

Chapter 7

Challenges of Waste Management in a Developing Context: Lessons From Lebanon

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ABSTRACT

Over the past years, several efforts were undertaken in an attempt to improve solid waste management in Lebanon. However, with the lack of a well-established national plan and defined policies and legislation, all attempts achieved little or no progress. Several challenges continue to hinder the sector's successful development at various levels: politically, legally and institutionally, socially, land use, and last but not least, technically. This chapter provides an overview of waste management practices in Lebanon such as waste generation, waste composition, current status of waste management practices, policy, and legislation, while highlighting the main challenges for implementing an integrated solid waste management towards a sustainable system.

INTRODUCTION

Worldwide, over 2 billion tons (BT) of solid waste are generated annually in large cities with projections to reach 3.4 BT by 2050, particularly in developing economies where waste generation rate is expected to increase by three folds by 2050 (Kaza et al., 2018). This can be mainly attributed to the rapid population growth, increasing urbanization, and socio-economic development. Along with inefficient waste

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management systems, these factors are increasingly raising management challenges and environmental concerns.

In Lebanon, municipal solid waste (MSW) disposal has been a persistent and a chronic challenge for a long time particularly in urban areas with high population density, high production of refuse, and low availability of land adequate for landfills. In the context of the capital Beirut and surrounding areas in Mount Lebanon, an Emergency Plan was developed in 1997, which remained effective until July 2015. This culminated a national waste crisis, which was mainly triggered by the premature closure of the main landfill (Naameh) that served as the primary largest sanitary landfill in the country serving more than half the total population. The site was closed in July 2015 without a designated alternative due to social opposition leaving piles of uncollected waste along the streets. This crisis has reportedly led to serious health, social, economic and environmental impacts.

In other parts of the country, open burning and uncontrolled dumping on hillsides and on seashores are common practice equally resulting in serious land, sea, and air pollution problems. Sea pollution along the Mediterranean shores is extensive and the focus of regular complaints by local fishermen and the general public. The unsanitary disposal of municipal wastes constitutes a pressing environmental stress at the national scale. The waste crisis has evolved with the expansion of uncontrolled dumpsites that increased from 670 in 2011 to 941 in 2016 (MOE/UNDP, 2017; MOE/UNDP/ELARD, 2011). The main existing landfills in Lebanon since 1998, namely the Naameh landfill, the Zahle landfill, and the Tripoli controlled dumpsite, have only served around 55% of the total MSW generated. The remainder is partially recycled/composted and partially disposed of in open dumpsites, by local authorities, such as municipalities and/or unions of municipalities (MOE/UNDP, 2017; MOE/GEF/UNDP, 2015).

Several factors were identified as key shortcomings in the waste sector in Lebanon, particularly the lack of an integrated waste strategy, the provision of comprehensive waste data, and the failure to allocate roles and responsibilities. In addition, social and political interventions prevent regulatory compliance, monitoring and enforcement exacerbating waste management challenges. This chapter provides a historical overview including current waste management practices in Lebanon while highlighting the main challenges for implementing an integrated solid waste management (ISWM) towards a sustainable system.

BACKGROUND

Country Profile

Lebanon is located in Western Asia along the shores of the eastern Mediterranean (Figure 1). It is as the smallest country in the Asian Continent with a surface area of 10,452 km². The country is bordered by Syria to the north and east, Palestine to the south, and the Mediterranean Sea to the west. A long narrow coastal strip characterizes its Mediterranean shores with a complex rich mountain area ranging from 400 to 3088 m in altitude. The country is divided into 8 Governorates (or Mohafazat) that is headed by a Governor (Table 1). The Governorates/administrative areas are further subdivided into 25 Districts (or Caza) with Figure 2 highlighting the boundaries of both Governorates and Districts and the location of main waste management facilities and disposal sites under different plans.

While the population of Lebanon was estimated at nearly 5 million including Palestinian refugees and foreign workers (World Bank, 2019), the influx of refugees as a result of the Syrian conflict coupled with emigration make it harder to accurately estimate the population with values ranging between 6 to

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