

Distress Experienced by People Forced to Confront Drifting Debris Pollution

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Introduction

The problem of marine debris pollution has historically mainly been approached from the perspective of natural science. In addition, the accumulation of trash and litter data on our beaches has been conducted by an NGO actively involved in the conservation of the marine environment. While this data may be insufficient for a comprehensive examination of the marine debris problem in Japan, I propose that we can use this data to gain an understanding of the tendencies evident in the drifting debris off the coast of our country. Particularly insofar as clarifying the fate of petrochemical products and nonbiodegradable potsherd that floats everywhere in the ocean, sinks to the ocean floor, and washes up along the coast.

Based on this research, the Japanese Expanded Polystyrene Recycling Association (JEPSRA) and parties concerned with the manufacture of polystyrene began to tackle the scattering problem associated with expanded polystyrene potsherd in the 2001 fiscal year. Subsequently, the Fisheries Agency began investigating the establishment of a recycling system for materials related to the fishing industry that were made of expanded polystyrene from the fiscal year in 2003. This is an example of a case in which research in the natural sciences greatly contributed to solving this problem.

There are principal problems associated with the marine debris problem are twofold: how to remove the marine debris scattered along the coast, and how to implement mechanisms directed at preventing the scattering of trash and litter on the coast in the future. Then, Action of JEPSRA and parties concerned with the manufacture of polystyrene and the Fisheries Agency of Japan, so eliminating the problem of scattering is very difficult in reality.

Furthermore, Though the effect on marine environment and wildlife by the marine debris only has been pointed out before, given that the negative effect of marine debris on human activities is gradually being clarified. And we have to clarify the structure of the problem — measures such as management systems, legal instruments, finance and manpower — in order to solve this problem. One such measure is a social scientific approach that involves assessing the opinions of people such as fishermen who face the marine debris problem directly. In this paper, I describe the difficulties associated with the recovery and disposal of marine debris that is scattered in the ocean and along the coast through distress experienced by people forced to confront drifting debris pollution.

Drifted debris to the coast

Plastic waste is a large problem in the ocean. In addition to the fact that it is not biodegradable, the sheer volume of plastic waste in the ocean has exacerbated the problem considerably. In a report published in July 2000 titled, "Investigation and survey of measures for the prevention of marine pollution by derelict plastic" by the Environment Agency Water Quality Bureau it was estimated that the quantity of drifting or waste plastic along the coast of our country is approximately 10,000 to 20,000 t per year (Environment Agency, 2000).

Here, I will give two instances of distress experienced by people forced to confront marine debris drifted from other regions.

1. Refuse that crosses borders

Figure 1 depicts the area to the west of the Tsushima Islands, Nagasaki Prefecture. It is only approximately 50 km from Tsushima Islands to Korea and much of the waste that is deposited here is of Korean origin. Many of waste in figure 1 are derived from the aquaculture industry in Korea. In addition, while it may not be apparent from the photo, fishing gear and day-to-day items also washed up on the beach. Of course there were also debris items derived Japan, China and Taiwan.



Fig 1. The area to the west of Tsushima Islands.

When debris is washed up in areas where the most of the local residents are elderly, the recovery and transportation of waste debris is very difficult. Figure 2 is the another west coast of the Tsushima Islands. A summit, Tsushima Conference on the Problem of Marine Debris Washed up on Islands, was held in Tsushima on the 9th and 10th October in 2004 in Tsushima. Figure 2 taken after the conference shows the participants of a beach cleanup and includes conference attendees visiting the island. Some objects could not be recovered using human force alone and these were removed by crane (Fig. 3). Cleaning activities such as

these are endless undertakings, because even if an area has been cleaned once it will soon be covered with the same refuse.



Fig 2. Beach clean up in the coast of the Tsushima Islands.

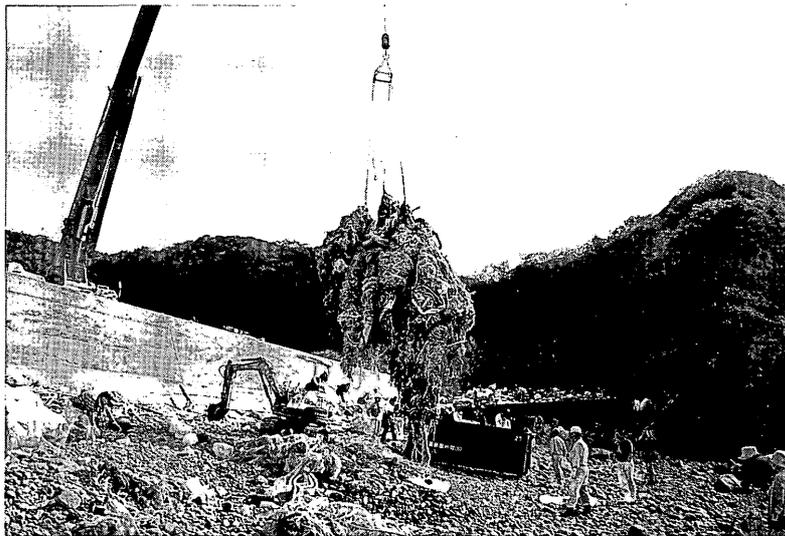


Fig 3. Refuse removed by crane.

Disposal of this refuse is also difficult once it has been removed from the coast. The treatment of refuse recovered from the seashore is not easier than the treatment of refuse derived inland. This is because refuse recovered from the seashore has a high salinity content and is often contaminated with foreign matter. These are important considerations, even if the refuse is incinerated or if it is recycled. Municipalities with small populations often do not have the facilities necessary to dispose of large refuse, and the disposal must thus be undertaken by the municipality of another region. In the case of Tsushima, such refuse is transported to Fukuoka by ship. Enormous costs arise when debris is recovered from beaches. For example, a two-day cleanup of the beach in Tsushima resulted in the collection of approximately 510m³ at a cost to the City of about 3 million yen (Hirayama, 2004). In the case of a clean up held in the Kamiagata Area of Tsushima

last summer the cost of disposal was estimated as being in excess of 10 million yen (Kanehiro, 2004). Consequently, some of the refuse gathered at the coast is incinerated in the vicinity in order to reduce the disposal costs.

The Waste Disposal and Public Cleansing Law (1970) states that the incineration of waste is prohibited except in instances where it is undertaken in compliance with standards as set out by the Ministry of the Environment (MoE) and relevant government ordinances. According to these standards, the incineration of marine refuse with a high proportion of nonbiodegradable plastic products at the coast is not possible given that such a method of treatment would not meet the standards as set out in the relevant legislation. Furthermore, authorities are concerned that the noxious material contained in the cinders may be dispersed if incineration is undertaken at the coast.

Incineration of refuse in areas that are not designated for this purpose is prohibited, even the standards regarding disposal conform to those specified by law. In the current system, the municipality that disposes marine debris must bear the enormous disposal costs. Conversely, debris left on the coast either covers vegetation or becomes drift once more and affects another location adversely.

Students of Busan University of Foreign Studies in Korea became aware of the situation surrounding the pollution of the Tsushima coastline by debris of Korean origin. In response, they undertook to clean up the coast of Tsushima last year and collected a total of approximately 510m³. Research into the prevention of pollution and drift into international waters and beyond is said to have been initiated by Korea and it is my hope that these efforts bear results in the very near future.

2. Trash and litter derived from other prefectures

Refuse does not always come from foreign countries, in some cases it may originate from another region in the same country. One such example is that of Towa Town on Suo-Oshima Island in the Setonaikai Sea of Yamaguchi Prefecture (Figs. 4 and 5). Figure 5 is an enlargement of figure 4 and shows the slender pipes used for oyster farming in Hiroshima Bay. Oyster farming involves making a hole in the shell of the scallop through which to pass a length of wire. In this way, several scallops are bound using lengths of wire. The oyster seeds adhere to the shells. The intervals between the shells of the scallops are made to increase the rate of growth of the oysters, and it is this space that the plastic pipes are used to make. The bottom of shell is secured using circular plastic gear called the washer. In areas where the aquaculture industry is well developed, litter consisting of floats and potsherd of expanded polystyrene has become a problem. In Hiroshima Bay and the surrounding areas, in addition to floats, the pipes and washers used for oyster farming form the bulk of litter that is collected or seen.

Clean up Kansai Jimukyoku, a group affiliated to the Japan Environmental Action Network (JEAN) that is responsible for organizing activities relating to the conservation of the marine environment in our country, has tackled this problem since 1992 by seeking the cooperation of administrative organizations, the



Fig 4. The coast of Towa on Suo-Oshima(1)



Fig 5. The coast of Towa on Suo-Oshima(2)

aquaculture industry and manufacturers of floats. In response to their activities, Molten, the manufacturer that produces rubber and resin products located in Hiroshima City started selling floats for oyster farming that were composed entirely of hard resin in 1996. These hard resin floats were subsequently developed by other manufacturers and sold on the market. From 2000, the Kansai Jūmūkyōku called for the conversion to hard resin floats in the oyster aquaculture industry. By way of incentive, stock from the aquaculture producers that converted to using hard resin floats was certified as environmentally friendly. This had the effect of creating consumer demand for those products and has encouraged the aquaculture industry to convert to using resin floats. And the Hiroshima Prefecture Western Fishery Promotion Conference initiated a program of recovering and reusing oyster farming pipes and washers that had washed up along the coast of Suo-Oshima.

It is important to note that litter consisting of piping used for oyster farming is not intentionally dumped and that it arises as a consequence of typhoons and related environmental conditions. Nonetheless, the

quantity of this material is enormous and recovery thereof is considerably difficult. An enormous quantity of refuse is washed up along the coast of Suo-Oshima, Yamaguchi Prefecture. Especially, with approximately half of the town's population aged 65 or older, Towa Town has the highest number of elderly people in Japan. As can be seen in these photographs (figs. 4 and 5) taken on March 7 of this year, the efforts of the manufacturers and fishing cooperatives of Hiroshima that have tackled the debris problem for several years, a large quantity of drift is on the coast of Suo-Oshima even now.

As we would clean our own gardens, so too should we clean the beaches of the regions where we live. However, how are we to cope if the quantity of litter and refuse generated exceed the ability of the region to clean it up supposing the inhabitants are willing? It is thus necessary to establish disposal systems for marine debris and develop countermeasures prevent the uncontrolled dispersal of refuse.

The effect of refuse on the fishery.

While fishermen, particularly those involved in the aquaculture industry, are often labeled as bad people, the impact of drift and litter refuse on the fisheries on which they depend can not be disregarded. One such impact is associated with the damage caused by refuse on the operation of the fishery itself, and the other is the related to the of recovery refuse.

An example of how litter can adversely affect fishery operations is the considerable damage that drifting refuse can do to fishing boats and small vessels and ships generally.

The pumps that take in the seawater to cool the engines are often rendered inoperable by refuse, causing the engine to overheat and become damaged. Refuse may also become entwined about the shaft of the propeller. One ship owner that encountered such a problem in Kagoshima Bay said that the resulting damage cost one million yen to repair.

Insofar as the fishery is concerned, trawl fisherman often retrieve refuse that has settled on the ocean floor. Upon retrieving the catch, refuse such as broken glass can damage the catch. Fixed shore net fisherman often spend considerable time trying to remove refuse that has become tangled in their fishing nets.

The problem of disposing recovered refuse refers to the disposal of debris that is collected by fishermen while fishing and that must be disposed of by the fishing cooperative. There are some cases where the municipalities of certain areas do not dispose of the refuse retrieved by the fishermen and the fishing cooperative is required bear the cost of disposal even if fishing cooperative can transport the refuse to waste treatment facilities of municipalities.

In the two aquaculture cooperatives that operate in the Kagoshima Prefecture which I had interview, activities relating to the activities relating to the conservation of the marine environment are done enthusiastically. Members of the fishing cooperatives that I have interviewed have said that they take care not to pollute the sea because to do so would endanger their lifestyles. According to the Kanoya fishing cooperative, fishermen have undertaken to cultivate underwater forests and they plant trees in the mountains. They are of

the opinion that the condition of the sea is possible better now than it was 20 years ago.

However, the refuse also drifts in such sea area where inhabitants and fishermen do the activities of the activities relating to the conservation of the marine environment. Azuma fishing cooperative is active in the Yatsushiro Sea and the movement of water into and out of the sea is restricted for reasons related to geography. Water from the large Kumagawa River flows into the Yatsushiro Sea, carrying with it a considerable quantity of refuse. The Kanoya fishing cooperative is active in Kagoshima Bay, an area characterized by currents. However, it is said that a large quantity of refuse from Kagoshima City is carried to the opposite shore of the bay by the wind blowing from the northwest, particularly in winter. A amount of refuse that originates from the this populated area is considerable and cannot be disregarded. There is no boundary in the sea, and the refuse tends to gather in specific places under the effect of the wind, tides and landforms, even if people make efforts to clean the ocean in their area. The distress of the fishermen who encounter the pollution in the sea cannot be measured.

However, floats made from expanded polystyrene have been used improperly, while the conversion from floats made of expanded polystyrene to hard resin float has advanced in the aquaculture industry. Figure 6 shows a location along the shore of Kagoshima Bay where uncovered expanded polystyrene-originally the fender of a boat-has become potsherd by friction and degradation and now litters marine environment and the coast. It remains in the sand and the marine environment and does not biodegrade even if it cannot be seen with the naked eye. The people who are dependent upon the sea need to exchange information with each other, assess the present state, examine the problem, and improve the situation themselves.



Fig 6. Floats made from expanded polystyrene.

Conclusion

I have described the distress of people in response to the deposition of refuse along the seashore. Compared to problems such as red tide and oil spills, the marine debris issue is a relatively new problem.

This means that remedial and control measures are still being developed and put into practice. As I have mentioned in this paper, many municipalities and fishermen are distressed by the refuse that is washed up along the coast. Therefore, The summit, Tsushima Conference was inaugurated to give people with similar concerns the opportunity to discuss methods directed at solving the problems of their region.

Even though Japan is surrounded by the sea, and people receive its blessing continually, it seems that we do not know the reality of the people who work or live on or near the coast where large amounts of debris are washed up. Furthermore, marine debris not only arise in the sea, but also from rivers. The sea is used as a refuse container on a daily basis, and if left unchecked, this problem will only become worse if the refuse is left untreated. It is therefore also necessary for people who do not come into contact with the sea often to recognize that this problem is not unrelated to their lives inland. It is for that purpose that people who experience this problem firsthand need to inform the rest of society about this serious problem.

We therefore need to understand the distress of the people who face this problem and we need to implement measures designed to reduce the distress experienced by people and prevent uncontrolled transport of refuse as a matter of urgency.

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