3R Policy Brief Series

3R Policy Brief

How to Ensure and Establish Environmentally Sound International Resource Circulation

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Introduction

As the world's economies become more global, various commodities are being traded in bulk transnationally. The same is true of recyclable resources and waste products generated in the process of manufacturing or consuming those commodities.

What view should we take of this trade in recyclable resources, or to put it another way, international resource recycling? Until the 1970s, trade in recyclable resources was perceived as beneficial in both economic and environmental terms, as it leads to an expansion of recycling volumes (Grace, et al. [1978])

Since the mid-1980s, however, problems of environmental pollution and health hazards have been caused by transboundary movements of hazardous waste. At first, transboundary movements of hazardous waste for disposal became a problem, but then environmental pollution and health hazards associated with transboundary movements of hazardous waste for recycling also came to be reported (Center for Investigative Reporting and Bill Moyers [1990], Basel Action Network [2002], etc.).

In this paper, the present status of international resource recycling will be summarised, based on the actual situation in Asian and Pacific countries, and an attempt will be made to propose solutions for the future.

Policy Brief from Asia Resource Circulation Policy Research Group

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1 Present status of international resource recycling

Just as international trade in general has expanded, so the volume of trade in wastepaper, plastic waste, scrap metal and other recyclable resources has also risen exponentially over the last 40 years.

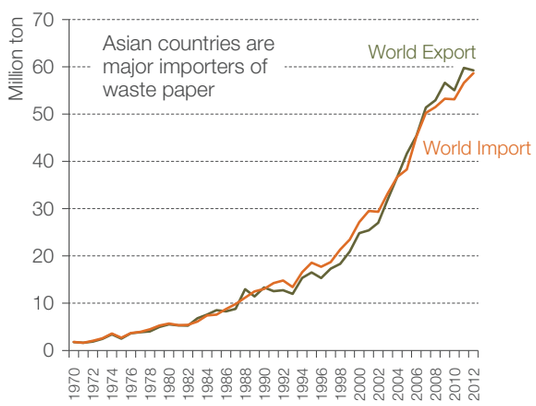

Figure 1: Trends in global imports and exports of wastepaper

Source: Compiled from data searched on the FAO statistics site (http://faostat3.fao.org/download/F/FO/E).

For example, trade in wastepaper was less than 1.8 million tons in 1970, but had risen to around 59 million tons in 2012. The biggest net importer in 2012 was China. China accounts for 52.9% of the world's import volume, and imports take up 39.5% of the 78.50 million tons of wastepaper used domestically. Although felling of timber is regulated in China to combat deforestation, China has become the world's factory, turning out corrugated cardboard and other packaging materials to be sent out to the world along with exported products. Domestic procurement of raw materials for papermaking is unable to keep pace, resulting in large volumes of imports including wastepaper.

Trade of waste plastics was around 0.8 million tons in 1990 but exceeded 16 million tons in 2010. Trade of ferrous scraps was 20 million tons in 1970 but increased to 38 million tons in 1990 and to more than 100 million tons in 2010.

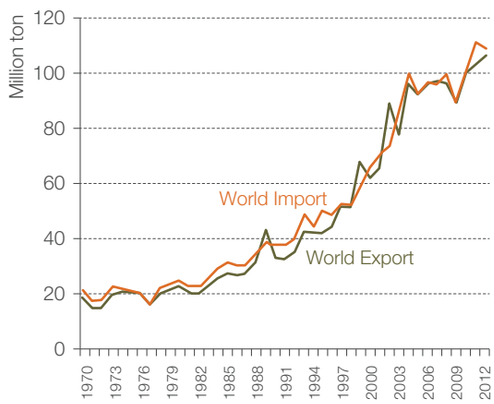

Figure 2: Trends in global imports and exports of ferrous scraps

Source: Compiled from data searched on UN Comtrade Deatabase (http://comtrade.un.org/)

Even on a global level, meanwhile, smelting facilities that accept the various types of non-ferrous scrap are few and far between. Transboundary movements are the only way of making effective use of many recyclable resources.

The volume of trade in hazardous waste also appears to be expanding. Transboundary movements of hazardous waste, based on advanced notification and

Table 1: Transboundary movements of hazardous waste

	2004	2005	2006
Annex VII countries to Annex VII countries	7,308,944	7,696,721	8,342,406
Non-Annex VII countries to Annex VII countries	105,515	166,260	200,610
Annex VII countries to non-Annex VII countries	336,818	281,936	28,763
Non-Annex VII countries to non-Annex VII countries	678,187	705,303	776,165

Note: Annex VII countries are EU member states, OECD member states, and Liechtenstein, as prescribed in Annex VII of the Basel Convention.
Source: Data distributed at Basel Convention Country Led Initiative meetings.

consent under the Basel Convention, accounted for less than 4 million tons in 1993 but had risen above 9.4 tons by 2006. Much of this consisted of transboundary movements between developed countries (Annex VII countries). Even developed countries have difficulty in recycling or disposing of all hazardous waste within their own borders, so that imports and exports of hazardous waste are an essential process in the appropriate disposal of recovered resources.

Moreover, exports from developed countries to less developed countries (non-Annex VII countries) have decreased. This means that less developed countries are importing more hazardous waste from less developed countries than from developed countries.

However, hazardous waste subject to transboundary movements based on advanced notification and consent is highly likely to be assured of environmentally sound management. In some less developed countries, pollution control and other measures are implemented on a par with those in developed countries, and environmentally sound management is thought to be assured. The problem is not the recycling and disposal of hazardous waste based on advanced notification and consent, but transboundary movements of hazardous waste without advanced notification and consent. This is because, in these cases, environmental countermeasures have not been assured in the process of recycling and disposal after import. It is nevertheless very difficult to ascertain the volumes of hazardous waste undergoing transboundary movements without advanced notification and consent.

2 Issues with international resource recycling

In many cases, the transboundary movements of recyclable resources and hazardous waste mentioned in the previous section have led to effective use of resources and appropriate disposal of hazardous waste. However, a variety of problems arise in conjunction with these transboundary movements. To prevent these, measures to regulate transboundary movements of hazardous waste, etc., are being implemented both internationally and by individual countries, but in some cases these regulations obstruct appropriate international resource recycling. Meanwhile, in small island developing states and landlocked countries where the industrial sector is underdeveloped, problems also arise due to the absence of international resource recycling.

1. Issues caused by international resource recycling

In both importing and exporting countries, problems arise in connection with imports and exports of hazardous waste and recyclable resources. Broadly speaking, importing countries face two problems. One is pollution in the process of recycling, and the other is an increase in waste. Meanwhile, a problem for exporting countries is that, when recyclable resources are exported, recycling facilities that used to accept those resources are no longer viable.

In recyclable resource importing countries, problems of pollution arising in the process of recycling imported resources have been reported. Typical examples involve used lead-acid batteries and e-waste.

At the end of the 1980s, used lead-acid batteries were exported from the USA, Japan and other countries to Taiwan, where pollution from a Taiwanese lead-acid battery recycling plant reportedly caused damage, including a decrease in the IQ of children attending a nearby kindergarten (Terao 2005). Again, used batteries were exported from Japan to Viet Nam and Hong Kong as secondhand goods from 2005 to 2006, but no secondhand market in the importing countries has been confirmed, and they are thought to have been forwarded for material recycling in third countries (Kojima, et al. 2013).

Similarly, it is reported that, at the end of the 1980s, e-waste was exported from the USA and Japan to Taiwan, where environmental problems arose in the process of recycling used products (Terao 2005). Another report describes how, in 2002, e-waste was exported from the USA to China, where environmental pollution was caused while it was being recycled (Basel Action Network 2002). Since then, there have been

advances in research on environmental pollution and health hazards accompanying the recycling of e-waste.

In some importing countries, the inclusion of hazardous waste and non-recyclable items among commodities imported as recyclable resources is regarded as a problem. Some have started imposing quality standards on recyclable resources that may be imported.

A problem emerging for exporting countries is that, as a result of exporting recyclable resources, recyclable resources are not collected domestically. This causes a decrease in the capacity utilisation ratios of factories that use recyclable resources, and they are forced into shutdowns or insolvency. In other words, this is a problem of the collapse of recycling systems previously built up within exporting countries. If recycling industries in exporting countries are eliminated not through fair market competition but because environmental pollution arises in importing countries, as described above, it would be an undesirable situation both for exporting countries and for importing countries. As such, both exporting and importing countries ought to cooperate in seeking solutions to these problems.

2. Issues caused by the unavailability of international resource recycling

While some problems arise from trade in recyclable resources and hazardous waste, others are caused by the unavailability of this trade. Here, these will be divided into (1) problems associated with import regulation on recyclable resources and hazardous waste, and (2) problems of small island developing states, landlocked countries and others where there is inadequate establishment of recycling industries. In this way, issues arising from the inability to engage in international resource recycling will be highlighted.

2-1. Import regulation on recyclable resources and hazardous waste

As stated above, transboundary movements of hazardous waste and recyclable resources have given rise to environmental pollution and health hazards. In 1992, the Basel Convention came into force with a view to preventing environmental pollution caused by hazardous waste. Meanwhile, some countries have imposed their own import regulation on non-hazardous recyclable resources.

Under the Basel Convention, before hazardous waste can be exported, the government of the importing country is required to be notified in advance and its consent obtained. Importing countries are required to judge whether importers of hazardous waste are capable of appropriately processing and recycling the waste in question, based on an examination of individual importers' capabilities. The judgement whether or not to permit imports for individual transactions would appear to be based on the environmental impact in the importing country, among other factors.

In the first half of the 1990s, there were reports of cases in which hazardous waste for recycling was exported to less developed countries, giving rise to pollution. As a result, a draft amendment to the Basel Convention (the BAN Amendment, prohibiting exports of hazardous waste from developed countries to less developed countries even for purposes of recycling) was adopted in 1995. Tens of countries have ratified it so far, and the Amendment has not come into force. Nevertheless, some European countries have already banned exports of hazardous waste to less developed countries, while others like China have completely banned imports of hazardous waste.

As for recyclable resources not categorized as hazardous waste, meanwhile, some countries have unilaterally banned imports while others have set standards on recyclable resources that may be imported. China, for example, has established standards on imports of scrap iron, plastic waste, non-ferrous scrap metal, etc., and has set regulations for contaminant ratios and the obligation to test for radioactivity, among others.

These regulations are necessary in order to reduce environmental impacts within importing countries accompanying the recycling of hazardous waste, etc. On the other hand, unnecessarily strict regulation sometimes causes other problems. For example, trade is not possible even when waste is appropriately recycled and processed, procedures are time-consuming, and operators engaged in appropriate recycling become less competitive compared to those

engaged in inappropriate recycling.

In landlocked developing states like Mongolia and Kazakhstan, hazardous waste is sent to facilities in developed countries for appropriate recycling and processing. Adverse effects sometimes appear in such cases, as capital is needed to build intermediate storage and processing facilities, etc., while sound management is difficult to achieve because some transit countries ban the passage of hazardous waste. Some countries, though ratifying the Basel Convention, have not yet determined how screening for import and export is to be achieved; others make this process more complex than necessary. Even when waste is processed and recycled appropriately, if the import-export procedures are time-consuming, the waste producer would have to bear higher costs (e.g. for storage) than is necessary. As a result, the waste is more likely to be handed over to non-compliant domestic and overseas recycling businesses. When waste can be judged to have been appropriately recycled and processed, procedures should be standardized and simplified, and incentives to pursue appropriate recycling increased.

In a case study of inappropriate transboundary movements uncovered in importing and intermediary countries, it has been revealed that importing and exporting countries often have conflicting views on what constitutes hazardous waste and what should be deemed subject to regulation (Kojima, et al. 2013). Without a shared understanding among states of export, import and transit/ waste that was thought to be outside the scope of prior notice and consent could be identified and blocked by governments or others in importing countries, thus compromising the stability of resource recycling. A common understanding needs to be formed between importing countries and exporting countries on what is subject to import regulation.

2-2. Problems in small island developing states and others where recycling industries are not established[1]

A problem arising in areas where recycling facilities have not been established and transportation costs are expensive is that even recyclable waste cannot be recycled and is discarded. Small island developing states are a case in point. For example, Pacific island states import large quantities of containerised drinks (in PET bottles, aluminum cans, etc.), electronic equipment, home appliances, secondhand cars (in Fiji, 2,000 automobiles are newly registered every year) and others, partly due to changes in logistics and lifestyles in recent years. Because populations are small and manufacturing industries are not established there, these products are not reused or recycled when no longer needed. Instead, they nearly all go to landfill as unprocessable waste, with some being illegally dumped. As well as reducing available space for final disposal in small island developing states, these could cause an increase in groundwater pollution due to inappropriate landfill and dumping, health impacts, and the risk of infectious diseases such as dengue fever and malaria. The problems faced by small island developing states will now be enumerated from the three angles of domestic recovery, operation of recycling businesses inside countries and regions, and transportation of valuable commodities from outside the region to recycling facilities.

Issue (1): Domestic recovery

In many small island developing states, waste management authorities and organisations are weak and valuable commodities cannot be recovered or hazardous waste appropriately processed, owing to shortages of money, capability and manpower. Even if management capability is higher on some islands (such as in national capitals), it would be difficult to raise the management capability in all islands. The rationale of separate disposal and collection of waste has not taken hold, and there is a low awareness among the inhabitants. Nor is there any legal framework, and most countries have no private operators capable of appropriate processing. Even if separate recovery of recyclable resources were possible, the scattered nature of small islands would make the cost of collecting them all (i.e. the domestic marine transportation cost) too high.

[1] This section is mainly based on Tsukiji [2015] and the Overseas Coastal Area Development Institute of Japan and Yachiyo Engineering Co., Ltd. [2013].

Issue (2): Problems with the operation of recycling businesses

In small island developing states, domestic industries are limited and there is little demand for recycled products. Because markets are small, hardly any recycling industries that process recyclable resources and manufacture products have been established. As stated above, no effective separate recovery systems have been created domestically, and valuable commodities are difficult to recover. Facilities and technology for recycling are limited, and not only is it impossible to prepare the initial investment cost needed just to introduce the necessary facilities and technology, but the procurement of parts needed for maintenance and the capability for inspections are also inadequate. In Oceania, the only examples of recycling businesses established domestically (i.e. where there is a demand) are those dealing with wastepaper and scrapped car batteries in Fiji.

Issue (3): Problems in sending valuable commodities to recycling plants

Various problems also arise when sending recyclable resources outside the region for recycling. Just as when recycling inside the region, domestic marine transportation would have to be used to recover recyclable resources from the various domestic islands, and additional costs would arise. Moreover, international marine transportation costs are expensive. Countries would have to discuss and collaborate with marine shipping businesses and port authorities, for example by making effective use of return trips and securing space for stocking valuable commodities at (international) ports. There is also a lack of information and capability in areas such as operators who accept valuable commodities (in the export destination), transportation routes, quarantine in the accepting country, procedures connected with the Basel Convention, and trends in the prices of valuable commodities. There is a lack of technology for reducing the cost of transportation by dismantling, compression, etc., or increasing the value of recyclable resources. Moreover, export taxes are also payable when sending valuable commodities outside the country, and there are not enough incentives for recovering recyclable resources.

In response to these problems, the J-PRISM project supported by JICA promotes appropriate waste processing and disposal in Pacific small island developing states. It also engages in surveys and others with the aim of sending ("returning") recyclable resources to recycling facilities, and there are high expectations of the outcome.

Although this discussion has focused on small island developing states, the same problems – i.e. the cost of collecting recyclable resources and transporting recyclable resources to recycling industries – apply to landlocked countries and regions, particularly mountainous areas and others where transportation infrastructure is not adequately developed, as well as areas where industry is not thriving and recycling industries are not established.

3 The need for international cooperation

To solve issues connected with international resource recycling such as those outlined above, various forms of international cooperation will be necessary.

The first is cooperation between importing countries and exporting countries with the aim of appropriately ensuring the quality of recyclable resources and preventing inappropriate transboundary movements of hazardous waste. Problems arise when importing countries set import standards for recyclable resources in order to promote appropriate recycling but do not inform exporting countries of these standards, violations are uncovered, and customs clearance is stopped. As well as creating a common awareness between importing and exporting countries, operators in exporting countries need to be made aware of importing countries' standards. Meanwhile, partly to prevent inappropriate transboundary movements, information on suspicious cargoes needs to be exchanged, and ways of regulating trade need to be studied while confirming whether or not resources are appropriately recycled.

The second is cooperation between multiple countries when the volume generated by individual countries is

not enough, but appropriate recycling can be achieved by combining the volumes generated by more than one country. Deregulating trade and simplifying procedures could enable recycling facilities that practice environmentally sound management to secure the recyclable resources necessary for their operation from multiple countries. If the import or customs clearance of hazardous waste is prohibited, the possibility is that not enough hazardous waste will be collected and investment in recycling facilities where environmentally sound management is practiced will not proceed. Based on cooperation between countries in the same region, and with countries outside the region, systems for the efficient recovery of recyclable resources need to be created.

Thirdly, when the volume generated by individual countries is small, it is difficult to gather recyclable resources and recycling industries are not established (as in the case of small island developing states), the idea of returning recyclable resources to external countries where recycling industries are established should be considered. The cost of transporting recyclable resources outside the region needs to be brought down by reducing or waiving export tax, compressing or crushing waste , etc. To respond to fluctuations in international prices for recyclable resources, meanwhile, it will be necessary to carry out community initiatives such as collective recovery, as well as separate collection and primary storage as government initiatives.

The fourth is to promote international cooperation in capacity building and other fields with a view to promoting environmentally sound circulation. In many less developed countries, recyclable resources such as lead-acid batteries and printed circuit boards are recycled using environmentally unsound methods. Recycling at the expense of the environment enables these operators to gather recyclable resources for higher prices at the collection stage, making them competitors for operators who recycle appropriately.

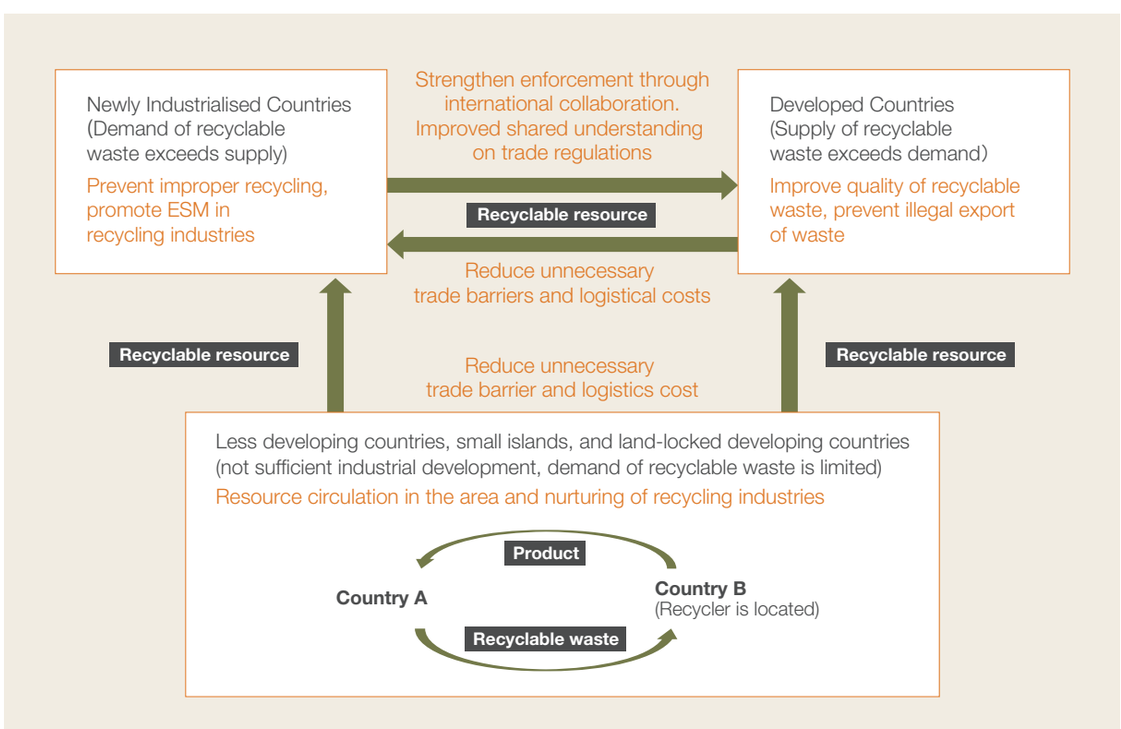

Figure 3: Areas requiring international cooperation

Source: Prepared by the author

4 Summary

As economies become increasingly globalised, a country's economic activity would be unthinkable without imports and exports. In the context of recyclable resources, similarly, a domestic balance between supply and demand in individual countries is unlikely to occur. Resources can be used effectively by adjusting supply and demand through international resource recycling. On the other hand, environmental problems have arisen in the process of recycling in importing countries, while exporting countries have faced problems such as the closure of recycling operations following investments in pollution control, due to an inability to gather recyclable resources. Meanwhile, in island and mountainous areas where logistics costs are high, there are many recyclable resources that are not recycled or appropriately processed but merely discarded.

While promoting a decrease in logistics costs and lower trade barriers to promote appropriate recycling, as well as a simplification of hazardous waste import and export procedures, we need to cooperate in halting transboundary movements of hazardous waste and others thought to be sent to environmentally problematic recycling facilities.

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