

## Article

# Earthquake Waste Management, Is It Possible in Developing Countries? Case Study: 2017 Mexico City Seism

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**Abstract:** After a seism, sanitation is an issue that requires immediate attention at different levels, with the aim of minimizing the latent risks to the public health. The aim of this study is to develop a methodological framework proposal to analyze the possibility of earthquake waste management, considering technical aspects and legal frameworks after an earthquake in a developing country. The implementation case study, the 2017 Mexico City earthquake, has presented data collection of the types of waste and quantities carried out in the field, as well as from government reports and calculations; furthermore, a study was developed to analyze the capacity installed to earthquake waste management, by means of interviews conducted in the field due to the lack of public and congruent institutional information. Finally, an analysis was conducted of the current legal framework and public policy of disaster waste management. In this sense, earthquake rubble totaled 344,211.3 tons and the estimated weight of households items per collapsed dwelling amounted to 424.16 kg. This manuscript deals with the management of earthquake waste in Mexico, based on the data of the 2017 earthquake; the study also explains possible problems and political challenges about the earthquake waste management with the limited conditions of a developing country.

**Keywords:** Mexico City earthquake; disaster waste management; disasters and legislation; legal framework of waste



**Citation:** Hernández-Padilla, F.; Anglés, M. Earthquake Waste Management, Is It Possible in Developing Countries? Case Study: 2017 Mexico City Seism. *Sustainability* **2021**, *13*, 2431. <https://doi.org/10.3390/su13052431>

Academic Editor: Bruno Barroca

Received: 31 January 2021  
Accepted: 19 February 2021  
Published: 24 February 2021

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## 1. Introduction

Earthquakes, as any disaster, can generate large amounts of waste that threaten public health, hinder reconstruction and affect the environment [1–6]. Effective post-earthquake waste management is, therefore, a critical aspect of response actions after such an event. Earthquakes generate waste types such as general way: general building rubble, household items, hazardous waste, etc.

In accordance with the Sendai Framework [7], one of the goals for disaster risk reduction is to increase the number of countries with national and local strategies for disaster recovery, which includes disaster waste management. However, as Brown et al. [8] explain, financial resources and technical expertise in developing countries are generally a limiting, if not prohibitive, factor in achieving disaster risk reduction goals. Consequently, disaster waste management plans in developing countries seldom exist. Brown et al. also pointed out that the main barrier to analyzing and developing a methodological approach to waste composition and quantity estimation is the availability and consistency of post-disaster waste data; in this sense, developing congruent and public databases about waste after disasters is not yet a reality in a developing country as Mexico.

Talking about disaster issues, Mexico is a country with high seismic risk. The probability that large-scale earthquakes occur, particularly in the so-called Brecha de Guerrero, is high, due to the continuous movement of the Cocos Plate subducting the North American plate [9].