

Accepted Manuscript

A novel multi-objective programming model of relief distribution for sustainable disaster supply chain in large-scale natural disasters

Ce-jun Cao, Cong-dong Li, Qin Yang, Yang Liu, Ting Qu



PII: S0959-6526(17)32688-4

DOI: [10.1016/j.jclepro.2017.11.037](https://doi.org/10.1016/j.jclepro.2017.11.037)

Reference: JCLP 11176

To appear in: *Journal of Cleaner Production*

Received Date: 18 March 2017

Revised Date: 30 October 2017

Accepted Date: 6 November 2017

Please cite this article as: Cao C-j, Li C-d, Yang Q, Liu Y, Qu T, A novel multi-objective programming model of relief distribution for sustainable disaster supply chain in large-scale natural disasters, *Journal of Cleaner Production* (2017), doi: 10.1016/j.jclepro.2017.11.037.

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.

Word count: 9914

1 **A novel multi-objective programming model of relief distribution for sustainable disaster**
2 **supply chain in large-scale natural disasters**

3 Ce-jun Cao^{a,b}, Cong-dong Li^{b,a,*}, Qin Yang^c, Yang Liu^{b,d,*}, Ting Qu^b

4 ^a College of Management and Economics, Tianjin University, Tianjin, 300072, China

5 ^b Institute of Physical Internet, Jinan University (Zhuhai Campus), Zhuhai, 519070, China

6 ^c School of Business, Sichuan Normal University, Chengdu, 610101, China

7 ^d Department of Management and Engineering, Linköping University, SE-581 83 Linköping, Sweden

8 **Corresponding Authors*: licd@jnu.edu.cn (C.D. Li), yang.liu@liu.se (Y. Liu)

9 **Abstract** To save lives and reduce suffering of victims, the focus here is to design the strategies of
10 relief distribution regarding beneficiary perspective on sustainability. This problem is formulated as a
11 multi-objective mixed-integer nonlinear programming model to maximize the lowest victims'
12 perceived satisfaction, and minimize respectively the largest deviation on victims' perceived
13 satisfaction for all demand points and sub-phases. Then, genetic algorithm is proposed to solve this
14 mathematical model. To validate the proposed methodologies, a case study from Wenchuan
15 earthquake is illustrated. Computational results demonstrate genetic algorithm here can achieve the
16 trade-off between solution quality and computation time for relief distribution with the concern of
17 sustainability. Furthermore, it indicates that the methodology provides the tools for decision-makers
18 to optimize the structure of relief distribution network and inventory, as well as alleviate the suffering
19 of victims. Increasingly, this paper expects to not only validate the proposed model and method, but
20 highlight the importance and urge of considering beneficiary perspective on sustainability into relief
21 distribution problem.

22 **Keywords:** Relief distribution; Sustainable disaster supply chain; Victims' perceived satisfaction;
23 Multi-objective programming model; Genetic algorithm

24 **1. Introduction**

25 The International Disaster Database (EM-DAT) indicates the total number of both natural disasters
26 and the affected people have steadily increased since 1900s. Such natural disasters pose serious
27 threats to sustainable development of society, economy and ecology, as well as place populations at
28 risk. Particularly, large-scale natural disasters have occurred frequently, resulting in tremendous

متن کامل مقاله

دریافت فوری ←

ISIArticles

مرجع مقالات تخصصی ایران

- ✓ امکان دانلود نسخه تمام متن مقالات انگلیسی
- ✓ امکان دانلود نسخه ترجمه شده مقالات
- ✓ پذیرش سفارش ترجمه تخصصی
- ✓ امکان جستجو در آرشیو جامعی از صدها موضوع و هزاران مقاله
- ✓ امکان دانلود رایگان ۲ صفحه اول هر مقاله
- ✓ امکان پرداخت اینترنتی با کلیه کارت های عضو شتاب
- ✓ دانلود فوری مقاله پس از پرداخت آنلاین
- ✓ پشتیبانی کامل خرید با بهره مندی از سیستم هوشمند رهگیری سفارشات