities are about 750 m<sup>3</sup> or above for the four registered Port Reception Facilities in NOWPAP region as of November 2009. The location of port reception facilities are shown in Figure 2.

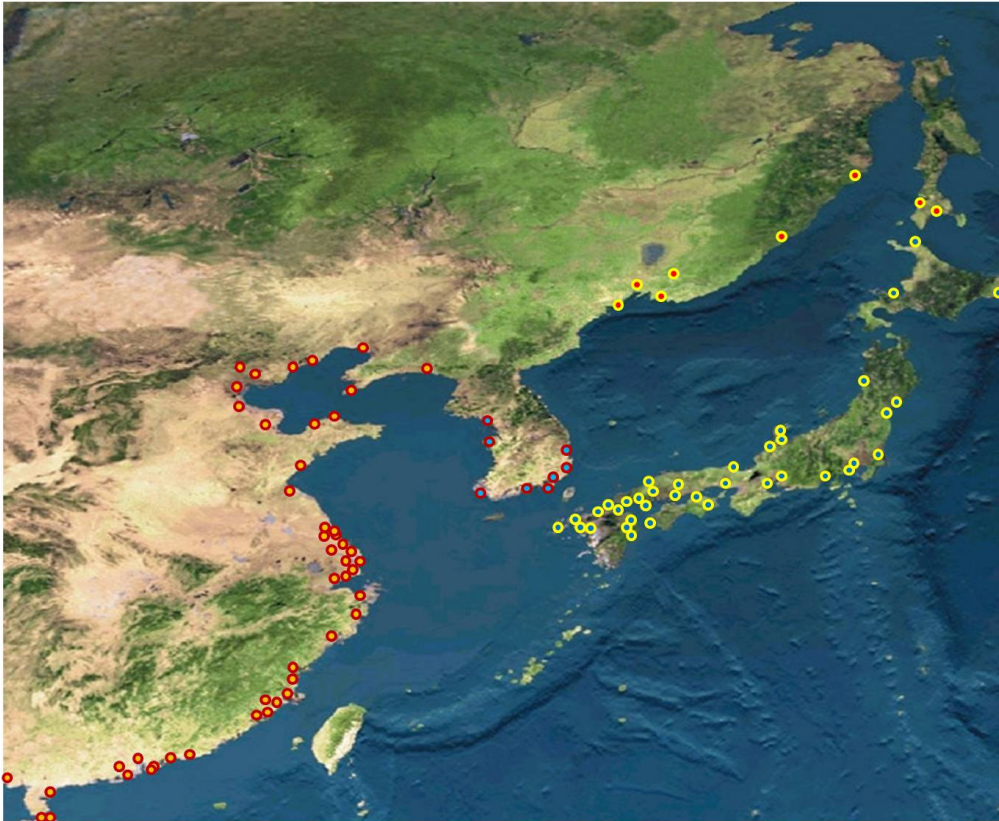


Figure 2. *The location of port reception facilities in NOWPAP region.*

### ***Garbage Record Book***

The garbage management plan is developed on the basis of the relevant IMO Guidelines, and should be implemented by designated personnel on board ships. The plan should include the written procedures for garbage collection, storage, disposal and treatment, and equipment operation procedures on board ships. All ships of 400 gross tons or above and all ships which are certified to carry 15 passengers or more should carry a garbage management plan to be observed by seafarers and carry a Garbage Record Book. On board all ships of less than 400 gross tons and all ships carrying fewer than 15 passengers, the garbage treatment information should be accurately recorded in the Ship's Log. Each discharge operation or action in relation to garbage on board ships should be properly recorded in the Garbage Record Book.

**Annex 1-1. Port reception facilities and disposal quantities in China registered in IMO GISIS**

Port	Service Provider	Discharge restrictions/limitations			Availability of the reception facility	Minimum prior notice required (hours):	Charging system	Additional information
		Min. quantity	Max. quantity	Max. discharge rate				
Qinhuangdao	QINHUANGDAO JIMEIDA SHIPPING SERVICE CO.,Ltd		4			1		
	QINHUANGDAO QUANSHUN SHIPPING SERVICE Co.,Ltd							
	QINHUANGDAO PORT AUTHORITY INDUSTRY AND COMMERCE COMPANY FOREIGN SHIPPING SERVICE							
	QIN HUANGDAO SHUNTONG SHIPPING Co.,Ltd	10			24 hours a day, 7 days per week	1		
	QINHUANGDAO YISHUNHAI SHIPPING AGENT Co.,Ltd	4				6		
	SHANHAIGUAN SHIP BUILDING INDUSTRY Co.,Ltd	10				12		
	QINHUANGDAO F.RICH MARINE SHIP SERVICE	10						
	QINHUANGDAO ZHANSHUN SHIPPING SERVICE Co.,Ltd	10						
	RAN OCEAN MARINE Co.,Ltd	5						
	Jingtang Port Co., Ltd., Ship Repair Branch	2	6		24 hours a day, 7 days per week		150RMB/ship	
Jingtang (Tangshan)	Tangshan Port FuHao Marine Safe Technique Service Co.,Ltd.		200			100RMB/ship	also in CaoFeidian	
	Tangshan Port XinDe Shipping Service Co.,Ltd.							
Huanghua (CNHHA)	HuangHua Port Xinhai Shipping Serves Company		3			1	bargaining	
	HuangHua Port Yongxing Shipping Washing Serves Company		3			1	bargaining	
	HuangHua Port Dongli Shipping Washing Serves Company		1				bargaining	
	HuangHua Port Haihua Shipping Serves Company		3			2	bargaining	
	HuangHua Port Shengda Foreign Shipping Serves Company		1			2	bargaining	
	HuangHua Port Jimilhai Shipping Serves Company		3			2	bargaining	
	HuangHua Port Dadongtai Commodity Company		1			2	bargaining	
	HuangHua Port Longxing Shipping Serves Company		1			2	bargaining	
	HuangHua Port Anda Shipping Serves Company		1			1	bargaining	
	BohaiXinqu Canghaiyidong Shipping Washing Serves Company		3			2	bargaining	
	BohaiXinqu Shenghua Shipping Serves Company		1			2	bargaining	
	HuangHua Port Haida Shipping Serves Company		1			2	bargaining	

Port	Service Provider	Discharge restriction/limitations			Availability of the reception facility	Minimum notice required (hours):	Charging system	Additional information
		Min. quantity	Max. discharge rate	Max. quantity				
Tangshan (CNTAS)	tangshancaofeidian yuyang ship service agency co.ltd							
	tangshancaofeidian xiaofei commerial co.ltd				demand service			
	tangshan fengyuan sea polluting manage co.ltd							
	tangshan zhongsheng ship manage co.ltd							
	Tianjin Port Port-Services Company Minzu Baiye Services Office			10				
	Tianjin Developing Area Boda Enterprise Co.Ltd			3				
	Tanggu Gaoan Labour Services Department			4				
	Tianjin Tanggu Gangwei Cleaning Services Center			5				
	Tianjin Port Free Trade Zone Zhibo International Business\$Trade Co.Ltd			2				
	Tianjin Xinhang Technology Equipment Services Co.Ltd			7				
Tianjin (CNTSN)	Tianjin Developing Area Anhui Ship Engineering Services Co.Ltd			5	24 hours a day, 7 days per week	1		
	Tianjin Shipyard			5				
	Bohai Petroleum Material Services Company			6				
	Tianjin Xinye Chuanwu Engineering Co.Ltd			9				
	Bohai Petroleum Junliangcheng Base Developing Company			3				
	Tianjin Tanggu Huanbohai Services Co.Ltd			8				
	Tianjin Honggangshun Labour Services Co.Ltd			6				
	Tianjin Haiyitong Ship Engineering Co.Ltd			5				
	haikou xinhaina port- technology service center		0.5	100	24 hours a day, 7 days per week		3	less than 300 gross tonnage 20 yuan per day for domestic and , more than 300 gross tonnage 50 yuan per day for domestic and 200 yuan per day for international
	haikou xinhaina port- technology service center			3			3	50 yuan per day for domestic,200 yuan per day for international

Port Reception Facilities in the NOWPAP Region

Port	Service Provider	Discharge restriction/limitations			Availability of the reception facility	Minimum notice required (hours):	Charging system	Additional information
		Min. quantity	Max. discharge quantity	Max. discharge rate				
Qinglan (CNQLN)	heikou xinhaina port- technology service center	10	100	10		3	less than 300 gross tonnage 20 yuan per day for domestic and , more than 300 gross tonnage 50 yuan per day for domestic and 200 yuan per day for international	
Yangpu (CNYPG)	Hainan Xinhaina Co., Yangpu branch		6			1		
	COSCO (DALIAN) SHIP YARD CO., LTD		50			24		
	Dalian liferaft preserving co.,ltd							
	Dalian beiliang harbor co.,ltd							
	Dalian harbor rixing industry and commerce co.,ltd							
Dalian (GNDLC)	Dalian huaifu shipping co.,ltd				24 hours a day, 7 days per week			
	DalianWan -Xingang Corporation							
	Dalian F.T.Z. jinxin petrochemical co.,ltd							
	Dalian ganghong logistics co.,ltd							
	Dalian zhuozhuotong dock service co.,ltd							
Dandong (CNDDG)	The precious steamer of riparian development zone of Dandong City is engaged in technology Ltd.							
Yingkou (CNYIK)	JIAIXING PORT SHIPPING SUPPLY CO.,LTD				24 hours a day, 7 days per week			
Shanghai (CNSHA)	Shanghai Waters Environmental Development Co., Ltd.							
	COSCO CONTAINER LINE CO., LTD			0.3				
	SHANGHAI XUN LONG SHIPPING SERVICE CO., LTD	49		1	24 hours a day, 7 days per week			
	Rizhao hengrun Shipping Serves Company	190		84				
Rizhao (CNRZH)	Lanshan port property management company	260		125				

Port	Service Provider	Discharge restriction/limitations			Availability of the reception facility	Minimum notice required (hours):	Charging system	Additional information
		Min. quantity	Max. quantity	Max. discharge rate				
Qingdao (CNTAO)	Jiaonan ship repairing and Constructing Plant	5	20	10				
	Qingdao Contain Shipping Service Co.Ltd	200	300	18				
	Qingdao Haihongyuan Shipping Service company	0.5	20					
	Qingdao Yahai Shipping Co.Ltd.	3	10	5				
	Sunic Ocean Marine Technical & Service Co.Ltd	5	10					
Penglai (CNPLA)	Qingdao Qianthe shipping Co.Ltd	1	15					
	YANTAI PORT GROUP PENGLAI PORT CO.LTD		9				bargaining	
	SHANDONG WEIYANG LUANJIAKOU PORT CO.LTD		20					
Longkou (GNLKU)	Longkou port industrial company ship receiving services		3	2				
Dongying (CNDGY)	ShengliOilfieldLongxiOilTechnicalServiceCo.LTD				3			
Shenzhen (GNSZX)	shenzhen hopeland co.ltd	1.5	3					
Lianyungang (CNLYG)	LIANYUNGANG FOREIGN SHIP SERVICE CORPORATION		6		1			
Nanjing (CNKNG)	nanjing port co.ltd		1500					
	no 3 tank cleaning plant		6156					
	meiqing ship service department of nanjing		31					
Zhenjiang (GNZHE)	Zhenjiang port foreign vessel Serves Company							
	Yangzhong Xianghui port Serves Company							
Yangzhou (GNYZH)	Zhenjiang Xinyu waste solid substance disposition company		3600		24		800	
	Yangzhou Ocean Shipping Service Company		10		1	200RMB/m3		
	SHIP'S GARBAGE DISPOSAL SERVICE		5	2	24	>=400 100RMB		
	Changfa Shipping Serves Company		7	2		10-350		
	RunHai Shipping Serves Company						International	
Jiangyin (CNJJA)	JiangYin YangZi Shipping cabin washing Co. Ltd.					voyage:205Yuan (RMB)/T.Civil	voyage:102Yuan (RMB)/T	
Zhangjiagang	TongHai Shipping Serves Company							
	Zhangjiagang City Changjiang Shipping Service Co., Ltd.							
	Zhangjiagang yinjiang ship Service Co., Ltd.				24 hours			
	Zhangjiagang yinjiang ship Service Co., Ltd.				a day, 7			
	Zhangjiagang Port Ship Service Co., Ltd.				days per			
	Zhangjiagang runhai Shipping Co., Ltd.				week			
	Zhangjiagang gangshun Shipping Co., Ltd.							



Port Reception Facilities in the NOWPAP Region

Port	Service Provider	Discharge restriction/limitations			Availability of the reception facility	Minimum notice required (hours):	Charging system	Additional information
		Min. quantity	Max. quantity	Max. discharge rate				
Nantong (CNNITG)	China Ocean Shipping Agency, Nantong Nantong Gang Ning Shipping Service Co.,Ltd							
Changshu (CNCGLU)	ChangShu Ocean Shipping Service Co.LTD	0.5	8	10			300	
	ChangShu DuSheng Labour Service Co.LTD	1	3				50	
Taicang (CNTAG)	Taicang Jinpeng shipping service Co.,LTD							
	Taicang Ocean Shipping Supply & Service Company		2					
	Taicang Tongda shipping service Co.,LTD							
	Taicang truly shipping Co.,LTD		3					
	taicang faster ship service trading CO.,LTD		5					
Fuzhou (CNFOC)	Taicang Fuqiao Town Lujiajiang District environmental sanitation institute							
	Fuqing Honghui Shipping Seves Co.,Ltd.		600				by voyage	
Xiamen (CNXMN)	Fuqing Yongrong Port Seves Co.,Ltd.						by voyage	
	Luoyuan Baixiang Shipping Co.,Ltd		496					2
	Fuqing Nanjizhou Shipping Co.,Ltd.		500	150	24 hours a day, 7 days per week			
	Xiamen Tonghai Shipping Co., Ltd							
	Xiamen Sitong Shipping Co., Ltd							
Ningde (CN594)	Xiamen Hongyi Shipping Co., Ltd							
	Hisincere Marine Suppor & Service Co., Ltd							
Zhangzhou (CNZZU)	FUANSHI BAIMA SHIP-CLEANING CO.LTD		10				ACCORDING TO SHIPS GROSS TON	
	XIAMEN SUNSHINE SHIP SERVICE CO.LTD ZHANGZHOU DEVELOPMENT ZONE BRANCH		58	15				
Putian (GNPUT)	ZHANGZHOU DEVELOPMENT ZONE SHENGNI SHIP SERVICE CO.LTD		65	15	1			
	haishen Shipping Seves Company		80	10				
Ningbo (CNNGB)	luming FUEL SUPPLING CO.LTD		70	30				
	Ningbo Port Huaqiang Garbage Treatment Factory						200 per cubic metre	
Zhongshan (CNZSN)	Yougang Lumbo Company of Ningbo Port Group		60				150 per voyage/54000 per 8 hours	
	Kongpu Huanwei Suo		5				200 per cubic metre	
	DingHai ZhongAi Goods Co. Ltd.		30		24 hours a day, 7 days per			
	ZhouShan Maritime Safety Technical and tradement Co. Ltd.							
	Zhoushan putuo haiyuan port service Co.Ltd		740	30				

Port	Service Provider	Discharge restriction/limitations			Availability of the reception facility	Minimum notice required (hours):	Charging system	Additional information
		Min. quantity	Max. quantity	Max. discharge rate				
Wenzhou (CNWNZ)	WENZHOUCHENGJIE SHIP SERVICE CO.LTD		3				50USD/m <sup>3</sup>	Disposal with agreement
Jiaxing (CNJIX)	JIAIXING PORT SHIPPING SUPPLY CO.,LTD		3		week	24		
Guangzhou (CNCAN)	GuangZhou Hua Yu Pollution Protection Co.Ltd.		20					
	GuangZhou Huang Pu Sui Qing Company		20			24	A Contract for reference	
	Guangzhou Nansha Xingli Ship Clean-up Services Company		20					
Zhanjiang (CNZHA)	ZHANJIANG SHENDE CLEANING SERVICE COMPANGY		1.25					
	YONGXIN SHIP SERVICE CO.LTD		1.25					
Shantou (CNSWA)	ShanTou LongYue Cleaning Protection Serves Co.,Ltd.		5		24 hours a day, 7 days per week			
	ShanTou LongShan Environmen Protection Serves Co.,Ltd.		20			1		
	ShanTou Ocean Shipping Agent Serves Co.,Ltd.		50					
	ShanTou Sea Rain Bow Shipping Serves Co.,Ltd.		10					
Shanwei (CNSWE)	XiaoGuang environmental protection of Shanwei Co.,Ltd.		50	10			BARGAINING	
	Jiangmen Zhongxin Shipbreaking &Steel.CO.LTD		39.6					
Jiangmen (CNJMN)	Jiangmen Zhongxin Shipbreaking &Steel.CO.LTD		20		24 hours a day, 7 days per week	3		
	Jiangmen Yinhu Shipbreaking.CO.LTD		20			1		
	Jiangmen Xinhui Shengrong Shiping.CO.LTD					3		
	Xinhui shi xijiang shiyou guangzhou qingwu zhuanYe dui				Business hours only, 7 days per week	1	1.5yuan/KG	
Jiangmen (CNJMN)	Jiangmen Xinhui Lvjie Youlei Qingli.CO.LTD		10		24 hours a day, 7 days per week	3		
	Jiangmen Xinhui Shuangshui Shipbreaking &Steel.CO.LTD		90		Business hours only, 5 days per week			

Port	Service Provider	Discharge restriction/limitations			Availability of the reception facility	Minimum notice required (hours):	Charging system	Additional information
		Min. quantity	Max. quantity	Max. discharge rate				
Huizhou (CNHUI)	Huizhou Daya Bay Hangpeng Environmental Protection Services Co.,Ltd.		13		24 hours a day, 7 days per week	2		
Dongguan (CNDGG)	DongGuan YongJie Ship Cleaning Service Co. Ltd.		90					
	DongGuan PeiJie Ship Cleaning Service Co. Ltd.		13					
Qin Zhou (CN602)	Qinzhou GuiTong Shipping Services limited company							
	Qinzhou SuNan Shipping Services limited company					2		
Quanzhou (CNQZJ)	QUANGANG XINGTONG SHIPPING CO.LTD							
	QUANGANG JUNHAI PORT%SHIPPING CO.LTD.				24 hours a day, 7 days per week			
	QUANZHOU PORT%SHIPPING CO.LTD.						100yuan	
	JINJIANG ANHAIBAY GARBAGE PETRIFACTION CO.LTD.				24 hours a day, 7 days per week			
	JINJIANG CHANGCHENG PETRIFACTION CO.LTD.							
	NANAN SHUIJING HUIXIANG SERVICE,QUANZHOU							

**Annex 1-2. Services in receiving shipboard wastes and availability of skimmers and litter collection barges in port of Russia**

No.	Port	Ship type	Quantity	Agency	Collected type	Note
Primorsky Krai						
1	Vladivostok	skimmer	3	"Trans-Eco" LLC	Shipboard waste and cargo waste (trash, cargo waste, grey water, bilge water)	Litter collected is transported by collection trucks to the municipal dump
		bilge water collection barge	2			
2	Vostochny	skimmer	2	Vostochny Branch, "Rosmorport" federal state unitary enterprise	All type of shipboard waste is collected	Litter is transported to the municipal dump
		bilge water collection barge	2			
3	Nakhodka	--	--	Vostochny Branch, "Rosmorport" federal state unitary enterprise	All type of shipboard waste is collected	--
4	Zarubino	--	--	"Sea Port in Troitsa Bay" OJSC	Solid waste collected only	Shipboard litter is transported from ships by collection trucks
5	Plastun	--	--	"Terneilles" OJSC	Solid waste collected only	Shipboard litter is transported from ships by collection trucks
Khabarovsky Krai						
6	Vanino	skimmer	2	Vanino Branch, "Rosmorport" federal state unitary enterprise	Shipboard waste	Litter is transported to the municipal dump
		bilge water collection barge	1			
Sakhalinskaya Oblast						
7	Kholmsk	--	--	"Kholmsk Sea Commercial Port" OJSC	Shipboard and cargo waste	Shipboard litter is transported from ships by collection trucks
8	Korsakov	--	--	"Grot-Oil" LLC	Shipboard and cargo waste (trash, cargo waste, grey water, oily water)	Shipboard litter is transported from ships by collection trucks

## Chapter 3. Case studies for management of garbage collection in the NOWPAP Region

In addition to port reception facilities, the Korean government manages the several types of activities for the efficient management of the collected marine litter, and this report introduced three different programs related port reception facilities in Korea: 1) Floating Receptacles for Marine Litter, 2) Buyback program for entangled marine litter, and 3) Bring back ship-generated litter campaign.

### 3.1. Floating Receptacles for Marine Litter

Dedicated floating receptacles for marine litter were installed in Haenam-gun, Cheollanam Province in 2001 and was well-received by fishermen. Fishermen pile up their used nets and farming gear onto the dedicated barge-type receptacles as they are returning from fishing. Because of many advantages such as easy accessibility, and voluntary participation of the fishermen, the Ministry of Land, Transport and Maritime Affairs (MLTM) plans to enlarge this program to 11 coastal local governments each receiving three receptacles yearly (total 33 receptacles) from 2010. The collection cost for marine litter can be reduced and the voluntary recovery of marine litter among fishing communities increased.

#### *Background*



Republic of Korea began to industrialize since the 1970s, and the speed of this industrialization was tremendous. Moreover, approximately 64% of the population lives near a river or coast, and it has been very difficult to prevent the influx of litter to the ocean. Korean government has noticed the negative impacts of marine litter.

In 2001, Kang et al. reported the spatial distribution of sustained seabed litter in ports and harbors (Table 2).

Table 2 shows that much of Korea's marine litter comes from sea-based activities, specifically from fishery-related one. A review of available literature shows that Korea Marine Environment Management Corporation (KOEM) and Korea Fisheries Infrastructure Promotion Association (KFPA) collected more than 10,000 tons of marine litter since 2000, and derelict fishing net was a relatively high portion.

**Table 2.** Types of sea-bed litter around Korean ports and harbors (Kang et al., 2001a)

Tires	Wire rope	Polypropylene rope	Timber/Lumber	Metal	Other	Total
4.70%	19.70%	23.40%	7.60%	22.70%	21.70%	100%

Various ways of managing the large amount of marine litter have been considered. To solve the problem of marine litter, it is important to collect marine litter with a proper way before the deposition. Appropriate disposal should be applied after the collection.

The dedicated barge-type receptacle, placed around the port, was created for the fishermen to pile up their used nets and gear on after returning from fishing. When the floating receptacle is full, manager contacts a disposal company. The receptacles made it easier for fishermen to unload their litter as well as reduced the possibility of dumping. The Ministry of Land, Transport, and Maritime Affairs (MLTM, formerly MOMAF) adopted these receptacles as a new nationwide program with the cooperation of local governments. While the program is underway nationwide, the case in Haenam-gun (2009) is presented here. The dedicated floating receptacle for marine litter was originally installed at Haenam-gun, Chullanam Province in 2001 and received good reviews from fishermen. Chullanam Province is where the fishermen are the most (Table 3)



**Table 3.** Number of people involved in fisheries (from Korean Statistical Information Service homepage)

City/Province	# of people involved in fisheries
Pusan-city	8,196
Incheon-city	7,767
Ulsan-city	3,083
Kyungki Province	4,328
Kangwon Province	10,619
ChungcheonNam Province	26,182
Chullabuk Province	9,501
Chullanam Province	61,631
Kyeonsanbuk Province	12,386
Kyeonsannam Province	30,184
Jeju Province	18,464
Total	192,341

### Methodology

Cheollanam Province is located in southwestern part of Korea Peninsula. Its population related to fisheries is more than 60,000, the largest in Korea. The main type of fishery in Haenam-gun district in Chellanam Province is abalone (ear shell) and laver (seaweed) farming. A small barge has been used as a receptacle for used nets and farming gear since 2001. This has resulted in fishermen collecting their own used net and gear voluntarily. The dedicated floating receptacles for marine litter had a positive effect on people in the area and thus MLTM began to support the building of barges in coastal local governments.

**Table 4.** The amount of the collected used fishing gear and marine litter according to the fishing population size and the type of fishery.

Fishing community	Population	Fishery type	Amount (ton)			
			2006	2007	2008	2009.7
A	34	abalone (90%)	40	40	40	40
B	60	abalone (70%) laver (30%)	-	-	-	30
C	200	laver (90%)		100		+

The barge is built of polyethylene to optimize its usability and safety. The standard size for a barge or floating receptacle is 9m X 6m X 1.47m, but can vary according to the characteristics and requirements of the port (Figure 3.1). Because of its small size, these barges can be easily towed and launched with a smaller ship and thus unloading it is much easier. It can be towed alongside a pier for easier unloading. Haenam-gun provided 25 million won (\$25,000 USD) for receptacle building. Local governments take care of maintenance and upkeep. In 2008, local communities with large amounts of marine litter, large farming areas, enough launching space and facilities ranked high on the list to receive these receptacles. Those villages with clean ports and coasts ranked even higher.



**Figure 3.** Process of building a floating receptacle for marine litter.





**Figure 4.** A floating receptacle before and after launching into port.

## **Results**

When the plan to build the first two receptacles for marine litter was announced, the response was so great that ten local fishing villages applied immediately. The local fishermen voluntarily collected their own marine litter and used gear on these dedicated floating receptacles and local authorities entrusted them to deal with waste treatment company. MLTM plans to enlarge this program to 11 coastal local governments each with three receptacles (total 33 receptacles) yearly from 2010. With the dedicated floating receptacles for marine litter, Haenam-gun reduced the collection cost for marine litter. Furthermore, voluntary recovery of marine litter now takes place among fishing communities. The resulting benefit is cleaner coastal waters.

### 3.2. Buyback program for entangled marine litter

Marine litter buyback program is an incentive program to encourage fishermen to bring to port entangled derelict fishing gear and other marine litter encountered while fishing. The program pays a small incentive fee for marine litter brought to port. Since its start in 2003 by the Ministry of Maritime Affairs and Fisheries (now the Ministry of Land, Transport and Maritime Affairs, MLTM) this program has been implemented in 51 local areas of 38 cities/towns within South Korea as of 2009. Fisheries Cooperative Union installs port reception facilities for the buyback program, and there is a caretaker who manages the reception facilities. He contacts treatment facilities when the reception facility is full, and marine litter is transported for disposal.

#### *Background*



Derelict rope collected in a sack provided through the buyback program.

The deposition of large amounts of marine litter in nearshore areas threatens the habitat of marine life and navigation safety, and may cause negative impacts to fisheries due to ghost-fishing. In the past, fishermen have encountered derelict fishing gear during fishing activities and throw it back into the sea after disentangling it from their own fishing gear. As a result, a great deal of fishery-related

marine litter has been deposited in coastal areas where it damages the spawning grounds and habitats of marine wildlife, threatens the safety of vessels, and impacts fishery operations and resources.

For this reason, the Korean central government's Ministry of Land, Transport and Maritime Affairs (MLTM, formerly MOMAF) established the buyback program. The main objectives of the buyback programs are to improve the marine environment and aid the recovery of fish populations. The buyback program for marine litter requires fishermen to bring back to port the collected

litter when they are fishing. Litter collected includes items such as worthless fishery-related marine litter (e.g., rope, net and vinyl). This program is not only an efficient and cost-effective way to collect marine litter, but it also increases the fishermen's awareness of the destructiveness of such litter to the marine environment. Another benefit of the program is the extra income fishermen receive. Under the buyback program, the government purchases the litter pulled up by fishermen and disposes of it under proper procedures.

### *Methodology*

Several entities have helped to implement the buyback program, including MLTM, local municipalities, the fisheries cooperative union, Korea Marine Environment Management Corporation (KOEM), Korea Fisheries Infrastructure Promotion Association (KFPA), and the fishermen themselves. Table 5 illustrates the role of each organization. MLTM accepts program applications from local municipalities, decides on program areas, allocates funds, and creates the project guide. Local municipalities also invest in the programs and help with supervision. The fisheries cooperative union plays a role in the direct buyback of marine litter from fishermen "on-the-spot."

The fisheries cooperative union distributes the sacks to fishermen as they leave port. Fishermen put the collected litter into sacks labeled with the vessel name, fishing type, fisherman's name, and phone number. When they return to port, they give the filled sacks to the fisheries cooperative union.



Fishermen bring to port litter-filled sacks, which they pile up on their boat.

**Table 5.** The respective roles of organizations participating in the waste buyback program

Organization	Role
MLTM	<ul style="list-style-type: none"> <li>● Develops and guides a master plan of buyback program</li> <li>● Supervises the project implementation and budget execution</li> </ul>
Local government	<ul style="list-style-type: none"> <li>● Metropolitan city &amp; Province <ul style="list-style-type: none"> <li>- Makes a public awareness &amp; education</li> <li>- Manages program implementation of city &amp; town &amp; village</li> <li>- Makes a project guide</li> <li>- Manages budget execution</li> <li>- Public awareness &amp; education</li> </ul> </li> <li>● City &amp; Town &amp; Village <ul style="list-style-type: none"> <li>- Decides buyback program area and</li> <li>- Expands allocated budget and make a contract with relevant agencies</li> <li>- Observes buyback program implementation</li> </ul> </li> <li>● Public awareness &amp; education</li> </ul>
Fisheries Cooperative Union	<ul style="list-style-type: none"> <li>● Purchases marine litter from fishermen</li> <li>● Operates caretaker who is in charge of bookkeeping and reporting</li> <li>● Distributes sacks to fishermen</li> <li>● Requests national funds</li> <li>● Makes and manages reception facilities</li> <li>● Public awareness</li> </ul>

Sacks are provided in three sizes: 40 L, 100 L, and 200 L. When they are returned full, the government pays the fishermen 4,000 won (\$4 USD), 10,000 won (\$10 USD), 20,000 won (\$20 USD) respectively (Figure 5). In the case of the larger litter, which can't be packed into sacks, the fishermen attach a tag to the item, and the government pays them 250 won per kilogram (\$0.25 USD/kg). The government also purchases shell, crab and eel trap for 150/250 won each (\$0.15-\$0.25 USD each).



Sack used in the buyback program.

Size	40 L	100 L	200 L	Tag	trap
Picture					 <p>(eel trap: 150 won)</p>  <p>(shell and crab trap: 250 won)</p>
Purchasing Price	4,000 won	10,000 won	20,000 won	250 won/kg	150/250 won per each

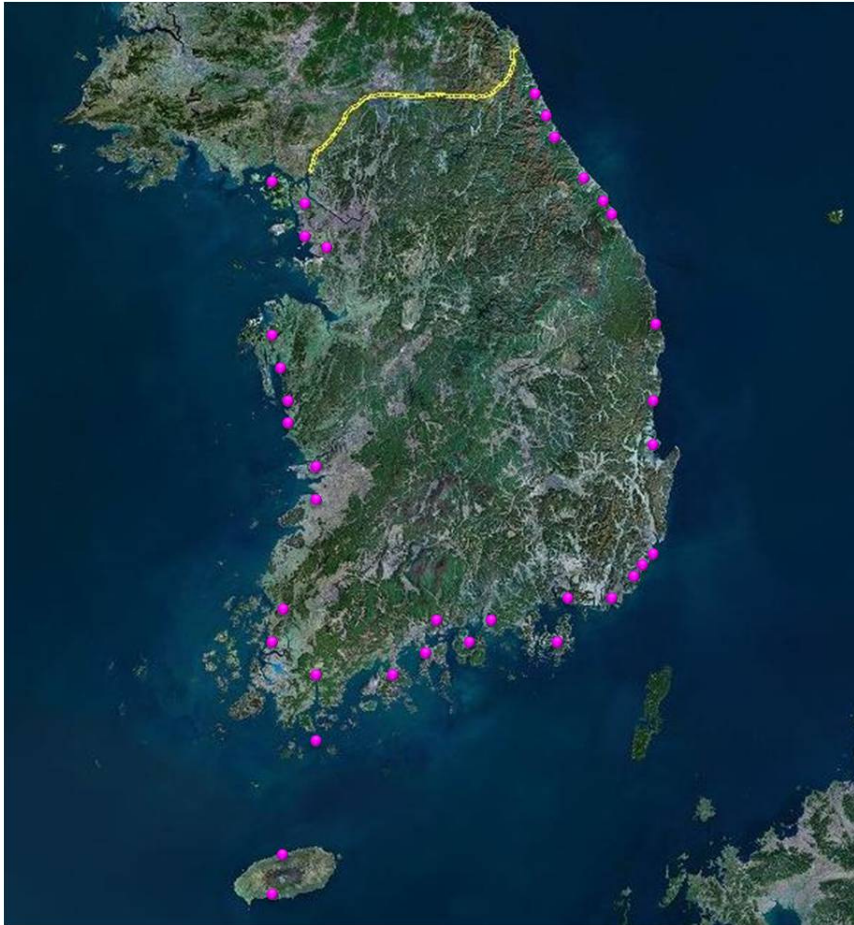
Figure 5. Sacks provided to fishermen, and an example of a tag.

### Port reception facilities

If fishermen returned back with sacks to harbours and ports, the sacks are stacked in the reception facilities. The reception facilities are managed by Fisheries Cooperative Union. Considering the local characteristic, a container or stationary facilities are installed. Each reception facility has navigable means such as truck and carts. Depending on local circumstances, barges, cranes and tugs are available, and local governments support the expenses for the equipment.

There is at least one caretaker who manages each reception facility. Caretaker is responsible for checking the sacks and making record books. Based on the record books, Fisheries Cooperative Union transferred the money into the bank accounts of fishermen to pay incentive. When the reception facility is full, the sacks are transported to treatment facilities for disposal.

As of 2009, total 51 offices have been implemented the buyback program (Figure 6).



**Figure 6.** Sites of the buyback program as of 2009

## ***Results***

A great deal of marine litter was collected through the buyback program between 2004 and 2008. Table 3.5 shows the volume of litter collected by the program.

The buyback program collected a total of 29,472 tons for the period at a cost of \$19,417 USD. In comparison, if this volume of litter were collected directly by the government, the cost would be much greater. Direct collection would require a fleet of vessels, a waste collecting boat, a towing boat, and a crane barge. Additionally there would be the added standard operating costs and



fuel. Table 2.5 shows a comparison of the amounts of litter collected and cost of the buyback program compared to direct collection of deposited marine litter.

**Table 6.** Amount of litter collected through the buyback program

Year	Buyback program			Clean up deposited marine litter		
	Budget (MLTM + local budget, won)	Amount of litter (ton)	Cost per ton (won/ton)	Budget (private capital, won)	Amount of litter (ton)	Cost per ton (won/ton)
2004	2,518,491	2,819	893	7,062,988	3,618	1,952
2005	3,383,713	4,639	729	8,189,750	5,352	1,530
2006	5,043,546	7,458	676	8,310,492	5,368	1,548
2007	4,215,804	5,759	732	8,527,030	4,114	2,073
2008	4,255,679	8,797	484	8,860,376	3,419	2,952
Total	19,417,233	29,472	3,514	40,950,636	21,871	10,055
Average	3,883,446	5,894	659	8,190,127	4,374	1,872

The buyback program is clearly a very cost-effective system with added benefits. It increases environmental awareness among the fishermen and provides them with an extra source of income. It also prevents damage to marine life, and uses existing resources (i.e., the fishing fleet). As of 2009, total 51 offices have been implemented the buyback program and made a proper disposal. However, it does not follow polluter-pays principle; therefore it is recommended to transit the program into voluntary program such as floating receptacles for marine litter.



Fishermen offload debris-filled sacks from their boat.



Sacks are stacked in reception area.



Sacks collected in port reception facility.



Sacks transported to waste management facility.



Sacks loaded into a container for transport.



Sacks offloaded at waste management facility.



Sacks to be incinerated.



### 3.3. Recycling ship-generated litter campaign

The recycling ship-generated litter campaign is developed by Korea Coast Guard in order to encourage fishermen to bring back their ship-generated litter. This program aims to increase fishermen's awareness and improve the marine environment. The recycling ship-generated litter campaign has been established since 2006 and amended accordingly to correct shortcomings. Many fishermen voluntarily participate in the campaign. Total 86 sites are now implemented the program as of 2009.

#### *Background*

Derelict fishing gear abandoned or discarded in during the operation of fishing activity is difficult to specify polluters and to trace the illegal disposal. The Korean government has taken the effort to reduce derelict fishing gear and implemented several programs such as the development of bio-degradable fishing gear and the real-name fishing gear system.

Specifically, there was lack of systems to collect ship-generated litter, except fishing gear, from small ships like fishing vessels. As a result, such ship-generated litter like bottle or plastic bags abandoned at harbor, port and shoreline, sometimes even illegally dumped into the sea. According to the research by MLTM, about 32% of fishermen dumped their ship-generated litter into the sea rather than disposed it in proper way.

It had been customary for fishermen an illegal disposal of marine litter at sea.

Fishermen's behavior was due to a lack of their awareness on marine litter as well as a lack of adequate port reception facilities.



Figure 7. Recycling bins for the campaigns.

In this regard, Korea Coast Guard has developed the recycling ship-generated litter campaign to encourage fishermen to bring back their ship-generated garbage voluntarily by providing a recycling bin (Figure 7).

## Methodology

In 2006, Korea Coast Guard started the recycling ship-generated litter campaign. Total 60 recycling bins were constructed at major ports and harbours. Korea Coast Guard educated fishermen to increase their awareness and provided information on the recycling bins for ship-generated litter such as bottle, can, paper, plastics and garbage.

Several shortcomings were pointed out as the recycling ship-generated litter campaign conducted. For example, some tourists thought a recycling bin for ship-generated litter as a trash can, and a recycling bin was filled with trash rather than ship-generated litter. Korea Coast Guard considered that such a situation was caused by a lack of public awareness and outreach. The shortcomings were improved based on the experience during the campaign implementation.



**Figure 8.** Cooperation between Korea Coast Guard, Fisheries Cooperative Union, local government and disposal companies.

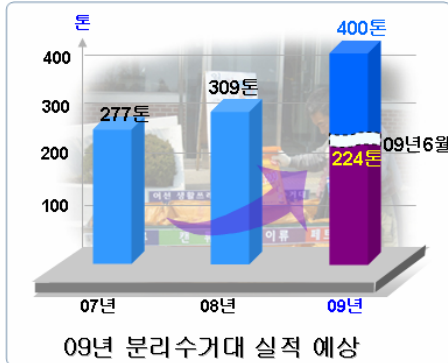
In March 2009, Korea Coast Guard and Fisheries Cooperative Union joined hands in effort to enlarge the campaign sites from 60 to 86 areas, and operated “Green Helper” who manages the recycling bins (Figure 7 and 8). In addition, some recycling bins were transferred where the bins are really

required. Public awareness and outreach were implemented using local media, electric sign, magazine articles, brochures and etc. Especially, tourists including anglers were one of main audience during public awareness and outreach.



**Figure 9.** *Location of recycling bins for ship-generated litter campaigns*

## Results



The recycling ship-generated litter campaign has brought big changes of fishermen's awareness. Green Helper handles on a daily cleanup the recycling bins as well as harbour surroundings, and it contributes to formation of clean harbour appearance. In addition, extra incomes from recyclable materials were used as a contribution for the old in near town or salary for Green Helper.

For these reasons, the recycling ship-generated litter campaign has been well-received by fishermen and increased the fishermen's awareness.

Korea Coast Guard plans to enlarge the recycling ship-generated litter campaign with close cooperation of Fisheries Cooperative Union to improve marine environment and to preserve marine resources.

**Table 7. Results of the recycling ship-generated litter campaign**

Year	Total (tons)	Recycling wastes (tons)				Garbage (tons)	# of sites
		Bottle	Can	Paper	Plastic		
'2009.06	224	36	35	47	41	65	86
2008	309	84	72	78	71	4	60
2007	277	66	62	74	67	8	60



# NOWPAP MERRAC

Northwest Pacific Action Plan  
Marine Environmental Emergency Preparedness and Response  
Regional Activity Centre

P.O. Box 23, Yuseong, Daejeon 305-600, Republic of Korea  
(c/o MOERI/KORDI)  
Tel: (+82-42) 866-3638, Fax: (+82-42) 866-3698  
E-mail: [nowpap@moeri.re.kr](mailto:nowpap@moeri.re.kr)  
Website: <http://merrac.nowpap.org>



9 788993 604016

ISBN978-89-93604-01-6