Annex XI CEARAC workplan for implementation of Marine Litter Activity (MALITA)

The work plan for MALITA was approved in the 10th IGM. According to the work plan, the activities on the below list (Table 1) are designated to CEARAC. Consulting with NOWPAP RCU, CEARAC will give priorities to activities and try to conduct activities in order of high priority.

Table 1. Activities designated to CEARAC for MALITA

- Development of regional and national strategies on integrated management of marine litter (No.9 in the work plan of MALITA)
- Development and implementation of long-term regional and national monitoring programmes on land-based ML, including formats for data gathering and storage (No.12-1)
- Formulation and implementation of awareness and education campaigns for general public, various groups within the tourism sector, industry, municipal authorities, local communities (No.13-1)
- Preparation of brochures in English for the purpose of promoting public awareness on the reduction of ML (No.15)
- Preparation of brochures in Japanese for the purpose of promoting public awareness on the reduction of ML (No.15-1)
- Development of sectoral guidelines for management of marine litter for tourism, costal construction, recycling (No.16-2)
- Development of responsible citizenship guidelines for children and youth (No.19-1)
- Practical demonstration through awareness raising campaigns in selected destinations and with selected tourism campaigns (No.19-2)

At first, CEARAC started activities related to Activity No.12-1 in Table 1. The progress of activities, expected works and outcomes to develop national monitoring programmes are shown in Appendix 1.

Appendix 1 :

Interim report of the progress of research on methods for monitoring of marine litter

1. Objectives

According to the workplan of MALITA, it is required to develop and implement long-term regional and national monitoring programmes. In fact, some methods of monitoring of marine litter have already been applied in the NOWPAP Region. Among them, one or two monitoring methods can be recommended as standards to monitor marine litter in this region for NOWPAP Members. Therefore, the purposes of this research are to find advantages and disadvantages of monitoring methods already implemented by Japanese organizations and to identify methods suitable for long-term monitoring in the NOWPAP Region among them for the first stage of an investigation of monitoring methods of marine litter in the NOWPAP Region.

2. Methods

3 monitoring methods for marine litter are compared, which have been used by the Northwest Pacific Environmental Cooperation Center (NPEC), the Ocean Conservancy, and Japan Environmental Action Network (JEAN), respectively.

3 main categories with 8 sub-categories, which are shown below, were selected for comparison (See Table A1):

(1) General information of monitoring activity

- (a) Objective of monitoring activity
- (b) Information about participants
- (c) Results of monitoring
- (2) Monitoring method
 - (a) Procedure of selecting of monitoring area(s)
 - (b) Procedure of monitoring of marine litter
- (3) Data sheet
 - (a) Way of distribution of data sheets
 - (b) General Entry
 - (c) Categories on data sheet

After comparison of the methods, advantages and disadvantages of each method are reviewed, and then suggestions for suitable monitoring methods of marine litter for the NOWPAP Region are made.

3. Results

The results of comparison among 3 methods are explained below by each main category (such as (1) General information of monitoring activity, (2) Monitoring method, and (3) Data sheet.)

(1) General information of monitoring activity

The main purposes of monitoring activities of the three organizations here are education. However, NPEC intends to educate children through monitoring marine litter. The Ocean Conservancy and JEAN are trying to educate people through cleanup and monitoring of marine litter picked up. Another difference among the three is that monitoring activities of the Ocean Conservancy and JEAN include "cleanup", but that of NPEC does not intends cleanup of beaches.

(2) Monitoring method

NPEC conduct preliminary work to obtain the monitoring result as accurate as possible. The work is to remove marine litter on the study area prior to monitoring. The actual monitoring is conduct after a few weeks of preliminary work so that the amount of marine litter washed up in some period can be understand.

There is no preliminary work for monitoring conducted by the Ocean Conservancy and JEAN. The organizations just designate places for cleanup. Their monitoring can be applied to any type of beaches.

NPEC sets a 10m-squrared area on a beach, which is fixed as a study area every year. Litter is picked up and monitored in the study area, and the monitoring results can be compared among study areas yearly.

Monitoring activities of the Ocean Conservancy and JEAN are a part of cleanup activities. Marine litter is gathered from the whole cleanup sites. It means that the more effort and the more time volunteers take, the more litter they can collect and monitor. In this respect, it seems difficult to compare the results of monitoring at different sites.

(3) Data sheet

NPEC uses a data sheet with 8 categories and 98 sub-categories are on the list to classify marine litter by material types. ICC data sheet of the Ocean Conservancy has 6 categories with 43 sub-categories. There are 4 categories with 64 categories in JEAN's data sheet. Categorization in data sheets used by the Ocean Conservancy and JEAN are based on sources of marine litter, which shows what kinds of human activities dispose of litter into the marine environment. (See Table A2)

The data sheets of NPEC and JEAN are modified version of ICC format to apply a

different methodology and to understand characteristics of marine litter on Japanese coasts. Although some efforts are needed for the data transformation, data of NPEC and JEAN can be transformed into ICC format to compare the data in places where ICC Campaign conducts around the world

4. Conclusion

Advantages and disadvantages in the three monitoring methods are discussed below. Then method of the Ocean Conservancy is quite similar to that of JEAN. Therefore, these two methods are evaluated together.

Advantage of NPEC monitoring methods

NPEC has a 10-year monitoring experience in the NOWPAP Region and constructed a monitoring network among local governments and NGOs in the NOWPAP Members. All the four countries of the NOWPAP Members participate in monitoring activities of marine litter. Although the number and weigh of marine litter monitored by this method fluctuate year by year, the monitoring method and analysis are kept as scientific as possible.

Disadvantage of NPEC monitoring methods

Since this quasi scientific method is more complicated and needs more preparation than the other two methods, it requires capable instructors to lead participants and collect data.

Advantage of monitoring methods of the Ocean Conservancy and JEAN

Monitoring activities conducted by the Ocean Conservancy and JEAN are much simpler than that of NPEC in that there is no preliminary work, and participants just counted marine litter which is picked up during cleanup activity. There are fewer regulations to apply these monitoring methods. Simple monitoring methods might be good for extending monitoring activities, increasing the number of participants, and managing them for a long time.

Disadvantage of monitoring methods of the Ocean Conservancy and JEAN

The amount and number of marine litter counted through these methods depend on how much efforts participants make and how many hours they spend for cleanup. In this point, the methods are less scientific than that of NPEC.

At this stage of the research, one method cannot be chosen for a standard method for monitoring of marine litter. Other methods in Japan and those in Korea should be also reviewed to standardize a monitoring method in the NOWPAP Region.

It would be necessary to clarify and show purposes of monitoring, conducting organizations of monitoring, support system of monitoring, and history of monitoring as well as advantages and disadvantage of monitoring methods in order to reach a consensus among the NOWPAP Members in the Intergovernmental Meetings in the future.

Org	anization	Northwest Pacific Region Environmental Coorperation Center (NPEC)	The Ocean Conservancy	Japan Environmental Action Network (JEAN)
Activity		Survey of Washed-up Driftage along the Coast of the Japan Sea and Yellow Sea	International Coastal Cleanup Campaign	International Coastal Cleanup Campaign
Outline	Objective of monitoring activity	The Research on Washed-up Driftage on the Coast of the Northwest Pacific aims to grasp the current status of contamination by artificial articles such as the plastics at the beaches along the Coasts of the Japan Sea and Yellow Sea. The survey will also make its participating residents gain a deeper understanding towards the marine environment and have a higher awareness of the importance of not throwing garbage and trying to protect it.	 The mission of the ICCC is as follows: Remove debris from the shorelines, waterways, and beaches of the world's lakes, rivers, and bordering oceans. Collect and catalog information on the amounts and types of debris. Educate people on the issue of floatable debris. Use the information collected from the cleanup to effect positive change—on all levels, from the individual to the international—to reduce floatable debris and enhance marine conservation. 	JEAN cooperated on International Coastal Cleanup, which American NGO "The Ocean Conservancy" is holding, since 1990.
	Information about Participant	Local governments in cooperation Elementary and junior high schools and private organizations in the region	Volunteers who want to take part in cleanup campaign	Volunteers who want to take part in cleanup campaign
	Results of	Results of 2003 research]	[Results of 2002 International Coastal Cleanun]	[Results of Cleanun Camnaion 2003]
	monitoring	Exercise of 2003 research Frequency ; Once/year Number of coasts ; 48 coasts Number of Participants ; 1,620 persons Count of Grand Total ; 70,652 pieces Weight of Grand Total ; 377.769 kg Count per $100m^2$; 427 pieces/ $100m^2$ Weight per $100m^2$; 2,133 g/ $100m^2$	Lresults of 2002 International Coastal Cleanup L Frequency ; once/year Number of Participants ; 391,733 Count of Grand Total ; 6,262,958 pieces Weight of Grand Total ; 3,731,668 kg Count per person ; 15.99 pieces/person Weight per person ; 15.99 pieces/person Distance of coastlines ; 19,967 km	Lresuuts of Cleanup Campaign 2003 Frequency ; 2 times/year Number of Site ; 365 sites Number of Participants ; 26,104 persons Count of Grand Total ; 842,207 pieces Weight of Grand Total ; 130,752.6 kg Count per person ; 35.55 pieces/person (Spring campaign) ; 30.65 pieces/person (Autumn campaign)
		10tat atea , 10,701 JII ²		
Monitoring Method	Procedure of selecting of monitoring area(s)	 Coastal areas along the Northwest Pacific [Procedure of selection] Selection of places for the Research Selection of places for the Research (1)The research is to be conducted in sand beaches; 1 or 2 beaches in each municipality. (2)In the case of a bathing beach, the research should be conducted after the bathing season is over and litters are cleaned up. (2)In the research should not be conducted in a place such as followings. • a place within 1 km from a side of a big river mouth • a place within 1 km from a side of a big river mouth • a beach with wave-dissipating blocks offshore Preliminary research, preliminary research is conducted to check on the use of the beach, circumstance around beaches and cleaning activities. 	Coastlines, rivers and lakes in the world [Procedure of selection] Place where affected by marine litter.	Coastlines, rivers and lakes in Japan [Procedure of selection] Place where affected by marine litter.

Table A1. Comparison among Methods for monitoring of marine litter

Orgar	nization	Northwest Pacific Region Environmental Coorperation Center (NPEC)	The Ocean Conservancy	Japan Environmental Action Network (JEAN)
Method Method	Procedure of monitoring of marine litter	Determine area of the survey Determine the research zone of 10m×10m. The research zones of 10meter-squares, so called "Designated Zone" are lined up in a line landward from water edge to the end of beach. Each Designated Zone is to be picketed with 4 stakes on the each corner and nylon rope between each corners is connected. Designated Zones are essentially set side by side in a single line. Plural lines are acceptable in case that the sand beach is too narrow to allocate a sequence of 3 zones on a line. Collect litter Separate the litter collected All collected litter in Designated Zone are separated into the 8 categories. Weigh and count the litter , and table value All collected litter in Designated Zone are counted and weighed. Collected object are categorized into either domestic or foreign sources.	The ICCC is a nonscientific survey designed to provide an annual "snapshot" of floatable debris. Within each state/territory and country, a local network of site captains are organized and supplied with the materials and information necessary to conduct the local events. The Ocean Conservancy provides data cards, trash bags, gloves, posters, and associated educational materials. Volunteers collect, catalogue, and weigh the debris found on their beaches and shorelines. Information is recorded and catalogued on the ICCC data cards by the volunteers, and the information is returned to The Ocean Conservancy to be processed and tabulated.	JEAN adopted the methodology of ICC, and added some Japanese original categories for sorting collected litter.
Data Card	Way of distribution of data sheet	One data sheet are distributed for each site	A data sheets are distributed to each group of participants	One data sheet are distributed for each site
1	General entry	Name of beach Date&time A Note-taker Count and Weight of each categories and Grand Total	Type of cleanup, Country where conducted, Zone or country cleaned, Beach site name, Date, Name of coordinator, Number of people working on this card, Distance cleaned, Total of trash bags/weight, Entangled animals, Most peculiar item collected	Coordinator's name, address, TEL, Group name, Place of research, Total amount, Number of participants Entangled animals, Foreign items, Impressions and comments,
	Categories on data sheet	8 categories Plastic- including 30 sub-categories Rubber- including 6 sub-categories Formed styrene- including 7 sub-categories Paper- including 13 sub-categories Cloth- including 13 sub-categories Glass/Ceramics- including 11 sub-categories Metals- including 15 sub-categories Other artificial object - including 10 sub-categories	 6 categories Shoreline and recreational activities - including 15 sub-categories Ocean/Waterway activities - including 14 sub-categories Smoking-related activities - including 4 sub-categories Dumping activities - including 6 sub-categories Medical/Personal hygiene - including 3 sub-categories Debris items of local concern 	4 categories fragmented objects - including 7 sub-categories land based - including 44 sub-categories sea based - including 12 sub-categories Debris items of local concern most of each sub-categories depends on ICC sub-categories

	Ta	ble A2. Comparision among data sheets	of NPEC, the Ocean Conservancy and	JEAN	UNEP/NOWPAP/CEARAC/EPM 4/1
Plastic	NPEC cate Bags	pones Plastic bags for food, or package	Bags/Food Wrappers	JEAN categories Bags/Food Wrappers	Annex X
		Plastic bags of shopping Plastic bags for snack		bags (except for agriculture) bags (except for agriculture)	Page 6
	Bottles	others Plastic bottles for drinking	Beverage Bottles (plastic) 2 liters or less	bags (except for agriculture) Beverage Bottles (plastic) 2 liters or less	ICC legends Shoreline and recreational
		Plastic bottles for detergent or bleach Plastic bottles for seasonings or sources	Bleach/Cleaner Bottles	Bleach/Cleaner Bottles	activities
	Containers	others Plastic containers for food, dish	Cupe Platos Forks Knives Spoons	Curs Plates Forks Knives Spoons(創口等)	Smoking-related activities
	Containers	Plastic containers food tray	Bags/Food Wrappers	Bags/Food Wrappers	Medical/Personal hygiene
		Plastic containers for seasonings Plastic containers caps, rids	Caps, Lids	Caps, Lids	Debris items of local concern
	Line	others Plastic line: string			JEAN legends
		Plastic line: rope Plastic line: tape	Rope	Rope · string	Fragmented objects Land based
	Miscellaneous goods	drinking straw	Straws, Stirrers Cigarettes/Cigarette Filters	Straws, Stirrers Cigarettes/Cigarette Filters	Sea based Debris items of local concern
		lighter tov	Cigarette Lighters	Cigarette Lighters	
		stationery	1043		
	Fishing gears	fishing line	Fishing Line	Fishing Line	
		buoy	Fishing Lures Buoys/Floats	Buoys/Floats	
	Broken pieces	others sheet or bag		pieces of plastic bag/sheet	
	Resin pellets(plastic grain)	plastic		pieces of plastic(hard) Resin pellets(plastic grain)	
	others(be specific as possible)		Shotgun Shells/Wadding Batteries	Shotgun Shells/Wadding Batteries	
			Appliances (refrigerators, washers, etc.)	Appliances (refrigerators, washers, etc.)	
				bags for pesticides and fertilizers for agriculture	
				shoes sandals medical materials (except syringes)	
· · · · · · · · · · · · · · · · · · ·			Tampons/Tampon Applicators Syringes	Tampons/Tampon Applicators Syringes	
			Plastic Sheeting/Tarps	oyster cultivation pipe Plastic Sheeting/Tarps	
Rubber	balls		6-Pack Holders	6-Pack Holders	4
	balloon		Balloons	Balloons	1
	rubber bands				1
	others(be specific as possible)		Condoms	Condoms	
			Tires	shoes sandals Tires	
Styrene foam	containers packages	food trays cups	Bags/Food Wrappers	Bags/Food Wrappers	
		for lunch box or noodle	Bags/Food Wrappers	Bags/Food Wrappers	
	Buoys Broken pieces			styrene foam floats	
	othera/ha aposifia on possible)			pieces of styrene foam: large	1
Paper	containers	cups	Cups, Plates, Forks, Knives, Spoons	Cups, Plates, Forks, Knives, Spoons(割り箸)	
		drinking packages plates	Cups, Plates, Forks, Knives, Spoons	Cups, Plates, Forks, Knives, Spoons(割り箸)	
	Packages	bags cigarettes	Tobacco Packaging/Wrappers	Tobacco Packaging/Wrappers	
		for snack cardboard box			-
	cardboard tube for fireworks	heavy paper box		fireworks	
	Pieces of paper	newspaper · magazine · leaflet			1
		broken pieces		pieces of paper	
	others(be specific as possible)		Diapers Cigarettes/Cigarette Filters	Diapers Cigarettes/Cigarette Filters	
Cloth	clothes		Cigar Tips Clothing, Cloth	Cigar Tips Clothing, Cloth	
	cotton work gloves Pieces of cloth				
	thread, yarn		Rope	Rope · string	
Glass/Coramic	others(be specific as possible)	drinking containers	Reverage Bottles (dass)	Reverges Rottles (dass)	
Glass/ Gerainic		food containers	Develage Dotties (glass)	Develage Dorries (glass)	
		tableware	Cups, Plates, Forks, Knives, Spoons	Cups, Plates, Forks, Knives, Spoons(割り箸)	
		fluorescents bulbs	Light Bulbs/Tubes Light Bulbs/Tubes	Light Bulbs/Tubes Light Bulbs/Tubes	
	Ceramic	tableware tiles, bricks	Cups, Plates, Forks, Knives, Spoons	Cups, Plates, Forks, Knives, Spoons(割り箸)	1
	Pieces of glass Pieces of ceramic			pieces of glass/ceramic pieces of glass/ceramic	
	others(be specific as possible)		Syringes	Syringes medical materials (except syringes)	
Metal	Can	aluminum drinking cans	Beverage Cans	Beverage Cans	
		cans for food			4
		others	Oil/Lube Bottles	splay bottles gas cartridges Oil/Lube Bottles	
	Fishing gear	fishhook sinkers			1
	Miscellaneous goods	others caps	Caps, Lids	Caps, Lids	
		pull-tub wire	Pull Tabs	Pull Tabs	
	Pieces of motol	nails		nails wires	
		aluminum foil			1
	outers(pe specific as possible)		55-Gal. Drums	55-Gal. Drums	
			Appliances (refrigerators, washers, etc.) Batteries	Appliances (refrigerators, washers, etc.) Batteries	
Other Artificial Object	Wood (synthetic)	timber pieces of wood square log board fireworks	Construction Materials	Construction Materials fireworks	
		chopsticks toothpics		Cups, Plates, Forks, Knives, Spoons(割り箸)	1
		matches			1
		others	Crates	Crates	
	Bulk waste		Cars/Car Parts	Cars/Car Parts	
			Appliances (refrigerators, washers, etc.)	bicycles bikes Appliances (refrigerators, washers, etc.)	
				oil balls	4
	Oil ball others(be specific as possible)			fish containers	
	Oil ball others(be specific as possible)		Shotgun Shells/Wadding Batteries	fish containers Shotgun Shells/Wadding Batteries	
	Oil ball others(be specific as possible)		Shotgun Shells/Wadding Batteries Appliances (refrigerators, washers, etc.) Cars (Car Parts	Tish containers Shotgun Shells/Wadding Batteries Appliances (refrigerators, washers, etc.) Cars/Car Parts	
	Oil ball others(be specific as possible)		Shotaun Shells/Wadding Batteries Appliances (refrigerators, washers, etc.) Cars/Car Parts Stransing Bood	Tish containers Shotum Shells/Wadding Batteries Appliances (refrigerators, washers, etc.) Cars/Car Parts bicycles bikes Stanging Bonde	
	Oil ball others(be specific as possible)		Shotgun Shells/Wadding Batteries Appliances (refrigerators, washers, etc.) Cars/Car Parts Strapping Bands Fishing Nets	Ifsh containers Shotqun Shells/Wadding Batteries Appliances (refrigerators, washers, etc.) Cars/Car Parts bicycles-bikes Strapping Bands Fishing Nets	
	Oil ball others(be specific as possible)		Shotgun Shells/Wadding Batteries Appliances (refrigerators, washers, etc.) Cars/Car Parts Strapping Bands Fishing Nets Bait Containers/Packaging Crab/Lobster/Fish Traps	Ifsh containers Shotqun Shells/Wadding Batteries Appliances (refrigerators, washers, etc.) Cars/Car Parts bicycles: bikes Strapping Bands Fishing Nets Bait Containers/Packaging Crab/Lobster/Fish Traps	