WASTE MANAGEMENT: A QUALITATIVE STUDY EXPLORING THE PERCEPTION OF FLOOD WASTE MANAGEMENT AMONG THE COMMUNITY OF PASIR MAS

NZM Saat[1*], Muhammad Ikram AW[2], Nur Ashikin MS[3], Zawaha I[4], Siti Aishah H[5], Nor Malia A W[1], Siti Norasmarina M[1] and Muhammad Mustaqim SMS[1]

Programme of Biomedical Science, School of Science Diagnostic and Applied Health, Faculty of Health Science, Universiti Kebangsaan Malaysia[1*]
Programme of Environmental Health and Occupational Safety, School of Science Diagnostic and Applied Health, Faculty of Health Science, Universiti Kebangsaan Malaysia[2]
Faculty of Economic and Management, Universiti Putra Malaysia[3]
Institute for Health Behavioural Research, Ministry of Health, Bangsar, Kuala Lumpur[4]
Faculty of Information Science and Technology, Universiti Kebangsaan Malaysia[5]

*Corresponding author: nurza@ukm.edu.my

ABSTRACT

The purpose of this paper is to examine the 2014 post-flood waste management in affected area. For this purpose, Pasir Mas in Kelantan was chosen as the sample area and interviews were conducted with the residents. The interviews aim to gather information about post-flood waste produced, sources of the waste, actions taken by the residents and related authorities bodies to clear the waste, impact of the waste on their living surroundings and health, and assistance needed to manage the waste. A total of 39 respondents consisted of 20 men and 19 women were selected at random for focus group discussion. These respondents represent persons of age 25 years old and above, local and whose living quarters have been affected by the flood. The large volume of mud left by the flood has been identified by the participants as the main source of the post-flood waste. In addition, good cooperation between government agencies and the residents is important to speed up the waste clearing works. However, residents are in much needed support, awareness and education about the impact of long due waste clearing on their health and living environment.

Keywords: disaster, flood, waste management, Pasir Mas, focus group discussion

1. INTRODUCTION

Flooding is a natural phenomenon that frequently occurs in the form of the disaster and brings high risks to the people involved. The frequency of flooding happens nowadays has spawned an atmosphere that does not calm the residents at risk, because flooding can occur any time and increasing its range since the 1970s. Moreover, the estimated average total annual rainfall received for Peninsular Malaysia around 2500 mm (Malaysian Meteorological Department, 2011) has placed Malaysia as among the countries which receive the highest rainfall every year. While in Asia, statistics indicate that natural disasters since 1992 to 2002 disasters including flood disaster have affected the lives of a total of 1.7 million people and have claimed a total of 420867 people. It also involves the loss of the property of us 369362 million dollars (Haryati, 2010). Besides that, the phenomenon of flooding and erosion is the natural disasters that occurs almost every year in the East Coast region of Peninsular Malaysia. In the State of Kelantan, rainfall during the month of November to January has increased up to 1750mm. This situation has resulted in the problem of flooding as the erosion rates has also increased dramatically. Large floods wash away homes and damage other items such as electrical goods, cars and so on. Thus, this leads to a major loss to the residents. In addition, flood also often leave solid residues in large quantities after the flood receding (Lamond 2012).

In Kelantan, flood 2014 in nine colonies consisted of 34955 from the signup list at evacuation centers. Those affected colonies were, Gua Musang, Jeli, Kota Bharu, Kuala Krai, Machang, Pasir Mas, Pasir Puteh, Tanah Merah, Tumpat and Kota Baru. Water levels in some of the main river trunked up with Sungai Kelantan in Tangga Krai, reaching 34.11 ft and surpassing the danger of 25 m, bridge 22.63 m (danger of 16 m) and in the Tambatan Diraja 6.88 m (5 m hazard).(Utusan Online, 2014)

2. METHODOLOGY

A total of 39 respondents consisting of 19 men and 20 women were randomly selected. Among The respondents were 25 years old and above, the locals, and directly affected by flood in 2014. The respondents were selected from the area hit by the flood disaster, namely Pasir Mas and were divided down into several groups of men and women separately ranging from 7 to 8 people.

Table 1. Research questions addressed in the present study

Research Questions
1. How did the people identify the type of flood waste?
2. What are the ways used to manage the flood waste?
3. What are the factors of effectiveness in flood waste management?
4. Was the health education about the flood waste management exposed to the people?

Selection of study sites and participants
The society of Pasir Mas within Kelantan was identified. The focus group participants consisted of the society with the age of 24 to 79 years old who were involved in flood 2014. All group discussions were conducted in Bahasa Melayu.

The study was conducted according to the guidelines written by the expert of the field at University Kebangsaan Malaysia. All the villagers in Pasir Mas received the information about the study and its purpose and provided written consent to participate. Money was provided as an incentive for the people to participate.

Focus Group Questions
A set of focus group discussion questions based on the research questions were organised into six topic areas and were formulated in Table 2.

Table 2. Questions for the focus group discussions

Broad topic area	Probes and Prompts
1. The background of participants	'Can you explain your background? ' 'Did you attend any course of the flood waste management?' 'When was the last time you received the information about the flood waste management (3R)?'
2. The perception on flood	'Does the waste bring the problems?' 'How can we solve the problems of waste?' 'Based on your experience, why do people take time to solve the waste problem' 'What do you do to control the waste effectively?' 'What are the types of waste?'
3. The disease	'What are the types of diseases happened due to the waste?' 'What do you do to avoid the infection of disease?' 'How did you get the treatment? Where?'
4. Difficult to manage the waste	'How do you manage the waste?' 'Is there any enforcement by the government?' 'What did the government do to manage the waste?' 'Was the enforcement by the government effective?'
5. Involvement of society	'Which agencies were attended?' 'Is there any 'gotong-royong' value among the people?' 'What were the types of 'gotong-royong' held?'
6. Health education exposure	'Is there any health education activity for people?' 'The activities - before, present and after the flood?'

Conduct of the focus groups

All focus groups were held in Pasir Mas and refreshments were provided to participants at the end of discussion. The discussion was confidential.

One of the interviewers was assigned to conduct the discussion and three facilitators were assigned as observers and note takers. The note taker documented important characteristics of group members not otherwise known, non-verbal behaviour, interaction and other key points to help them interpret the transcripts.

The participants provided written consent for the discussions to be digitally recorded. Moreover, the discussions were transcribed in full with the identity of groups retained. The participants provided background or demographic information.

3. RESULTS

Group and participant characteristics

Four focus groups were conducted, two on the first day and two on the second day. The total of participants was 39 and each group consisted of eight to ten participants.

Table 4 shows the summary of the demographic characteristics of participants. Most participants were males (51.2%) and the rest were females (48.7%).

Table 4: Demographic profile of participants: 39 participants aged 24-79 years, Pasir Mas, Kelantan.

Varibles	Percent (n=39)
Sex	
Men	51.2%
Women	48.7%
Religion	
Islam	100%
Kristian	0%
Buddha	0%
Hindu	0%
Other	0%
Race	
Malay	100%
Chinese	0%
Indian	0%
Others	0%

Marital Status	
Single	69.23%
Married	7.69%
Widow	23.07%
Occupation	
Housewife	48.7%
Self employment	51.2%
Address	
Kg. Seberang Pasir Mas	100%
Duration of Settlement	
< 10 Years	7.6%
11-50 Years	25.6%
> 51 Years	66%
Flood Involvement	
YES	100%
NO	0%

The thematic findings are summarised below in relation to the research questions.

How did he people identify the type of flood waste?

Participants described the type of flood waste in the interviews. Food, vegetables, leaves, bottles, plastics, tin, wood, furniture, electrical item, iron, bamboo, cloths, carpet, pot and mat were the waste.

When asked to identify the waste, participants stated the variety of items that were damaged due to the flood. Some of them described the electrical items and furniture destroyed but they also kept items which could still be beneficial to them. They threw the items that were fully damaged (R3, FGDL2, Lelaki, Pasir Mas, 30 tahun) : "baghe - baghe elektrik gapo tu gak, perabot apo tu abih. Serupo baghe- baghe elektrik tu, ado hok bulih bulih guno..ado hok abih, abih lah tokleh guno, srupo tv apo tu Alhamdulillah la bulih guno. Macey almari ko, katil ko abih doh la".

Others mentioned that many things were unable to be used: (R7, FGDP2, Perempuan, Pasir Mas, 70 tahun) : "oloh banyok lah baghe. Kapet kapet abih. Punoh abih. Cabut pintu cabut sorok. Kito sepuluh bijik almari. Sepuluh bijik habih. Periuk periuk teggeley abih. Peti teggeley, mesin basuh"

What are the ways used to manage the flood waste?

The waste was destroyed by many ways. The majority of participants managed the waste with their own way, for examples burning, throwing to the dustbin

and putting it into the ground. Some of them hired children to get their waste and throw it into the dustbin at the main road. For example, (R9, FGDL1, Lelaki, Pasir Mas, 62 tahun) : "hok bakar api bakar api.tambang bin gi tohok mano-mano gi buwey". This statement shows the ways they managed the waste individually.

What are the factors of effectiveness in flood waste management?
The effectiveness of waste management occurred by doing the 'gotong-royong' among the society. Some participants helped only their neighbours, relatives or sibling, then there was no cooperation to help other people. Like the statement, (R7, FGDP2, Perempuan, Pasir Mas, 70 tahun) : "kito? kito erm adiknyo natu maghi hok duk Pahang nuh.dio itu nge jack water". But they would help to clean the certain public places together such as the mosque and school. Besides that, the NGO was also involved in helping the victims. In terms of medicine service, the government side came and gave some of the free medicine like panadol.

Was the health education about the flood waste management exposed to the people?
Participants had their own views on the health education after the flood. Majority stated that the people from the Ministry of Health did not come to Pasir Mas to explain about the health education. Only one participant, (R10, FGDL2, Lelaki, Pasir Mas, 50 tahun) : "dia bagi risalah-risalah tu (pamphlet)". The view shows there was assistance of health pamphlets from the government. Some participants got the treatment at the hospital and clinic while the minority said about they got the medicine from the pharmacy.

4. DISCUSSION

This section explains the outcomes from the focus group discussion. There were two types of waste that can be divided which , the organic waste and the non-organic waste. Organic waste included the food, vegetables and leaves. For the non-organic waste, the components were the bottles, plastics, tin, wood, furniture, electrical item, iron, bamboo, cloths, carpet, pot and mat. Another study by Douglas et al.(2008) stated that flood water carried organic waste into people's homes due to the small streams and rivers overflow to the urban areas.

The second aspect was the effectiveness of waste management, which can be divided into three sub-themes which were the waste management by individually, the assistance of NGO and the assistance of the government sectors. Participants used many ways to manage the waste including burning, putting the waste into the ground and so on. Some of them needed to hire other people like children to throw away the garbage. Moreover, they solved the waste in their house before helping the neighbours or relatives. Then, the 'gotong-royong' value arose among them. But, some participants helped only their neighbours, relatives or siblings, and there was no cooperation to help other people. Meanwhile, they showed their cooperation to clean the certain places like mosque and school. Besides that, the NGO also provided the assistance to then. These people came from all places in Malaysia like Penang, Negeri Sembilan, Kuala Lumpur, even the universities students took part in giving assistance to people in Pasir Mas. Other studies suggested that the effectiveness of waste management was to educate people to proper waste disposal and enforcement of municipal law (Douglas et al. 2008). A study in Sri Lanka, proposed a model of waste management on disasters which consists of reduce generation of waste, collecting waste, transporting waste to relevant site, processing of waste and disposing of waste (Karnasena et al.2009)

The next point referred the factors of ineffectiveness in waste management, which was due to the weaknesses of the system. In the residences opinion there were no standard operation procedures (SOP) to manage the waste. Moreover, participants also did not get any information about the waste management activities and this situation would lead to the ineffective ways to manage the waste. Then, the effect of flood suggests us that the waste became the burden to people, because people had to struggle to clean the mud at their place. So that, the process of clearance took too much time to clean it. A study in a few countries in Africa such as Mozambique, Uganda, Kenya and Ghana emphasises that the major cause of poor waste management is due to poor management of existing drainage, human factors and unplanned urban development (Douglas et al. 2008)

Next, the diseases such as dengue, malaria, TB, fever, leptospirosis, vomit, poisoning and diarrhea also arose because of the waste, as the failure of the waste management affected people's life. When people got the disease, they needed to get the treatment at the hospital, clinics, pharmacies and other. As a prevention, they used the common ways like cooking the food and drink and washing their hands before eating. The mud produced after the flood had given a lot of trouble to people in terms of the health. A study done by Shultz et al. (2005) explored the type of disease occurred after the disaster hurricane such as malaria, measles, typhoid, gastrointestinal disease, infection hepatitis and others.

5. CONCLUSION AND IMPLICATIONS

Flood on 2014 which occurred in Malaysia especially on the East Coast Country, Kelantan was disastrous. The effect of the flood can caused difficulties to the residents due to the increase of waste level which required their properties to be vacant. The waste was wood, bottles, furniture, cloths, books and so on. Having less cooperation among the people was one of the problems to solve the waste. All agencies, including NGO and the government have to take fast actions when flood happens in the future to find coordination in solving the issue.

6. ACKNOWLEDGEMENT

7. REFERENCES

Brown, C., Milke, M., & Seville, E. (2011). Disaster waste management: A review article. Waste management, 31(6), 1085-1098.

Douglas, I., Alam, K., Maghenda, M., Mcdonnell, Y., McLean, L., & Campbell, J. (2008). Unjust waters: climate change, flooding and the urban poor in Africa. Environment and Urbanization, 20(1), 187-205.

Haryati Shafii & Sharifah Meryam. (2010). Kajian Pengurusan Banjir di Lembangan Sungai Batu Pahat, Johor dan cabaran-cabaran yang dihadapi oleh PBT., Persidangan Kebangsaan Masyarakat, Ruang dan Alam Sekitar, 297-312.

Igawa, N. and H. Nakamura, (2001). All Sky Model as a standard sky for the simulation of daylit environment. Building and Environment, 36: p. 763-770.

International Daylight Monitoring Programme, [Online], Available: http://idmp.entpe.fr/ [16 June 2008].

Karunasena, G., Amaratunga, D., Haigh, R., & Lill, I. (2009). Post disaster waste management strategies in developing countries: case of Sri Lanka. International Journal of Strategic Property Management, 13(2), 171-190.

Lamond, J., Bhattacharya, N., & Bloch, R. (2012). The role of solid waste management as a response to urban flood risk in developing countries, a case study analysis.

Kittler, R., (1985). Luminance distribution characteristics of homogeneous skies: a measurement and prediction strategy. Lighting Research and Technology, 17(4): p. 183-8.

Perraudeau, M., (1988). Luminance models. In National Lighting Conference. Cambridge, UK, March 27-30.

Shultz, J. M., Russell, J., & Espinel, Z. (2005). Epidemiology of tropical cyclones: the dynamics of disaster, disease, and development. Epidemiologic reviews, 27(1), 21-35.

Utusan Online. Banjir Gelombang Kedua Landa Kelantan 18 Disember 2014 http://www.utusan.com.my/berita/nahas-bencana/banjir-gelombang-kedua-landa-kelantan-1.37766 (accessed online 15 September 2015)