

Study on the Global Recycle System construction for trans-boundary trade of recyclable wastes

Koizumi Kunishige

Economic growing countries in Asia, especially China needs resources to make industrial commodities not only for domestic demands but also for foreign needs as a world factory. China has imported wastes such as waste steel, copper, aluminum, plastics and paper to use as recycled resources since 1998 and the amount has increased 30% every year. These wastes are recycled by high recycling rates thanks to Chinese manual recycling process by a lot of low paid migrant workers from rural district, while advanced countries choose mechanized process. As Chinese recycling centers can supply jobs to low paid migrant workers, the government of China is promoting recycling industries to secure enough employment. However illegal exports thorough recyclable waste trade, disqualified waste treatments and employee's health problems often come out.

The researcher hypothesize that "trans-boundary trade of recyclable wastes (called global venous system : waste → collection → recycle) had to construct naturally as industrial commodities trade (called global arterial system : manufacturing → distribution → consumption) had expanded toward various trading systems. Since the people of advanced countries had no idea to recycle the waste and the trading rule of recyclable wastes had not been studied, illegal exports and pollution problems rose. By making an international rule for recyclable waste trade, the new manufacturing system of recycling including the global venous system can be constructed."

The researcher named the circulation system of trans-boundary recyclable waste as global recycle system from the viewpoint of effective use of waste. The fatal object of this study is to construct a legal and safe global recycle system.

In the 1st section, the concept of "global recycle system" is defined. Current global recycle system has various merits and demerits for both exporting countries and importing countries, so that we must study if waste trade is appropriate on a case-by-case basis. To judging the waste trade, I propose "the stakeholder analysis for the waste trade" to consider both merits and demerits one by one to from the viewpoint of environment, economy, social ethics and law. The appropriateness of the waste paper export and waste Pet bottle export to China can be judged from the case studies based on specific criteria.

In the 2nd section, the propriety of the global recycle system is measured by questionnaire research from the third person to avoid the psychological bias of the researcher who believes the effectiveness of global recycle system. Three different analysis methods are used. The 1st one is a simple statistical calculation from the result of questionnaire about ecology-conscious people's perception on global recycle system. The respondents are explained about outline of global recycle system beforehand (Pre-recruit type gang survey method). The 2nd one is AHP (Analytic Hierarchy Process) aimed at employees of home appliance recycling center and environmental researchers. It was conducted by mail survey method. The 3rd one is the path analysis and the factor analysis on the psychological resistance of ordinary people to trans-boundary trade of recyclable wastes. It was conducted by mail survey method, too. Also, by conjoint analysis, the psychological resistance is measured through the willingness to pay recycle fee for waste refrigerator.

In the 3rd section, global recycle system is measured by LCA (Life Cycle Assessment) to assess the environmental impact. The 1st case study is about the economical and environmental measurement for waste paper export to China. China increases the import of waste paper at extraordinary high speed and because of this, people worried that Japanese waste paper recycle system might fail. In consequence of the waste paper export to China, it is not only redresses Japanese waste paper recycle system bankruptcy caused by the dull market, but also improves river pollution and water consumption at the paper factories in China. The 2nd case is the study on the LCA measurement and recycling rate. Waste refrigerator had been exported until China prohibited importing them as hazardous substances when they entered into Basel convention. As a result, it is verified that disassembling process which is connected with mechanical cracking system in Japanese home appliance recycling centers can reduce air pollution and improve recycling rate.

In the 4th, the final section, the new policy for recycle-based manufacturing system is proposed to construct a legal and effective global recycle system. The policy of EPR (Extended Producer's Responsibility) proposed by OECD is to lay some recycle responsibility to manufacturers and to let the government establish the own recycle system matched to the circumstances of every country. However, the trade toward developing countries which do not have manufacturing facilities, recycling technology and social recycling system, has not established because of few trade turnover. EPR is re-defined and "Extended Production Countries Responsibility" is newly proposed. Industrial countries must take a "moral responsibility" of making efforts to support developing countries which do not have manufacturing facilities, recycling technology and social recycling system to enact a recycling law and social recycling system. In addition to this, companies must have "CSR (Company Social Responsibility) " to establish a manufacturing system of recycling including the arterial system and the venous system.