

## ABSTRACT

Information and Communication Technology (ICT) improvises emergency response in order to assist the rescue group to work effectively during disaster. However, the contribution of ICT for community has always been deserted. Community is always the first to cope with disaster as well as those who suffered most in disaster. Unlike the first line workers, members of community are not professionally trained to deal and confront with emergency situation. Perceived logical, common sense, and spontaneous decision often determine the types of action taken. These however lead to higher risk of losing lives and loss of properties. To determine the decision making for community during emergency and framework of community emergency fire response, Analytical Hierarchy Process (AHP) and Simple Multi Attribute Rating Technique (SMART) were compared in order to select a suitable technique for synthesizing the community decision making. Qualitative and quantitative research methodology is chosen to acquire criteria and alternatives for decision matrix development. The framework of community fire emergency response is proposed and validated through interview with experts. Data were obtained from Pasir Gudang community, who lives in high intensive area. The results revealed that community were very much concern on risks of human lives while making decision for fire emergency, and the priority action taken by community is to inform family members and neighbours to prepare for leaving the building. Future work suggests that the framework is used as approach for experts in designing emergency drill as well as established awareness and better understanding of decision making for community during fire.

## ABSTRAK

Teknologi Maklumat dan Komunikasi (ICT) mengimprovisasi tindakan kecemasan demi untuk membantu pasukan penyelamat dalam melaksanakan tugas dengan cekap dan berkesan semasa bencana. Namun begitu, sumbangan ICT kepada masyarakat sering diabaikan. Masyarakat selalu merupakan orang pertama yang tertimpa bencana dan juga menderita kesusahan. Berbeza daripada pasukan penyelamat, masyarakat tidak dilatih secara profesional untuk menghadapi dan menangani situasi kecemasan. Kelihatan logikal, akal sehat, dan keputusan spontan sentiasa mendorong masyarakat melakukan pelbagai tindakan, lalu menyebabkan peningkatan risiko terhadap nyawa dan pencerobohan. Bagi menentukan pengambilan keputusan masyarakat semasa kecemasan dan juga rangka kerja untuk tindakan kecemasan masyarakat terhadap kebakaran, Analytical Hierarchy Process (AHP) dan Simple Multi Attribute Rating Technique (SMART) dibandingkan untuk memilih teknik yang sesuai bagi mensintensis keputusan masyarakat. Kaedah kajian kualitatif dan kuantitatif dipilih untuk memperoleh kriteria-kriteria dan alternatif-alternatif bagi pembinaan matriks. Rangka kerja bagi tindakan kecemasan kebakaran untuk masyarakat dicadangkan dan disahkan melalui sesi temuduga dengan pakar-pakar. Data-data itu diperolehi daripada masyarakat Pasir Gudang di mana kawasan industri yang berintensif tinggi. Keputusan itu mendedahkan bahawa masyarakat sangat prihatin tentang risiko terhadap nyawa manusia semasa membuat keputusan, dan tindakan keutamaan yang diambil oleh masyarakat adalah menghubungi keluarga and jiran-jiran agar bersedia untuk meninggalkan bangunan. Cadangan penyelidikan pada masa depan adalah rangka kerja itu digunakan sebagai panduan bagi pakar-pakar dalam latihan serta tubuhkan kesedaran dan kemahaman yang baik bagi masyarakat dalam mengambil tindakan yang wajar terhadap kebakaran.

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## **CHAPTER 1**

### **RESEARCH OVERVIEW**

#### **1.1 Introduction**

Despite improvement of information and communication technology (ICT), the role of improvisation, adhocacy, and other emergency response has not diminished (Mendonca *et al.*, 2007). Administrative regions are mostly responsible to provide first line workers to respond to disaster rescue. Particularly in Malaysia; Pasir Gudang as one of the most industrial intensive area in the state of Johor are equipped with team of policemen, fire fighter and PAGEMA. PAGEMA is a special coordination unit which is activated in an event of emergency, especially related to industrial accidents.

Coordination is crucial, however not all people especially public has the proper skills and know how. In 2008, the public of Pasir Gudang were frightened by a huge gasoline reserve tank that caught fire at Tanjung Langsat, Pasir Gudang. The community of Pasir Gudang did not know what appropriate action they should take

for the situation. Parker *et al.* (1995) stated that most people have time to take protective actions during emergency but they often do not know what they ought to do. It is true that community is always unaware with disaster and thus they may not take any protective action towards disaster, whereas community who has not been trained and owning some emergency knowledge might hesitate to respond.

Individuals, groups and organizations from different backgrounds and levels of experience are always needed to be involved in emergency rescue. A solely relief will not succeed in disaster operation. According to Mendonca *et al.* (2007), “Collaboration – the process by which members of responding organizations think, work, and communicate to achieve common objectives – therefore has a central role in determining the effectiveness of emergency response.” However, cooperation and coordination between the community and rescue workers is the central to effective emergency response.

Today, a good coordination between the community and rescue workers is barely to be established during emergency rescue. Therefore, the community has to acknowledge with appropriate actions regarding emergency in order to carry out the task that requested by rescue workers. Once, as community understand the process of rescue operation and capable to accomplish the task given by rescue workers, a good cooperation between rescue workers and community can be established to succeed the emergency rescue. Furthermore, rescue workers and community can also communicate well if both parties understand their roles and responsibilities. A fast and better coordination between community and rescue workers can thus be established.

## 1.2 Background of Problem

Tsunami can be predicted, but unfortunately the information was not disseminated to responsible organization or at least to community in Aceh. No one knows with the Aceh Tsunami attack in December 2004. Formerly, everyone around the world was concerned with Taiwan's disaster. Because of the government's slow response and chaotic situation, community was victimized in the disaster. Heavy tolls of human lives were taken by Typhoon Morakot and its triggered flooding. The people were unaware with the state of disaster as well as unable to rescue themselves before the first line rescue workers came in place.

Communities are always the one who suffer most in every disaster. Thus, the member of communities or generally the public should know what appropriate decision to make in order to cooperate with rescue worker during disaster. The decisions have to address the issues of "how we act during this emergency". Without appropriate decision for the given situation, it will cost lives in chaotic state, and will potentially worsen the outcomes. Community should know how to act based on the understanding of risk involved.

Razak (2008) stated that disaster risk reduction should not only be viewed as the sole responsibility of Government; disaster can be reduced substantially if people are well informed about measures they can take to reduce vulnerabilities. In Malaysia, it is definitely community will not facing disaster such as earthquake, tsunami and typhoon, but however, fire, one of the man-made disasters is always happen in Malaysia. For instance, another huge fire that happened in Pasir Gudang was caused by a lightning during a thunderstorm in an evening of year 2006. The lightning strike Petronas Dagangan Berhad fuel supply depot at Johor Port and then caught fire, causing a massive inferno as well as explosion. The community was panic and do not know how to act towards the disaster. Hence, most of them were running far away

from the district to save themselves from fire and affected massive traffic happened along the Pasir Gudang highway. Meanwhile, it also influenced the response time of rescue workers.

In brief, being aware of appropriate action taken in an event of fire is essential for community in order to reduce risk of disaster in community level as well as established a good cooperation and coordination between community and rescue workers during rescue operation.

### **1.3 Statement of Problem**

The research question of this study is how to develop a community emergency fire response framework that can ensure effective communication between community and rescue workers?

### **1.4 Objectives of Research**

This study embarks on the following objectives:

- i. To conduct survey with regards to community decision making in case of fire incident.

- ii. To design instrument and acquire information for criteria for decision table development.
- iii. To develop a framework that able to help communities to make decision in emergency situation.
- iv. To validate the proposed framework through interview with experts.

## **1.5 Scope of Research**

This research is based on the assumption that the presence of framework for community emergency fire response will be effective for cooperation between rescue groups and community.

The study will focus on Pasir Gudang district; the most industrial intensive area in the state of Johor. In the past, numbers of fire incidents occurred at high risk industrial area such as Johor Port and Tanjung Langsat Port in Pasir Gudang.

The data collected via questionnaires were distributed to respondents, who are Pasir Gudang communities, which were randomly selected by the author.



## **1.6 Significance of Research**

The significances of this project are:

- i. A better cooperation of communities with rescue groups can be established.
- ii. Fast coordination and decision making can shorten the time spent in any relief operation.
- iii. Reduce risk of disaster at community level especially the communities in high risk area.

## **1.7 Chapter Summary**

Synthesizing an emergency response framework based on criterion is essential. Risk can be reduced if communities know what appropriate action to make in an event of fire. Simultaneously, a better cooperation between communities and rescue workers can be established.