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Information management for humanitarian aid distribution system in Malaysia

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Abstract. Effective information management is one of the key success factors in managing the humanitarian aid distribution process during and post disasters and it depends on how much, how accurate, and how reliable the available information is. However, there are several key issues that need attention, such as redundancy of information about the disaster and fraudulent reports that could be retrieved by malicious persons which can have negative effects on the humanitarian aid distribution process. This paper aims to investigate the current practices of the information management system used by disaster management stakeholders in Malaysia during a natural disaster. Eighteen participants were interviewed to find out about their current strategies or plans for managing information during a natural disaster. Findings revealed that there is no information management process or protocol for non-government organizations (NGOs) requesting and receiving information on humanitarian aid. Conclusions are drawn about proposing a new information management process or protocol in the humanitarian aid distribution process.

1. Introduction

Since the Second World War, humanitarian aid has become an extensive activity throughout the world [1, 2]. Nowadays, the role of humanitarian aid has become a feature of the disaster management agenda during and post disasters of a natural disaster, which aims to lighten the burden of disaster victims. Humanitarian aid consists of several activities and several stakeholders. The main activities in humanitarian aid during and post disaster are search and rescue, welfare as well as health and medical [3-5]. The key drivers in managing the humanitarian aid activities consist of different stakeholders, which are Government agencies, non-government organizations (NGOs), volunteers, and the private sector [6-8].

Information management plays significant roles in managing humanitarian aid [9-11]. The effectiveness in managing disaster information during a natural disaster could avoid problems in the humanitarian aid distribution process. However, the involvement of several stakeholders in managing humanitarian aid has caused some problems in information management. Several papers have addressed the information management problems in managing the humanitarian aid process and have highlighted two (2) problems: the first one is redundancy of information on the disaster. This problem will lead the NGOs, volunteers or the private sector to respond to an individual request at the same time [12]. The second problem is fraudulent reports from malicious persons [12, 13]. The

uncoordinated information management could lead to these fraudulent reports being retrieved by malicious persons for their own intentions [12, 13]. Consequently, these information management problems will affect the humanitarian aid distribution process and disaster victims in several ways, as follows:

- Evacuation centres become overloaded and clogged with non-critical items, which causes wastage [14];
- Chaotic processes arise in distributing goods and basic needs to disaster victims [14];
- Unequal distribution of goods and basic needs to the affected disaster area and disaster victims [14].

Therefore, this paper aims to investigate current practices of information management systems during a natural disaster occurrence. This is important to propose a new information management process in humanitarian aid distribution which will avoid information management problems and increase effectiveness and efficiency when managing the humanitarian aid distribution process.

2. Methodology

All the information in this paper is based on primary and secondary data. Multiple case studies were conducted to obtained data of this research at three (3) natural disaster risk areas in Malaysia, which are Kelantan, Terengganu and Pahang [15, 16]. First, primary data was collected through semi-structured interviews with 9 government officers (GO) and 9 local non-government organizations (NGOs). The GO participants are consisting of GO from Department of Social Welfare (JKM) (3 district officers, 3 state officers and 1 central officer), 1 GO from Malaysian Civil Defence Force (APM) (central level) and 1 GO from National Disaster Management Agency (NADMA). All the participants were experienced in managing the humanitarian aid distribution process (more specifically in foods and basic necessities distribution) at the selected case studies area.

Second, secondary sources were gained through a literature review on humanitarian aid distribution, which covered its concepts, processes, disaster management teams, enabling technologies, and issues. Various sources were reviewed, such as books, journal articles, international conference papers, government reports, and material available on the internet. Content analysis techniques were used to analyse both primary and secondary sources. All the findings presented in this paper are through text, images and expressions.

3. Disaster management stakeholders

The disaster management stakeholders according to Asproth, Amcoff Nyström [6] comprise government agencies [17], non-government organizations (NGOs) [17, 18], volunteers [19] and the private sector [9, 19]. The roles and responsibilities of disaster management stakeholders in disaster management is to provide humanitarian aid to the disaster victims. Findings from the interviews revealed that, in Malaysia, government agencies form the focal agency in disaster management, while NGOs, volunteers and the private sector are classified as supporting stakeholders in disaster management. All the disaster stakeholders were involved in disaster management by providing humanitarian aid distribution to the disaster victims during and post disaster. In Malaysia, the government agencies are divided into three (3) command and control levels as shown in Figure 1. The three (3) Command and Control levels of the government agencies in disaster management are shown in Figure 1, they are level I: District disaster management and Relief committee, level II: State disaster management and Relief committee and level III: Central disaster management and Relief committee. Each level consists of several government agencies.
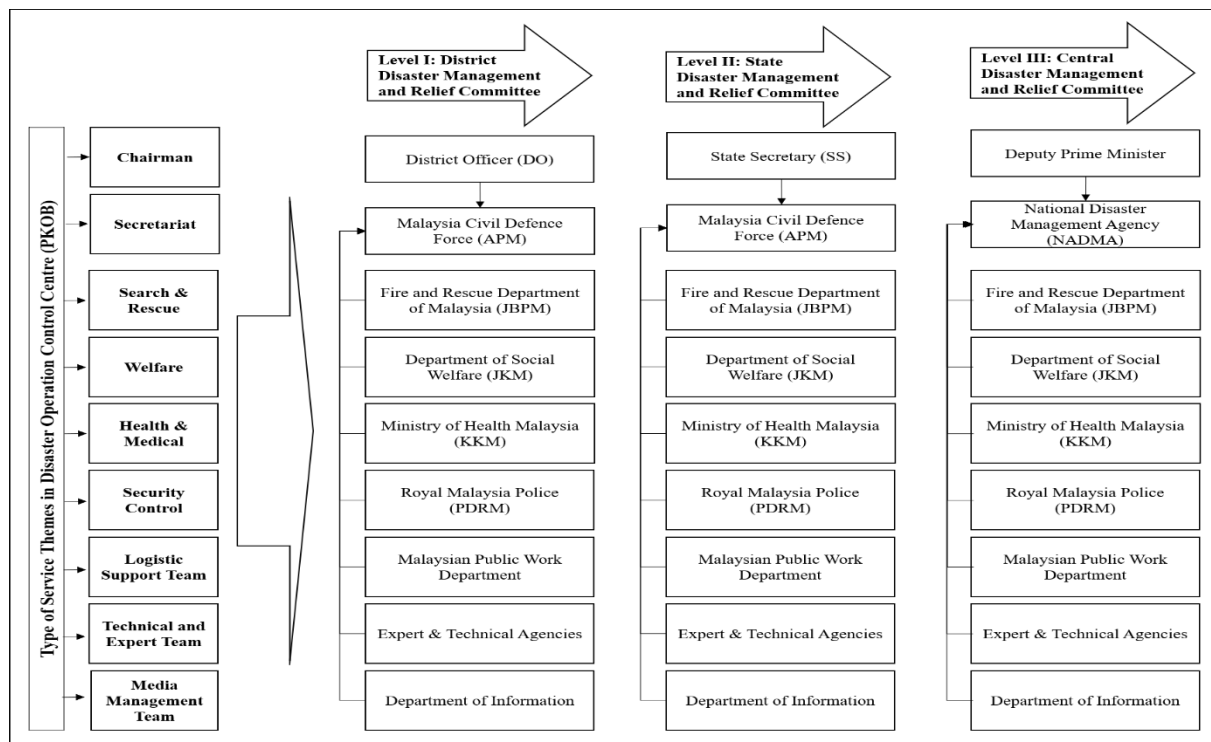
Figure 1. Government agencies in the disaster management and relief committee in Malaysia.

Finding from both the document review process (current legislation: Directive No.20) and interviews with GO participants revealed that the roles and responsibilities of Government agencies are well-defined in Directive No.20 compared to those of NGOs, volunteers and the private sector as supporting stakeholders in disaster management which are loosely defined. This is agreed by all the participants in this research, which highlighted the need to develop a standard operating procedure (SOP) to define the roles and responsibilities of NGOs, volunteers and the private sector as supporting stakeholders as well as a procedure or process for disaster management. This is in line with Dahari, Yusof [20], which explained the importance of a SOP as a guidance in planning and monitoring the NGOs activities during all phases of disaster management by government agencies. More important, the existing of the SOP is believed could reduce problems in managing humanitarian aid distribution process during and post disaster.

4. Current information management flow in humanitarian aid

It is very important to understand on how is the disaster information management is been manage by disaster management stakeholders. Figure 2 presents the current information management flows conducted by one of the disaster management stakeholders during a disaster, which is the Social and Welfare Department (JKM). According to all GO participants, there are four (4) main roles and responsibilities of the JKM in disaster management, as follows:

- Prepare and maintain evacuation centres for disaster victims;
- Prepare and distribute foods, clothes, and others basic needs to the disaster victims;
- Carry out the registration of disaster victims for recovery purposes;
- Provide guidance, advice/counselling to disaster victims.

The implementation of the roles and responsibilities of JKM is divided into three (3) stages, which are: (1) pre-disaster, (2) during a disaster and (3) post-disaster. The current information

management flow for humanitarian aid done by JKM is discussed in this paper based on all the findings gained from GO participants, as follows:

4.1. Level I: District disaster management and relief committee
The main roles and responsibilities of the Social and Welfare Department at the district level (JKMD) of the disaster management and relief committee are to recover and give help to the disaster victims. JKMD will open the evacuation centres that have been declared safe to become a shelter for disaster victims. Then, the JKMD will manage the registration of the disaster victims to track the record of their information. The disaster victims will be provided with several basic necessities throughout the disaster. The registration process will continue throughout the disaster. At the same time, the JKMD will also need to identify and record the information on disaster victims that have returned home. All the information will be updated to the district officer (DO), the Malaysia Civil Defence Force (APM) officer (the secretariat at district level) and the state Social and Welfare Department (JKMN) 4 times per a day. Moreover, the JKMD will provide food and water to the disaster victims. Each evacuation centre will be provided with sufficient stocks of food and water for 7 days.

4.2. Level II: State disaster management and relief committee
The information updated by the JKMD will be analysed and used by JKMN. The information will be used to update the Social and Welfare Department portal, called the 'Info Banjir JKM V2.0'. All the information will also be used during disaster management meetings at state level. Besides that, the JKMN is also responsible for providing food and other necessities to the disaster victims as well as being responsible for managing the volunteers and other government officers mobilized to the district or area affected by the disaster, if necessary. Besides that, JKMN also needs to update all the disaster information to the federal JKM 4 times per a day. Other roles and responsibilities of the JKMN explained by GO participants are listed as follows:

- Managing logistic facilities for land, air and water transportation for the purpose of supplies delivery.
- Update the latest disaster information to the Prime Minister, other ministers, the chairman of the disaster management committee at state level; post-scene control (PKTK), and the JKM control centre.
- Coordinate humanitarian aid requests from the district.
- Coordinate the contribution of goods and make distributions.
- Record types and the total amount of humanitarian aid that have been channelled to the disaster victims.
- Coordinate and monitor additional officers who have been placed in their respective states.
- Provide lists of volunteers' teams to assist disaster operations in other states if needed.

4.3. Level III: Central disaster management and relief committee
At central level, JKM needs to open a disaster operation centre after receiving a command from the KPKM. JKM at national level will also receive a disaster report from JKMN 4 times per a day. At the same time, JKM national must use the latest disaster information report from JKMN and update the information to the:
- Minister of Women, Family and Community Development (KPWKM);
- Deputy Minister of KPWKM;
- Chief Secretary of KPWKM;
- Highest Management of KPWKM;
- Director of Social and Welfare (KPKM);
- Highest Management of JKM;

- National Disaster Control Centre (NDCC).

Other than that, the roles and responsibilities of JKM federal are listed as follows:
- Coordinate humanitarian aid requests and the needs of disaster victims from the state.
- Coordinate the purchase of disaster-relief necessities according to their suitability and transfer to disaster relief storage facilities.
- Coordinate the needs of the additional volunteers needed by the state.
- Provide the latest disaster-related information to the ministers, KPWKM, KPKM, the media and others.
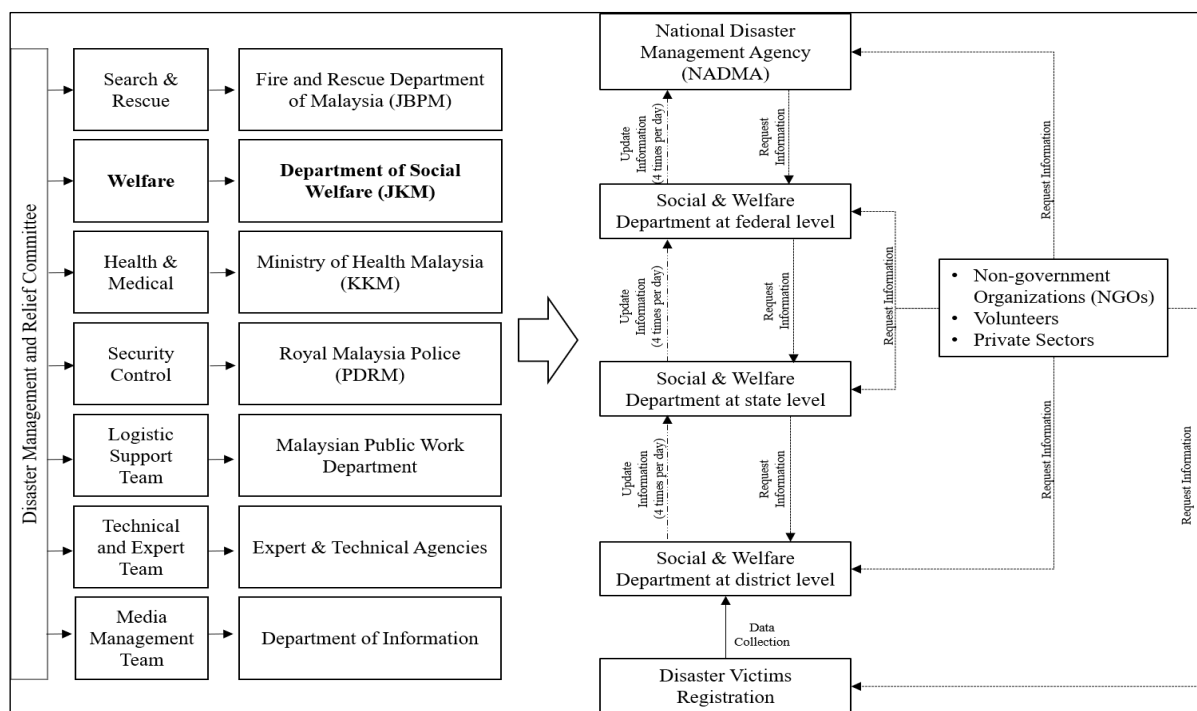- Coordinate the contribution of goods and manage humanitarian aid distribution.

Figure 2. Current information management flows of the social and welfare department during a disaster.

Meanwhile, three (3) of the NGO participants explained that their organizations will gather information on a disaster by referring to one of the disaster management stakeholders: The National Disaster Management Agency (NADMA), JKM federal, JKMN or JKMD. Five (5) of the NGO participants explained that their organizations gather information on disaster victims based on their own surveys. All the NGO participants stated that the information is important to their organizations to make decisions based on their capabilities in managing humanitarian aid.

5. Current disaster information management tools
According to all GO participants, current disaster information management tools used to disseminate disaster information among the disaster management stakeholders are through WhatsApp application, Short Message Service (SMS), Fax, Telephone, Media and warning system. This is in line with research conducted by Zakaria, Said [21], where all the tools were mainly used in disseminating the disaster information among disaster management stakeholders. All GO participants agreed that the used of WhatsApp application as a tool is the faster way in disseminating disaster information among the Government agencies however, the information could not be fully controlled by the Government

agencies. This is explained by the GO participants that, most of the disaster information spread through WhatsApp group created by them is too overwhelms and sometime are redundant. In the chaos situation, overwhelms and redundant information can affect the humanitarian aid activities especially in search and rescue task as well as welfare task.

    Moreover, all GO participants explained that overwhelms WhatsApp and SMS from the NGOs, private sectors as well as volunteers that request for disaster information's during disaster were also disturbing their task. All GO participants explained that during disaster they could not respond to NGOs, private sectors and volunteers to their request immediately due to chaotic situation. Consequently, all NGO participants explained that, most of NGOs, private sectors and volunteers tend to request information from others Government agencies that involved during disaster. This is one of the factors contribute to redundancy of disaster information that lead to problem in managing humanitarian aid distribution process. Besides that, all NGO participants were explained that, due to limited information gained from the government agencies has encouraged them to use their own initiative to obtain disaster information. Without a proper guideline from the Government agencies will lead to several problems in humanitarian aid management and it could affect the disaster areas as well as disaster victims.

6. Discussion

Regarding management of the humanitarian aid distribution information, it should be noted that, commonly, disaster management stakeholders should collaborate in managing and distributing such information. This will enhance the communication with better understanding between the disaster management stakeholders. This research has considered the main disaster management stakeholders providing humanitarian aid that focus on providing food and the distribution of basic necessities to the disaster victims. To improve humanitarian aid information management between disaster management stakeholders, therefore we would like to propose a new humanitarian aid information management system as shown in Figure 3. The proposed humanitarian aid information management system was developed based on information from all the participants in this research.
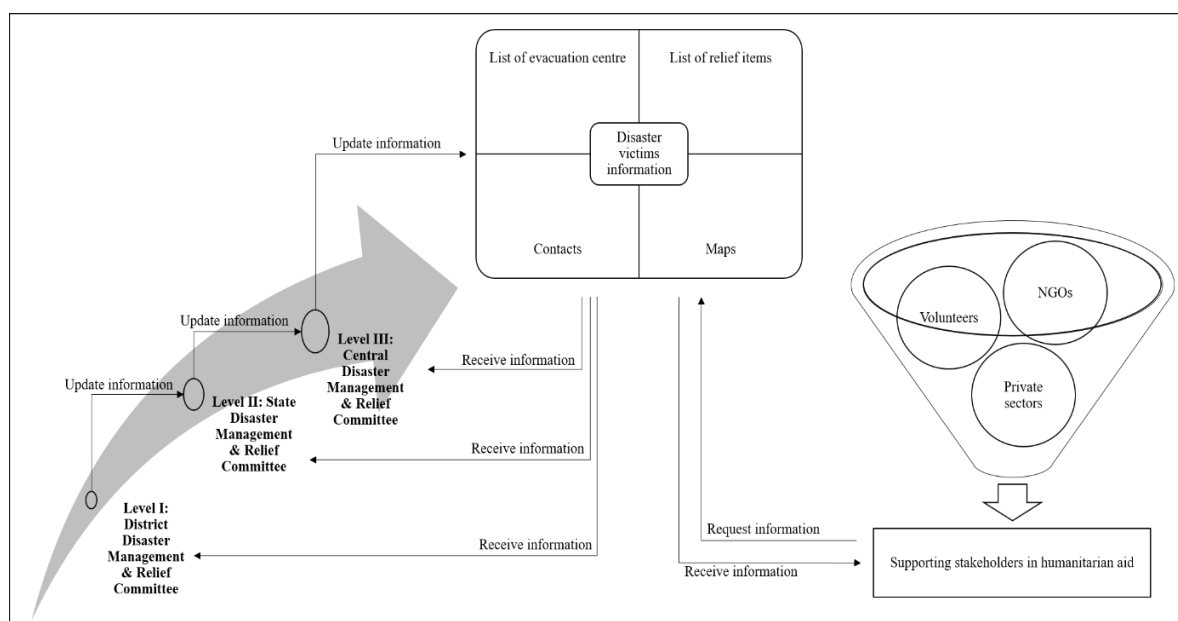

Figure 3. Humanitarian aid information management system.

    The new humanitarian aid information management system is very useful in order to improve and control the information management in a disaster. The system will also have the potential to avoid

known issues with information management, which are fraudulent reports and redundancy of disaster information. Due to the absence of a standard operating procedure (SOP) that explains the roles and responsibilities of NGOs in managing humanitarian aid distribution, this system is one of the potential platforms to allow Government agencies and NGOs to control and disseminate disaster management information.

7. Conclusion

Information management is the main important factor to manage the effectiveness and efficiency of the humanitarian aid distribution process. The different stakeholders within the humanitarian aid distribution process require strong collaboration and coordination to control and disseminate disaster management information. The major concern within the distribution process is how to facilitate, collaborate, and integrate the various stakeholders within humanitarian aid so that their mutual goal can be attained. The disaster management stakeholders should accomplish the humanitarian aid distribution process by using the humanitarian aid information management system to improve effectiveness and ensure efficient delivery of disaster management information. Consequently, to enhance and improve the humanitarian aid information management system, it could be integrated with new technology such as mobile applications. Therefore, further research will be conducted to integrate the humanitarian aid information management system with mobile applications in the hope of significantly mitigating the major issues in the humanitarian aid distribution process.

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