

ABSTRACT

Kim, JooHo. M.S., Purdue University, December 2013. A framework of effective debris management for a resilient community. Major Professor: Makarand Hastak.

This paper presents a framework for effectively removing debris from a disaster-affected community for expediting disaster recovery. Currently, natural disasters have a very high physical impact on communities with generating a huge volume of debris. The amount of debris is almost five to ten times higher than the annual solid waste volume in a community. The cost of debris management reaches more than 27% of total disaster recovery costs. Thus, a debris management task team will have considerable challenges for debris removal. Finally, slow debris removal hinders both an emergency response and a proceeding recovery task.

This research suggests a framework for an effective debris management based on the interrelationship between critical infrastructure system for debris management and resources that would enable a community to effectively remove debris from disaster-affected areas. This research also focuses on the impact of capacity of infrastructure system and required resources for debris management with respect to general debris removal procedure: generation, collection, transportation, process and disposal.

A debris management team would have benefits from this research by evaluating the existing debris management system in a community at pre- or post-disaster situations. It assesses current resilience, total duration for debris removal, in a community in order to set up a short and long term strategy. At last, it suggests feasible capacity of debris

handling facility and resources required to improve the resilience of a community with respect to debris management.