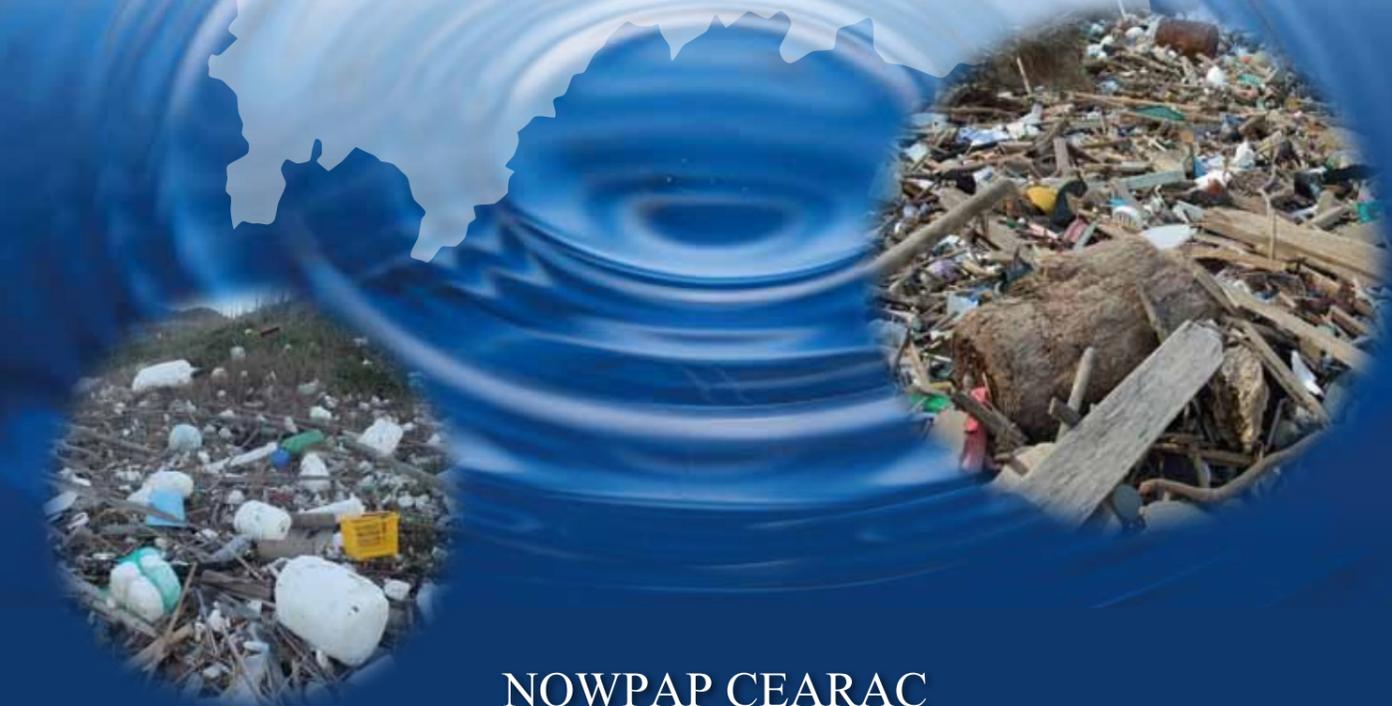




Marine litter management within a river basin:

**A case study of Oyabe river basin,
Toyama Prefecture, Japan**



Introduction

The 'Washed-Ashore Articles Disposal Promotion Act'* was enacted in July 2009 and includes measures necessary to promote smooth disposal of marine litter and reduction of marine litter input. Given that the prefectures of Japan were required to formulate regional plans which were to specifically identify priority areas where measures against marine litter were to be promoted, as well as the details of those measures, role sharing and cooperation between concerned groups, and points to consider in implementing measures against marine litter, in March 2011 Toyama Prefecture Government formulated the 'Toyama Prefectural Regional Plan for the Promotion of Measures against Marine Litter'.

In preparing this Regional Plan, a survey on marine litter in all of Toyama Prefecture was conducted to obtain up-to-date information of marine litter situation in the Prefecture. As a result, it was found that the highest density of marine litter per 100m² was observed at the Rokudoji seashore in Imizu City located at a river mouth, with 2.5m³/100m² (March) and 2.0m³/100m² (June). Plastic litter and other artificial litter items made up three-fourth of the marine litter, which was somewhat different comparing with other beaches where natural litter was predominant. The reason for this is thought to be due to the fact that this beach is situated between the river mouths of two of the five major rivers of Toyama Prefecture, the Oyabe River and the Sho River, and that land-based litter comes to the sea shore via these rivers. It is for this reason that the Rokudoji seashore was specified as a priority monitoring point.

Given the above observations, the Prefecture set up the Oyabe River Basin Subcommittee (Hereafter 'Subcommittee') of the Association Promoting Measures against Marine Litter on the Coast of Toyama Prefecture. The purpose of the subcommittee is to develop cooperative framework for preventing the input of land-based litter and reducing marine litter in the area of the Oyabe River mouth. The subcommittee is currently promoting litter control measures in the upper, middle and lower reaches of the river by the five cities located in the Oyabe River Basin (Imizu City, Oyabe City, Takaoka City, Tonami City, and Nanto City) as well as by the Ministry of Land, Infrastructure, Transport and Tourism (which administers rivers in Japan) and by concerned groups.

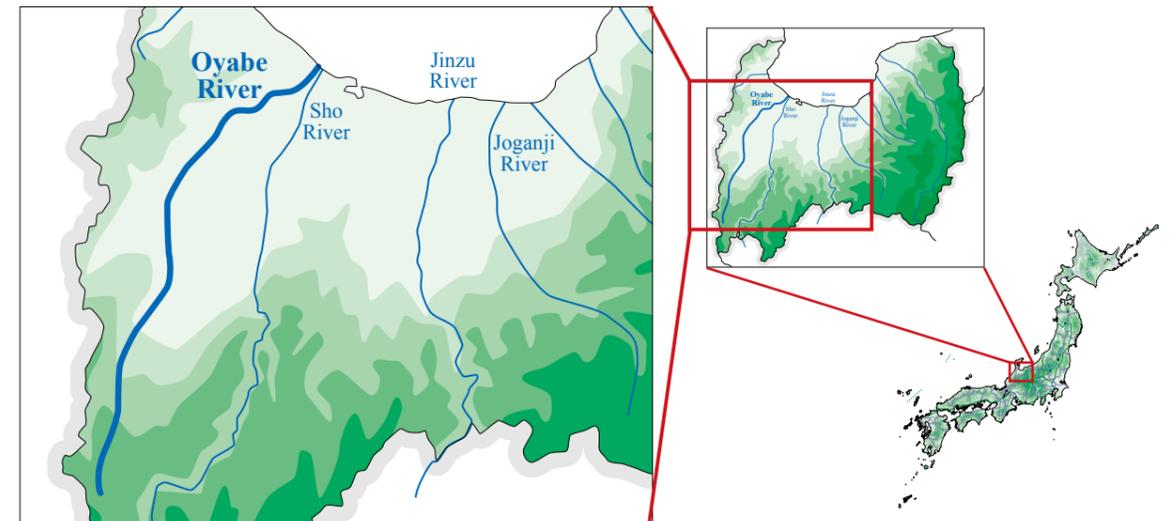
This report includes various initiatives undertaken in the Oyabe River Basin in terms of preventing the input of land-based litter. We hope that this information will be useful for other regions and river basins to apply measures against marine litter.

In preparing this report, Toyama Prefecture Government provided a lot of data and materials for which we are grateful.

*'Washed-Ashore Articles Disposal Promotion Act' is officially called 'the Act on Promotion of Disposal of Articles Washed Ashore for Conservation of Good Coastal Views and Environment for Conserving Beautiful Rich Nature'

About Oyabe River

Oyabe River is 68 km long with a catchment area of 682 km² and has its headwaters in Mt. Daimon (in the southern part of Nanto City, Toyama Prefecture), flowing into Toyama Bay via Nanto City, Oyabe City, Takaoka City and Imizu City. It is named as one of the five major rivers in Toyama, along with the Kurobe River, Joganji River, Jinzu River and Sho River. Given that Toyama Prefecture is a center for rice growing, agricultural irrigation channels crisscross the plains. Many of the channels and drains over the Tonami Plain flow into the Oyabe River via 63 tributaries. The population of the catchment is 300,000 people, one-third of Toyama Prefecture's population.



What is the Oyabe River Basin Subcommittee?

The Rokudoji seashore, located at the Oyabe River mouth, has the most marine litter in the Prefecture. It was found by simulation that the majority of the marine litter washed up on the beach was land-based and transferred by the river, and the Oyabe River Basin Subcommittee was set up to encourage cooperation among local authorities, concerned organizations and residents in both upstream and downstream areas to address the marine litter issue.

The main reasons why the subcommittee was established are as follows: (1) the sources of marine litter are very different - from industrial activities (including commerce, agriculture, and fisheries) and from households; and (2) cooperation among various stakeholders to prevent litter input is necessary, and the following activities must be carried out:

- A survey of the current situation of marine litter and river litter;
- A study of area-specific measures to prevent litter input based on the mutual understanding of the situation of litter input among the concerned groups in the river basin; and
- Development of a leaflet on the current situation of marine litter and the countermeasures, as well as a litter map for environmental education.

Members in the subcommittee are industry (the Takaoka Chamber of Commerce and Industry, Takaoka City Society of Commerce and Industry), agricultural groups (Tonamino Agricultural Cooperative), fisheries groups (Oyabe River Fisheries Cooperative, Shinminato Fisheries Cooperative), consumer groups (Toyama Prefectural Consumer and Lifestyle Research Group Liaison Council), women's groups (Takaoka Regional Women's Network), educational groups (Toyama Prefectural Confederation of Parent Teacher Associations), residents' associations (Takaoka City Confederated Residents' Association), environmental groups (Takaoka City Environment and Health Association, Tonami City Environment and Health Association, Oyabe City Environment and Health Association, Nanto City Environment and Health Association, Imizu City Environment and Health Association, Toyama Environment Foundation, Northwest Pacific Region Environmental Cooperation Center), governmental agencies (Takaoka and Oyabe sub-branches of Toyama River and National Highway Office, Hokuriku Regional Development Bureau in the Ministry of Land, Infrastructure, Transport and Tourism, Takaoka City Environmental & Civic Affairs Department, Tonami City Welfare and Citizens' Department, Oyabe City Citizen and Living Department, Nanto City Mayor's Policy Office, Imizu City Citizens and Environment Department). Toyama Prefectural government serves as the secretariat of the subcommittee and the chair of the subcommittee is a professor of Toyama Prefectural University.

Measures to prevent the input of marine litter through cooperation between upstream and downstream authorities in the Oyabe River Basin

The Oyabe River Basin Subcommittee is encouraging concerned groups to implement measures for prevention of litter input from the river basin, based on their respective action plans. The developed action plans are basically categorized into the following three areas.

1. Creation of a collaboration system between governmental agencies and concerned groups
 - (1) Promotion of regional collaboration
 - (2) Information sharing
2. Enhancement of knowledge and understanding of the current situation with marine litter
 - (1) Knowledge of the current situation of marine litter
 - (2) Beach cleanups in observation tours and/or training sessions
 - (3) Dissemination of information via newsletters/public information magazines.
 - (4) Dissemination of information via leaflets and websites
 - (5) Environmental education for children
 - (6) Promotion for preventing input of cut weeds into waterways
3. Promotion of activities such as cleanups/beautification and litter reduction
 - (1) Cleanup activities
 - (2) Illegal dumping prevention patrols and river inspections
 - (3) Promotion of litter reduction
 - (4) Promotion of activities relating to the 3Rs (reduce, reuse, and recycle)

Below are the details of the actions set by each organization.

1. Creation of a collaboration system between governmental agencies and concerned groups

(1) Promotion of regional collaboration

The purpose of the action plans in this category is to strengthen the collaboration between the concerned groups and governmental agencies through various meetings for the Oyabe River Basin Subcommittee.

Actions by stakeholders:

Toyama Prefecture

- Organizing meetings of the Association Promoting Measures Against Marine Litter on the Coast of Toyama Prefecture and the Oyabe river Basin Subcommittee of the Association Promoting Measures against Marine Litter on the Coast of Toyama Prefecture sharing information and strengthen collaboration among stakeholders

Five cities in the Oyabe river basin

- Enhancing collaboration with concerned groups

Concerned groups

- Promoting sharing information with similar groups in the Oyabe river basin and with different groups in each city
- Supporting actions implemented by prefectural and municipal government

Example of Activities

Oyabe River Basin Subcommittee meetings

- First subcommittee meeting (2 August 2013)
Review of the situation of marine litter input and actions by the subcommittee.
- Second subcommittee meeting (12 November 2013)
Review of the survey results (preliminary report) on measures to prevent marine litter input and consideration of measures to reduce the marine litter input (draft plan)
- Third subcommittee meeting (6 February 2014)
Review of the final survey report on measures to reduce the marine litter input and finalization of measures to reduce the marine litter input
→Formulation of action plan
- Fourth subcommittee meeting (26 May 2014)
Review of the results of various surveys on marine litter in 2013, and consideration of measures to reduce the marine litter input in 2014
- Fifth subcommittee meeting (3 February 2015)
Review of implementation of measures to reduce the marine litter input in 2014



(2) Information sharing

The purpose of the action plans in this category is to collect, organize and share data on the situation of marine litter and the implementation of the measures to prevent marine litter input.

Actions by stakeholders:

Toyama Prefecture

- Implementing monitoring survey of the current situation of marine litter, and providing information to the subcommittee

Five cities in the Oyabe River Basin

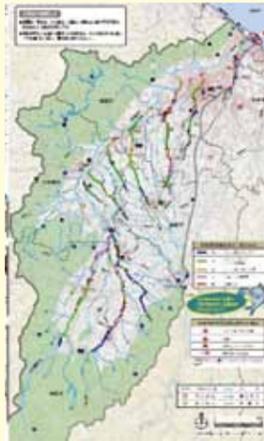
- Monitoring the status of implementation of actions by concerned groups in each city

Concerned groups

- Monitoring the status of activities by group members, and providing information to prefectural and municipal government

Example of Activity

A survey on the current situation of marine litter, and the distribution and outflow of litter in river



A survey on the distribution of litter in Oyabe River and its tributaries, the amount of litter input to the sea via rivers, and the amount of marine litter has been undertaken. The results were shown on a map to consider the areas/locations in need of priority measures.



Survey of litter using oil fence

2. The Promotion of knowledge and understanding of the current situation of marine litter

(1) Knowledge of the current situation of marine litter

The purpose of the action plans in this category is to deepen the understanding on the current situation of marine litter through presentations and/or lectures on marine litter at the meetings and/or study sessions.

Actions by stakeholders:

Toyama Prefecture and five cities in the Oyabe River Basin

- Organizing fora on marine litter in the upstream area of the four cities
- Organizing coastal cleanups with local upstream residents
- Encouraging local residents to actively participate in information sharing and beach cleanup activities
- Explaining the current situation of marine litter at various meetings upon requests from concerned groups

Concerned groups

- Providing information on marine litter at the meetings of group
- Providing opportunities for promoting marine litter awareness through 'Marine Litter Art Exhibition' and 'Marine Litter Art Caravan' etc.

Example of Activity

Forum on Marine Litter (Takaoka)

7 June 2014, 13:00-15:30

At Fukuoka Cultural Center, Imizu City Rokudoji Beach

Program

- The current situation of washed-up coastal debris
- What we can do to protect the beautiful coast of Toyama -
- Environment beautification activities in Takaoka City
- To make the Sembo River more attractive
- Coastal cleanups



(2) Beach cleanups, observation tours and/or training sessions

The purpose of the action plans in this category is to designate the coast near the Oyabe River mouth as an observation/training site and to conduct beach cleanups and interactions with local concerned groups.

Actions by stakeholders:

Toyama Prefecture

- Organizing bus tours including a study session about generation of marine litter and beach cleanups

Five cities in the Oyabe River Basin

- Encouraging residents' groups to participate in coastal cleanups
- Organizing training sessions including on-site cleanup activities

Concerned groups

- Incorporating opportunities for observation of the current situation of marine litter and cleanup experiences
- Organizing surveys of marine litter by coastal municipalities' authorities of the four countries of, China, Japan, Korea and Russia.

Example of Activity

Coastal observation and cleanup by residents' groups (e.g. residents' associations, and women's groups) in the upstream area

Coastal observation and cleanup by residents' groups in the upstream area (residents' associations, women's groups etc.) that have less opportunities to visit the beach/coast in their daily lives

First-hand experience (seeing the situation of marine litter with their own eyes) is extremely effective from an educational point of view.

(3) Dissemination of information via newsletters/public information magazines

The purpose of the action plans in this category is to present the current situation of marine litter in group newsletters and governmental public information magazines, and to raise public awareness on prevention of dispersal, outflow and irresponsible disposal of litter.

Actions by stakeholders:

Ministry of Land, Infrastructure, Transport and Tourism

- Raising awareness of prevention of dispersal and outflow of litter among construction companies and farmers

Toyama Prefecture and five cities in the Oyabe River Basin

- Disseminating information on prevention of litter dispersal and outflow by newsletters and other information tool

Concerned groups

- Disseminating information on the current situation of and measures against marine litter by newsletter

(4) Dissemination of information via leaflets and websites

The purpose of the action plans in this category is to develop and distribute educational leaflets (including photos of the beach in the river mouth area, to put relevant information on the websites), and to provide relevant information to mass media.

Actions by stakeholders:

Ministry of Land, Infrastructure, Transport and Tourism

- Distributing leaflets on marine litter to construction companies and farmers
- Developing a 'Litter map in Oyabe river/Jinzu river'
- Announcing winning groups of prize for river beautification activities

Toyama Prefecture and five cities in the Oyabe River Basin

- Developing an educational leaflet with information on the situation of marine litter and measures against it, and to widely distribute it
- Creating a website relating to marine litter and disseminating information

Concerned groups

- Distributing to members the leaflets and other materials developed by prefectural and municipal government
- Disseminating information by the email magazines
- Developing an educational DVD and a report on best practices for prevention of marine litter

Example of Activity

Litter Map in Oyabe River/Jinzu River



- Conducting surveys of the distribution of litter in the areas of the Oyabe and Jinzu Rivers
- The surveys of the main parts of the Oyabe and Jinzu Rivers are conducted by the central government (the Ministry of Land, Infrastructure, Transport and Tourism) who manages them, and the surveys of the tributaries are conducted by the prefectural government who manages these rivers.
- Raising public awareness towards prevention of illegal dumping

(5) Environmental education for children

The purpose of the action plans in this category is to develop a map showing the distribution of litter in river areas and to conduct coastal cleanup tours in the river areas in order to enable children to understand the issues on marine litter such as the flow of water and marine litter.

Actions by stakeholders:

Ministry of Land, Infrastructure, Transport and Tourism

- Conducting a survey of aquatic life in rivers for elementary school students

Toyama Prefecture and five cities in the Oyabe River Basin

- Developing a map showing the distribution of litter in river area, and distributing it to elementary and junior high school
- Organizing bus tours for children to learn the flow of water and litter and to experience coastal cleanups
- Asking elementary and junior high schools to encourage students to make posters and wall hangings on the theme of marine litter

Concerned groups

- Conducting beach cleanups and beautification activities with local elementary and junior high school students and their parents
- Recruiting members for the 'Kids Eco Club' to involve environmental activities, provide relevant information and support to them
- Organizing on-demand classes for elementary school students to learn marine litter

(6) Promotion for preventing outflow of cut weeds

The purpose of the action plans in this category is to remind people, via newsletters and other means, of seasonal increase of cut weeds in the river mouth areas and advise proper disposal of cut weeds.

Actions by stakeholders:

Toyama Prefecture and five cities in the Oyabe River Basin

- Encouraging contractors to collect weeds cut on levees and prevent outflow of cut weeds downriver
- Giving reminders to river and irrigation channel manager of preventing outflow of cut weeds into rivers
- Calling for proper disposal of cut weeds to agriculture-related groups

Concerned groups

- Giving reminders for prevention of outflow of cut weeds by notice on the newsletters and distribution of leaflets

Example of Activity

Tour on river flow and coastal cleanups

A bus tour to see the flow of rivers and floating litter from upstream to downstream and to understand that usual items in daily life turn to marine litter by beach cleanup experiences

Eco craft-making projects using milk cartons and plastic bottles are also included to enable tour participants to learn the issues of marine litter and the environment with fun.

25 July 2014: Takaoka/Tonami Course

1 August 2014: Oyabe/Nanto Course

6 August 2014: Eastern part of Prefecture Course



Example of Activity

Distribution of a notice relating to preventing outflow of cut weeds into rivers



In order to control the flow of cut weeds which is a problem in the downstream area at the Rokudoji seashore, a notice has been developed including the current situation of damage due to cut weeds and methods of cutting weeds. This notice is distributed to concerned groups and organizations, and encouraging people to prevent cut weeds from entering the rivers.

3. Promotion of activities such as cleanups / beautification and litter reduction

(1) Implementation of cleanup / beautification activities

The purpose of the action plans in this category is, by continuing cleanup and beautification activities in each area such as 'The Great Cleanup Operation' and city and district cleanups, to make it known to residents that their activities will contribute to reduction of generation of washed-up coastal debris and to promote integrated activities in the catchment area.

Actions by stakeholders:

Ministry of Land, Infrastructure, Transport and Tourism

- Providing support to volunteer groups carrying out river cleanups and relevant activities
- Collecting litter in river areas after floods/heavy rain

Toyama Prefecture and five cities in the Oyabe River Basin

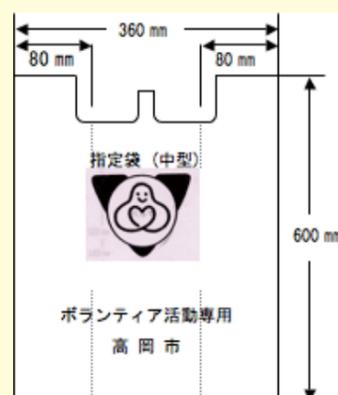
- Conducting prefecture-wide cleanup activities of roads, rivers and beaches
- Collecting and disposing marine litter and discarded litter in river areas
- Providing support to beautification activities

Concerned groups

- Conducting beautification activities at rivers and roads back-to-back with local events
- Conducting beach cleanups on Marine Day every year
- Organizing the Prefectural Residents' Meeting for Promoting Beautification (85 groups) and giving an award to people for their dedication
- Notifying cleanup activities and relevant events by email and website

Example of Activity

Provision of volunteer bags



Official bag (medium) for volunteer activities only in Takaoka City

- Provision of litter bags to collect litter during volunteer activities such as coastal cleanups, and collection and disposal of the collected litter.
- Normally, burnable litter from general households is collected for a fee, however litter collected in these bags during volunteer activities are collected free of charge.

(2) Illegal dumping prevention patrols and river inspections etc.

The purpose of the action plans in this category is to prevent illegal dumping of litter on beaches and roads, and in rivers and forests, as well as to prevent outflow of litter into rivers, by regular patrols and warning signs to prevent illegal dumping

Actions by stakeholders:

Ministry of Land, Infrastructure, Transport and Tourism

- Monitoring and collecting litter in river areas as part of river patrols
- Putting up signs to call for stopping illegal litter dumping in river areas

Toyama Prefecture and five cities in the Oyabe River Basin

- Monitoring and patrolling for illegal dumping
- Putting up signs to call for stopping illegal litter dumping

Concerned groups

- Conducting regular patrols on roads, river and beaches

Example of Activity

Putting up signs to prevent irresponsible disposal and patrols to prevent illegal dumping

In addition to the patrols to prevent illegal dumping conducted by the central government and prefectural government, the five cities in the catchment area have assigned residents in each area as 'illegal dumping monitoring officers', and regular patrols are undertaken at rivers, on roads and in forests.



(3) Promotion of litter reduction

The purpose of the action plans in this category is to encourage people to establish a litter-free lifestyle in terms of using reusable bottles and cups in daily life as well as refillable products.

Actions by stakeholders:

Toyama Prefecture and five cities in the Oyabe River Basin

- Promoting a litter-free lifestyle
- Calling for reduction of litter

Concerned groups

- Collecting agricultural waste such as pesticide containers and bottles and fertilizer bags with the fee
- Practicing litter reduction activities in daily life such as using reusable chopsticks
- Distributing the educational leaflet at various opportunities

Example of Activity

Activities on raising public awareness by 'Toyama's Ten Environment Challenges' initiative

As part of environmental education mainly aimed at elementary school students, it is encouraged to practice litter reduction at home and establish a litter-free lifestyle.



(4) Promotion of activities relating to the 3Rs (reduce, reuse and recycle)

The purpose of the action plans in this category is to promote environmentally-friendly initiatives through cooperation between stores and residents with the Toyama Eco-Store System* such as customers' bringing their own shopping bags for grocery shopping and cooperation of stores by collecting recyclable materials.

*What is the Toyama Eco-Store System?

While residents have been participating in eco-friendly activities such as the prefecture-wide discontinuation of free distribution of shopping bags, Toyama Eco-Store System goes one step further - it involves registration of stores that are active in carrying out eco-conscious initiatives with consumers, such as, in addition to the discontinuation of free distribution of shopping bags, collections of recyclable/reusable materials and eco-conscious air conditioning temperatures in stores, aiming at further establishment and proliferation of eco-friendly life style. As of 19 March 2015, 977 stores of 60 companies as well as 6 shopping districts have registered.

Actions by stakeholders:

Toyama Prefecture and five cities in the Oyabe River Basin

- Establishing eco-conscious consumer behavior among prefecture residents through practices in the Toyama Eco-Store System
- Disseminating information by newsletters and the website to promote activities on 4Rs (3Rs of reduce, reuse and recycle + refuse)
- Increasing the number of stores registered in the Toyama Eco-Store System

Concerned groups

- Using reusable shopping bags
- Collecting recyclable materials
- Organizing the Environment Toyama Prefectural Residents' Meeting (116 groups) and to honor the groups for their contribution to zero-waste/recycling practices

Example of Activity

Promotion of the Toyama Eco-Store System

With the initiative to discontinue free distribution of shopping bags which started in April 2008 throughout the prefecture, the use of plastic shopping bags has reduced by more than 1 billion bags.

In addition, it is aimed to establish more eco-conscious consumer behavior among prefecture residents through the Toyama Eco-Store System such as by promotion of store collections of recyclable/reusable materials and the promotion of eco-conscious product sales.



4. Summary

The highest concentrations of marine litter in Toyama Prefecture are found in the estuary of Oyabe River. In order to solve this anthropogenic problem, new actions aiming for prevention of litter input into Oyabe River were taken involving cooperation of all stakeholders from upstream and downstream areas. As a result of these actions, the state of the river has gradually been improved, indicating that measures taken within river basins can effectively reduce the amount of litter coming to the sea (marine litter). There are four other major rivers in Toyama Prefecture, and once the same river basin management is applied to these rivers, we can expect the overall situation with coastal environment in Toyama Prefecture to be improved.

In order to efficiently and effectively reduce marine litter input, it is necessary to encourage involvement of the residents in the river basin as much as possible. To raise public awareness, it is advisable to organize events such as beach cleanup tours and upstream to downstream cleaning relays, which citizens living within river basins can participate in, so that they will better understand the problem of marine litter.

Various actions introduced in this case study report are good examples to prevent marine litter input from land-based sources. In particular, the cooperative actions implemented by all stakeholders from upstream to downstream areas of Oyabe River could be applicable to other river basins. It is expected that this report will help conducting similar actions in other regions of Japan and in other NOWPAP member states.