Goal programming optimization model under uncertainty and the critical areas characterization in humanitarian logistics management

Abstract

Purpose: The purpose of this paper is to improve disaster management models, have an optimal distribution of assets, reduce human suffering in a crisis and find a good solution for warehouse locations, distribution points, inventory levels and costs, considering the uncertainty of a wide range of variables, to serve as a support model for decision making in real situations.

Design/methodology/approach: A model is developed based on the recent models. It includes structured and non-structured data (historical knowledge) from a humanitarian perspective. This model considers the uncertainty in a landslide and flood area and it is applied in a representative Peruvian city. Findings: The proposed model can be used to determine humanitarian aid supply and its distribution with uncertainty, regarding the affected population and its resilience. This model presents a different point of view from the efficiency of the logistics perspective, to identify the level of trust between all the stakeholders (public, private and academic). The finding provides a new insight in disaster management to cover the gap between applied research and human behavior in crisis. Research limitations/implications: In this study the access of reliable information is limited. Practical implications: This paper provides an operation model with uncertainty in a humanitarian crisis and a decision-making tool with some recommendation for further public policies. Originality/value: This study presents a model for decision makers in a low-income zone and highlights the importance of preparedness in the humanitarian system. This paper expands the discussion of how the mathematical models and human behaviors interact with different perspectives in a humanitarian crisis. © 2019, Emerald Publishing Limited.
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