



ISSN: 2521-0920 (Print)
ISSN: 2521-0602 (Online)

CODEN : MJGAAN

DOI : <https://doi.org/10.26480/mjg.01.2018.30.33>



DEVELOPMENT OF HUMANITARIAN SUPPLY CHAIN PERFORMANCE CONCEPTUAL FRAMEWORK IN CREATING RESILIENT LOGISTICS NETWORK

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ARTICLE DETAILS

ABSTRACT

Article History:

Received 12 November 2017
Accepted 12 December 2017
Available online 1 January 2018

Humanitarian logistics which is precisely known as humanitarian supply chain (HSC) plays a major role in reducing the impact of disaster on human life and livelihood by providing humanitarian aid in the forms of food, water, medicine, shelter and other supplies. Unfortunately, anecdotal evidences indicated that relief chain tends to be unstable, unpredictable and unresponsive to the needs of disaster victims. The 2004 Asian tsunami highlighted the lack of coordination between the relief chain linkages that hampered effective supply of aid. This phenomenon was further evident in our own context during the 2014 flood devastation in Peninsular Malaysia. Floodwaters and subsequent landslides blocked major roads, limiting access to evacuation centres and impeding the delivery of emergency relief supplies. Hence, an effective humanitarian supply chain management (HSCM) should be able to be deployed rapidly enabling provision of aid to beneficiaries. Notwithstanding the frequency and impact of disasters, humanitarian organizations today are under continuous pressure of improving their logistics performance. Departing from this need, this study aims to examine the criteria that influence the humanitarian aid actors in their decision making while increasing transparency and accountability of relief operations. Therefore, it is imperative for humanitarian sector to quantify the efficiency and effectiveness of a particular relief operation using set of performance metrics. A mixed methods approach comprising qualitative and quantitative survey will be used. The study intended to identify and define the metrics that would determine successful operational performance of disaster relief. This research will contribute mainly in the development of a HSCM performance model that (i) informs decision makers at the strategic, tactical and operational level in tracking progress, (ii) facilitate a more open and transparent communication and cooperation between humanitarian actors, and (iii) improve the logistics of disaster management both at the government and at non-governmental level.

KEYWORDS

Humanitarian logistics, supply chain, disaster.

1. INTRODUCTION

Natural disaster that usually occur may affect the population area causing destruction to the community which leads to the suffering and deprivation [1]. With the increasing number of natural disaster that occur around the globe such as tsunami in Indonesia, earthquake in China and Japan, flood disaster in India and heavy rain in China causing the rapid assistance need to be provided to the victims immediately. Providing an assistance for the victims may occur in different ways such as such as salvaging those who are wounded and/or stranded, collecting and disposing corpses, resource allocation, provision of food aid, shelter and medical care, and restoring access to remote locations [1].

Performance measurement is known to become one of the important factor in order to improve the efficiency and effectiveness of commercial supply chain. However, measuring performance in structured and standardized ways is not common in humanitarian supply chain [2]. Humanitarian supply chain need to be focused on as the increasing number of natural disaster happened. In Malaysia, devastated flood that occur in 2014 have become an injection towards a better delivery of emergency relief supplies. Therefore, the objectives of this study is to

establish four proposed constructs, namely Beneficiary Perspective, Financial Perspective, Internal Process Perspective and Learning and Growth Perspective and establish their definitional dimensions of each of the metric for humanitarian supply chain performance model.

2. LITERATURE REVIEW

The occurrence of both natural and man-made disasters is on the rise worldwide. Disaster has been defined as disruption that cripples the functionality of a community causing major human, material, economic or environmental losses which surpass the ability of the affected people to cope using existing resources [3,4]. The aftermath of these events is enormous, not only in the short term which is evident by injuries, loss of life and damaged properties but could also prolong for a great period of time when it comes to social and economic conditions. 2004 Asian tsunami and 2005 flooding of New Orleans following hurricane Katrina were considered to be among the greatest destructions in this century. Both events became an eye-opener of a missing element under the domain of disaster management as surviving inhabitants waited for several days to receive most elementary goods such as water, food and medicine [5,6]. Hence, an effective and efficient delivery of critical goods is a crucial element of successful disaster relief operation and is closely related to

humanitarian logistics which is also precisely known as humanitarian supply chain.

Humanitarian logistics could be defined as logistical activities that comprise planning, implementing and controlling the efficient, cost-effective flow of and storage of goods and materials as well as related information, from point of origin to point of consumption for the purpose of alleviating the suffering of vulnerable people [7]. Goods and materials in this context are better known as humanitarian aid in the forms of food, water, medicine, shelter and other supplies. Some researchers indicated that most of the humanitarian supply chain are unstable, unpredictable and stiff to respond to the needs of the affected victims [4]. This is further worsened by the fact that no single individual or group controls a relief operation [8]. More lives could be saved, and great degree of suffering could be reduced by the efficiency and effectiveness of humanitarian aid delivery in response to disasters. A researcher asserted that the only way to achieve efficiency and effectiveness is through humanitarian supply chain management as 80% of disaster relief efforts are governed by logistics [9]. Katrina and Asian tsunami have proven that the problem of failing links within the logistical chain is quite common at times of disaster.

Humanitarian supply chain management (HSCM) is about managing the processes and systems involved in mobilizing people, resources, skills and knowledge to help vulnerable people affected by disaster [10]. The HSCM and the commercial supply chain management (CSCM) are different in their motives and operating conditions [11]. HSCM is more towards serving the mankind while CSCM focuses on the generation of profit. The customers in a disaster supply chain include the population at the affected area, as well as intermediate customers at local and global storage facilities. Their needs change significantly according to disaster types and the phases in the disaster timeline. The main task is to mobilise the goods, finance and to administer the services to the beneficiaries. For instance, the 2004 Asian tsunami saw the biggest amount of humanitarian aid in the history, hitting the worth more than USD 13 billion [12]. Disaster relief requires the activities in many dimensions such as rescue efforts, health and medical assistance, food, shelter and long-term relief activities. The success of any relief activity depends heavily on the logistical operations of the supply deliver [13]. Humanitarian supply chain is the central to disaster relief due to its function to serve as a bridge between disaster preparedness and response as well as between procurement and distribution [9, 14].

Any event of disaster tends to be considered as a test the readiness of human and relevant systems in place to face it, especially the capacity of different actors to work together [15]. Actors in humanitarian supply chain refers to various stakeholders who are directly or indirectly involved in the relief operations such as government, aid donors, other NGOs, military, logistic providers, and aid agencies [16,10]. In normal situations, these actors have the least motivation to work together for an extended period of time. However, upon the arrival of disaster, they combine their capacity and capability to relieve human suffering [17, 18]. Although these actors are instrumental to an effective response, they are capable of creating confusion as they compete for with each other for funds, resources, critical infrastructure and decision-makers' attention [7].

Notwithstanding the frequency and impact of disasters, humanitarian organizations today are under continuous pressure of improving their logistics performance. Departing from this need, this study aims to examine the criteria that influence the humanitarian aid actors in their decision making while increasing transparency and accountability of relief operations. Therefore, it is imperative for humanitarian sector to quantify the efficiency and effectiveness of a particular relief operation using set of performance metrics. A mixed methods approach comprising qualitative and quantitative survey will be used. The study intended to identify and define the metrics in the various perspectives such as beneficiary financial, internal process as well as learning and growth that would determine successful operational performance of disaster relief. This research contributes mainly in the development of a HSCM performance model as illustrated in Figure 1 that informs decision makers at the strategic, tactical and operational level in tracking progress as well as to facilitate a more open and transparent communication and cooperation between humanitarian actors whilst improving the logistics of disaster management both at the government and non-governmental level.

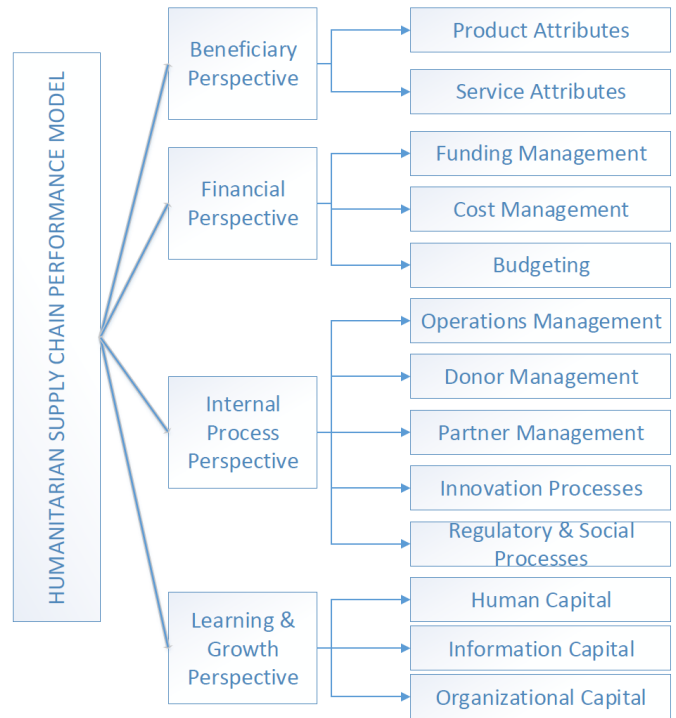


Figure 1: Conceptual Framework for Measuring Humanitarian Supply Chain Performance

3. THE WAY FORWARD

When a disaster strikes be it natural or man-made, the ultimate aim of emergency management stakeholders would be to protect and assist the civilian population in the affected regions. Successful disaster relief operations involve various tasks such as rescue efforts, health and medical aid, food, shelter and long-term relief activities which are heavily reliant on logistical operations of the supply delivery [13]. However, this is never as simple as A, B, C. Effective and efficient humanitarian supply chain is imperative in saving lives and reducing suffering for those people affected by disaster [19]. Notwithstanding the increasing pressure from the donors to prove that aid and goods are really reaching the ones in need during emergency relief operations, at present little work has been conducted to determine the viable metrics and corresponding definitions which could assess and further improve humanitarian logistics performance.

The purpose of this study is to identify appropriate metrics to quantify efficiency and effectiveness which represent two central goals of any humanitarian organization, the weight of importance the metrics are considered, and how each factor is defined among the actors of supply network of humanitarian aid during the recent flood catastrophe. By having a validated set of metrics and their corresponding definitional dimensions, the humanitarian relief operation management key players could apprehend the nature and characteristic of the real-time relief chain related processes compared to the elements outlined in the current Standard Operating Procedures (SOPs). Therefore, formulation of an appropriate humanitarian supply chain performance model would help humanitarian aid actors in their decision making to improve the efficiency and effectiveness of relief operations which takes into account the issues of transparency and accountability. This will further enhance and reinforce the disaster planning and preparedness initiatives to be undertaken in facing any future calamities.

This study is to be carried out using simultaneous qualitative and quantitative approaches to identify, define and assign weight of importance to the metrics which quantify efficiency and effectiveness of relief operations during disasters. Through these processes the envisaged information could be augmented as advisory points by National Disaster Management Agency (Agensi Pengurusan Bencana Negara) as well as by other lead agencies during the outbreak of a relevant disaster. Developing a systematic process and procedure for measuring relief chain performance especially for delivery of aid to the victims can provide the key stakeholders the information required to maximize the effort taken in relief operations during disaster [20]. With a clear perspective of what might transpire during the actual event, a list of proven and tested on the ground metrics, definitional dimensions, and weight of importance, the humanitarian relief operation management key players could better

anticipate and approach certain scenarios which were not comprehended before.

This study is neither undertaken as a fault-finding exercise nor as a comparison of lead agencies as well as humanitarian organizations performance during the recent flood catastrophe. Instead, it represents an effort to provide a list of metrics, corresponding definitional dimensions, and weight of importance as identified by actors of supply network of humanitarian aid during the actual disaster relief operations which would be assisting future Disaster Risk Reduction (DRR) strategy in this country.

4. METHODOLOGY

The research process which will be adopted for this study is summarized in Figure 2.

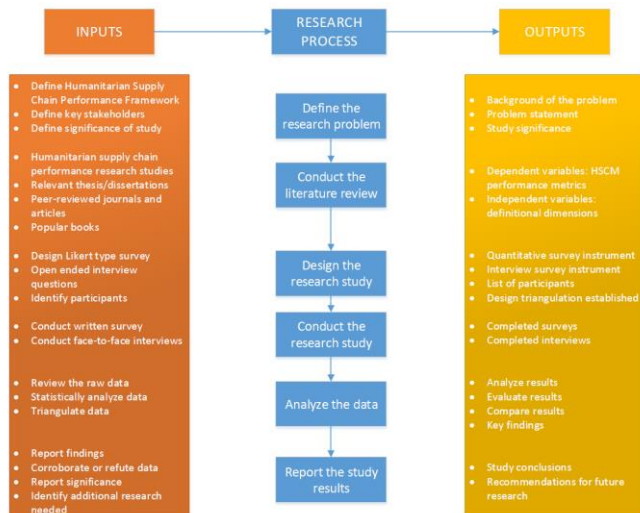


Figure 2: Research Process

4.1 Literature Review

A literature review on disaster management, as well as humanitarian supply chain management process will be carried out.

4.2 Data Collection

A mixed methods approach comprising qualitative and quantitative survey will be utilized to examine the stated research questions. Operations of lead agencies and humanitarian organizations during the recent flood disaster formed the basis of the study with questionnaire survey and semi-structured interviews. The participants are targeted among key decision-makers. The study intended to identify and define decision making criteria and their corresponding definitional dimensions.

4.3 Data Analysis

The researcher will examine the survey data derived from the multiple-choice questions using the Statistical Package for the Social Sciences (SPSS) which facilitates accurate analysis of research data. Data from the conducted interviews will be analyzed using NVivo which simplifies the process for thematic analysis. The quantitative and qualitative findings will be triangulated to provide a deeper understanding of both the quantifiable and qualitative drivers of humanitarian supply chain performance model with regards to the Malaysian disaster management context. Finally, AMOS (Analysis of Moment Structure) will be used to establish confidence in the measurement model which states the hypothesized relationships of the observed variables to the underlying constructs.

4.4 Formulation of Humanitarian Supply Chain Performance Framework

The triangulated results will form the basis of formulating humanitarian supply chain performance framework.

4.5 Validation

A focus group will be conducted to validate the findings of this study. The participants will be among selected subject matter experts in the domain of disaster management in Malaysia.

5. EXPECTED FINDINGS

The current study addressed this gap in the literature review and gave disaster management related officials in the lead agency and humanitarian organization an opportunity to contribute their voices to the growing body of research about humanitarian supply chain performance tracking for disaster relief operations. The current study provides a greater understanding of the perceptions that lead agencies and humanitarian organizations officials hold regarding delivery of humanitarian aid and the extent to which these perceptions are consistent with findings from prior studies.

The results of the research can be of value to the current and future direction of disaster management in Malaysia, and the extent to which disaster management related personnel who utilizes it as a source in their decision-making processes. Findings from the current study is envisaged to assist in three areas:

- To further the research knowledge base regarding humanitarian supply chain for disaster victims in lead agencies and humanitarian organizations by focusing on the perceptions of these key stakeholders.
- To inform policy decisions about humanitarian relief decision making standards.
- To aid in the development of a humanitarian supply chain performance model during disaster.

6. CONCLUSION

Humanitarian supply chain is one of the way that organization, non-organization and stakeholders can practice having better and immediate response during humanitarian operation. This study is an effort to provide a list of metrics, corresponding definitional dimensions, and weight of importance as identified by actors of supply network of humanitarian aid during the actual disaster relief operations which would be assisting future Disaster Risk Reduction (DRR) strategy for Malaysia. One successful operation in one humanitarian operation cannot be replicated in other humanitarian operation as the occurrence and nature of disaster will be unique from one another. More studies and needs to be done in order to improve the theoretical and the practical aspects.

ACKNOWLEDGEMENT

This work would not have been possible without the unwavering support from National Disaster Management Agency (NADMA), Tenaga Nasional Berhad, Ministry of Higher Education and Malaysia Civil Defense Force.

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