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북서태평양 지역의 해상기인 해양쓰레기 저감을 위한 NOWPAP 방제지역활동센터의 지역협력 활동현황 분석 및 향후 발전방향

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Regional cooperation of NOWPAP MERRAC against marine litte from sea-based activities in the Northwest Pacific region

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요 약

경제개발 및 산업활동에 따라 발생된 쓰레기들이 하천 및 해상활동에 의해 직 · 간접적으로 해양에 유입되고 있다. 산업활동에 의해 제조된 물질들은 자연적으로 거의 분해되지 않거나 분해 속도가 매우 느린, 플라스틱, 유리, 폴리스티렌, 고무, 금속 등으로, 그 종류가 매우 다양하다. 이러한 해양쓰레기들은 연안환경뿐만 아니라 해수의 표층이나 수중, 해저면에 오랜 기간 존재하면서 인간과 동물의 건강 및 생명을 위협하거나, 선박 사고 등을 유발하기도 한다. 특히 해양쓰레기는 해수의 흐름에 따라 인접한 국가와 지역에도 피해를 미치기 때문에 국가간 마찰을 일으키기도 한다. 한 · 중 · 일 · 러가 접하고 있는 북서태평양의 경우도 해양쓰레기 문제로 국가간 마찰이 종종 발생한다. 특히 해류의 흐름에 의해 중국 또는 한국의 쓰레기가 일본 등에 유입되곤 하는데, 이러한 문제점을 인식하여 관련 국가들은 해양쓰레기 지역협력사업을 추진하기로 하였다. 북서태평양실천계획(NOWPAP)에서는 해양쓰레기사업(MALITA)을 2006-2007년에 거쳐 실시하였으며, 아울러 2008-2009년에는 이의 후속사업으로써 해양쓰레기 지역협력계획(RAP MALI)을 계획하여 이행해나가고 있다. NOWPAP 방제지역활동센터(MERRAC)는 NOWPAP 지역활동센터의 하나로써, 2005년 NOWPAP 정부간회의에서 해상기인 해양쓰레기관련 국제협력사업 추진업무를 부여 받아 2006년부터 관련 사업을 이행해 나가고 있다. MERRAC은 그동안 해저침적쓰레기 모니터링 방안, 항만수용시설 가이드라인, 해양 분야 쓰레기 저감 방안 및 홍보 브로셔를 개발하였고, 해양쓰레기 워크샵을 개최하여 관련 전문가들간의 토론 및 정보교환을 지원하였다. 본 논문에서는 그동안 MERRAC의 해양쓰레기 관련 지역협력 활동을 소개하면서 향후 해상기인 해양쓰레기 저감을 위한 지역협력 추진방안에 대해 몇 가지 사항을 제안하고자 한다.

Abstract – The marine litter generated as by-products of human activities and economic development enters to the sea through rivers or stream indirectly, and through sea-based activities directly. It is commonly comprised of materials that degrade very slowly, such as various plastic products, polystyrene, glass, rubber, metal, wood, derelict fishing nets, wire, rope and so on. Such litter is found in the water column and on the seafloor as well as coastal areas in the Northwest Pacific region. It causes injury or death of human and other living organisms and also accident or damage of the vessel. It is not only a problem of country but also regional and/or global problem because it is transported by currents and winds from one country to another. In this regard, Northwest Pacific Action Plan (NOWPAP) Marine Litter Activity (MALITA) project had been carried out during 2006-2007 biennium and NOWPAP Regional Action Plan on Marine Litter (RAP MALI) has been also continuously implemented in the 2008-2009 biennium as next phase step of MALITA. MERRAC, one of four Regional

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Activity Centres (RACs) of NOWPAP, has developed monitoring guidelines, sectoral guidelines, and brochures related to sea-based marine litter and port reception facilities and services through MALITA project. Based upon these output, MERRAC will continuously implement relevant activities of RAP MALI in order to help to establish and improve a regional mechanism to deal with the sea-based marine litter problem. This paper aims to introduce MERRAC activities under MALITA and RAP MALI, and to suggest several recommendations to reduce marine litter in the NOWPAP region.

Keywords: Marine litter(해양쓰레기), Marine environment(해양환경), Northwest pacific(북서태평양), Regional cooperation(지역협력), NOWPAP(북서태평양실천계획), MERRAC(방제지역활동센터)

1. INTRODUCTION

Marine litter is recognized as one of the pollutants that destroys the ecological, economic, cultural, recreational and aesthetic values of the marine and coastal environment (UNEP[2005a]). Marine litter can cause injury or death of human and other living organisms by entanglement and ingestion (Laist[1987]). Marine animal might occasionally feed on plastic bag looks like food which may lead them to starvation or malnutrition. Abandoned fishing nets can trap a number of animals and lead to their death consequentially. Vessels can also be damaged by buoyant materials which can result in considerable costs to repair. The NOWPAP member states, the People's Republic of China, Japan, the Republic of Korea, and Russian Federation, are also faced with marine litter problem which are closely affected by neighbor countries because of transboundary movements of marine litter.

In acknowledging the problems imposed by the marine litter in the region, 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, United National Environmental Programme (UNEP) has prepared "Guidelines for the Development and Implementation of Regional Strategies for Addressing Marine Litter" in 2006. Three phases were suggested by the guidelines, i.e., Phase I (assessment of the regional situation), Phase II (preparation of a Regional Action Plan), and Phase III (integration of the Regional Strategy into the Programme of Work).

As one of UNEP Regional Seas Programmes, NOWPAP has participated in this UNEP global initiative. The Tenth NOWPAP Intergovernmental Meeting held in Toyama, Japan, approved the implementation of NOWPAP Marine Litter Activity (MALITA) for 2006-2007 biennium in November 2005 (UNEP[2005b]). Again, the Twelfth NOWPAP Intergovernmental meeting (Xiamen, China, 23-25 October 2007) approved a NOWPAP Regional Action Plan on Marine Litter (RAP MALI), as a next phase of MALITA.

The NOWPAP Regional Coordinating Unit (RCU), in cooperation with UNEP, has coordinated the overall management of the MALITA. Under MALITA project, the four Regional Activity Centres (RACs), together with the national Marine Litter Focal Points, have the responsible for various segments of MALITA. NOWPAP MALITA has supported by all NOWPAP member states and implemented successfully (UNEP[2007]).

For example, four International Coastal Cleanup (ICC) campaigns were held in Yamagata in Japan, 2006, Rizhao in China, 2007, Busan in Korea, 2007, and Vladivostok in Russia, 2007, respectively, and raise public awareness on marine litter. Existing data and information on marine litter in member states were collected and reviewed by Data and Information Network Regional Activity Centre (DINRAC), and the data base on marine litter is available at their website (http://dinrac.nowpap.org). Special Monitoring and Coastal Environmental Assessment Regional Activity Centre (CEARAC) has carried out many activities related on land-based marine litter. Pollution Monitoring Regional Activity Centre (POMRAC) has also conducted MALITA projects.

Especially, Marine Environmental Emergency Preparedness and Response Regional Activity Centre (MERRAC), as one of four RACs, has successfully covered the sea-based marine litter issue as a newly designated MERRAC activity, in cooperation with other RACs, NOWPAP RCU, UNEP and International Maritime Organization (IMO). This paper aims to introduce the MALITA activities implemented by MERRAC, and to propose several suggestions to reduce sea-based marine litter in the NOWPAP region.

2. NOWPAP MALITA AND RAP MALI

NOWPAP MALITA has been started from its approval by

Table 1. The three phases of the NOWPAP RAP MALI development and implementation (NOWPAP[2008a])

Phase I	**Assessment of the regional situation:** For the NOWPAP region, the first assessment is available in NOWPAP[2008b]. Regular assessments are expected in the future as part of the RAP MALI implementation.
Phase II	**Preparation of the Regional Action Plan:** Draft NOWPAP RAP MALI was presented at the 12th NOWPAP IGM in October 2007 and its implementation was discussed in detail at a special NOWPAP RAP MALI meeting in November 2007.
Phase III	**Integration of the Regional Strategy into the Programme of Work of the respective Regional Seas Programmes and the implementation of the Regional Strategy at the national and regional level:** In the NOWPAP region, this phase is started in the 2008-2009 biennium. For the RAP MALI implementation, the 12th IGM allocate approximately USD 50,000 from the NOWPAP Trust Fund. Nevertheless, it is expected that most activities of the Phase III will be funded by the member states. There is no definite timeframe for the Phase III, the marine litter issues should be addressed continuously, together with other environmental issues in the NOWPAP region, such as oil spills or harmful algal blooms.

the 10th Intergovernmental Meeting in November 2005. MALITA was the first NOWPAP project implemented by all RACs together with RCU. The overall goal of MALITA is to assist the environmental protection and sustainable development of the region through the development of a NOWPAP RAP MALI. MALITA had been successfully implemented, mostly due to the strong support from all NOWPAP member states and close collaboration between all RACs, RCU and other organizations and many individual experts involved.

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 (CEARAC[2007a]) as well as on the seabed (MERRAC[2007b]), and sectoral guidelines focusing on fishing, shipping and tourism were developed (CEARAC[2007b]); MERRAC[2007d]; MERRAC[2007e]; MERRAC[2007f]; MERRAC[2007g]). Fourth, brochures, leaflets and posters were published to increase the public awareness on the marine litter problem as a whole (CEARAC[2007c], MERRAC[2007h], NOWPAP[2007]). 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 in October 2007 and finalized at the NOWPAP RAP MALI meeting in November 2007. The three phases of NOWPAP RAP MALI are shown in Table 1 (NOWPAP [2008a]).

Overall objective of RAP MALI, as a next step of MALITA, is to (1) prevent the marine litter input into the marine and coastal environment; (2) to monitor the quantities and distribution of marine litter; and (3) to remove existing litter that was already discarded, disposed of and abandoned (NOWPAP[2008a]).

To achieve the above objectives, the workplan of RAP MALI for 2008-2009 was established at the NOWPAP RAP MALI meeting, Toyama, Japan, 20-21 November 2007 (Table 2). MERRAC has been continuously designated to

Table 2. Workplan of RAP MALI for 2008/2009 (modified from NOWPAP[2008a])

Activities	Participants
1. Prevention of marine litter inputs to marine and coastal environment	
1.1. Legal and administrative instruments	
· Update national summaries (prepared initially during MALITA implementation) on legal instruments, institutional arrangements and programmes related to marine litter, including solidwaste management, integrated coastal and river basin management, and market-based economic incentives	RCU, member states
· Prepare regional overview on legal instruments, institutional arrangements and programmes related to marine litter based on updated national summaries	DINRAC
1.2. Wise management of marine litter	
· Organize workshop on marine litter-related issues (expected to be supported by member states)	RCU
· Apply sectoral guidelines on land-based sources of marine litter	CEARAC POMRAC
- Translate developed guidelines into national language of each member state and update them as appropriate	RACs, member states
- Publish translated guidelines	CEARAC POMRAC
- Distribute guidelines to the relevant sectors and organizations, including the public and workers, through appropriate occasions (e.g., workshops and campaigns)	member states, RACs

Table 2. (Continued) Workplan of RAP MALI for 2008/2009 (modified from NOWPAP[2008a])

Activities	Participants
· Apply sectoral guidelines on sea-based sources of marine litter	MERRAC POMRAC
- Translate developed guidelines into the national language of each member state and update them as appropriate	RACs, member states
- Publish translated guidelines	MERRAC POMRAC
- Distribute guidelines to the relevant sectors and organizations, including the public and workers, through appropriate occasions (e.g., workshops and campaigns)	member states, RACs
· Assessment of port reception facilities in the NOWPAP region	MERRAC
- Develop methodology and formats for assessment of port reception facilities	MERRAC
- Collect databased on agreed methodology and formats	member states
- Develop assessment report	MERRAC
1.3. Information, education, outreach and public awareness	
· Develop public awareness materials	RCU, RACs
- Translate developed brochure into national language of each member state	RACs
- Publish translated brochures	RACs
- Distribute brochures to relevant sectors and organizations, including the public and workers, through the relevant occasions (e.g., workshop and ICC campaign)	member states, RACs
1.4. Cooperation with civil society	
· Organize joint workshops and campaigns, in conjunction with NOWPAP ICC, as appropriate	RCU, RACs member states
1.5. Research activities	
· Introduce and exchange information (by e-mail, during workshops and similar events) on research outcomes and technologies on marine litter prevention and reduction	RCU, RACs member states
2. Monitoring of marine litter quantities and distribution	
2.1. Marine litter monitoring using NOWPAP guidelines	
· Implement marine litter monitoring using NOWPAP monitoring guidelines	member states
2.2. Maintenance of marine litter database	
· Maintain and update data and information based on national inputs by member states and RACs	DINRAC
2.3. Compilation of data from national monitoring programmes	
· Compile and harmonize marine litter monitoring data on beaches (provided by member states) and submit collected data to DINRAC	CEARAC, member states
· Compile and harmonize data on marine litter on seabed (provided by member states) and submit collected data to DINRAC	MERRAC, member states
2.4. Regular assessment of current situation and trends in marine litter quantities and distribution	
· Updated regional assessment on a regular basis	RCU
2.5. Collection of marine litter-related research outcomes	
· Collect and put collected information on NOWPAP website or share with member states by e-mail	RCU
· Interpret results of marine litter monitoring on beaches	CEARAC
3. Removing existing marine litter and its disposal	
3.1. Beach Cleanups Campaigns	
· Organize NOWPAP ICC campaigns during 2008-2009, together with marine litter workshops and/or working meetings	RCU DINRAC POMRAC
3.2. Removal of existing marine litter	
· Collect data and information on marine litter collection/disposal in fishing sector, including policies, technologies, etc., and share with member states	RCU, member states, RACs
3.3. Research activities related to marine litter	
· Introduce and exchange information on technologies and research outcomes on removal of existing marine litter (by e-mail and through workshops and other relevant events)	RCU, RACs member states
· Develop technical materials and introduce best practices on solid waste management, including removal of marine litter on beaches	CEARAC
· Develop technical report on technologies and research outcomes on prevention, collection and treatment of marine litter	MERRAC
4. Coordination of RAP MALI implementation	
· Organize working meetings on RAP MALI implementation in conjunction with workshops and/or NOWPAP ICC campaigns	RCU, RACs member states

implement the sea-based marine litter related activities, likewise MALITA project.

3. ASSESSMENT OF SEA-BASED MARINE LITTER IN THE NOWPAP REGION

In order to understand current status of sea-based marine litter, it was decided to establish an expert group to develop the national reports on sea-based marine litter in the NOWPAP region at the 9th MERRAC Focal Points Meeting in 2006 (MERRAC[2006a]), as a basis for further works on sea-based marine litter issue. Based upon the national reports, MERRAC made an assessment on sea-based marine litter in the NOWPAP region (MERRAC[2007a]).

According to the reports, NOWPAP member states are faced with sea-based marine litter from fishing vessels and aquaculture, due to active fishing activities and aquaculture. Although sources and types of marine litter are various depending on countries and sea areas, sea-based marine litter shows a considerable portion compared to land-based marine litter in the NOWPAP region. According to the national reports of NOWPAP member states, sea-based marine litter takes a portion of about 20% in China, and 30% in Korea (Fig. 1). It could be expected that other two countries – Japan and Russia – may show similar portion of sea-based marine litter.

The impact of sea-based marine litter on the environment seems to be serious. For example, "ghost fishing" could result in consequent deaths of marine species (Brown and Macfadyen [2007]). Recently, "ghost fishing" has been observed in the coastal waters in the NOWPAP region. It was reported that various marine animal, such as king crab, mackerel, shellfish, starfish, etc., were caught in derelict fishing nets at the sea bottom. Sea-based marine litter also brings numerous

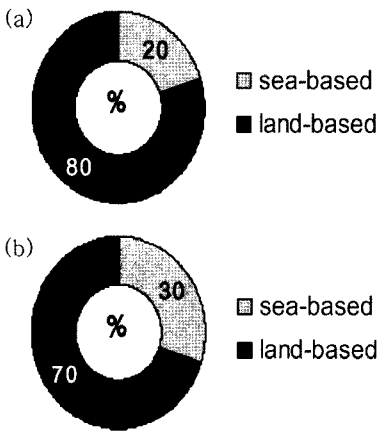


Fig. 1. The proportion of sea-based marine litter in (a) China and (b) Korea.

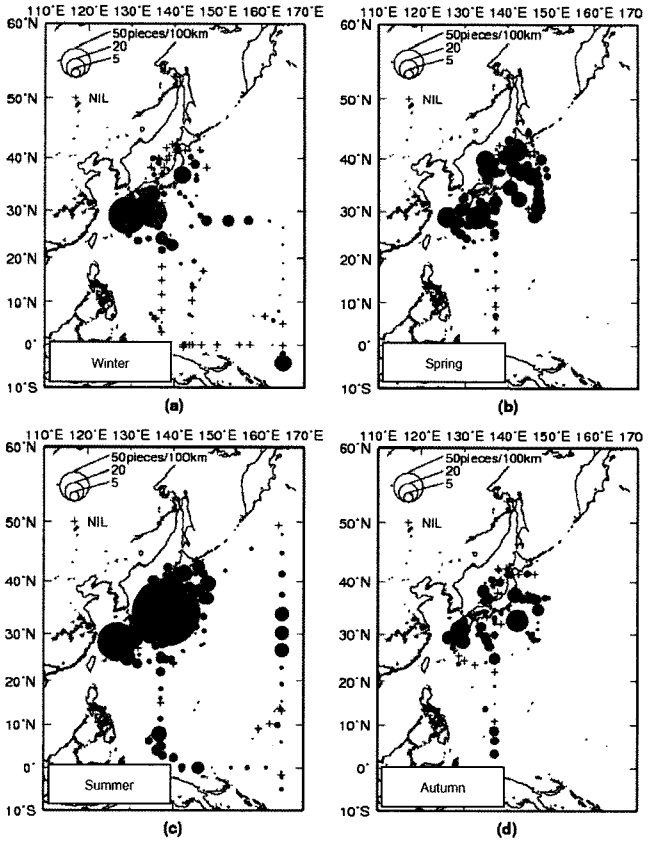


Fig. 2. Floating plastics observed in 2007 (MERRAC[2008]).

potential hazards to the maritime activities. Damaged vessel may not return to shore or steer, or hard to avoid a collision. Although it even returns to shore safely, it may need considerable costs to repair. According to the national report of Korea, marine litter is one of main causes of maritime accidents in Korea. According to the study on maritime accidents during 1996-1998 in Korea, 204 (9%) maritime accidents occurred due to marine debris among total of 2,273 accidents. The marine litter from sea-based sources, especially fishery related activities, therefore, is a serious problem which needs to be solved in the NOWPAP sea areas.

The survey on floating litter near the coastline of Japan indicates that large proportion of floating plastics are found in the Nortwest Pacific region (Fig. 2), and plastics in the form of fishing gear account for 50%. This kind of quantitative research on marine litter, especially from sea-based sources, should be implemented in NOWPAP region for more understanding.

4. MERRAC ACTIVITIES DURING MALITA PROJECT

MERRAC has carried out the relevant designated activi-

Table 3. The tasks and activities of MERRAC for MALITA project

Main tasks and activities
- Organization of the 1st NOWPAP Workshop on Marine Litter in conjunction with NOWPAP regional meeting
- Development of long-term monitoring guidelines on seabed marine litter in the NOWPAP region including formats for data gathering and storage
- Development of sectoral guidelines on fishery activities, commercial shipping, recreational activity and passenger ships
- Development of a programme for the improvement of port reception facilities and services for garbage collection from the shipping and the fishing industries
- Preparation of brochures on sea-based marine litter in order to promote public awareness on the reduction of marine litter

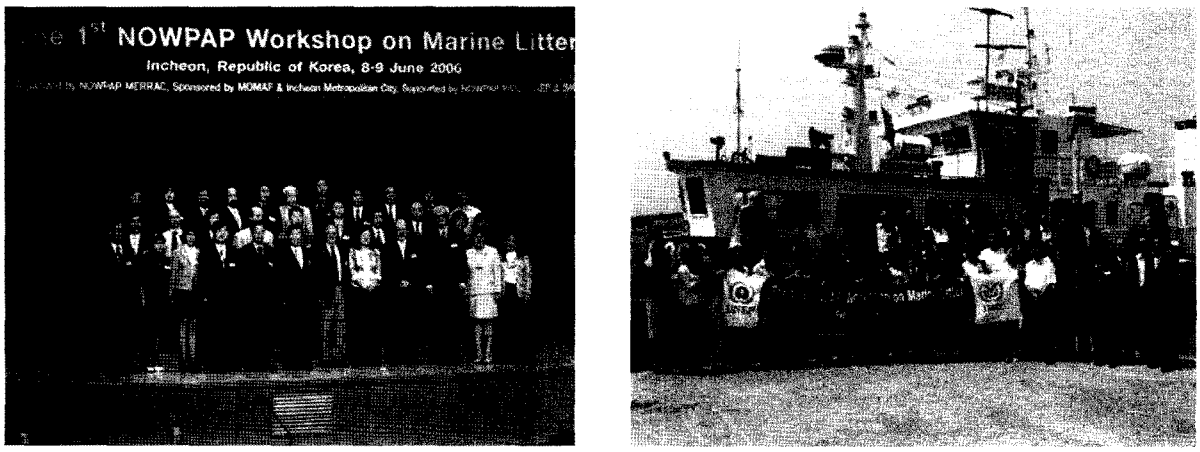
ties under the MALITA projects in co-operation with NOWPAP RCU, MERRAC Focal Points, Marine Litter Focal Points and other RACs. Table 3 shows the tasks and activities of MERRAC that had been implemented during MALITA project.

4.1 The 1st NOWPAP Workshop on Marine Litter

MERRAC organized the 1st NOWPAP Workshop on Marine Litter in Incheon, Republic of Korea on 8-9 June 2006, back to back with the 9th NOWPAP MERRAC Focal Points Meeting, as one of the major activities for the MALITA projects with kind supports from the Korean Government, NOWPAP RCU, UNEP and IMO (Fig. 3). A total of 15 presentations were made at the workshop by representatives of UNEP, IMO, NOWPAP RCU and member states with respect to marine litter monitoring, distribution, policies and management, treatment and recycling technologies. Additionally, a side event was organized in order to learn Korean Buyback Programme which encourages fisherman to bring back the marine litter collected during fishing activities. Also, a visit to a recycling facility for treating discarded polystyrene was arranged.

The participants of the workshop discussed and made comments on existing data and information related to the marine litter, especially on the litter from sea-based sources in the region, and exchanged their relevant experience and expertise. Recognizing the severity of the problems imposed by the marine litter on the marine and coastal environment of the NOWPAP region and the transboundary nature of the problem, the workshop participants re-affirmed the need for cooperation among the NOWPAP member states and also between the NOWPAP and the neighboring Regional Seas such as COBSEA and PEMSEA in order to better cope with the marine litter problem (MERRAC[2006b]).

The participants noted that marine litter monitoring, related regulations and policies as well as treatment technologies already exist in this region. Nevertheless, the participants came to an understanding that further efforts are continuously needed to co-ordinate these regional activities, to raise public awareness of marine litter problem, to increase participation of all concerned stakeholders, and to exchange information, experience, expertise and lessons learned. Also, they agreed that it is necessary to manage the sea-based marine litter issue through the full implementation of existing global regulations such as the London Convention concerning dumping at sea and MARPOL Annex V regulating



(a) (b)

Fig. 3. The picture of (a) the 1st NOWPAP Workshop on Marine Litter and (b) field trip.

ship-generated garbage, as well as the MALITA projects approved by the 10th NOWPAP Intergovernmental Meeting.

4.2 Monitoring guideline on seabed marine litter in the Northwest Pacific region

Most of the existing marine litter monitoring programmes are carried out on the beaches and shorelines which are easily accessible by human, and the marine litter can be collected without any special assistance such as scuba divers or ships. However, a significant proportion of marine litter discarded, disposed of or abandoned enters into the sea and subsequently remains floating on the sea surface, mixed in the water column and sank on the seabed (Galgani *et al.*[2000]). Marine litter found under the sea, particularly on the seabed, can not be easily visible and recognized by the general public. Therefore, such litter has not been drawn public attention, even though it causes navigation hazard and a growing threat to marine environments.

In this regard, MERRAC has developed the monitoring guidelines on seabed marine litter in order to help the effective management of seabed marine litter, and ultimately to protect the health and safety of human and marine organisms and to preserve the marine and coastal environment in the Northwest Pacific region (MERRAC[2007b]). The guideline introduces timing and frequency of monitoring, methodology, identification method, and etc.

The monitoring surveys on seabed litter are desirable to be organized at least once a year, preferably in September or October in combination with the existing monitoring surveys and/or cleanup events (e.g., International Coastal Cleanup). The timing and frequency of the survey should be determined by the national organizers of the NOWPAP members, considering other important variables such as fishing period, weather conditions, etc.

The NOWPAP member states are recommended to select at least 5-10 monitoring sites (1-3 sites for each province) in their respective countries, depending on their technical capabilities and expertise. The members already having national/local monitoring programmes on seabed litter are encouraged to continue the existing monitoring at the designated sites to ensure the long-term data collection. The location and number of the monitoring sites should be ideally kept the same for the future surveys, if appropriate, using the Global Positioning System (GPS) or other methods to determine the site coordinates.

Methods of monitoring marine litter on the seabed can be varied depending on the site situation. Two direct methodologies, scuba diving and trawling, can be applied for the monitoring of the seabed litter. Seabed litter in relatively shallow areas accessible by divers can be monitored by scuba diving. Where it is too dangerous or deep to be accessed by scuba divers, it can be monitored by trawling. When the seabed litter collection is completed, it is required to identify its quantities, composition and distribution of marine litter.

The data collected should be entered on the data card developed by MERRAC (MERRAC[2007b]). The national coordinator or focal point should submit the collected data to MERRAC with the site map, other relevant information available, and photographs taken during the monitoring survey. These data will be eventually entered in the NOWPAP marine litter monitoring database (http://dinrac.nowpap.org), and be regularly updated and be available on the website for general public.

4.3 Sectoral guidelines for management of marine litter

Sea-based activities include fishing, shipping, recreational activities and passenger ships that generate a significant proportion of sea-based marine litter. To reduce sea-based marine litter such as derelict fishing nets, wire, rope and plastic bags from above activities, MERRAC has developed sectoral guidelines for management of marine litter (MERRAC [2007d]; MERRAC[2007e]; MERRAC[2007f]; MERRAC [2007g]). Through these guidelines, each sector can recognize that the kinds of marine litter could lead to the some decline of marine species and consequently pose a threat to sea-based activities as a whole. Theses guidelines provide that examples of marine litter generated from each activities and helpful action tips for relevant people and general public to reduce marine litter from sea-based activities.

4.3.1 Fishing

Fishing is human activities catching fish or other aquatic species. During fishing activities, various kinds of marine litter can be generated, and abandoned, lost, and derelict fishing gears take a greatest portion among sea-based litter. Fishing sector should recognize that these kinds of marine litter could lead to the some decline of fish stock and consequently pose a threat to fishing activities as a whole. The guideline provides several practical methods to reduce marine litter from fishing activities.

4.3.2 Commercial shipping

Shipping is basic process of transporting goods and cargo.

Since commercial shipping activities currently increase in the NOWPAP region due to bringing more ocean freighters because of rapid economic development and increasing international trade, the possibility of generating marine litter from shipping sector also increases. Commercial shipping basically creates litter such as straps, sheets, pallets, etc. Regular and systematic check of the shipment status is an essential step to enhanced marine litter management systems. Shipping activities also generate marine litter like food containers, tableware and motor oil from shipboard life and ship maintenance. Therefore, the guideline provides several practical methods to reduce marine litter from commercial shipping.

4.3.3 Recreational Activities

Many people come to the sea to enjoy the recreational activities like fishing, boating and diving. The amount of marine litter generated carelessly during the recreational activities such as fishing lines, lures and plastic bags might be relatively small among the total amount of marine litter from a variety of sea-based human activities. However, if these kinds of litter are continuously accumulated, the marine and coastal environment can be seriously damaged. Therefore, practical methods to reduce marine litter from recreational activities need to be developed and informed to the public. In this regard, some helpful action tips that are common and activity-specific to reduce marine litter are introduced by the guideline.

4.3.4 Passenger ships

Passenger ships include cruise lines, ferries, and ocean liners with the purpose of carrying passengers. Marine litter related to accommodation facilities, food and beverage services and administrative functions can be generated from passenger ships such as food containers, tableware and office supplies. Passengers and crew need to understand the severity of the marine litter problem and its impact on the marine and coastal environment in order to reduce it. To increase the awareness and to reduce the amount of marine litter generated from passenger ships, and the action tips for passengers and crews are provided by the guideline.

4.4 Programme for improvement of port reception facilities and services for garbage collections from the shipping and fishing industries

The NOWPAP member states have tried to provide adequate reception facilities at ports and marinas for ship-generated waste, including garbage, in order to treat sea-based marine litter. According the national reports, however, at certain ports and marinas in the region, the port reception facilities seem partially insufficient to deal with sea-based marine litter. Since the lack of adequate port reception facilities may result in solid waste being disposed at sea and then being transported by wind and currents to shore often in locations distant from the original sources of the material, MERRAC developed the guideline on adequate port reception facilities for waste generated by fishery and shipping activities (MERRAC[2007c]).

The guideline is to help reduce the discharge of ship-generated marine litter (garbage) into the sea by the provision and improvement of the capacity and efficiency of port reception facilities and waste management practices onboard, thereby enhancing the protection of the marine and coastal environment.

Based on the guideline, the NOWPAP members need to (1) report their current status on port reception facilities on a regular basis through the GISIS system which has been developed by IMO (IMO[1999]); (2) manage port reception facilities to maintain the relevant equipment; (3) share and exchange relevant data and information on port reception facilities among the NOWPAP members; and (4) educate port reception facility users, related companies and organizations in order to facilitate the use of port reception facilities. The NOWPAP members should co-operate with one another involving port authorities, ship operators, port agents and waste collection service providers, in order to improve port reception facilities and services for ship-generated marine litter in the NOWPAP region. These activities may be facilitated by MERRAC under its mandate within the framework of NOWPAP.

4.5 Brochure on sea-based marine litter

The brochure was developed in order to raise public awareness on sea-based marine litter by providing good action tips how to reduce the amount of marine litter from the sources (MERRAC[2007h]). This brochure is helpful to understand regulations on sea-based marine litter and practical principles of environment-friendly behaviors.

5. RECOMMENDATIONS

In order to reduce and manage marine litter in the NOWPAP region effectively, several recommendations are suggested as

follow:

(1) To introduce and improve waste management policies and systems of the NOWPAP member states, legislations and regulations need to be assessed. Based on the results of assessments of current waste management with collaboration of the civil society (private sector, NGOs and the scientific community), the enforcement legislations and regulations should be conducted.

(2) Regular monitoring should be implemented at the beaches and shorelines, and seabed in the NOWPAP region within the framework of the national strategies using the NOWPAP guidelines. Long-term monitoring will provide information assessing marine litter types, abundance, and its sources to develop management policies and systems. Simultaneously, regular removal marine litter from polluted sea area need to be implemented to preserve marine and coastal environment.

(3) If marine litter is collected, appropriate procedure of disposal should be followed. The NOWPAP member states should enforce their legislation and practices on the port reception and treatment facilities and its services in compliance with relevant international convention such as MARPOL convention. Trough GISIS which was developed by IMO, the NOWPAP member state can provide relevant information on the port reception facilities for their country, including contact point, so that the facility users can easily find the information on port reception facilities of the NOWPAP region in the GISIS website.

(4) The authorities, agencies and NGOs of the NOWPAP member states need to continue and develop education campaigns and outreach programmes such as International Coastal Cleanup (ICC) to increase public awareness.

(5) Collaboration from various stakeholders is necessary to develop partnerships and voluntary agreements. Community-based education programmes are necessary if the public is going to become fully engaged in the process to protect their own environment and existence. The sectoral guidelines for the wise management of marine litter will also help to provide practical methods to general public and industries.

(6) Finally, regarding the marine litter issue, the NOWPAP member states should strengthen regional cooperation in technical research, management practices and joint efforts on marine litter prevention. Efficient management policies and systems will help to reduce marine litter and conserve marine and coastal environment in the NOWPAP region as a whole. Therefore, the NOWPAP RAP MALI is necessary to establish the regional co-operative mechanism.

6. CONCLUSION

Marine litter is any persistent, manufactured or processed solid material discarded, disposed of or abandoned in the ocean. Because of its trans-boundary characteristic, marine litter is now recognized as regional and global problem that threatens the marine environment. Northwest Pacific region is no exception to the problem, and there has been a need for the marine litter management that cover marine litter issues in the NOWPAP region. NOWPAP MALITA, therefore, has been initiated since the Tenth NOWPAP Intergovernmental Meeting. MALITA is the first regional co-operation project against the marine litter in the region.

To deal with marine litter generated from sea-based activities such as fishing, shipping, recreational activities and passenger ships, MERRAC has successfully carried out relevant activities covering sea-based marine litter issue includes organizing the 1st NOWPAP Workshop on Marine Litter and developing relevant guidelines and brochure under the MALITA projects, in co-operation with. national Mairne Litter Focal Points, NOWPAP RCU and other three NOWPAP RACs during 2006-2007. Based on these outcomes and the UNEP guidelines, NOWPAP RAP MALI has been developed by NOWPAP RCU in order to prevent the marine litter, to monitor the quantities and distribution of marine litter, and to remove existing litter. Under RAP MALI, MERRAC will continuously implement the designated activities to reduce sea-based marine litter and help to improve the marine environment in the NOWPAP region.

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