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# Nongovernmental organizations coordination models in natural hazards: A systematic review

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## Abstract:

**INTRODUCTION:** Nongovernmental organizations (NGOs) play a significant role to provide humanitarian services in natural hazards. However, few studies have been conducted on the coordination models of NGOs. Using these models, NGOs are expected to act along with other agencies to provide unified and effective humanitarian's services. The present study aimed to identify the published coordination models of NGOs.

**MATERIALS AND METHODS:** This systematic review was conducted from October to November 2017. Electronic source, including PubMed, Web of Science, ProQuest Research Library, and Scopus were examined. All English articles published in journals or presented at conferences were included in the study. Nonjournal and irrelevant articles were excluded from the study. Furthermore, papers which were not available as a full text and published in languages other than English were also excluded. Thematic analysis technique was used to analyze the articles.

**RESULTS:** From 871 documents which captured in initial search, only 7 studies identified as eligible articles for extract 8 coordination models of NGOs in disasters and emergencies including: (1) Sphere project, (2) Cluster approach, (3) Code of conduct, (4) Decentralized approach, (5) National Disaster Response Framework, (6) Conceptual integrated NGO collaboration framework for community postdisaster reconstruction, (7) Model of temporal coordination of disaster response activities, and (8) Collabit application.

**CONCLUSIONS:** This systematic review identified eight proposed coordination models that have been implemented internationally, nationally, and locally in natural hazards. However, these models are not enough, and there are some gaps between what is it and what should be. More effective and efficient models and strategies are needed to increase the effectiveness of coordination activities at all levels of community. These results should serve policy-makers and administrators of NGOs delivering humanitarian services during and postnatural hazards to choose from a number of options on how to coordinate their efforts.

## Keywords:

Model, natural hazards, nongovernmental organizations coordination

## Introduction

With the increase in the number of people injured in disasters<sup>[1]</sup> as a result of the increased incidence and consequences of disasters in recent years,<sup>[2]</sup> nongovernmental organizations (NGOs) have had a remarkable cooperation with governmental organizations and agencies

to provide humanitarian services in natural hazards. Currently, NGOs work independently or cooperate with other organizations and have a significant role in providing relief and reconstruction services.<sup>[3]</sup>

For instance, more than 3000 NGOs were involved in the provision of aid to the victims of the 2010 Haiti earthquake. Moreover, right after the 2003 Bam earthquake, the

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International Committee of the Red Cross and other local and national NGOs assisted the affected population with different capacities, experiences, and attitudes.<sup>[4]</sup>

Historically, the topic of humanitarian assistance coordination started from the 1960s.<sup>[5]</sup> Large organizations such as the UN Red Cross and governmental and nongovernmental agencies attempt to propose mechanisms and frameworks for coordination.<sup>[6]</sup> However, the explosion of NGO/International NGO organizations involved in disasters which has increased more than tenfold in the past 30 years, and a lack of responder standards made the need for a “universally” accepted model critical and facilitates NGOs’ coordination.<sup>[7]</sup> For instance, Bradt (2003) argued that health-sector coordination in the field based is nonstandardized because “United Nations, Red Cross, governmental, and nongovernmental agencies have evolved different mechanisms to achieve it.”<sup>[5]</sup>

Despite many efforts in the humanitarian relief domain, there has been limited success in coordination among NGOs.<sup>[8]</sup> Numerous studies exist on the challenges faced by NGOs in providing humanitarian services.<sup>[9-11]</sup> Still, the coordination among NGOs which is a major challenge for these organizations has received little attention. Many systems have been proposed for resource management during crisis. However, few studies have proposed coordination models for activities in response to natural hazards.<sup>[12]</sup> This is especially tangible when it comes to NGOs. Lack of communication and coordination among NGOs, insufficient communication without a clear policy, and little knowledge of NGOs and local organizations of one another were problems mentioned by managers. For example, some NGOs made direct contact with different local organizations, wasting their time and energy. Moreover, there was no coordinating center for providing information to them as to what organization they should collaborate with. Numerous problems among NGOs themselves were also observed; they obstinately followed their own rules and were inflexible in executing measures parallel to other NGOs.<sup>[13]</sup>

To this end, the present study was conducted to describe the coordinating models of NGOs with implications to their challenges in providing coordinated humanitarian services in natural hazards.

## Materials and Methods

### Systematic search

This study is a systematic review of publications relating to coordination models of NGOs in natural hazards. By applying available electronic, a systematic review was carried out between October and November 2017.

After consulting with the health information specialist, search strategies of all databases with the agreement of member’s team were checked and revised. Accordingly, four databases including PubMed, Web of Science, ProQuest Research Library, and Scopus were searched by the final modified search strategies. Databases were studied for models of coordination among humanitarian NGOs in crisis and disasters. To find as many records as possible, the following keywords (using medical subject headings) were used:

Coordination OR cooperation OR collaboration OR interorganiz \* AND assistance OR relief OR aid OR help \* OR support \* AND humanitarian OR Philanthropic \* AND NGO \* OR organize \* OR association \* OR charit \* AND chart OR Model \* OR framework \* OR theory \* OR pattern \* OR structure \* OR organize \* OR guide \* OR plan \* OR program \* AND disaster \* OR hazard \* OR emergency \* OR crisis \* OR earthquake \* OR flood \* OR tsunami.

### Inclusion criteria

To retrieve relevant articles, attempts were made to examine and include all cases which had relevant subjects. Therefore, all English articles related to coordination models of NGOs in disasters or described the process of coordination among NGOs were reviewed. Articles published in various formats, including research, review, case studies, letter to the Editor, as well as articles presented at conferences and seminars were included.

No constraint was applied on inclusion in terms of selecting articles related to specific hazards. Thus, all hazards, including natural and man-made ones were included. In this study, attempts were made to investigate coordination, regardless of specific stages of crisis management (preparedness, response, and recovery). In cases in which the full text of articles was not available, full texts were retrieved by E-mailing the authors. No time constraint was applied.

### Exclusion criteria

All irrelevant articles were excluded. Papers which were relevant to the coordination among governmental, public, or private sector were not included as well. Dissertations, reports published in tabloid newspapers, subjects of animal in disasters, articles with unavailable full texts, and articles published in languages other than English were also excluded from the study.

### Studies selection

In the initial search, 871 potential studies based on keywords were included. After removing duplicate cases, 734 articles were included for screening. Then, 712 references which met the exclusion criteria were removed from the study. After that, by reading the topic and abstracts of the remaining 22 articles, 14 were selected

for reading their full texts. Finally, 8 key studies entered the present review. These steps are illustrated in Figure 1.

### Data analysis

Text analysis began after extracting relevant documents and the selection of final articles. The characteristic required for achieving study goals were specified by team members and data belonging to each article were accordingly extracted and recorded in the tables of results. In order to have a descriptive and comparable overview of founded models and the aims of this study, research team decided to consider the following variables for final studies: Variables considered for final studies were type of model, creator, approach, provision of tools or guideline, focus on coordination of NGOs, type of disaster, stage of the disaster, and first author [Table 1]. The final articles were classified based on their topics and objectives. This study is reported based on the guideline of Preferred Reporting Items for Systematic Reviews and Meta-analyses.

### Ethical considerations

Before initiating the study, the approval of Iran University of Medical Sciences' ethics committee, code IR.IUMS.REC 1395.9221567203 was granted.

## Results

### Thematic analysis

In the following table, eight models extracted in this study are described in detail. Table 1 compares the main characteristics of the eight models, including:

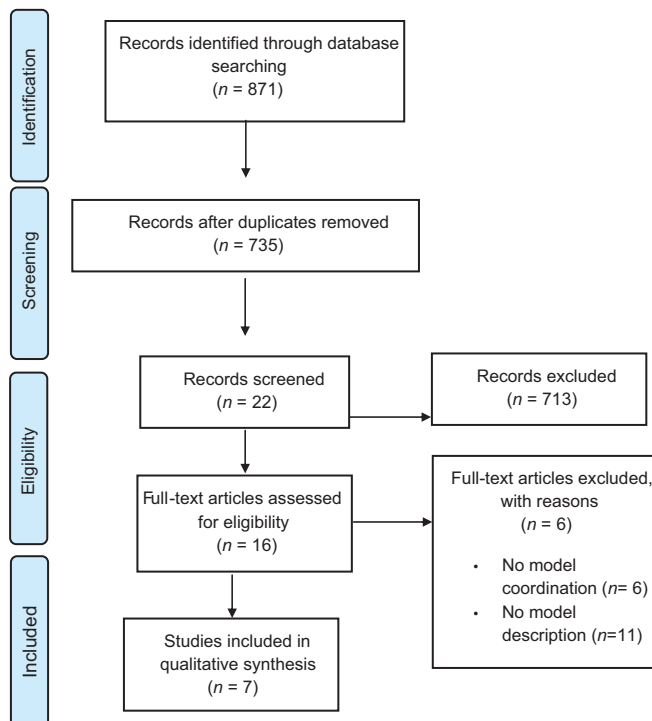


Figure 1: Flow diagram of the search and selection of papers

1. Sphere project
2. Cluster approach
3. Code of conduct
4. Decentralized approach
5. National disaster response framework
6. Conceptual Integrated NGO collaboration framework for community postdisaster reconstruction (CPDR)
7. Model of temporal coordination of disaster response activities
8. Collabit application.

### The sphere project

In 1997 and after the 1994 Rwandan genocide, a group of NGOs and the International Red Cross and Red Crescent (ICRC) Movement founded the Sphere Project which included universal rules on minimum standards in the domains of humanitarian services. This project provided a tool for creating interagency coordination at the site of the disaster which included (1) principles of agreement and cooperation, (2) a protocol for assuming duties, (3) identification of gaps in the health sector, and (4) a summary of the parts of the health sector. It is considered as the best practice in disaster response.<sup>[6]</sup>

### The cluster approach

In the 2005 reform, with the aim of promoting the effectiveness of humanitarian assistance, four major approaches were considered: the Cluster Approach; enhancing the coordination system in humanitarian assistance; effective, flexible, timely, and sufficient funding; and increased cooperation and coordination among institutes and organizations related or unrelated to the UN. The Cluster Approach has two major aims at the level of the country: establishing a clear system of international leadership and response to needs in each cluster and creating a framework for effective coordination and cooperation among national and international organizations in each cluster.<sup>[6]</sup> Figure 2 shows the mechanism of cluster approach.

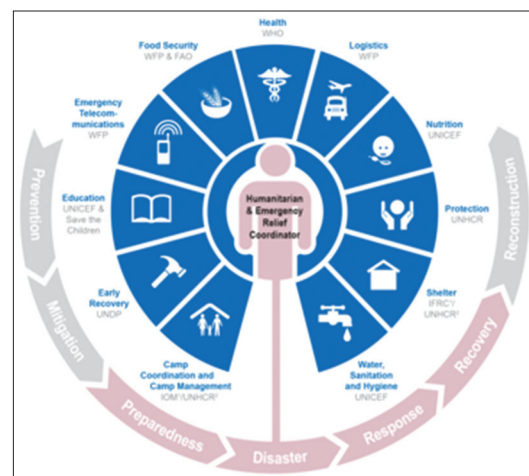


Figure 2: Diagram illustrating how the cluster system works. Photo credit: Office for the Coordination of Humanitarian Affairs

**Table 1: Comparison of the main characteristics of eight nongovernmental organizations coordination models**

First author	Number of NGOs/responders	phase	Disaster	NGO coordination topic focus	Tool/guide provided	Approach	Developer	Model
Lotfi (2016)	International level	Response	Natural/man-made	None	✓	Provision guidance for humanitarian responders in all sectors	NGOs and ICRC	Sphere Project
Lotfi (2016)	International level	Response	Natural/man-made	None	✓	Providing a framework of agreed objectives between local authorities and avoids gaps in resources	IASC/United Nations	Cluster approach
Hilhorst (2005)	International level	Response	Armed conflict (man-made)	None	✓	A voluntary code seeks to guard humanitarian standards of behavior	ICRC/IFRC	Code of Conduct for Disaster Relief
Dolinskaya (2011)	-	Response	Natural/man-made	✓	-	Decentralized approaches to logistics coordination in humanitarian relief through different platforms and UN logistic cluster	Aidmatrix Foundation relief And Northwestern University	Decentralized approaches to logistics coordination in humanitarian relief
Ainuddin (2013)	National level	Preparedness	Natural/man-made	none	✓	A disaster management tool in order to develop policy, plan, and guideline legislation at the national level	National level of countries	National Disaster Response Framework
Yi Lu (2014)	National level (30 NGOs)	Postdisaster reconstruction	Natural (earthquake)	✓	✓	A collaborative framework for community postdisaster reconstruction	Yi Lu	A Conceptual integrated collaboration framework for community postdisaster reconstruction
Albahari (2013)	One	Response	Natural (flood)	✓	✓	Providing a framework of agreed objective for relief affair	A voluntary group called Nafeer	A model for Temporal Coordination of disaster Response Activities
de Lanerolle (2010)	13 groups	Response and recovery	Natural/man-made	None	✓	Provides remotely posted incident updates	New York City Voluntary Organizations Active in Disaster (NYC VOAD group)	Web-based application (Collabit)

NGOs: Nongovernmental organizations

### The code of conduct

This code was published by ICRC after the 1994 Rwandan genocide. In fact, it is a shared principle and humanitarian standards of behavior for agencies which are engaged in humanitarian measures, including NGOs. This code

is used as a tool and guideline for creating coordination and making decisions regarding humanitarian measures. It seeks to maintain the high standards of independence, effectiveness, and impact to which disaster response NGOs and the ICRC Movement aspires.<sup>[14]</sup>

### Decentralized and centralized approaches

Systems and tools currently available to facilitate humanitarian coordination can be divided into centralized and decentralized categories in terms of the presence of one or more main players with authorization for directing relief operations. Recent study suggests the use of a decentralized approach, in which each organization independently makes decisions. To share its information, experts, and responsibilities with other organizations, it can utilize any of the decentralized approaches such as Inter-Agency Standing Committee (IASC) and Inter-Agency Working Group (IAWG).<sup>[8]</sup>

### National Disaster Management Authority

National Disaster Management Authority (NDMA) is a mechanism that aims to promote response during disasters. In fact, it is a disaster management tool in order to develop policy, plan, and guideline legislation at the national level. In Pakistan, for example, this approach through multistakeholder collaboration in the preparedness phase tries to address disaster risk and vulnerability to coordinate NGO activities at different levels.<sup>[15]</sup>

### Integrated nongovernmental organization collaboration framework for the community postdisaster reconstruction

After earthquake in Sichuan of China (2008), over 300 NGOs and voluntary groups entered the affected region. Then, an association of NGOs named Sichuan NGO Disaster Relief Joint Office was established with more than 30 NGOs and nonmilitary urban service centers with 30 members. This significant cooperation by NGOs was effective in reducing the burden on people and the government and helped save lives which results in proposing the Integrated NGO Collaboration Framework for the CPDR and includes three interrelated components: organizational structure, operational processes, and reconstruction goals [Figure 3].<sup>[3]</sup>

### A model for temporal coordination of disaster

After the flood in Khartoum, Sudan, in August 2013, a retrospective study was conducted to examine the

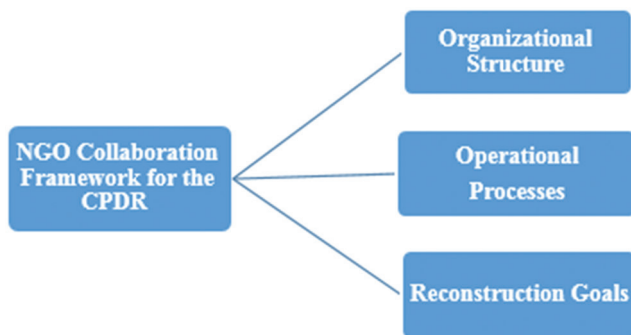


Figure 3: Categorizing nongovernmental organizations collaboration framework

activities performed by a voluntary group called Nafeer. The main question was whether these voluntary groups can provide coordinated relief services after disasters.

Nafeer provided services by creating a “flat management structure” which is illustrated in Figure 4, divided into 14 equal committees although each committee was independent. In fact, the flat or horizontal structure promoted involvement of the staff in the decision-making process with managers by decreasing the level of middle managers. The coordination committee coordinated the other committees such as health and engineering committee. Using this mechanism, Nafeer succeeded in meeting three basic standards of the Sphere.<sup>[16]</sup>

### Web-based application

In 2009, the New York City Voluntary Organizations Active in Disaster introduced Collabit, an application for facilitating the receiving and sharing of information among organizations engaged in relief response. This application aimed to create a shared operational picture of the status of relief for different agencies. Collabit is a web-based open-source application aiming to effectively manage emergencies by sharing asynchronous data among nonprofit relief organizations and agencies in order to coordinate the response operation and recovery from disasters.<sup>[17]</sup>

## Discussion

This systematic review of Disaster NGOs’ coordination models highlights the gaps in theoretical knowledge and practical mechanism to conduct NGOs’ coordination before and after disaster occurrences which should be researched further. In particular, the findings of the descriptive and thematic analyses can be discussed and implications for both the scholars and the practitioners who operate in the field of community-based disaster management can be suggested.

Three models including Conceptual Integrated Framework for CPDR, Temporal Coordination of Disaster Response Activities, and Decentralized Approaches to Logistic Coordination in Humanitarian Relief, only focused on coordination among NGOs. However, the

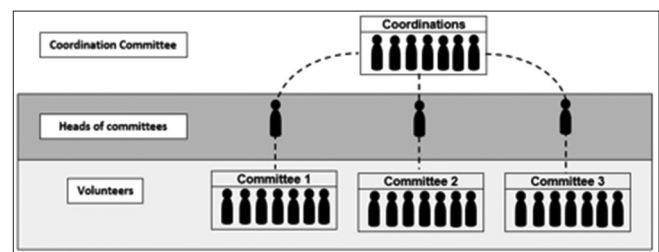


Figure 4: Organizational structure of Nafeer. Albahari® 2017 prehospital and disaster medicine

other models focused on a general coordination among all organizations, governmental, or otherwise.

The descriptive analysis of the eight selected models indicates that only three models including: Conceptual Integrated Framework for CPDR, Temporal Coordination of Disaster Response Activities, and Decentralized Approaches to Logistic Coordination in Humanitarian Relief, focused on coordination among NGOs with their own challenges and weaknesses. However, the other five models focused on a general coordination among all organizations, governmental, or otherwise. This result indicates that in spite of the growing number of NGOs who are actively serve people in disasters the subject of coordination among them should be emphasized more in practical aspect of the topic.

The general approach of the extracted models is another result of the present study. In terms of being specified to a special hazard or incident, the Code of Conduct, A Conceptual Integrated Collaboration Framework, and the Model of Temporal Coordination of Disaster Response Activities focused in turn on armed conflict, earthquakes, and floods, which may cause doubt of generality of using these models.

In addition, except for a Conceptual Integrated Collaboration Framework and Collabit which were designed for the stage of reconstruction and recovery response, the six remaining models mostly focus on the response phase of disaster and only NDMA is focused on preparedness time. Therefore, further studies are required to answer the question whether organizations providing humanitarian services need coordination mechanisms at times other than the time of disasters and emergencies.

With regard to our findings, currently, there are mechanisms and tools related to coordination of humanitarian measures in disasters and emergencies at the regional, national, and international levels, including the Sphere Project, the Cluster Approach, the National Disaster Response Framework, Nafeer, or the use of up-to-date technological tools such as social media and cell phone applications. However, it seems that an agreement is needed on NGOs coordination models in the future. In another word, novel and more developed and agreed upon models can be created and important measures can be taken for providing further coordination among NGOs in disasters by regional, national, and international cooperation.

In general, these models can be studied in the following three general categories:

1. Mechanisms and approaches discussed at international levels are the Cluster Approach, the

Sphere Project, and the Code of Conduct. The Cluster Approach and the Sphere Project create coordination among governmental and international organizations and agencies by providing guidelines and frameworks for humanitarian response measures. The Code of Conduct, however, also highlights the shared principle and standards of behavior governing the provision of humanitarian services with the aim of achieving effective coordination among NGOs and IRCR in disasters and emergencies

Each of these mechanisms has practical challenges. For instance, regarding the sphere project, several agencies have expressed concerns on the approach. For example, the validity of the sphere's rights-based approach has been questioned. There is a poor link between the rights of affected individuals and standards for technical interventions. Furthermore, although the sphere is based on the right to assistance, there is no right in international law. Overcoming such problems requires solving complex political and legal issues, where sphere had been unsuccessful in solving. In general, there are concerns based on doubts about the validity and usefulness of global standards, such as sphere, which further represents the concerns and priorities and values of technical specialists rather than the damaged population<sup>[18]</sup>

Currently, the main question is whether or not the Code of Conduct can still be used as a tool and guideline for creating coordination and making decisions regarding humanitarian measures. According to Hilhorst (2003), code of conduct should be revised and updated in the future and some changes need to be done in the wording of terms in this document in order to be more applicable.<sup>[14]</sup>

According to literature, the cluster approach is faced with some difficulties when it is implemented,<sup>[19]</sup> and it has a "gap between theory and practice."<sup>[20]</sup> The best effectiveness of the coordination of humanitarian relief efforts could be provided when the majority of locally active NGOs participate.<sup>[21]</sup> Therefore, it should be considered in the planning of future humanitarian assistants in national and international platforms.<sup>[20]</sup>

2. As a disaster management tool, NDMA provides mechanisms for promoting the response to disaster operation at the national level. Furthermore, as a planning mechanism and framework of cooperation postearthquake reconstruction through sharing project sharing and project pooling (as components of collaboration bodies), the Integrated Collaboration Framework for CPDR tries to overcome the problems caused by in coordination among different agents engaged in humanitarian relief

The effectiveness of these mechanisms requires coordination and sufficient preparation at the district and community level. In case, the approach is not well implemented at these levels, the effectiveness is reduced, so that the gap was reported after the 2005 earthquake in Kashmir followed by NDMA by the Pakistani government<sup>[15]</sup>

3. Nafeer is a successful, but temporal coordination model for disaster response which provides coordination among NGOs at the regional and national level using a flat organizational structure with the help of international guidelines and standards such as the Sphere. Using communication technologies such as social media, E-mail, and SMS, it tries to share and receive information among NGOs present in the area for providing humanitarian services. The problem of this mechanism is how to evaluate it in the services, which is obvious for insufficient documentation and not determining the objectives<sup>[16]</sup>

At present, there are criticisms and challenges for the use of centralized approaches in disaster response operations and emergencies as the UN alone cannot respond to needs. Therefore, decentralized approaches to disaster response have been discussed in which a more effective and harmonious response to disaster can be provided through mechanisms such as IASC and IAWG in which all parties involved in disaster response have members and decisions will be made by an agreement.

In addition, except for a Conceptual Integrated Collaboration Framework and Collabit which were designed for the stage of reconstruction and recovery response, the six remaining models mostly focus on the response phase of disaster and only NDMA is focused on preparedness time. Therefore, further studies are required to answer the question whether organizations providing humanitarian services need coordination mechanisms at times other than the time of disasters and emergencies.

Another result of the present study was the general approach of the extracted models. In terms of being specified to a special hazard or incident, the Code of Conduct, A Conceptual Integrated Collaboration Framework, and the Model of Temporal Coordination of Disaster Response Activities focused in turn on armed conflict, earthquakes, and floods.

### Limitations

The major limitation of this study was the use of articles in English, preventing the use of reports and documents in other languages, and the inclusion of relevant studies which met other inclusion criteria except for language. This affects the generalizability of the results of the present study.

## Conclusions

This study highlights the current existence models of the NGOs coordination in disasters which are being used internationally, nationally, or even locally, as well as some implications of their challenges, with the intent of helping authorities officials in providing coordinated services in disasters and to take the first step in filling the current gap between theory and practice in this field by addressing the NGOs' coordination models.

It is challenging to provide specific guidance on which model to use. However, we suggest that decision makers prioritize models that have been used in settings similar to theirs, such as the type of disaster or the countries in which the crisis is taking place. There is a need to conduct further research to assess the effectiveness and efficiency of the identified models, specifically in terms of the availability of human services and access to such services.

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### Conflicts of interest

There are no conflicts of interest.

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