Chapter 13
Solid Waste Management in the Republic of Serbia

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ABSTRACT

In most of the countries of South East Europe, the current situation in the field of municipal waste management is characterized by unreliable and incomplete data about the physical characteristics of generated municipal waste. The first and the second part of the chapter contain the description of specific project activities that are related to measuring quantity and composition of municipal waste in municipalities in the Republic of Serbia. The methodology description for the determination of the quantity and composition of waste is analyzed in this chapter. The potential of implementing the circular economy concept in developing countries is reflected primarily in the optimization of production and industrial activities; the example of Serbia in the third part of chapter shows the opposite. In the fourth part, results of application of the AHP method are presented. Taking the obtained results as a basis, it can be concluded that the applied model can be efficiently used to support decision-making in this kind of problem.

WASTE DEFINITIONS IN THE REPUBLIC OF SERBIA

The level of waste management system in Serbia is similar to those of almost all South-Eastern European (SEE) countries. Based on the results of measurements in reference municipalities, about 2,374,374 tons of waste were generated in 2008. The results of the 2014 modeling, obtained for the needs of innovating the waste management strategy, indicate that the amount of generated municipal waste has increased by about 0.5% on the annual basis compared to 2008. This means that 2,448,566 tons of municipal waste, i.e. 340.7 kg/inhabitant per year (0.93 kg/inhabitant/day) are currently generated in Serbia. Measurements and control measurements were done for the first time in the Republic of Serbia in 2008 and 2014,

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respectively, according to the methodology developed at the Department of Environmental Engineering of Faculty of Technical Sciences, University of Novi Sad, with the help of German Corporation for International Cooperation.

The waste landfilling is the dominant waste treatment in Serbia and in all Southeastern European countries as well. In Serbia, about 20,000 tons of waste is burned in cement factories, which makes up about 1% of the total generated amount of waste.

The national target for 2015 was 31% of packaging waste recycling and the previous target of 25% for 2014 had been reached. In Serbia, a total of 5% of the total generated waste is recycled; if we add extraordinary activities of the informal sector, this percentage doubles and reaches 10% of recycling. The composition of waste recycled consists primarily of PET, and other plastics, paper, and paperboard. Table 1 gives the generation of municipal waste and reduction of waste in accordance with EU Landfill Directive and EU Packaging Directive. Whereas, Table 2 enlists the estimation of the amounts of biodegradable and packaging waste that are expected to meet the EU targets for the City of Novi Sad and Novi Sad region.

The average morphological composition of waste in Serbia is shown in Figure 1 (it should be noted that the said waste composition figure seemingly differs from more detailed figures in the following chapters, which is due to the client's request to classify a large percentage of individual waste streams as 'other', and in more detail, it is defined individually), which is dominated by biodegradable waste that accounts for more than 50% of the total generated waste, due to which Serbia can be classified as a developing country characterized by a high share of biodegradable waste in the waste morphological composition (Hoornweg and Bhada-Tata, 2012; IMG, 2014).

Table 1. The estimated amounts of waste in accordance with the goals of the EU landfill directive, the framework directive and the packaging and packaging waste directive

			Reducing the amount deposited in relation to the amount generated in the reference year, according to the EU Landfill Directive				**Increasing the recycling of packaging waste according to the EU Packaging Directive**	
		Total generated amount of municipal waste - 2014	**Total generated amount of biodegradable municipal waste - 2014**	**1 target 2022 - to 75%**	**2 target 2026 - to 50%**	**3 target 2030 - to 35%**	**Total amount of packaging waste - 2014**	**Target 2025 - Recycling of at least 55%**
Region	Municipality	t/yrs	t/yrs	2022	2026	2030	t/yrs	2025
Novi Sad	Novi Sad	133939	90409	33360	62836	84767	27190	17565
	Bačka Palanka	19108	12898	4807	9045	12213	3879	2518
	Bački Petrovac	4115	2778	939	1790	2396	835	519
	Beočin	5407	3650	1356	2553	3446	1098	711
	Žabalj	8071	5448	1950	3688	4963	1638	1044
	Vrbas	14034	9473	3336	6323	8498	2849	1802
	Srbobran	5625	3797	1289	2455	3289	1142	710
	Temerin	10062	6792	2238	4282	5722	2043	1255
Total		200361	135244	49276	92971	125592	40673	26124