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Problems in Japan's governance system related to end-of-life electrical and electronic equipment trade

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ABSTRACT

Recyclable materials can potentially be either resources or pollutants, and this is especially the case with end-of-life electrical and electronic equipment (EoL EEE). We often experience difficulties in assessing whether EoL EEE trade should be promoted or regulated. This study looks to determine the level of consistency among the components of Japan's governance system related to EoL EEE trade.

As a result, we found that the conceptual direction is to accept or promote trade on the condition that such trade does not in turn promote environmental pollution. However, we also found that at the present time, the governance system within Japan that defines various procedures in support of this direction is not keeping pace with this concept. The prevention of illegal exportation without disturbing the promotion of recyclable-resource trade predicated by the prevention of environmental pollution should be addressed as the most crucial issue here. Especially, the decision-making criteria for the relevance of the legal "waste" definition pose an institutional problem, when the material that may have a positive market value when recycled abroad, while not when recycled domestically.

We estimated the value of EoL EEE, both for the case of domestic recycling and for that exported to and recycled in China and found that only PHS terminals and cellular phones could be economically recycled in Japan. One effective solution for prevention of improper exports is to make recyclable resources legal "waste," when they bear a net negative value fall under the condition of being processed domestically based on the estimated value.

1. Introduction

Economies are now more globalized, and enterprises operate worldwide while establishing global supply chains; this means goods and even services are moving transnationally. However, in the case of the downstream recycling/waste management market—which includes the collection of waste and final disposal and/or recycling—transnational movements are often restricted in cases where the goods have pollution potential (Hosoda, 2007). On the other hand, there is the opinion that recyclable-resource trade should be actively promoted in order to secure the economic development of each country and to bring about sound material cycles worldwide, ultimately to ensure higher resource efficiency. On an international scale, 3R initiative and regional 3R forum in Asia and the Pacific started by Japan's proposal treat recyclable-resource trade as an important issue (Hotta, 2011; Ministry of Foreign Affairs, 2015).

In Japan, the Law for the Promotion of Recycling of Small Waste Electrical and Electronic Equipment (PRSWEEE Law) (Central Environment Council, 2011) took force on April 1, 2013. This law provides a legal recycling system that aims to recover more resources from the urban mine of small-sized WEEE. In the process of establishing this system, various stakeholders have insisted that if this system is to be effective, the exportation of end-of-life (EoL) electrical and electronic equipment (EEE) needs to be prevented. Outflows of recyclable resources can weaken the domestic recycling system by leaching potential resources; this is recognized as a potential environmental problem known as the "e-waste problem" (Basel Action Network (BAN) and Silicon Valley Toxic Coalition (SVTC), 2002), and it should be prevented as needed while respecting the principle of free trade.

Recyclable materials have both of resources potential and pollution potential, these potentials greatly influence our decision as to whether trade should be regulated or promoted. EoL EEE is a prototypical example where both potentials co-exist, and so they have been studied considerably. The literature falls into three categories: that which examines the state of trade, that which discusses

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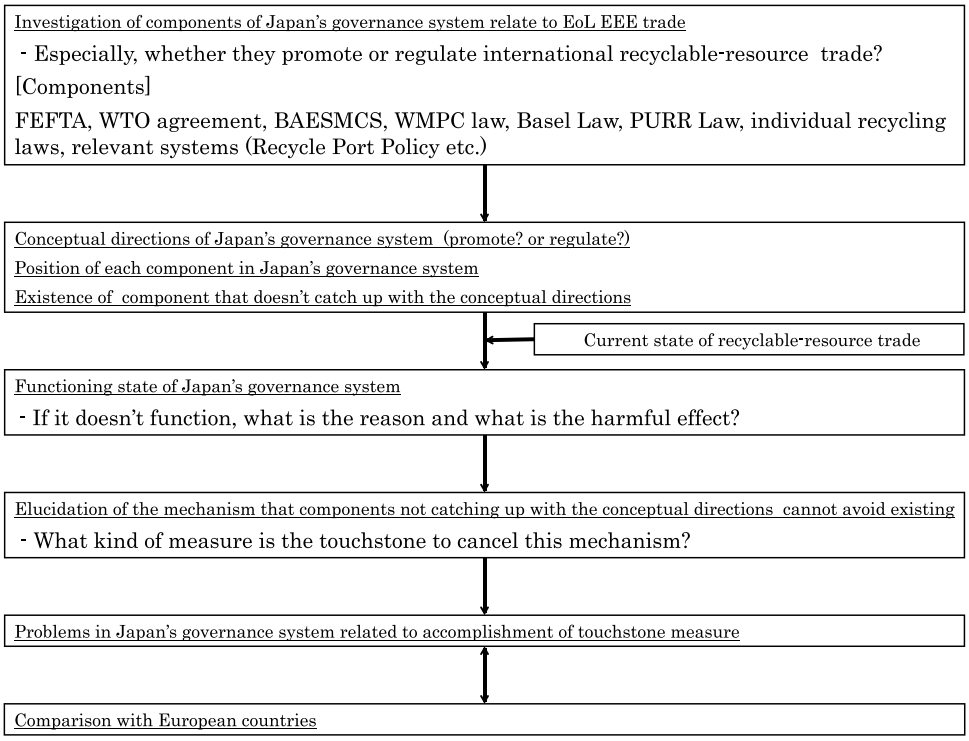

Fig. 1. Research steps.

the problems of trade while paying attention to pollution potential, and that which evaluates governance systems in terms of policy.

To understand the current state of EoL EEE trade and related recycling, there are no better means than estimation, simply because direct observation with sufficient detail is usually impossible. Underestimations (Central Environment Council, 2011; Central Environment Council and Industrial Structure Council, 2011) and estimations with great uncertainty (Terazono et al., 2011) are conspicuous. Shinkuma and Huong (2009) found that exportation for reuse leads to illegal re-exportation. Studies that focus on problems at the destination countries (i.e., the illegality of imports, or environmental or health impacts) are numerous and thorough (Fujimori et al., 2012; Ni and Zeng, 2009; Ongondo et al., 2011; Sothun, 2012; UNEP, 2010; Wei and Liu, 2012; Yang et al., 2009; Yu et al., 2009; Davis and Garb 2015; Umair et al., 2015; Yoshida et al., 2016). Some studies pay attention to informal sectors among the trade flows (Li and Tee, 2012; Wilson et al., 2006; Yu et al., 2009). Some previous studies in Japan describe the environmental problems experienced at the destination countries of exported EoL EEE (Hosoda, 2007; Kojima, 2007). There are some previous researches that reviewed the situations of EoL EEE trade or environmental pollution caused by exported EoL EEE at the destination countries. However, no study has uncovered the strict causal relationship between the environmental pollution and the exports from Japan. This paucity of research may be a good reason to delay preventive countermeasures regarding improper outflows of EoL EEE.

As to policy viewpoints, Terazono (2010) summarizes the state of outflows of EoL EEE, and provides a control scheme; Hosoda (2007) proposes solutions for problems caused by these outflows. Okuma (2005) analyzes policy principles and implications for the international movement of waste recycling. When the scope of environmental governance is smaller than that of economic activities, the strategy for reducing hazardous waste transactions through prohibition has been effective in reducing waste disposal, but it may have an adverse effect on waste recycling. He asserts that a problem appears with respect to the middle domain between open and close trade strategy. Tsuruta et al. (2013) addresses problems related to the Law for the Control of Export Import and Others of Specified Hazardous Wastes and Other Wasted (Basel Law), the relevant Japanese domestic law to pertain to the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal.

While many previous studies address proper processing or the prevention of the exportation of materials that bear a pollution potential, few studies except Hotta and Elder (2009), Kojima (2010), Aoki-Suzuki et al. (2013), Milovantseva and Fitzpatrick (2015) and so on have evaluated from a broader perspective the governance systems that relate to recyclable resources (i.e., considering not only pollution but also resource potentials). The Japan's governance system that governs the country's recyclable-resource trade has many components; some may promote trade, while others may not. In this study, we review each component and determine whether there is any inconsistency among them. In addition, we address relevant problems and solutions.

This paper is organized as follows. Section 2 describes the methodology used in this study. In Section 3, we investigate the components of the Japan's governance system and its conceptual directions that relate to the promotion of recyclable-resource trade. In Section 4, we examine the state of recyclable-resource trade and problems inherent in the governance system. Finally, Section 5 concludes the paper.

2. Methodology

The scope of this study is limited to EoL EEE; because it can be either a resource or a potential pollutant, it is difficult to assess whether such trade should to be prevented or promoted, and it therefore stands as a worthwhile case study. Fig. 1 displays our overall methodological approach.

Japan's governance system with respect to EoL EEE trade comprises a package of both legislative and other relevant systems that relate to international trade and waste management,