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Review of Improvement Measures through Analysis of Intake and Sorting Volumes of Recyclables at Living Resource Recovery Centres

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Recyclables separated and discharged from homes can be classified into two domains: One domain (single-family houses) where they are collected and transported under the management of local governments and taken to Living Resource Recovery Centres, and the other domain (apartment housing) where they are separated and transported by private recycling companies and brought into the resource recovery system. Currently, the most unreliable statistics on waste management in Korea are the volumes of separately discharged and treated recyclables, and it has been pointed out that there is a problem with the statistical calculation method.

In this study, we analysed the volume and density of recyclables collected under the collection system of S district in S city, the basic units of separately discharged recyclables, and the volume of intake and proportions of sorted materials at recycling sorting facilities in order to review the improvement measures for systems and policies concerning the recyclable sorting system and statistics on recyclables.

First, investigating the load density of each waste collection vehicle by analysing load capacity against actual load revealed differences by area and vehicle. The average load density was measured to be 0.196 ton/m^3, and an amount range of 0.086 – 0.143 kg/man*day and the average of 0.109 kg/man*day were obtained as basic units by using the collection volume and population of total households in the collection areas of each recycling company. These figures were confirmed to be significantly different from the waste statistics currently being aggregated. In addition, examining the apparent density of recyclables brought in showed great differences between material types and very low values (Table 1).

Moreover, investigating the recovery rate from recyclables brought into sorting facilities showed 45% recovery of materials with value and 55% being treated as residues. It confirmed that recyclables collected from single-family houses were extracted of materials with value in advance and comprised largely of unrecyclable substances. An investigation of the composition of wastes discharged as residues showed 20% paper, 18% PET, 14% PS materials, 15% fabrics, 13.5% PP packaging, 12.33% glass bottles, and 1.6% packaging films in dry weight ratios, confirming that it would be possible to enhance the sorting rate of materials with value at sorting sites by improving facilities and increasing the manpower input. It was also confirmed that residues have value as solid fuel due to a high content of combustible wastes.

Table 1. Apparent Density of Recyclables Brought In

	Glass bottles	Metal cans			Paper	Vinyl (film)	Plastic	PET bottles	PP	PE	PS
		Steel	Aluminium	Mixed							
1st	22.000	7.400	3.200	5.500	4.000	3.500	3.700	4.400	3.200	4.800	2.800
2nd	17.500	5.800		6.000	4.800	3.000	3.100	3.300			
Average	19.750	6.600	3,200	5.750	4.400	3.250	3.400	3.850	3.200	4.800	2.800
Density (kg/m^3)	328.18	89.09	27.273	73.63	49.09	28.18	30.90	39.09	27.27	56.36	20.00

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