

Post earthquake debris and waste management in Italy. **Extended Abstract.***

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Introduction

Italy is a country affected by seismic hazard for the greatest part of its territory and Italian history is marked by numerous earthquakes¹. More severe earthquakes cause huge damages to people, physical capital, cultural heritage and, more in general, to the whole socio-economic context of the affected areas. Moreover, these events produce huge quantities of disaster waste and debris.

Although, in the post-event scenario, the emergency response by the National Civil Protection Service is well structured and regulated, disaster waste management receives very little attention, both at the academic and institutional level. Nonetheless, after the occurrence of a disaster, the ordinary “peace-time” waste management procedures are difficult to apply, because of the urgency to recover the urban and community infrastructures. In this regards, it is worth noting that Italy does not have a proper national protocol for addressing disaster waste management (DWN) (Gabrielli et al., 2018). Pursuant to the Civil Protection Code (Degree-Law n.1/2018²) and the Environmental code (Article. 191 of Legislative Decree n.152/2006³), public authorities can issue ordinances aimed at disaster waste management in the emergency phase. Therefore, an *ad-hoc* legislation is adopted for each event, in order to consider local and specific conditions (such as the geomorphological characteristics of the damaged territory). According to the above mentioned Environmental Code, special requirements apply to the management of hazardous waste, because of its environmental impact. Although it may slow down debris removal, also in emergency scenarios, the ad-hoc legislation has to comply with this provision.

This paper aims to study how debris and disaster waste have been managed in the following recent dramatic earthquake events: L’Aquila, 2009; Northern Italy, 2012 and Central Italy, 2016. Relevant legislation and available data on debris and waste will be analysed. In particular, the speed of debris

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¹[Rovida et al. \(2015\)](#)

²<https://www.protezionecivilebiella.it/documenti/dlgs-1-2018.pdf>

³<https://www.camera.it/parlam/leggi/deleghe/06152dl3.htm>

removal will be evaluated, taking into account of both quantitative and qualitative (e.g. types of waste generated, based on the European Waste Catalogue - EWC) aspects.

The main characteristics of disaster waste management in the selected case studies are the following:

- **L'Aquila 2009:** Debris collection has been performed by the local multi-utility company, which usually manages the “peace-time” waste. Legislative framework: Law 190/2014 (Art. 1). Qualitative and quantitative data are available (providing EWC codes for each ton of waste and debris generated)
- **Emilia-Romagna 2012:** Debris collection has been performed by the fire department. Legislative framework: Decree-Law 74/2012. The flow of information between damaged people and public authorities responsible for debris removal, supported by ICT, emerges as a best practice.
- **Center Italy 2016:** Debris collection has been performed by the local institutions and the total amount of waste and debris has estimated to be 2.667.000 tons.

Remarks and additional Research questions

The analysis is also aimed at addressing the existent gap in the literature ([Brown et al., 2011](#)) about the socio-economic impacts of debris waste management in post-event areas. We propose to connect technical management aspects, legislative and institutional setting to the efficiency of proposed disaster waste management. The comparative analysis of the three recent seismic events will allow us to identify best practices and make policy recommendations.

References

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