

Regional Overview: Marine Litter in the NOWPAP Region

(Second Edition)



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Northwest Pacific Action Plan
<http://www.nowpap.org>

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**Regional Overview:
Marine Litter in the NOWPAP Region
(Second Edition)**

Northwest Pacific Action Plan 2008

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1. Introduction

Marine Litter, also known as marine debris, is defined as any persistent, manufactured or processed solid material discarded, disposed of or abandoned in the marine and coastal environment. It can enter directly (e.g., from a ship) or indirectly when washed out to sea through rivers, streams and storm drains. Marine litter causes a complex and multi-dimensional problem with significant implications for the environment and human activities.

Recognizing the severity of marine litter issues, the United Nations General Assembly adopted resolution (UN GA Resolution A/60/L.22) in November 2005 calling for global and regional actions to address the problem. In response to this resolution, UNEP has developed a global initiative on marine litter. Eleven UNEP Regional Seas Programmes currently participate in this UNEP global initiative and NOWPAP is one of them. The geographic scope of NOWPAP is shown in Figure 1.

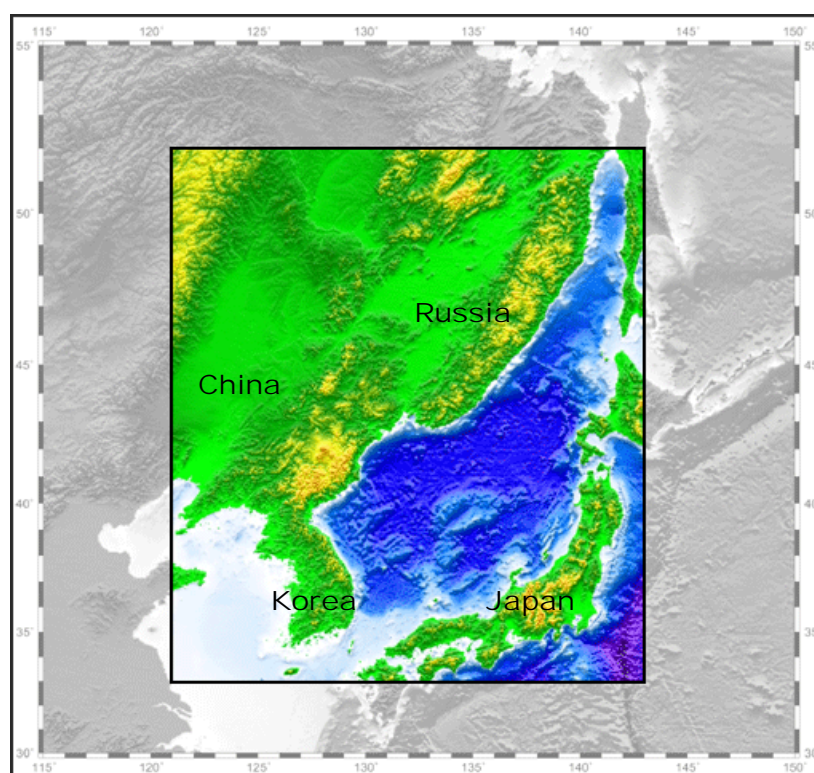


Figure 1. Geographic scope of the NOWPAP region

NOWPAP Marine Litter Activity (MALITA) has been initiated since its approval by the Tenth NOWPAP Intergovernmental Meeting in November 2005 with the overall goal of the development of a NOWPAP Regional Action Plan on Marine Litter (RAP MALI). Since then, several MALITA components have been successfully implemented. First, marine litter-related data and information available in the region were collected and analyzed. On the basis of collected data and information, a NOWPAP marine litter database (<http://dinrac.nowpap.org>) was established. Second, a regional overview on legal instruments, institutional arrangements and programmes related to marine litter was prepared (DINRAC 2007). Third, monitoring guidelines for marine litter (found on beaches and shorelines as well as on the seabed) and sectoral guidelines focusing on fishing, shipping and tourism were developed (CEARAC 2007a, b; MERRAC 2007a, b, c, d, e, f). Fourth, brochures, leaflets and posters were published in English to increase the public awareness on the marine litter problem as a whole. Some of them were translated into national languages of the NOWPAP member states to facilitate and promote their practical use. Finally, a draft NOWPAP RAP MALI was developed, further discussed at the Twelfth NOWPAP Intergovernmental Meeting (October 2007) and finalized at the NOWPAP RAP MALI meeting (November 2007). The RAP MALI was approved by the NOWPAP member states in March 2008 and is now integrated into the NOWPAP Programme of Work (together with the existing work on harmful algal blooms, oil spills, integrated coastal area and river basin management, etc.).

While implementing the two years' project of MALITA, NOWPAP has prepared this regional overview on marine litter based on data and information available in the region. The objective of this overview is to assess the current situation of marine litter in the region in order to assist the NOWPAP member states in the development and formulation of the necessary measures for environmental protection and sustainable management of marine litter. This overview contains review of available data and information on marine litter; existing legal instruments, institutional arrangements, programmes and initiatives; gaps and needs in coverage of marine litter management; and proposals for changes and recommendations.

2. Assessment of the Current Status of Marine litter

Our seas and waterways are constantly polluted with a wide variety of marine litter ranging from plastic bottles to derelict fishing gear. Despite alarming evidences on the marine litter problem, our current knowledge about the overall situation of marine litter is still not enough. Data and information on marine litter will definitely provide a solid basis for actions to be taken to deal with the litter problem as a whole at the regional and national level.

Data to assess the regional situation of marine litter are very unevenly distributed geographically in the Northwest Pacific region. Recognizing the urgent necessity of dealing with the marine litter problem, however, several national initiatives to collect data have already been undertaken by the NOWPAP member states. In addition to data on marine litter provided in this overview, some national information is available at the NOWPAP marine litter database (<http://dinrac.nowpap.org>).

The best data available for the NOWPAP region can be, at present, obtained from the research results of the Northwest Pacific Region Environmental Cooperation Centre (NPEC), Japan (NPEC 2003, 2004, 2005, 2006). NPEC has initiated a research on washed-up driftage on the coasts on the Northwest Pacific region since 1996 and extended gradually its survey area to the neighbouring countries such as Republic of Korea, People's Republic of China and Russian Federation (Table 1). The research was carried out once a year using the relatively unified methods.

Table 1. The number of survey locations in each of the NOWPAP member states (NPEC, 2002-2005)

Year	Number of survey locations				
	Japan	Korea	Russia	China	Total
2002	26	9	5	0	40
2003	26	5	5	12	48
2004	26	6	5	14	51
2005	44	6	6	14	70

2.1. Amounts of Marine Litter

2.1.1. Japan

In the NPEC research, marine litter was classified into eight categories: plastics, rubber, polystyrene, paper, cloth, glass and ceramic, metals, and others (NPEC 2003, 2004, 2005, 2006). According to the results of the 4 years' research, plastic litter was most prevalent along the coastal areas of Japan, accounting for 76.2% of the total collected litter in number and 51.3% in total weight (Figure 2). The next dominant item was polystyrene in the total number collected and glass and ceramic in the total weight collected.

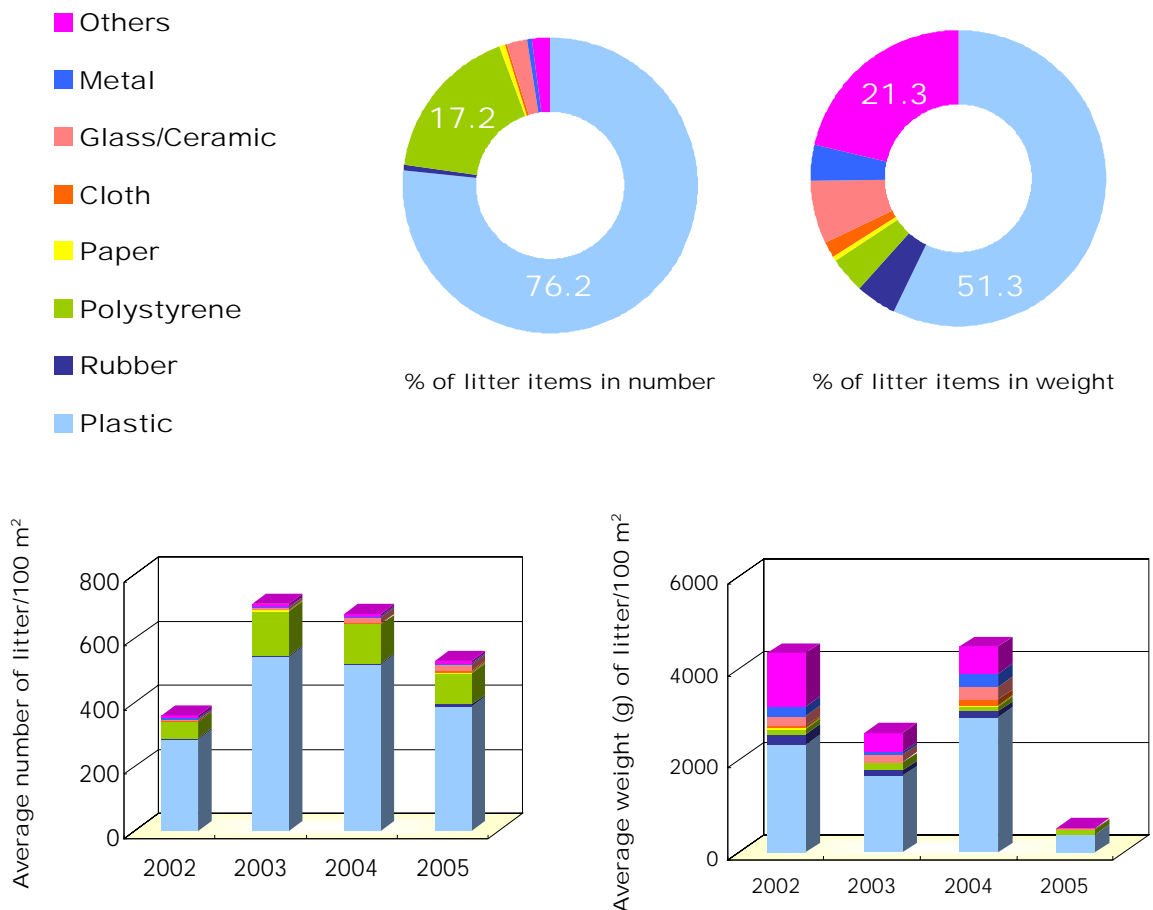


Figure 2. Composition of marine litter along the coastal areas of Japan from 2002 to 2005 (data from NPEC)

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Approximately 570 pieces (3,864 g) of marine litter were, on average, found per 100 m² from 2002 to 2005 (NPEC 2003, 2004, 2005, 2006). The annual average number of marine litter collected per 100 m² varied from 360 in 2002 to 707 in 2003 (Figure 2). The annual average weight of marine litter collected per 100 m² was between 532 g in 2005 and 4,482 g in 2004. However, these annual average values presented in Figure 2 do not represent the actual inter-annual variation in the quantities of marine litter because they can vary depending on the intensity of each survey (e.g., different number of participants), survey locations, weather conditions (e.g., before or after heavy rain or typhoon) and other peculiarities (e.g., peak season of tourism including local festivals and other events held at the surveyed beaches, the presence of other cleanup operation at the given survey location, etc.).

In the NPEC research, the survey locations can be grouped into 5 areas (Figure 3, Table 2; NPEC 2003, 2004, 2005, 2006). In the area A, the average number of marine litter observed per 100 m² from 2002 to 2005 was 1,366 pieces that was up to 7 times higher than that in the remaining 4 areas (Figure 4). However, the annual average values in each grouped area do not directly represent actual inter-annual variation in the amount of marine litter (as previously described). This pattern might be related to direction of ocean currents such as the Tsushima current and the Kuroshio current. Further detailed research is required to identify the relation between the distribution of marine litter and the ocean currents.



Figure 3. Map of survey locations carried out by NPEC, Japan, in 2003

Table 2. The number of survey locations in the 5 grouped areas (data from NPEC)

Year	Number of survey locations					Total
	A	B	C	D	E	
2002	4	7	7	5	3	26
2003	4	9	7	5	1	26
2004	4	8	7	5	2	26
2005	7	16	8	3	3	37

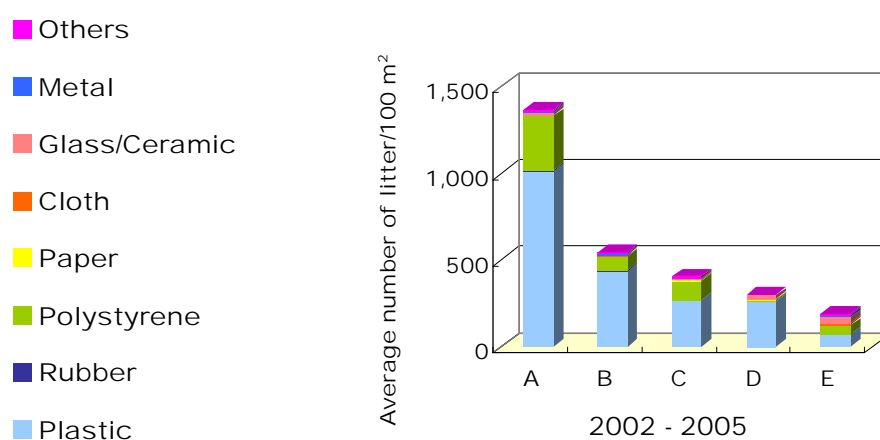


Figure 4. Amounts of marine litter collected in 5 survey areas of the west coast of Japan (data from NPEC)

2.1.2. Republic of Korea

According to the results of the 4 years' NPEC research, the most prevalent litter item along the coastal areas of Korea was plastic, accounting for 53.6% of the total collected litter in number and 33.7% in the total weight (Figure 5; NPEC 2003, 2004, 2005, 2006). The next dominant item was metal in the total number collected (21.5%) and the glass and ceramic in the total weight collected (14.4%).

Approximately 30 pieces of marine litter were, on average, observed at every 100 m² of the NPEC survey areas along the costal zone of Korea from 2002 to 2005 (Figure 5; NPEC 2003, 2004, 2005, 2006). The annual average number of marine litter collected per 100 m² varied between 20 in 2005 and 53 in 2004. The annual average weight of

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marine litter collected per 100 m² was from 20 g in 2005 to 269 g in 2003. However, these average values do not represent the actual annual fluctuation in quantities of marine litter (as previously described).

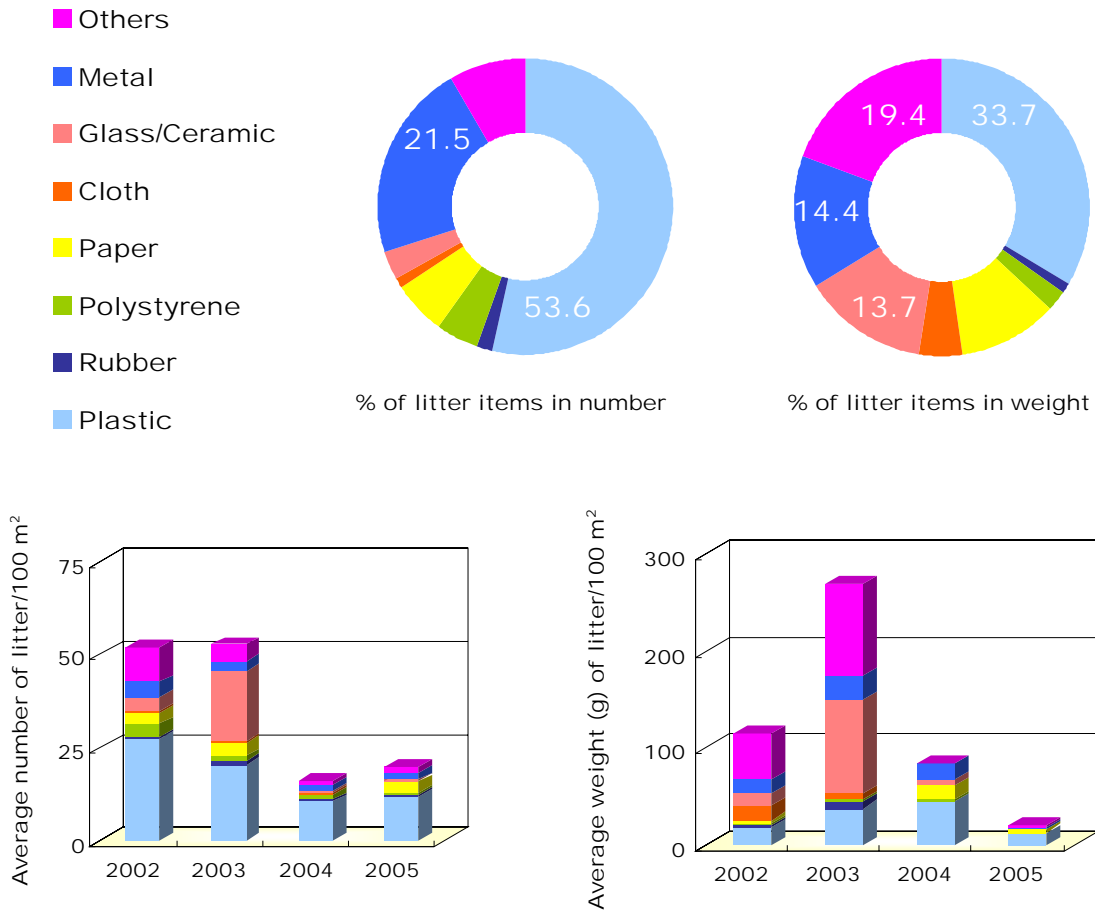


Figure 5. Composition of marine litter along the coastal areas of Korea from 2002 to 2005 (data from NPEC)

The Ministry of Land, Transport and Maritime Affairs (MLTM, formerly Ministry of Maritime Affairs and Fisheries), Korea has implemented national marine litter monitoring surveys since 2000. This overview used the data obtained from the two years' survey only (Figure 6). The data used are available on the NOWPAP Marine Litter Database (<http://dinrac.nowpap.org>). Polystyrene was the most prevalent item in the total number collected while plastic litter in the total weight collected (Figure 7). A significant proportion of wood was also found in both the total number and weight collected.

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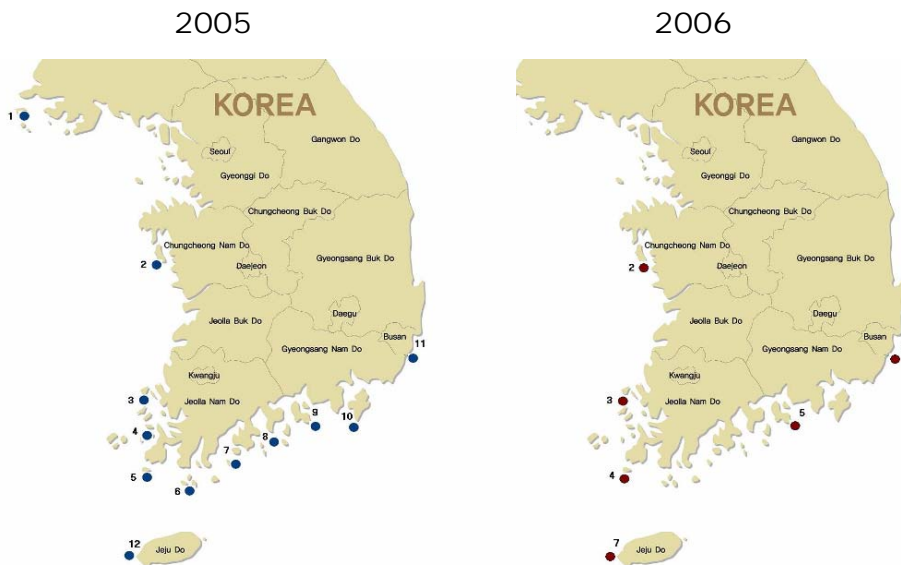


Figure 6. Maps of survey locations carried out by MLTM, Korea

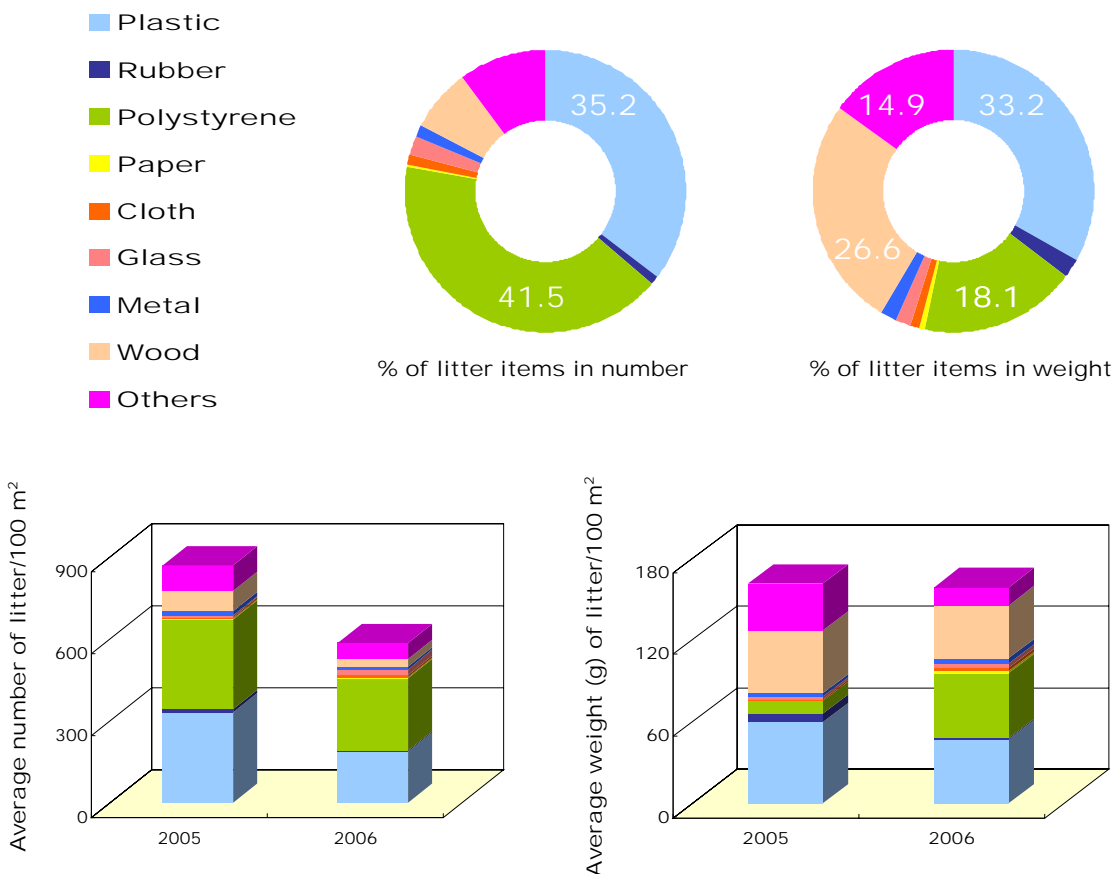


Figure 7. Composition of marine litter along the coastal areas of Korea (data from MLTM)

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According to Figure 5 and 7, there are some differences in the survey results provided by NPEC (Japan) and MLTM (Korea) regarding the amount of collected marine litter and the dominant litter items. These discrepancies are mainly due to different survey areas (in addition to factors previously mentioned such as the number of participants and their expertise, weather conditions, previous cleanup activities, etc.). In case of the NPEC surveys, the local volunteers collected litter mainly in the public beach areas, while the MLTM surveys were carried out mostly by researchers (familiar with litter hot spots around fishing grounds). Therefore, in the MLTM surveys, high percentage of polystyrene possibly indicates intensive fisheries-related activities around the study areas.

2.1.3. Russian Federation

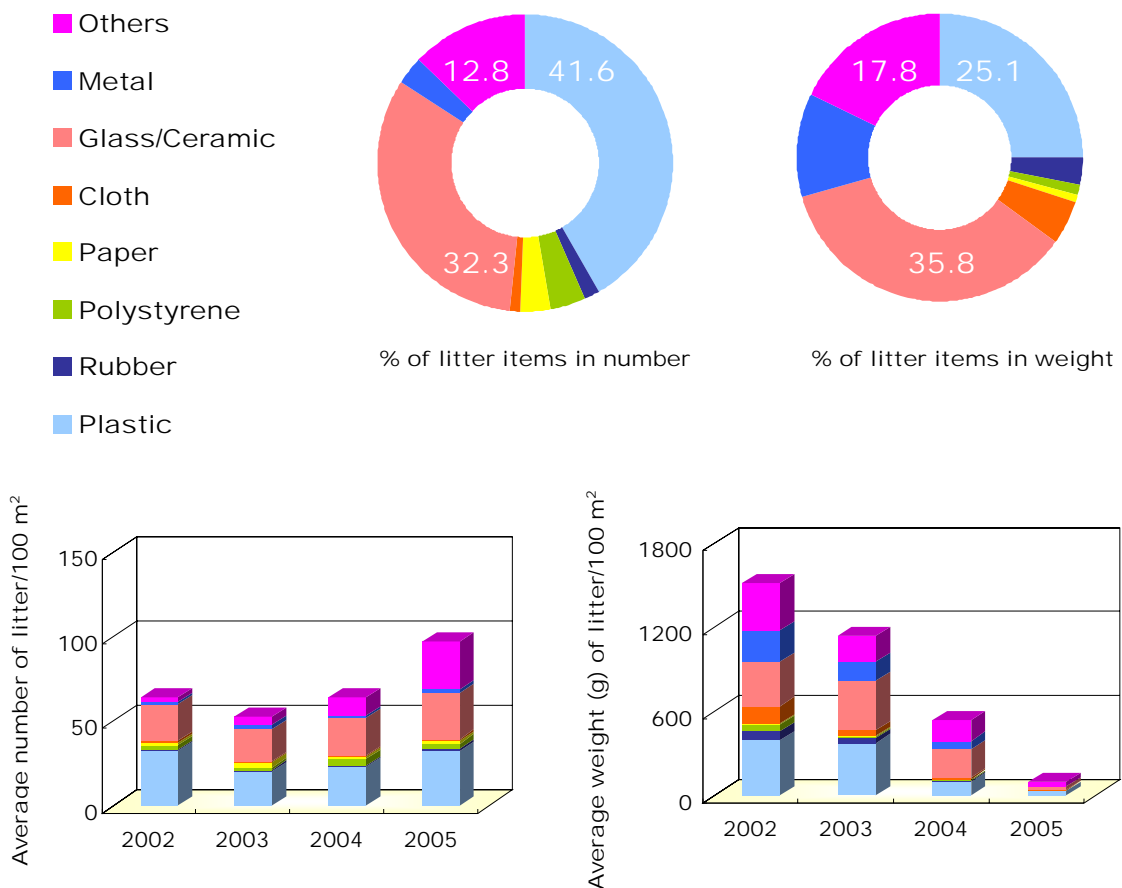


Figure 8. Composition of marine litter along the coastal areas of the Russian Far East from 2002 to 2005 (data from NPEC)

In the Russian Far East, there were no national data available for this overview. However, the NPEC surveys provide limited data on marine litter in the three coastal provinces of the Russian Far East between 2002 and 2005 (Table 1, Figure 3; NPEC 2003, 2004, 2005, 2006). Plastic litter was most dominant in the total number of marine litter collected while glass and ceramic litter in the total weight collected (Figure 8).

According to the NPEC surveys, approximately 70 pieces (822 g) of marine litter were, on average, found per every 100 m² of the coastal areas of Russian Far East from 2002 to 2005 (Figure 8; NPEC 2003, 2004, 2005, 2006). The annual average number of marine litter collected per 100 m² ranged from 53 in 2003 to 98 in 2005. The annual average weight of marine litter collected per 100 m² was between 97.4 g in 2005 and 1,515.1 g in 2002. These variances do not represent the actual increase or decrease in the quantities of marine litter in the given survey locations (as previously explained). According to the NPEC data, the proportion of glass and ceramic litter is higher than that in Japan and Korea,

2.1.4. People's Republic of China

Since very little is known about marine litter in China, no national data were available for this overview. The NPEC surveys cover the east coastal areas of China (Table 1, Figure 3; NPEC 2003, 2004, 2005, 2006). Glass and ceramic litter was most prevalent in the total number collected, while polystyrene in the total weight collected (Figure 9). A significant proportion of plastic litter was also found in both the total number and weight collected. These finding is somewhat similar to that in the Russian Far East but different from that in Japan and Korea (Figures 2, 4, 5, 7-8).

In the NPEC surveys, every 100 m² of the observed areas along the Chinese coast were polluted with 120 pieces of marine litter on average from 2003 to 2005 (NPEC 2003, 2004, 2005, 2006). The annual average number of marine litter collected per 100 m² of the survey areas was between 64 in 2003 and 166 in 2005 (Figure 9). The annual average weight of litter collected per 100 m² varied from 128 g in 2002 to 1,982 g in 2005. However, these average values do not reflect the actual annual variations in the amounts of marine litter as previously explained.

This overview is dealing only with marine litter accumulated at beaches and coastal areas because of availability of data for the time being. Marine litter can be found not

only at beaches and costal areas but also floating on the water surface, mixed in the water column and sank to the seabed. For better scientifically reliable assessment on the current status of marine litter, further detailed research is needed at the national and regional level.

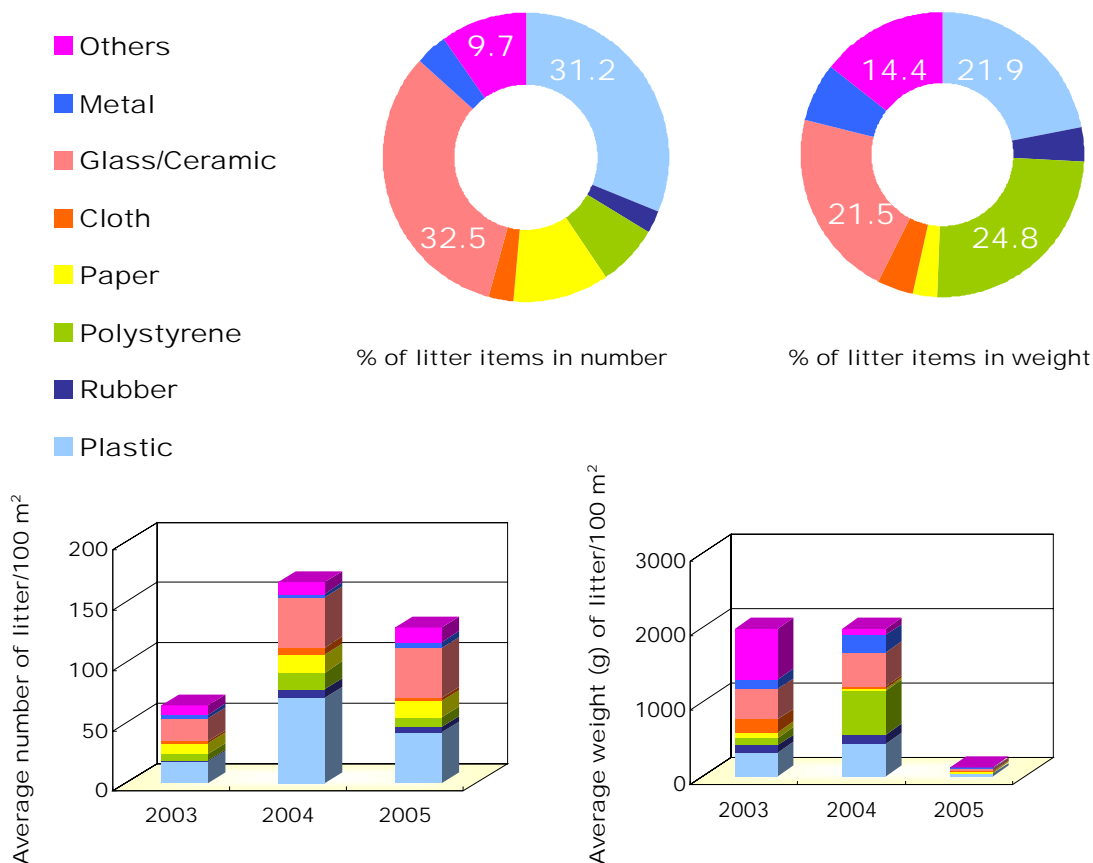


Figure 9. Composition of marine litter along the coastal areas of China from 2003 to 2005 (data from NPEC)

2.2. Sources of Marine Litter

The International Coastal Cleanup (ICC), initiated and promoted by the Ocean Conservancy (OC, an U.S.A. NGO) and known as the largest and most successful volunteer event of its kind in the world, collects data on marine litter. The ICC organizes an annual, worldwide beach cleanup in September. In the year of 2006, over 358,000 volunteers in 68 countries took part and removed litter from over 55,620 km (34,560 miles) of coastline and waterways. The ICC results show that almost 60% of litter found

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could be attributed to shoreline and recreation activities such as beach picnics (Figure 10).

Among the NOWPAP member states, Japan and Korean have participated in the ICC campaign since 1990 and 2001, respectively. In 2006, China has joined the ICC campaign. This overview used the ICC data from 2004 to 2006 (Table 3; OC 2004, 2005, 2006).

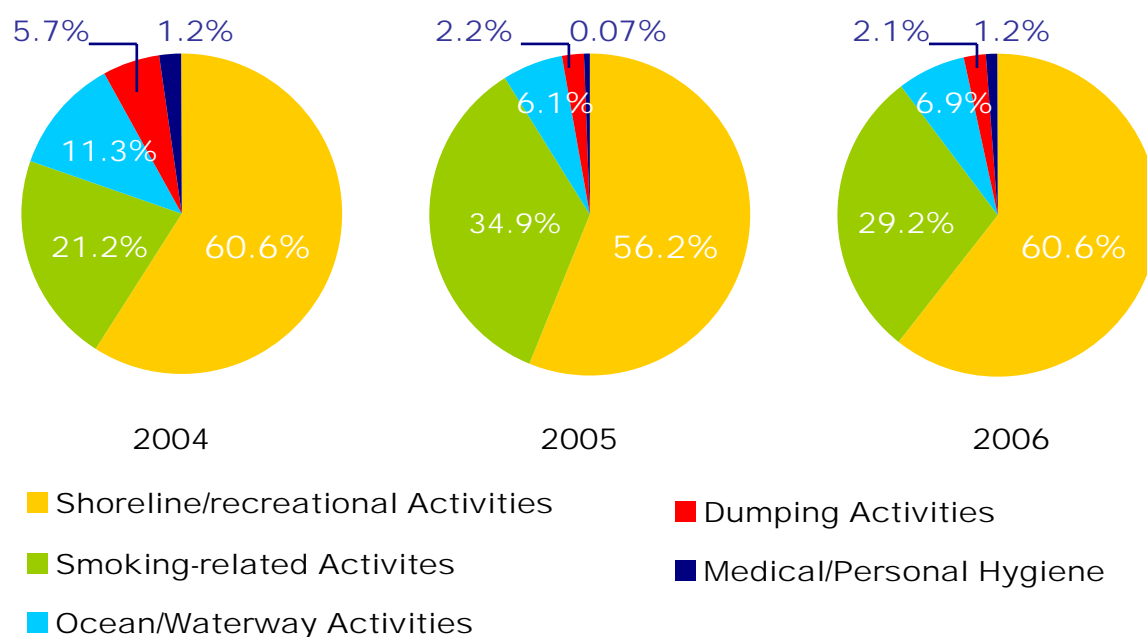


Figure 10. Worldwide sources of marine litter (data from the Ocean Conservancy)

Table 3. ICC Participation of the NOWPAP member states

	ICC information	2004	2005	2006
Japan	No. of volunteers participated	17,773	14,809	16,878
	Total length cleaned up (km)	110.4	40.2	2,732.6
	Total litter weight collected (ton)	122.3	33.3	17.3
Korea	No. of volunteers participated	2,003	3,971	3,655
	Total length cleaned up (km)	46.7	35.1	89.8
	Total litter weight collected (ton)	16.7	134.3	323.9
China	No. of volunteers participated	-	-	30
	Total length cleaned up (km)	-	-	24.1
	Total litter weight collected (kg)	-	-	50.3

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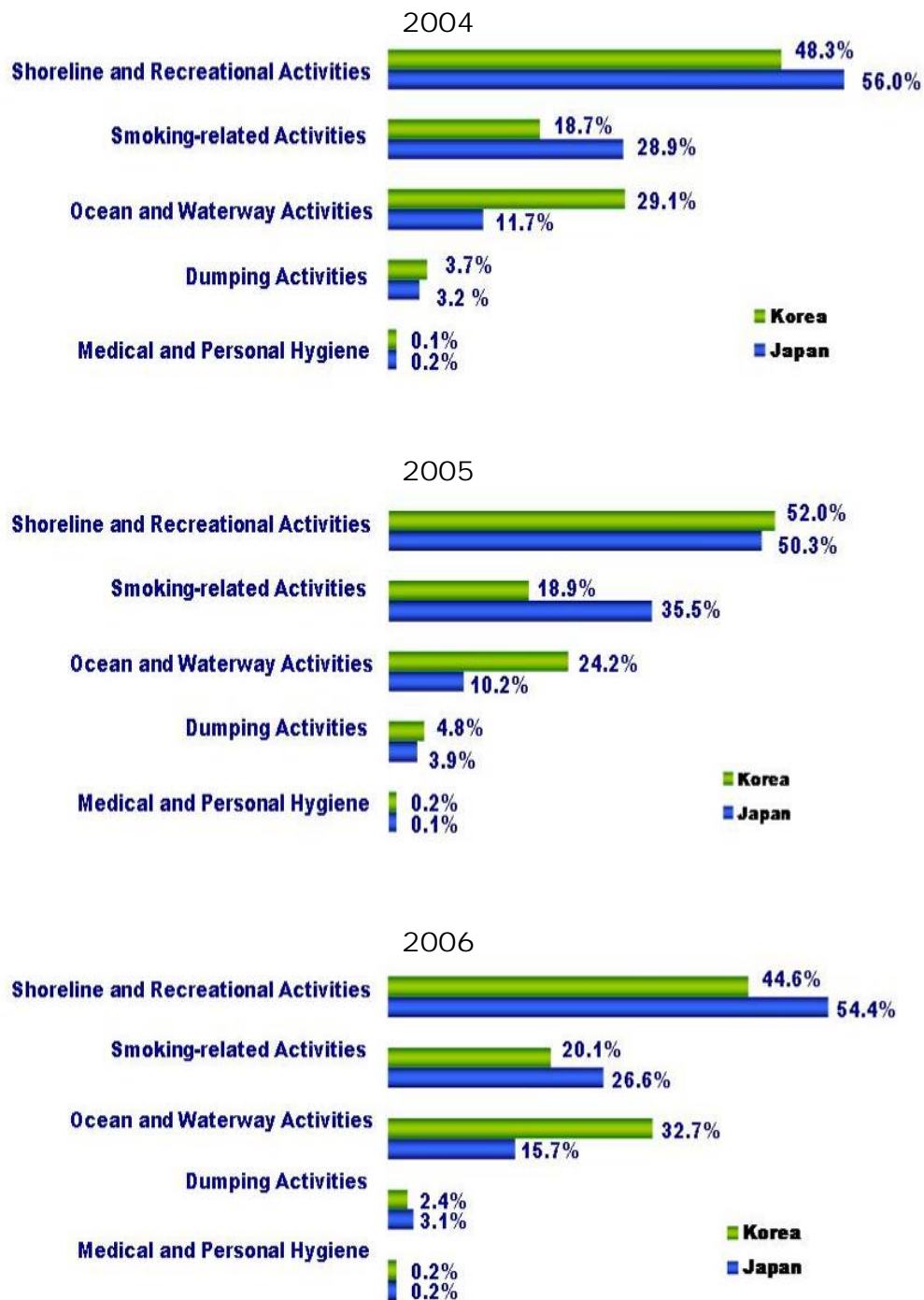


Figure 11. Sources of marine litter in Japan and Korea in percentage (data from the Ocean Conservancy)

According to the ICC reports of Japan and Korea, almost 50% of marine litter collected originated from shoreline and recreational activities (Figure 1; OC 2004, 2005, 2006):

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food wrappers and containers, beverage bottles and cans, and straws. In Japan, smoking-related activities came in second (accounting for over 31%) while in Korea, ocean and waterway activities (29%). The majority of ocean and waterway activities was fishing-related items (e.g., bait containers, floats, traps, fishing line, lures and nets, light sticks and bulbs, rope, etc.). Dumping activities were responsible for a little less than 5%. While medical and personal hygiene made up little more than 0.1% of the total marine litter on average, it accounted for some of the more disturbing items such as syringes and tampons.

In 2007, China has organized an ICC campaign in Rizhao as part of the NOWPAP MALITA implementation and local volunteers organized an additional ICC campaign in Shanghai. Russia also conducted a pilot ICC campaign in 2007 and is expected to organize the full scale ICC campaigns. The ICC data to be produced by China and Russia will contribute to better understanding of sources of marine litter.

3. Legislation, Policies and Institutional Arrangements

3.1. Legislation and Policies

According to the regional overview on legal instruments, institutional arrangements and programmes related to marine litter, based on the four national summaries prepared as a part of NOWPAP MALITA, each of the NOWPAP member states has marine litter related national laws and regulations (Table 4; DINRAC 2007). National legal instruments of the NOWPAP member states comply with marine litter-related international conventions and agreements such as the International Convention for the Prevention of Pollution from Ships (MARPOL Convention); the Convention for the Prevention of Marine Pollution from Dumping of Wastes (London Convention); the Basel Convention on the Transboundary Movements of Hazardous Wastes and Their Disposal; and the Global Programme of Action (GPA) for the Protection of the Marine Environment from Land-based Activities (Table 5). The regional overview is available at the NOWPAP marine litter database (<http://dinrac.nowpap.org>).



Figure 12. NOWPAP Marine Litter Database

Marine litter is, in most cases, not specifically mentioned in national legal instruments of the NOWPAP member states. The litter problem is more likely connected to other marine and coastal environmental protection and health issues. It is clear that marine litter should be further addressed by the existing national legislation with measures to prevent, reduce and control the discharge of land-based and ship-generated wastes, and to reduce the loss of fishing gear from fishing vessels. These measures can also contribute to the Integrated Coastal Area and River Basin Management (ICARM).

Table 4. Marine litter-related national laws and regulations in the NOWPAP region

	National laws and regulations
China	<ul style="list-style-type: none"> • Environmental Protection Law (EPL) sets the overall supervision and management of the environmental protection throughout the country. • Marine Environment Protection Law (MEPL) aims to supervise the nationwide marine environment protection, conserve marine resources, prevent pollution, safeguard human health and promote economic and social development. • Law on Control of Ocean Waste Dumping regulates waste dumping at sea. • Regulations on Prevention of Pollution Damage to Marine Environment by Land-based Pollutants prohibit to pile up, discard or dispose of solid waste along seashores and beaches without authorized permission. • Regulations on the Control of Environmental Pollution by Ship-based Wastes describe the treatment of garbage from ships. • Regulations on Strengthening Management of Plastic Package Wastes along Main Roads, in River Basins and at Tourist Attractions prohibit littering plastic waste or other solid waste into rivers, lakes and their banks and to use non-degradable tableware on passenger ships and cruise lines. • Regulations on Prevention of Pollution Damage to Marine Environment by Coastal Construction Projects concern the protection of the marine environment from the costal development and construction.
Japan	<ul style="list-style-type: none"> • Basic Environment Law sets forth basic principles for the environmental policy. • Waste Management and Public Cleansing Law regulates industrial waste disposal, including waste dumping at sea, and concerns the maintenance of ports and harbours. • Cabinet Order of Waste Management and Public Cleansing Law sets the standards for the collection, transport and disposal of municipal solid waste, including industrial waste and ocean dumping of solid waste. • Law Related to Prevention of Marine Pollution and Maritime Disasters regulates the discharge of waste generated from ships and its management onboard. • Seacoast Law aims to protect the seacoast area from damages caused by a variety of oceanological phenomenon (e.g., tsunami, storm surges and high waves) and promote coastal zone conservation and its proper use. • Port and Harbour Law describes the maintenance and management of port areas and facilities. • Establishment Law of the Ministry of Land, Infrastructure and Transport concerns the matters of the prevention of the marine environment pollution.

Table 4. Continued

National laws and regulations	
Korea	<ul style="list-style-type: none"> • Environmental Policy Basic Law provides the overall supervision of management of the environmental protection. • Maritime Pollution Prevention Law aims to prevent the marine and coastal environment from hazardous pollutants (mainly from ships) such as oil, sewage and garbage. • Ocean and Fisheries Development Basic Law sets forth basic principles for the development of ocean-related industries including fisheries. • Port Management Law prohibits the discharge of waste in the port area for safe navigation and describes the development, maintenance and management of ports and their facilities. • Coast Management Law aims towards the sustainable use of the coastal environment, including beaches and public swimming areas, and regulates coastal construction. • Waste Management Law concerns the collection and treatment of industrial waste and household waste.
Russia	<ul style="list-style-type: none"> • Environment Protection Law sets basic policies for the environmental protection and ecological safety. • Water Code deals with the water protection from pollution and abuse. • Production and Consumption Wastes Law focuses on the waste management from production and consumption. • Inland Sea Waters, Territorial Sea and Contiguous Zone Law describes surveillance in case of incidents. • EEZ (Exclusive Economic Zone) Law contains the protection and conservation of special areas to prevent marine pollution from ships. • Regulations on Waste Disposal and other Kinds of Abuse define environmental pollution and related adverse effects where procedures of waste disposal are included. • Fishery Fleet Instructions on Preventing Pollution from Ships focus on preventing marine pollution from fishing vessels. • Polluted Harbour Waters Cleanup Operation Rules deal with cleaning polluted water in the port areas, including oil spill incidents. • Compulsory Regulations on Sea Ports address the management of garbage from ships.

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Table 5. The current status of compliance with marine litter-related international conventions and agreements by the NOWPAP member states

	China	Japan	Korea	Russia
MARPOL Convention Annex V	Implements nationally through Regulations on Prevention of Ship-based Sea Pollution	Implements nationally through Law relating to the Prevention of Marine Pollution and Maritime Disaster	Implements nationally through Marine Pollution Prevention Law	Implements nationally through Fishery Fleet Instructions on Preventing Pollution from Ships; and Compulsory Regulations on Sea Ports
London Convention	Implements nationally through Regulations on Control over Waste Dumping to the Marine Environment	Implements nationally through Law Relating to the Prevention of Marine Pollution and Maritime Disaster	Implements nationally through Marine Pollution Prevention Law	Ratified
Basel Convention	Implements nationally through Regulations on Prevention of Environmental Pollution by Solid Waste	Implements nationally through Waste Disposal and Public Cleansing Law; and Law for the Control of Export, Import and Others of Specified Hazardous Wastes and Other Wastes	Implements nationally through Law on Transboundary Movement and Treatment of Marine Debris	Ratified
GPA	Implements nationally through Regulations on Prevention of Pollution Damage to Marine Environment from Land-based Activities	Implements nationally through Water Pollution Control Law; and Law Concerning the Examination and Regulation of Manufacture	Implements nationally through National Clean Water Action Plan	(No clearly defined regulations for the prevention of the sea from land-based activities)

3.2. Institutional Arrangements

According to the regional overview on legal instruments, institutional arrangements and programmes related to marine litter, based on the four national summaries, governmental responsibilities for marine litter issues are shared by different authorities such as ministries, provincial and municipal governments and agencies (Table 6; DINRAC 2007). In general, environmental ministries take the lead for the overall supervision of land-based marine litter and maritime ministries/administrations take responsibility for sea-based marine litter. Local governments are in charge of the general management of waste generated within their coastal area. Therefore, at the national level, a mechanism to strengthen cooperation between different national institutional bodies is needed for better management of marine litter. There has been developed no comprehensive national action plans on marine litter in the NOWPAP member states.

Table 6. Institutional arrangements to deal with marine litter issues in the NOWPAP member states

	Institutional arrangements
China	<ul style="list-style-type: none"> • Ministry of Environmental Protection (MEP, formerly State Environmental Protection Administration) responsible for the overall supervision and management of environmental protection issues • State Oceanic Administration (SOA) in charge of surveys, monitoring and surveillance of the marine environment (including scientific research) and waste dumping at sea • Fishing Management Bureau (FMB) responsible for fisheries resources-related issues, including the supervision of the pollutant discharge by fishing vessels, under the Ministry of Agriculture • State Harbour Superintendent Administration responsible for supervision, investigation and disposal of the pollutant discharge by ships, surveillance of water quality of harbour areas, and prevention of pollution caused by ships • Environmental Protection Department of the Armed Forces responsible for the supervision of the pollutant discharge by military vessels and surveillance of naval port waters • Local People's Government in Coastal Areas responsible for protection of the marine environment from construction and land-based pollutants

Table 6. Continued

	Institutional arrangements
Japan	<ul style="list-style-type: none"> • Ministry of Environment (MOE) responsible for the overall supervision and management of environmental protection issues • Ministry of Land, Infrastructure and Transport (MLIT) responsible for the discharge of waste from ships at sea (with MOE) • Japan Coast Guard (JCG) responsible for the enforcement of marine-related laws and regulations, including waste discharge from ships • Port Authorities in charge of port management • Prefecture and Local Municipalities responsible for the general waste management
Korea	<ul style="list-style-type: none"> • Ministry of Land, Transport and Maritime Affairs (MLTM, formerly Ministry of Maritime Affairs and Fisheries) responsible for the overall supervision of the protection of the marine and coastal environment including the management of marine litter • Ministry of Environment (MOE) in charge of the overall environmental protection issues in inland areas including the management of land-based waste • Korea Coast Guard (KCG) responsible for the enforcement of marine-related laws and regulations, including waste discharge from ships at sea • Local Governments responsible for the protection of the coastal zone and the general management of waste including marine litter (in collaboration with MLTM)
Russia	<ul style="list-style-type: none"> • Ministry of Natural Resources (MNR) responsible for marine environmental protection issues including the management of biological resources • Ministry of Transport (MOT) in charge of shipping-related issues including safe navigation of ships • Administration of Sea Port responsible for merchant shipping-related issues in subordination to MOT • Administration of Primorsky Kray in charge of the overall environmental protection in the area

3.3. Programmes and initiatives

Marine litter-related programmes and initiatives have been drawn from several outcomes obtained through the NOWPAP MALITA implementation, such as a regional overview on legal instruments, institutional arrangements and programmes related to marine litter based on the four national summaries (DINRAC 2007) and proceedings of a series of NOWPAP marine litter workshops (Table 7).

Table 7. Marine litter-related national programmes and initiatives in the NOWPAP member states

	Programmes and initiatives
China	<ul style="list-style-type: none"> • Strengthening the Management of Plastic Package Waste along Main Roads, in the River Basins and at the Tourist Attraction Sites, approved by the State Council, prohibits throwing away plastic litter into rivers, lakes and their bank. • The Ministry of Communication prohibits the use of non-degradable tableware on passenger ships and cruise lines sailing along the Yangtze River, the Taihu Lake, etc. • Ban on Plastic Shopping Bags prohibits providing free plastic bags from 1 June 2008 in all shops and also prohibits producing ultra-thin bags.
Japan	<ul style="list-style-type: none"> • Marine Environmental Improvement Project is operated by the Ministry of Land, Infrastructure and Transport (MLIT). It is focusing on recovering floating marine litter in Tokyo Bay, Ise Bay, Seto Inland Sea, etc. • Natural Disaster-related Emergency Large-scale Countermeasures Project is carried out by MLIT and Ministry of Agriculture, Forestry and Fisheries. It is targeting to collect and remove driftwoods mainly in the conservation areas and within 1 km of dikes, jetties, etc. This project operates only in case of emergency but not on a routine basis. • Subsidy for Promoting the Recycling-based Society is carried out by the Ministry of Environment. It is aiming to restrict waste discharge and promote recycling where the subsidy is provided to develop necessary facilities for the waste treatment and recycling. • Charge for Plastic Bags is initiated by Toyama Prefecture in April 2008 to pay 5 Japanese Yen (approximately US\$ 0.05) for a plastic bag in grocery stores. It aims to reduce the number of plastic bags used and to encourage carrying reusable bags.

Table 7. Continued

	Programmes and initiatives
<p>Korea</p>	<ul style="list-style-type: none"> • National Integrated Management Strategy for Marine Litter has been in place since 1999 by the Ministry of Land, Transport and Maritime Affairs (MLTM, formerly Ministry of Maritime Affairs and Fisheries). Relevant local governments, research institutions, private sector and NGOs are involved. This covers a wide range of surveys and monitoring of marine litter, and the development of environmentally sound technologies and marine litter-related policies. The results of this on-going effort provide a solid basis for a national action plan on marine litter that is currently under development. • Waste Fishing Gear Buy Back Project has been implemented since 2003 by MLTM to collect fisheries-related marine litter (e.g., fishing nets, traps, lines, floats, etc.) deposited in the sea and on the seabed. This project primarily encourages fishermen to bring ashore litter caught in their nets while fishing by providing large hardware bags to easily collect it. When fishermen bring waste fishing gear, it is purchased at the cost of approximately US\$ 10 per 100 litre bag. • Cost-sharing Programme has been initiated since 2001 based on “an agreement for litter disposal in Incheon Coastal Wasters and the Han River Watershed” between Seoul, Incheon and Gyeong-gi Province. Three local governments share the cost of improving coastal water quality around Incheon, including the marine litter removal and treatment cost. In 2007, this programme was further extended to the Nakdong River Basin where the four local governments are involved. They will cooperatively cope with the marine litter problem in a cost-sharing manner. • Charge for Plastic Bags has been introduced by the Ministry of Environment since 2001 to pay 50 Korea Won (approximately US\$ 0.05) for a plastic bag in all kinds of shops and stores. It aims to reduce the number of disposable plastic bags used and to encourage carrying reusable bags.
<p>Russia</p>	<ul style="list-style-type: none"> • Specific Activities on Coastal-sourced Pollution have been carried out based on Polluted Harbour Waters Cleanup Operation Rules. • City Territories Accomplishment Programmes and Waste Target-oriented Programme are implemented in Primorsky Kray. • Interdepartmental Cleanup Commission on the Peter the Great Bay was established in 2005 to improve the port water quality and prevent oil and marine litter pollution in Vladivostok.

In Japan and Korea, relevant national activities to deal with the marine litter problem have already been in place (Table 7), in addition to national legal instruments and administrative institutions as described. Such national programmes and initiatives are expected to be further developed and specified taking into account the growing magnitude of the litter problem. In particular, two projects implemented in Korea, “Waste Fishing Gear Buy Back Project” and “Cost-Sharing Programme”, could be replicable good practices not only in the NOWPAP region but beyond the region.

In case of China, no directly relevant information is available for this overview but such activities seem to be covered under other marine and coastal environmental protection, pollution prevention and health issues (except for ship-generated marine litter and waste dumping at sea that are relevant to Annex V of the MARPOL Convention and the London Convention, respectively). In Russia, marine litter-related national initiatives are more likely to focus on the port areas that are mainly organized by local administration authorities governing the coastal zone. Furthermore, there are very positive signs that the Chinese and Russian governments have started paying more attention to the marine litter problem, in particular since the implementation of the NOWPAP MALITA project.

3.4. Outreach

The marine litter problem can not be resolved solely by means of legislation, law enforcement and technical solutions. Therefore, it has to be addressed by efforts to change attitudes, behaviours, management approaches, education and involvement of all sectors and interests, including public at large.

Addressing the marine litter problem should begin with a wide range of public awareness programmes that influence people’s attitudes and behaviours, including information sharing among related stakeholders, aiming at the prevention and reduction of the generation of marine litter at sources. Extensive educational programmes for a variety of sectors (e.g., fishing, shipping and tourism) and the general public are important to deal with the litter problem, in particular with respect to better waste management on land and at sea. At the regional level, NOWPAP has established a mechanism to communicate between the NOWPAP member states which contributes to information sharing and awareness building.

3.4.1. NOWPAP Marine Litter Workshops

Since the initiation of the NOWPAP MALITA project (and its preparation), six NOWPAP marine litter workshops have been held to share and exchange the overall marine litter-related information (e.g., national policies, monitoring programmes, scientific research and technologies and public awareness, etc.) between the member states and interested parties beyond the region such as UNEP, IMO and other regional seas conventions and action plans (e.g., see Figure 13). National experts in this field, governmental representatives and NGOs actively participated in the workshops.

Most of all, a series of workshops was of great use to build common understanding on the marine litter problem between the NOWPAP member states. The NOWPAP MALITA working meeting was held twice, in conjunction with the two major workshops held in Incheon, Korea in June 2006 and in Toyama, Japan in May 2007, respectively. The meeting discussed the progress on the project implementation and further activities to be taken based on the agreed MALITA workplan. These workshops and meetings, in combination with other activities of the MALITA workplan, contributed to implementing the project successfully and to developing a draft NOWPAP Regional Action Plan on Marine Litter.



Japan, 2005 Korea, 2006 Japan, 2007 China, 2007 Korea, 2007

Figure 13. Proceedings of NOWPAP marine litter workshops held between 2005 and 2007 while implementing the MALITA project.

3.4.2. NOWPAP International Coastal Cleanup (ICC) Campaigns

The workplan of NOWPAP MALITA includes the organization of the International Coastal Cleanup (ICC) campaigns. During 2006 and 2007, four NOWPAP ICC

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campaigns have been organized with the financial support from the member states, in combination with other side events such as exhibitions, workshops and NGO meetings (Figure 14).



Figure 14. ICC campaigns organized during the NOWPAP MALITA implementation

In addition to Japan and Korea that have participated in the ICC campaign since 1990 and 2001, respectively, China has joined the ICC campaign since 2006 and organized the NOWPAP ICC campaign in Rizhao in 2007 showing strong ownership as a member state of NOWPAP. It is one of achievements of the NOWPAP MALITA project. Russia

also conducted successfully a pilot ICC campaign in Vladivostok in October 2007. A unique feature of the ICC campaigns is the identification of sources of marine litter which eventually contributes to changing the behaviours that cause the litter pollution (see also 2.2.).

The ICC campaigns provide a very good opportunity to raise the public awareness and to collect data of marine litter sources, in particular for those who have not yet had systematic national marine litter surveys.

For the purpose of public awareness raising on marine litter and its adverse effects on the marine and coastal environment, NOWPAP developed several sectoral guidelines (for fishing; for shipping, including passenger ships and cruise lines, and for tourism), booklets, brochures and leaflets, in collaboration with the nominated Marine Litter National Focal Points of the member states and the four Regional Activity Centres (CEARAC 2007b; MERRAC 2007b, c, d, e, f). Some of them were translated into national languages of the NOWPAP member states to be easily readable by the general public, including the school children and youth. Further activities were also carried out such as exhibitions and environmental education in conjunction with other occasions.

4. Strengths, Gaps, Needs and Proposals for Action

Marine litter issues have been of increasing concern in the Northwest Pacific region, in particular since the initiation of the NOWPAP MALITA project. During the project period, the NOWPAP member states have demonstrated a remarkable strong willingness to implement the MALITA project with the full extent of ownership and cooperation between the member states. First, the NOWPAP marine litter data base was established that was not possible without national data and information provided by the member states (<http://dinrac.nowpap.org>). Second, a regional overview on legal instruments, institutional arrangements and programmes related to marine litter was developed on the basis of national summaries prepared by the Marine Litter National Focal Points (DINRAC 2007). This overview to assess the overall status of the marine litter problem in the NOWPAP region is drawn from such national information available and outcomes achieved during the MALITA implementation.

This overview finds some barriers and gaps between the NOWPAP member states, mainly due to different levels of national economy; different priorities set by each member state among a variety of marine and coastal environmental issues; the different extent of the coverage of marine litter issues in national legal instruments and administrative institutions; inefficient enforcement of national and international laws and regulations; and lack of public awareness. In most cases, marine litter is not clearly specified in national legal instruments which are related to other marine and coastal environmental protection and health issues. Government responsibilities for marine litter issues are mostly shared between several different authorities (e.g., ministries, provincial and municipal governments and agencies). In general, authorities taking the lead for marine and coastal environment issues, including marine litter, are different from those taking responsibility for the whole nationwide environmental issues. The involvement of several ministries, on the other hand, can positively lead to more comprehensive awareness on the marine litter problem as long as they cooperate with each other.

Barriers and gaps found in this overview can be mostly overcome through a change in the wide recognition of marine litter as one of marine pollution issues since the legal framework to protect and conserve the marine and coastal environment from pollution has already been in place in the NOWPAP member states. However, it is recommended that the NOWPAP member states develop, and implement, comprehensive national

action plans including measures to prevent, reduce and control the litter from its generation to treatment and proper final disposal. Marine litter should be integrated into the national solid waste management plans, with application of the 3R principles (Reduce, Reuse and Recycle). Public involvement and the results of scientific research are expected to eventually influence the national policy makers. Regarding best management practices, including preventive and control measures and environmentally sound technologies to deal with marine litter, continuous exchange of the marine litter-related information within and beyond the NOWPAP region will also greatly contribute to changing people's attitudes and behaviours and to increase the public awareness on this matter as a whole.

Taking into account the severity of the marine litter problem in the Northwest Pacific region and the growing concern at the global level, NOWPAP successfully implemented from November 2005 to the end of 2007. A Regional Action Plan on Marine Litter (RAP MALI) was developed as an ultimate outcome and successor of MALITA. RAP MALI approved in March 2008 suggests a series of detailed actions to be taken by the member states as well as at the regional level: on prevention of marine litter input, on monitoring of marine litter, and on removal of existing marine litter in the marine and coastal environment. Such actions will be applicable to national legal instruments, administrative arrangements, research activities and technology development (e.g., measures to decrease or eliminate the discharge of ship-generated litter; to stop the discharge of solid waste from land-based sources; to protect rivers from pollution; and to reduce the loss of fishing gear from fishing vessels).

As it has proven to be effective through the implementation of the MALITA project, the established NOWPAP mechanism, consisting of the four Regional Activity Centres, nominated Marine Litter National Focal Points of the member states, in close collaboration with the UNEP Regional Seas Programme and other UN agencies and programmes (e.g., FAO, IMO and GPA), should continuously work to better cope with the marine litter problem in the region. The NOWPAP RAP MALI will serve as a roadmap to improve the overall regional status of marine litter pollution with active participation of (and cooperation among) the member states. This overview will be updated regularly to illustrate the overall status of the marine litter problem in the Northwest Pacific.

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