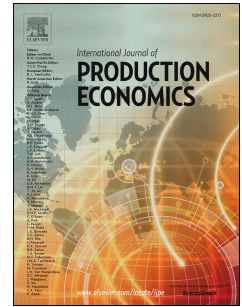


# Accepted Manuscript

Dynamic formulation for humanitarian response operations incorporating multiple organisations

Oscar Rodríguez-Espíndola, Pavel Albores, Christopher Brewster



PII: S0925-5273(18)30288-3

DOI: [10.1016/j.ijpe.2018.07.023](https://doi.org/10.1016/j.ijpe.2018.07.023)

Reference: PROECO 7107

To appear in: *International Journal of Production Economics*

Received Date: 18 May 2017

Revised Date: 10 July 2018

Accepted Date: 25 July 2018

Please cite this article as: Rodríguez-Espíndola, O., Albores, P., Brewster, C., Dynamic formulation for humanitarian response operations incorporating multiple organisations, *International Journal of Production Economics* (2018), doi: 10.1016/j.ijpe.2018.07.023.

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

## **Dynamic formulation for humanitarian response operations incorporating multiple organisations**

Oscar Rodríguez-Espíndola<sup>1\*</sup>, Pavel Albores<sup>1</sup> and Christopher Brewster<sup>2</sup>

<sup>1</sup> Aston Business School, Aston University, Birmingham, UK.

<sup>2</sup> Data Science Group, Toegepast-Natuurwetenschappelijk Onderzoek (TNO), the Netherlands.

\*Corresponding author. Tel. +44(0)121 204 3558. E-mail address: o.rodriguez-espindola@aston.ac.uk

### **Abstract**

Disasters represent a significant challenge for countries globally. Balancing human and material resources during these situations is not a trivial issue, and that is further complicated by the participation of several actors at multiple periods. However, there is an absence of articles considering the importance of deploying only the required organisations for response activities depending on the conditions and the stage of the disaster. This research proposes a dynamic model to support disaster response which incorporates human and material resources from multiple organisations. The multi-modal, multi-commodity optimisation model supports resource allocation and relief distribution decisions through the maximisation of the level of service provided to disaster victims and the minimisation of cost. The model is the first dynamic formulation in the literature with the ability to optimise the number, type and stage of deployment of organisations required according to the circumstances of the emergency. The model has been applied to two major floods that have occurred in Mexico in recent years. Each case was tested using three different scenarios to investigate the ability of the model to handle different conditions. The results of both cases were compared to scenarios with independent participation from each organisation and an instance capturing the

Download English Version:

<https://daneshyari.com/en/article/7355016>

Download Persian Version:

<https://daneshyari.com/article/7355016>

[Daneshyari.com](https://daneshyari.com)