

Small Grant Program Final Report

Fishermen's self monitoring of marine litter in Boryeong, W Korea

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Summary

'Fishermen's self monitoring of marine litter' was conducted by Korea Marine Rescue Center in Boryeong with Moochangpo fishing village cooperative in Boryeong city, Chungcheongnam-do from Sep. 2007 to June 2008. Main activities of the program were retrievals of marine litter and recordings of litter log sheets. We gathered opinions of fishermen on marine litter issues and decided the method of self monitoring. Supplements such as trash containers, stickers for ships, and zippered files were distributed to ships of participants. Debris log sheets were bundled with sailing list card and deposited in the branch office of coast guard. Total number of participants was about 20 persons, but only six recorded and submitted log sheets. A workshop was held to introduce marine debris issues and main policies of government to fishermen and to listen to their opinions about that. Clean up campaigns were conducted twice by the fishermen group. KMRC in Boryeong organized ICC event with the municipality of Boryeong and several schools. Questionnaire survey was carried out in wrap-up meeting. The result shows that intentions of the program were good, but the practical methods for raising awareness of fishermen need more careful considerations about characteristics of them. Long term interests and approaches should be settled down in community level. For development of fishermen education program, it is needed to deeply consider the usual ways of working, behaviors on board, degree of recognition, culture, etc.

Background information

Korea and China are potential sources of marine litter in the Yellow sea. Coastal residents and local governments in both sides of the sea are necessarily required to share protection effort from pollutants.

The geographic area covered in this project is part of Ungcheon-eup, Boryeong city in the middle part of western coastline of Korean peninsula (Fig. 1). Its coastal line is 114.9km in length and it has 74 islands and about 100,000 residents. Fishermen consist of 5.5% of the population and contribute to local economy as much as 37% (Boryeong statistics annual report, 2005). They are the major

stakeholders and have relatively low awareness about marine conservation and passive attitude in management although they are the direct beneficiaries of marine resources.

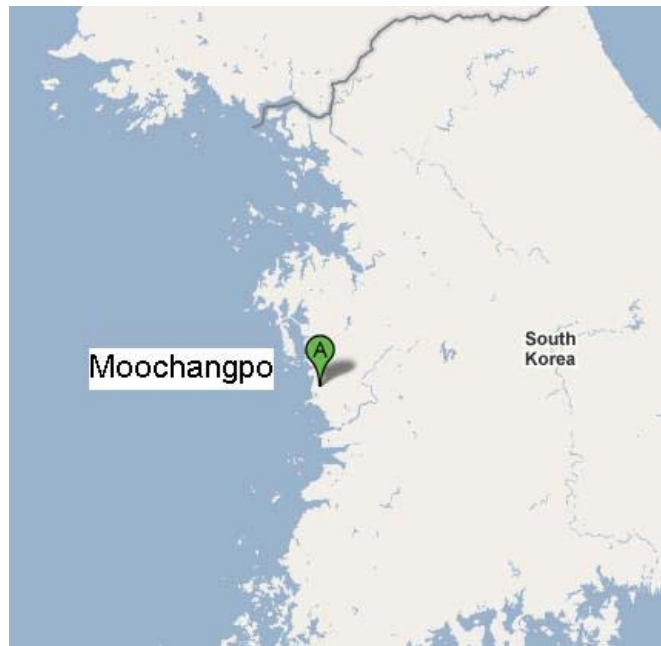


Fig. 1 Location of area covered in the program

The result of International Coastal Cleanup in Korea has shown that 'ocean & waterway activities' account for more than 20% of marine litter (e.g. MOMAF, 2007). The trend is almost same in Boryeong. Fishermen can be the first proper destination of the marine litter-related program. Government has tried various measures to get rid of derelict fishing gears and to make fishermen retrieve them. However, the relative cost effectiveness of management measures is questionable (Brown & Macfadyen, 2007).

Through the activities relevant to marine debris for years, we clearly recognize that the most effective way to reduce marine litter is raising public awareness and then changing behaviours based on partnership among various stakeholders. It is, however, real that there are rare programs for raising fishermen awareness.

The program is for fishermen group and an NGO to have enough time to deal with marine debris problem through gear retrieval and recording log sheets and to communicate for months. The worst accident of oil spill in history occurred in Taean where is not far from the program area in 7th, Nov. 2007. Most of the fishermen in Moochangpo could not work normally. They all participated voluntary activities on oil prevention, not marine debris. And some members of KMRC in Boryeong had to monitor if oil film might spread near Moochangpo. The accident definitely and negatively affected this program.

Rationale and objectives

1) Rationale

Of the coastal stakeholders, fishermen are mostly not interested in and rarely participate in marine conservation programs. The reason is probably that there are rare opportunities for promoting fishermen's awareness in local levels. We need to excavate and educate fishermen who are willing to take the initiative for reducing marine litter. It can also contribute to raise their leadership.

One-sided lecture by professionals, one-time forum or debate, visiting model communities are effective to induce temporal change in recognition but have some difficulties for stakeholders to take the concerns and actions into daily lives. This program focuses on fishermen who are major polluters and victims at once in marine litter problem. It is planned that fishermen themselves retrieve discarded fishing gear and their garbage without any economical incentives, record the amounts and sorts, and suggest better ways to effectively reduce marine debris.

We provided various opportunities to help for fishermen to keep their concern to this problem during the period: International coastal cleanup in Boryeong with children and NGO members; beach cleanups by fishermen themselves; preparation and launching meetings; promotion materials like trash containers and stickers for ship, etc.; log sheets for daily self checking; workshop for education and raising awareness; wrap-up meeting; awards of certificates; questionnaire for evaluation and listening to opinions, etc.

It is important for fishermen to know that they have partners who are very supportive and cooperative to solve the same problem. They can open their mind and try to suggest alternatives and the best way how to deal with through this program.

2) Objectives

- To increase stakeholders' awareness of marine litter handling problems from fisheries and to educate fishermen and any stakeholders concerned with fisheries;
- To develop the self monitoring program of marine litter, give its action to fisheries and change behaviours causing problems;
- To reduce marine litter with proper prevention and disposal through joint conservation activities;
- To build up partnership for marine environment governance in local level

Target audience

This program focuses on marine debris problem originated from fisheries. So main target audience is fishermen group, especially boat owner who uses nets and ropes for fishing. We selected one cooperative of fishermen village, which is a basic unit of fishery community. The cooperative has 203 of fishermen members who earn their living on 124 fishing boats, 25 angling boats and aquacultures.

Main products are a kind of octopus (*Octopus ocellatus*), finespotted flounder, shrimp, swimming crab, flatfish, etc. This is why there have been held seafood festivals such as "Octopus Festival (around

Mar. and Apr.) and Shrimp Festival (around Sep. and Oct.)". Moochangpo beach is very famous for the so-called "Moses' Miracle" which is a phenomena of exposure of low tidal zone at spring tide. Numbers of tourists visit to enjoy the phenomena, beautiful beaches, diverse seafood, leisure boating, and fishing.

Activities implemented

1) International Coastal Cleanup:

We organized the 'International Coastal Cleanup in Moochangpo Beach on Sep. 14th 2007 where 190 volunteers participated (Fig. 2 & 3). The volunteers consisted of members of KMRC in Boryeong (20), children from 4 preschools (120), officers from Boryeong City and Ungcheon Eup (10), fishermen from Moochangpo Fishing Village (20) and others from Kwandang Branch Office of Taeon Coast Guard, Society of Tourism in Moochangpo, and Meeting of Merchants (20). The site captain (Mr. D.S. Hwang) and staffs educated participants about marine debris problem, showing pictures about damaged marine animals and ship safety, etc. (Fig. 3). We picked up 2,266 trashes, filled data cards, measured the weight (194kg) and sorted according to composition for recycling.

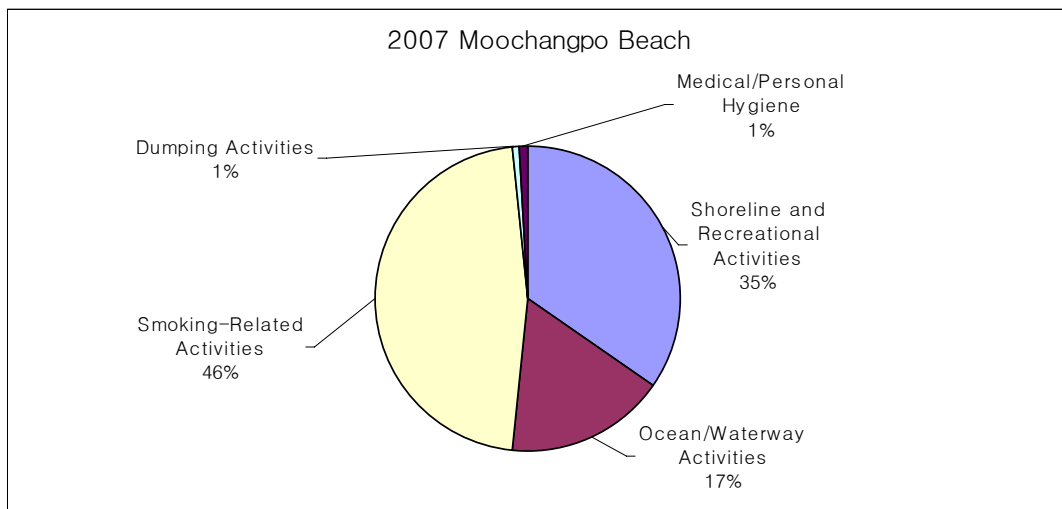


Fig. 2. Source of marine litter picked up on Moochangpo Beach



Fig. 3. Pictures of International Coastal Cleanup in Moochangpo Beach, Boryeong

2) Preparation meeting

- Title : Preparation meeting for 'Fishermen's self monitoring of marine litter program
- Date: Oct. 5th, 2007
- Location : Dehero restaurant, Moochangpo Beach, Boryeong, Choongchungnam-do
- Lecturers : Ms. Sunwook Hong & Mr. Jong Myoung Lee (Korea Marine Rescue Center)
- Participants : 12 people in total (Moochangpo fishing village cooperatives, Boryeong City, KMRC in Boryeong, Taean Coast Guard)

We contacted 'Moochangpo fishermen village cooperative' which is related to fishing crabs and shrimps, aquaculture of sea cucumbers and ear shells, and angler's boating. We introduced 'Yellow Sea Project and Fishermen's self monitoring of marine litter program by KMRC in Boryeong' and lecturers explained status of marine litter in coastal area in Boryeong, based on the results of marine litter monitoring and International Coastal Cleanup since 2000.

We figured out fishermen's situation in Moochangpo, awareness and actions for reduction of marine litter, conflicts among different types of fishing activities, the most common marine litters, and urgent problems in solving marine litter, preference to supplements for encouraging voluntary participation, required administrative support, etc.



Fig. 4. Preparation meeting of fishermen, officers, NGOs, and experts.

3) Developing log sheets and supplements for voluntary participants

Based on the interview in the preparation meeting, we developed the log sheet which contains most common items usually collected on boat. We categorized items from fishing work (nets, ropes, traps, etc.) and litters on their boat (food wrappers, plastic bottles, etc.).

There can be seen unique items, i.e. parachute and light bomb. The air force has used an island called Hwangjuk-do nearby as a shooting camp since 1980. It has usually dropped light bombs with parachute for midnight shooting training. Synthetic parachutes, metallic light bombs, and even rocket bombs are marine debris in this area, threatening seriously safety of residents, commercial fishing and leisure boating, and marine ecosystem.

We also developed supplements such as trash containers, stickers for boat, wind jacket, etc. which fishermen preferred to litter bags, flags, and caps. The supplements were used for encouraging participation and concern to this program.

4) Launching meeting and Providing voluntary participants' supplements

- Title : Workshop on Fishermen's Self Monitoring of Marine Litter
- Date: Nov. 9th, 2007
- Location : Office of Moochangpo fishing village cooperatives, Boryeong, Choongchungnam-do
- Lecturers : Daesik Hwang & Seong Su Choi (KMRC in Boryeong)
- Participants : 20 people in total (Moochangpo fishing village cooperatives, Boryeong City, KMRC in Boryeong, Taean Coast Guard)
- Main themes : Introduction of aims of fishermen's self monitoring program, stimulation of voluntary participation, and distribution of materials for promotion such as log sheets, zippered files, trash cans, stickers for ships, and wind jackets

We had a meeting with 20 boat owners who were interested in the program and encouraged them to involve the program with supplements. We introduced 'Self monitoring of marine litter' again and



Fig. 4. Examples of zippered file, trash container with the sticker, and wind jacket

5) Workshop for local stakeholders

We held a workshop for raising awareness on sea-based marine debris. Invited experts gave lectures about advanced cases of derelict fishing gear retrieval and net recycling program in America, grass root activities by NGO nationwide, and national marine debris management plan. We had an active discussion on prevention and control of marine debris and contracted 'Memorandum of Understanding among Moochangpo cooperative of fishing village, KMRC in Boryeong, Boryeong City and Taean Coast Guard' at the end.

- Title : Workshop on Fishermen's Self Monitoring of Marine Litter
- Date: Dec. 7th, 2007
- Location : Office of Moochangpo fishing village cooperatives, Boryeong, Choongchungnam-do
- Lecturers : Daesik Hwang (KMRC in Boryeong), Sunwook Hong, Jong Myoung Lee (KMRC), (Boryeong City)
- Participants : 26 people in total (Moochangpo fishing village cooperatives, Boryeong City, KMRC in Boryeong, Taean Coast Guard)
- Main themes :

Lectures :

Introduction to YSLME, Small Grant Program and Fishermen's self monitoring program

Grassroots activities and model cases for reduction of derelict fishing gears

National policies and management plan for marine debris control

Boryeong City's policy for marine environment and debris management

Video show :

Volunteer activities for marine environmental protection from marine debris

Discussion and opinion collection

MOU contracting among fishermen and NGO



Fig. 5. Workshop with fishermen, members of NGO, experts and coast guard

6) Beach cleanup

- Title : Beach cleanup by fishermen themselves
- Date: Nov. 9th, 2007 (after workshop) / May 31st, 2008
- Location : Moochangpo Beach and port
- Participants : 30~40 people (Moochangpo fishing village cooperative, KMRC in Boryeong, Coast Guard)

Fishermen have implemented to clean debris on the beach and the port monthly. Program conductors joined twice. The amount of derelict fishing gear seems not to decrease in spite of regular cleanups.



Fig. 6 Beach and port cleanups (7th Dec. 2007, 31st May, 2008)

6) Self monitoring of marine litter (Nov. 2007 ~ June 2008)

Bringing back garbage on board and derelict fishing gear in trash container

- Check the number and weight of the can
- Recording log sheets with help of Korea Coast Guard in Boryeong
- Keeping the sheets in zippered file in the Coast Guard office where every boat owner is supposed to declare whenever he or she leaves or enters port
- Collection of sheets at the final meeting



Fig. 7 Snapshots in the process of self monitoring of marine litter

7) Final meeting

- Title : Wrap-up meeting for 'Fishermen's self monitoring of marine litter program'
- Date: June 18th, 2008
- Location : Office of Moochangpo fishing village cooperatives, Boryeong, Choongchungnam-do
- Lecturers : Ms. Sunwook Hong & Mr. Jong Myoung Lee (Korea Marine Rescue Center)
- Participants : 17 people in total (Moochangpo fishing village cooperatives, KMRC in Boryeong, Taeon Coast Guard)
- Main themes:
 - Oral report on the progress and result of fishermen's self monitoring program in Moochangpo during the project period
 - Implementation of questionnaire
 - Awarding ceremony of certificates for six volunteers
 - Listening to fishermen's opinion

We organized a wrap-up meeting with approximately 20 participants who attended to present and share the result of the self monitoring program. A questionnaire survey was conducted at the end of the meeting. We listened to what active fishermen say about government's potential policy and measures such as marine debris gathering barge, paying retrieved fishing gear, fishing gear identification system, etc.



Fig. 8 Final meeting and awarding of certificates

Produced outputs

According to the proposal, we produced outputs below.

Table 2. List of produced outputs

Date	Title	Numbers	Content	Remarks
Sep. 14 th	International coastal cleanup in Boryeong	190 volunteers	Joined an international effort	
Nov. 9 th / May 31 st	Beach Cleanup	20 fishermen		
Dec. 7 th	Workshop MOU Beach cleanup	26 participants	Proceeding of workshop (Hebei Oil Spill)	Annex I
Nov. '07~ June '08	Self monitoring by target audience	6 boat owners 35days in total 5.5days per boat	Log sheet sign, plastic trash container, zippered file wind jacket	
June 18 th	Wrap-up meeting	23 participants		
	Questionnaire	18 responses		Annex II
	Certificate award	6 fishermen		
June 26 th	Stickers*	10,000 in number	"When bring back own garbage, ocean comes back to life"	Annex III

* Based on the discussion with fishermen, we published 10 thousand copies of sticker in stead of brochure.

Evaluation: Effectiveness of implemented activities

We conducted the survey to evaluate the program by fishermen. It contained an overview, not detailed, with several questions. The detailed result is given in Annex I. Numbers in brackets indicate point of each question.

The result of survey showed that the subject of this program, marine debris, was appropriate. Many fishermen thought that marine debris problem was the most seriously affecting (4.61) marine environmental problem to their fisheries than any other problems, such as oil pollution and global warming. And it was also good to make a fishing village cooperative as main target audiences.

The approach to the fishermen with marine debris monitoring could be motivation to keep the action for reduction. Their practical activities in the program were participation of education opportunities, meetings, beach cleanups, bringing back litter they generated from their work places, and recording debris log sheets. The result said that more fishermen had joined if we should have made full use of monthly-based regular meeting itself and they preferred community-based voluntary activities as educational ways (3.6). We had 4 times of meetings and workshop, so they had to come to meeting places on purpose, which was not preferable for them (2.92). But to program manager it was a good opportunity to take much information and their views on marine debris management policies.

We had done two times beach cleanups and one time International Coastal Cleanup event in the program. The fishermen have participated in beach cleanups regularly and recognized the need of the activities (3.83). But they showed low participation in International Coastal Cleanup than we expected. It seemed they had difficulties in cooperating with different groups and in organizing the activities related marine environmental problem by themselves. The ICC in Boryeong was held at the beginning of the program (14th Sep.) with lack of communication with fishermen, which could be possibly a part of reasons.

'Paying retrieved fishing gear' ranked top (4.22) in the marine debris policies. We had ever questioned what if there were no rewards for retrieved fishing gear. However, Moochangpo fishermen's response implicated they have considered the part of 'retrieval' larger than 'paying'.

There were only 6 participants recording the cards for several reasons. Most of fishermen were passive because of troublesome work (3.43), Hebei oil spill accident (3.42), or no meaning (3.00). On that score, we had lack of full consideration of their work and life pattern. There were some reasons to hard recording log sheets. Usually one or two fishermen work on their fishing vessel. So they have no hand to record the cards. And when they come into port, they need to carry their catch somewhere as fast as possible. Besides, they have wet hands.

Log sheets possibly helped to lead fishermen to retrieve their debris. Actually we found that they used to bring their debris generated while fishing back to port and reception facility. However, only six fishermen having own fishing boat recorded log sheets we developed (e.g. Fig. 10). They recorded 34 days in total, which was 5.5days per person. Two of them actively joined this program for 14 to 15 days.

They are regarded as potential leaders in marine environmental activities in fishermen communities with proper capacity building.

The quantitative conclusion is not clearly given because the number of log sheets is very low. However, the log sheets they finished to record showed some implication. One of active participants recorded to bring back tens of kilograms of nets whenever he operated in the sea (Fig. 10-1). He could mark the approximate locations where he found during fishing. In addition, military debris were still found, posing serious safety risks for fishers although the shooting training using light bombs and parachute was recently stopped. Another one's sheets showed if he did not bring back the garbage (food wrappers, plastic bottles or something) on board, which could be found on some other beaches (Fig. 10-2). One fishermen wrote down even the exact longitude and longitude he found, which could be very good information for governmental agency to clean sea bottom.

Boryeong City has strengthened to administratively and financially support Moochangpo cooperative since the start of the program. It is known that the city has assisted with budget in the activities such as debris cleanup at port, extermination of starfish (regarded as a marine evasion organism in fishing zone), and leisure fishing which produces less problem in fishing debris issue with budget. Based on mutual understanding, the positive relationship among fishermen, NGO and local government and authority would contribute to save management cost and cleaner coastal environment and then to develop a model case about fishing gear control by fishermen themselves in future.

(성경호) 해양쓰레기 자율관리 기록 카드
(조용원)

단위: 수량·무게(Kg)

월	일	1/26	1/27	2/4	2/5	2/6	2/14	2/19	2/22
조업 중 인양 쓰레기	페그풀	.	4kg	5kg	5kg	2kg	2kg	2kg	.
	봉말	.	.	.	.	.	2kg	.	.
	로프	.	.	.	.	.	.	.	.
	부표	.	.	.	.	.	.	.	.
	유상쓰레기	.	.	.	.	.	.	.	1kg
	낙하산 및 조명탄	2kg	.	.	5kg	.	.	.	.
선상 발생 쓰레기	식품 포장용기	.	.	.	.	.	.	.	.
	음용료 용기	.	.	.	.	.	.	.	.
	담시 도구	.	.	.	.	.	.	.	.
	오일 통	.	.	.	.	.	.	.	.
	기타(종류별로)								
합계 - 수량·무게(Kg)		.	.	.	.	.	.	.	.

무창포어촌계(041-936-3510), 한국해양구조단 보령지역대(019-686-9999)
 - 1. 1. 26. 4kg - 2. 1. 27. 5kg - 3. 2. 4. 5kg - 4. 2. 5. 2kg - 5. 2. 6. 2kg
 - 6. 2. 14. 2kg - 7. 2. 19. 2kg - 8. 2. 22. 1kg

Fig. 9-1 Examples of log sheets recorded by fishermen

(호) 해양쓰레기 자율관리 기록 카드
대성호 (김정업)

단위: 수량·무게(Kg)

월 일	4/27	4/28	4/29	5/8	5/10	5/15	5/17	5/24
조업 중 인양 쓰레기	페그물	.	.	.	.	.	.	.
	통발	.	.	.	.	.	.	.
	로프	.	.	.	.	.	.	.
	부표	.	.	.	.	.	.	.
	육상쓰레기	.	.	.	.	.	.	.
	낙하산 및 조명탄	.	.	.	.	.	.	.
기타(종류별로)								
선상 발생 쓰레기	식품 포장용기	13.05	15.06	9.04	14.06	13.05	15.06	14.06
	물·음료 용기	10.1	8.1	12.1	20.15	16.08	20.15	20.15
	납시 도구	.	.	.	30.	.	.	20.
	오일 통	.	.	.	.	.	.	.
	기타(종류별로)							
합계 - 수량·무게(Kg)	.	.	.	.	.	.	.

무창포어촌계(041-936-3510), 한국해양구조단 보령지역대(019-686-9999)

Fig. 9-2 Examples of log sheets recorded by fishermen

Conclusion

The 'Fishermen's self monitoring program of marine debris' is a meaningful trial to KMRC in Boryeong, a nonprofit organization which has been involved in efforts to reduce marine debris for years. This program is more valuable in the way that it targets on fishermen who earn their living on resources of the Yellow Sea and polluters at once. Fishermen group has been recognized as one of the major

sources of marine debris in the country. Aging, apathy due to decreasing resource by overfishing and pollution or low education level seem to have interrupted to activate education and public awareness programs for them.

Most of the people who think it is essential to educate fishermen for solving marine debris problem don't know much about the processes and behaviors which produce debris in the sea. It is needed to excavate and train fishermen leaders who have strong concerns and intentions and to give more roles for raising awareness.

Moochangpo cooperative of fishing village has ever awarded as a self-control model community on resources by government. The head and members have relatively highly recognized the importance of resources and environment in Yellow Sea. They were eager to share and solve the problem with NGO activists. Their active response in several meetings and workshop was admirable and hopeful even to us. Continuous backup and support would produce more valuable outcome in the area in future.

Some of participants can play roles as good instructors if they would get properly trained on education skill or program leading. Moochangpo cooperative has an enough potential to be a model case on marine debris self-management. It is worth to develop further programs including field trips where people from other districts can join.

The most valuable outcome is to listen to various opinions about sea-based marine debris. The new important facts we get to know are like below.

First, government has a plan to disseminate debris gathering barges for easy collection of fishing gear. However, fishermen say it is more important and effective to get rid of marine debris on time and quickly.

Second, conflicts among different fishing methods can be one of major reasons. Government needs to play a role to induce sharing information and volunteer agreement between fishermen groups action, which can directly help for reduction.

Third, fishermen have recorded the location of derelict fishing gear they encounter during fishing on the ship navigator. This information can be very useful and cost-effective to clean fishing zone by government.

Problem to be solved

It is not easy to make fishermen voluntarily record and find out alternatives for reduction of marine debris. Long term interests and approaches should be settled down in community level. For development of fishermen education program, it is needed to deeply consider the usual ways of working, behaviors on board, degree of recognition, culture, etc.

Fishermen hesitated to give notice of location of abandoned fishing gear because they have less confidence in coast guards and government. We clearly found that confidence-building between government and fishermen is necessary for better management measures and policies against marine debris.

Annex I Proceeding of workshop (hard copy)

Annex II Result of questionnaire

Annex III Stickers (hard copy)

Annex IV References

Annex II

Result of Questionnaire Survey

Target: Participants of wrap up meeting (23 persons including lecturers and program conductors)

Date and time: 16:00~17:00, 18th June, 2008

Method: Questionnaire

Participants: 18 persons

Contents of the questionnaire survey

The survey included four fields: 1. recognitions of impacts of marine environmental problems to fisheries, 2. evaluation of national marine debris policies in progress, 3. educational methods of marine environmental awareness for fishermen, 4. reasons for low participation of recording log sheets. Each field has several questions. The respondents need to make a decision on their level of agreement, on a five degree scale (i.e. strongly disagree, disagree, undecided, agree, strongly agree) with a statement.

The first field has questions about how seriously they feel about impacts of marine environmental problems on their fisheries. We furnished respondents with several problems of oil pollution, marine debris and global warming as marine environmental problems.

The second is for marine debris policies in progress (MOMAF, 2007). We mentioned 7 policies, such as 'Paying retrieved fishing gear', 'Fishing zone Cleanups', 'Fishing gear identification system', 'Education for fishermen', 'Beach cleanups', 'Debris reception barges' and 'Styrofoam compactors'.

The third is about educational methods of marine environmental awareness for fishermen. It included 'Voluntary activities of fishing village corporation', 'Monthly meeting of fishing village cooperative', 'Fishermen education by municipal government', 'Separate schedule only for education', 'Posters', 'Leaflets', 'TV campaign' and 'Radio campaigns'.

The last is about reasons of low participation in the self monitoring program we designated. It included 'Uselessness of recordings', 'Hardness of recordings' and 'Hebei oil spill accident'.

Results

Each question was measured in Likert type scale.

Responses of questions can rate on a 1-to-5 response scale where:

1 = strongly disagree

2 = disagree

3 = undecided

4 = agree

5 = strongly agree

Recognitions of impacts on fishery from marine environmental problems

	Average	Responses	Rank
Oil pollution	3.83	18	2
Marine debris	4.61	18	1
Global warming	3.78	18	3

Marine debris policies evaluations

Paying retrieved fishing gear	4.22	18	1
Fishing zone Cleanups	3.39	18	6
Fishing gear identification system	3.61	18	3
Educations for fishermen	3.44	18	5
Beach cleanups	3.83	18	2
Debris reception barges	3.47	17	4
Styrofoam Compactors	3.24	17	7

Evaluations about educational methods of marine environmental awareness for fishermen

Voluntary activities of Fishing village corps.	3.60	15	1
Monthly meeting of Fishing village corps.	3.31	13	2
Fishermen educations by municipal government	3.15	13	4
Separate educations	2.92	13	7
Posters, leaflets	3.08	13	5
TV campaign	3.29	14	3
Radio campaigns	2.93	14	6

Reasons of low participation in the self monitoring program

Uselessness of recordings	3.00	12	3
Hardness of recordings	3.43	14	1
Because of Teraan oil spill accident	3.42	12	2

1. Recognitions of impacts on fishery from marine environmental problems

The average of item about 'marine debris problem' was 4.61 point, showing the fishermen consider it very severe. 'Oil pollution' remarked 3.83 point and there wasn't much different from 'global warming', 3.78 point. The gap between 'oil pollution' and 'marine debris problem' was 1.00 point instead. One of the reasons of the result was that the participants on the survey understood this program related with marine debris problem as well. Although Hebei oil spill accident was an extremely severe and huge accident we haven't met before, the fishermen understood that oil pollution was not a primary reason affecting on their usual fisheries.

2. Evaluation of marine debris policies

'Paying retrieved fishing gear' got highest score of 4.22, 'Beach cleanup' 3.83, 'Fishing gear identification system' 3.61 and other four policies got higher than the average. The respondents evaluated all policies we mentioned above the average score (3 point) in this survey.

3. Educational methods of marine environmental awareness for fishermen

'Voluntary activities of fishing village cooperative' has highest scored of 3.60, the next score 3.31 was to 'Monthly meeting of fishing village cooperative'. 'Separate schedule for only educations' ranked the lowest with 2.92 point. It showed fishermen preferred community-based activities like self action program and conjugation of monthly meeting rather than separate schedules for only education.

4. Reasons for low participation in recording log sheets

They were answered like: Recording was hard and troublesome (3.43); target people were not fully concerned because of oil spill accident (3.42); and recording is meaningless (3.00). It tells the oil spill accident somewhat affected the self monitoring program and hard to record their monitoring card while at work.

**YSLME 어업인 해양쓰레기
자율관리 사업 설문지**

아래 문제들이 본인에게 얼마나 영향을 주고 있다고 생각하시는지
해당 칸에 √표시해 주세요.

	매우 심각	심각	보통	약함	매우 약함
기름 유출	___①	___②	___③	___④	___⑤
해양쓰레기	___①	___②	___③	___④	___⑤
지구온난화	___①	___②	___③	___④	___⑤

바다쓰레기를 줄이기 위한 정책들에 대한 의견을 해당 칸에 √표
시해 주세요.

	매우 좋음	좋음	보통	안 좋음	아주 안 좋음
조업중 쓰레기 수매	___①	___②	___③	___④	___⑤
어장 수중 정화사업	___①	___②	___③	___④	___⑤
어구 실명제	___①	___②	___③	___④	___⑤
어민 교육홍보	___①	___②	___③	___④	___⑤
태안청소	___①	___②	___③	___④	___⑤
항포구에 쓰레기 집하용 평부선 설치	___①	___②	___③	___④	___⑤
스티로폼 강용기 보급	___①	___②	___③	___④	___⑤

바다쓰레기를 줄이기 위한 어업인 교육의 방법들에 대한 의견을 해당 칸에 √표시해 주세요.

	매우 좋음	①	②	③	④	⑤	보통	안 좋음	아주 안 좋음	
어촌계 자율실천 프로그램	___	①	___	②	___	③	___	④	___	⑤
어촌계 월례회	___	①	___	②	___	③	___	④	___	⑤
보령시 어민교육	___	①	___	②	___	③	___	④	___	⑤
별도 교육시간마련	___	①	___	②	___	③	___	④	___	⑤
포스터, 전단지	___	①	___	②	___	③	___	④	___	⑤
TV 방송	___	①	___	②	___	③	___	④	___	⑤
라디오 방송	___	①	___	②	___	③	___	④	___	⑤

'어업인 해양쓰레기 자율관리 프로그램'의 기록지 작성이 잘 안 된 이유에 대한 의견을 해당 칸에 √표해 주십시오.

	매우공감	공감함	보통	아님	절대아님					
기록지 의미가 없어서	___	①	___	②	___	③	___	④	___	⑤
기록하기 힘들고 귀찮아서	___	①	___	②	___	③	___	④	___	⑤
기록유출사고로 신경을 못 써서	___	①	___	②	___	③	___	④	___	⑤

※ 해양쓰레기 줄이기를 위해 제안하고 싶은 내용을 적어 주세요.

Annex III Sticker



Sticker for public relations in Moochangpo area

Annex IV References

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