

ISSUES AND CHALLENGES IN THE EXECUTION STAGE OF POST-
DISASTER RECONSTRUCTION FOR PROJEK RUMAH KEKAL BAHARU

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ISSUES AND CHALLENGES IN THE EXECUTION STAGE OF POST-
DISASTER RECONSTRUCTION FOR PROJEK RUMAH KEKAL BAHARU

SHARIFAH RADHIAH BINTI SYED AZMAN

A project report submitted in partial fulfillment of
the requirements for the award of the degree of
Master of Technology and Innovation Management

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To my beloved mother and father

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ABSTRACT

With the changing of world climate the world now is prone to disasters, be it natural disasters; man-made or could be both. In disaster management, there are four phases which are mitigation, preparedness, response and recovery. In this research it covers the recovery phase which is the post-disaster reconstruction of housing and rehabilitation. Post-disaster recovery is a broad and multi-faceted procedure that includes physical, monetary, physiological, social administrations, natural and ecological aspects. Malaysia rarely hit by a monstrous disaster as it geographically located outside the pacific ring of fire. Nonetheless, every monsoon season the East-coast area are prone to flood. In the recent massive flood in 2014, many lives and houses were lost. The objective of this research is to explore the issues and challenges in execution stage of the post-disaster reconstruction which in case study of *Projek Rumah Kekal Baru* (RKB). A thorough review of literature and case studies from previous disaster event had been referred. This research is qualitative base and all data and information are collected are using primary and secondary sources.

ABSTRAK

Dengan perubahan iklim dunia sekarang, kita terdedah kepada bencana, sama ada bencana alam; bencana buatan manusia atau campuran kedua-duanya. Dalam pengurusan bencana, terdapat empat fasa iaitu mitigasi, kesiapsiagaan, tindak balas dan pemulihan. Dalam kajian ini ia meliputi fasa pemulihan yang merangkumi pasca bencana pembinaan semula perumahan dan pemulihan. Pemulihan selepas bencana adalah sangat luas dan mempunyai pelbagai prosedur termasuklah fizikal, kewangan, fisiologi, pentadbiran sosial, alam dan ekologi. Malaysia jarang dilanda bencana besar kerana kedudukan geografi yang strategic iaitu diluar kawasan lingkaran api Pasifik. Namun begitu, setiap musim tengkujuh kawasan Pantai-Timur Malaysia terdedah kepada banjir. Dalam kejadian banjir besar yang melanda negara pada tahun 2014, banyak nyawa dan rumah- telah hilang. Objektif kajian ini adalah untuk meneroka isu-isu dan cabaran pasca bencana dalam melaksanakan pembinaan semula dan pemulihan rumah bagi Projek Rumah Kekal Baru (RKB). Satu kajian literatur menyeluruh dan kajian kes dari peristiwa bencana sebelum ini telah dirujuk. Kajian ini adalah berasaskan kualitatif dan semua data serta maklumat yang dikumpul menggunakan sumber primer dan sekunder.

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LIST OF ABBREVIATIONS

CIDB	-	Construction Industry Development Board
HODT	-	Head of Design Team
HOPT	-	Head of Project Team
JD	-	Jurutera Daerah
JKKPBB	-	Jawatankuasa Penempatan Kekal dan Pembaikan Kerosakan Rumah Pasca Banjir
JKR	-	Jabatan Kerja Raya
KKR	-	Kementerian Kerja Raya
MKN	-	Majlis Keselamatan Negara
NADMA	-	National Disaster Management Agency
PBT	-	Pihak Berkuasa Tempatan
RKB	-	Rumah Kekal Baharu
TNB	-	Tenaga Nasional Berhad
UNISDR	-	United Nations International Strategy for Disaster Reduction

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CHAPTER 1

INTRODUCTION

1.1 Introduction

Post-disaster reconstruction and rehabilitation is a complex issue with different dimensions. Post-disaster reconstruction projects often deals with uncertainties (Hayles, 2010; Sun & Xu, 2011) complexity (Bello, 2006; Boano & García, 2011; Wardak et al., 2012; Ye & Okada, 2002) and is being as consider one of the most challenging tasks to deal with for those involved in reconstruction of disaster-affected areas. Post-disaster recovery is s a comprehensive and multi-layered procedure that integrates physical, monetary, phycological, social administrations, natural and ecological aspects (May, 2003). Reconstruction should be clearly defined, well planned, and implemented in stages (Roosli, et.al, 2012). Yi & Yang (2014) suggested that Post Disaster Reconstruction (PDR) require existing tools or new tools to be adapted, that if not well planned and implemented, can create further vulnerabilities in a disaster-affected community (Chang & et.al, 2010). Planning for reconstruction from a disaster must be realistic and reflective. Without a plan, it is impossible to predict or expect a successful recovery (Ye & Okada, 2002).

In this research, the focus is to explore the issues and challenges in the execution stage of the post-disaster reconstruction. The next section in this chapter begins by demonstrating the importance of the post-disaster reconstruction and policies practices

in Malaysia. The significance of the study, research problems and the operational definition sections will follow through.

1.2 Background

According to Rautela (2006), the world has for centuries, been through many disasters that causes damages to the beings especially human, and this appears parallel to human race being existed. A disaster can be defined as an interruption of human activity causing major human, materials or environmental losses which beyond the capability of affected society to survive using its own resources.(Australian EMA, 1998). According to Mutugi & Maingi (2011), a disaster is defined as a phenomenon which gives destruction or loss of equity, infrastructures and human resources.

As mentioned by Shaluf, (2008) there are three types of disasters which are (1) natural disasters resulted from natural forces (e.g. earthquakes, typhoons, floods); man-(2) made disasters caused from human decisions; and (3) hybrid disasters that occurs because of from both natural and man-made causes. Rahman, (2014) also share the theory that natural disaster with natural environment mostly happened due to human actions such as over-exploitation of natural resources and unsustainable development. Every country in the world nowadays is at the threat of exposure to some type of disaster, either natural or man-made, and either slow or rapid onset (Kangabam, Panda, & Kangabam, 2012). This event was complex and requires a long period of time and need management that includes coordination, collaboration of various agencies, capital, work force and equipment (National Security Council of Malaysia. 1997).

Every part of the world nowadays is prone to natural disasters. In Figure 1.1 shown a chart that shows the number of loss event happened worldwide has increased in the millennium era compare to the event during the 1980s. For example, the Sri Lanka flood in 2003, Indian Ocean Tsunami in 2004, earthquake in Bagh, Pakistan in 2005,

China 2008, Indonesia 2009, Haiti in 2010 and Japan 2011 and typhoon in Philippines 2013, worth billions of reported damages (Ismail, et al, 2014).

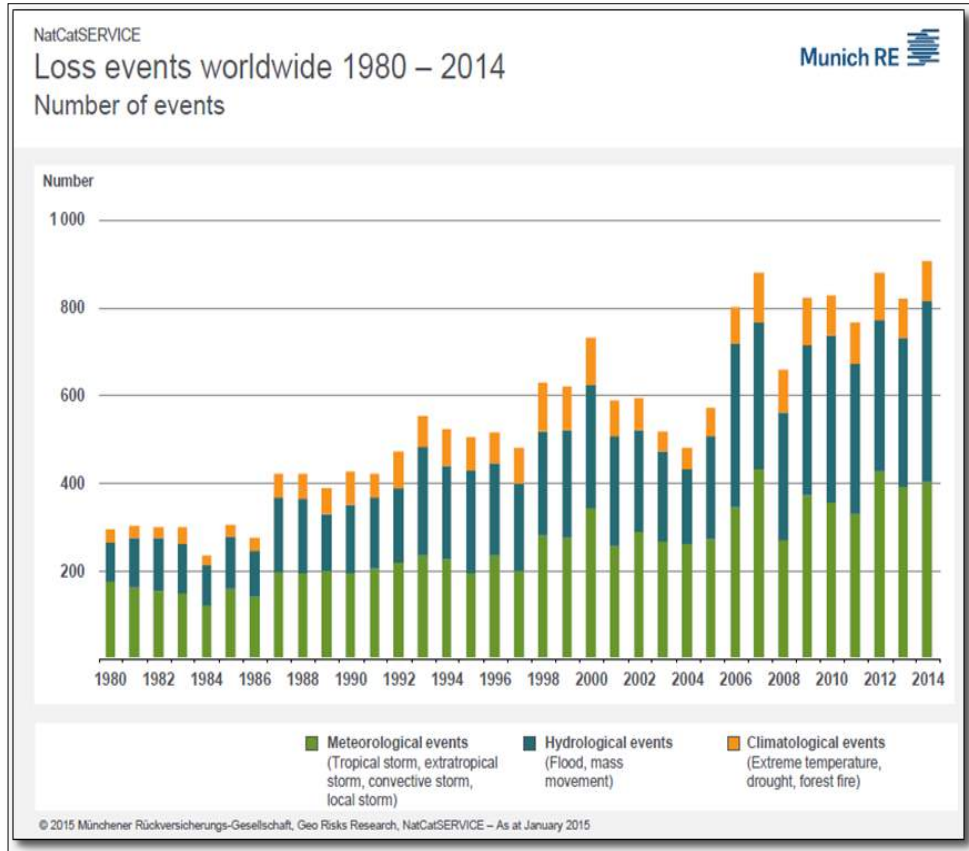


Figure 1.1 Number of loss events worldwide from 1980-2014

As reported in the UNISDR, the impact of disasters within the last 10 years caused 1.4 \$Trillion worth damaged, with 1.7 billion people affected and 0.7 million people were killed as shown in Figure 1.2

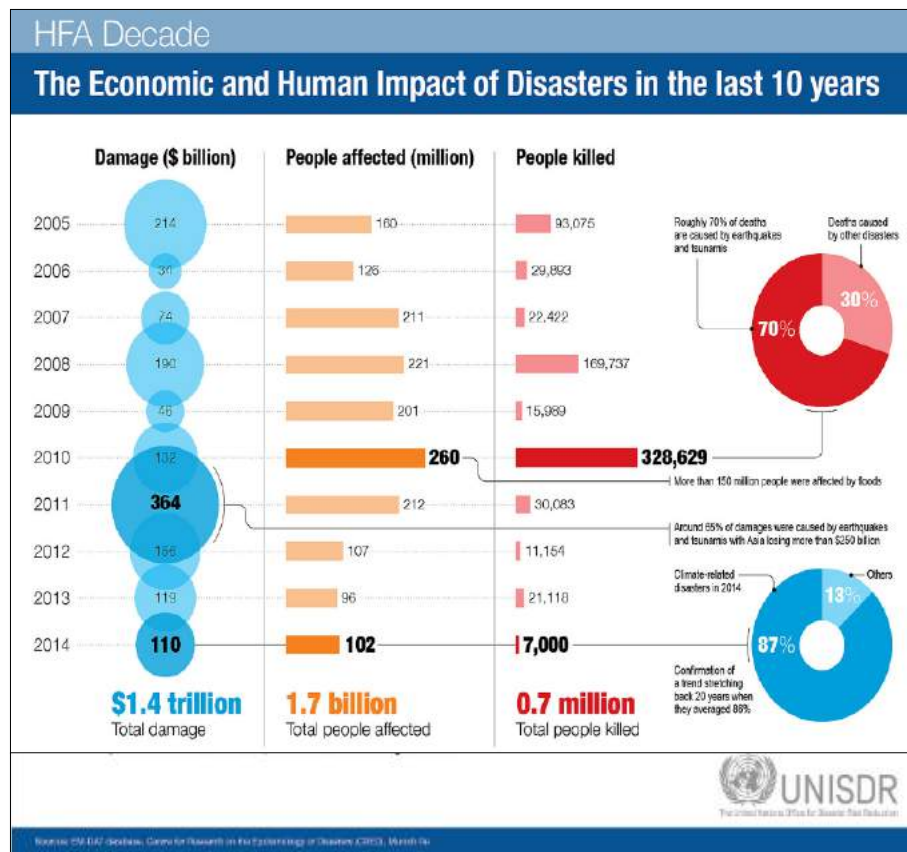


Figure 1.2 The economic and human impact of disasters in the last 10 years

Recently, in December 2014, a number of 232,913 registered evacuees in various evacuation centers across Peninsular Malaysia due to the massive flood (MERCY,2014). In early March 2015, an earthquake hit Nepal that incur 8800 loss of lives and livings but most surprising that recently hit Sabah, Malaysia with 5.9 magnitude of earthquake befallen in Ranau close proximity with the Mount Kibabalu that causes 19 death. Sadly but true, with the changes of world climate (W. Ibrahim & Abdurahman, S.M., 2015) and the movement of earth pectoral, Malaysia was known as the country outside of the *ring of fire* has now also become affected and need to face the impact of natural disasters .

1.2.1 Post-disaster Housing Recovery and Reconstruction

Housing, as an integral part of the built environment, is a unique phenomenon and has its unique political, economic, and social connections with humans (Clapham, 2009). Aside from the fact that the United Nations charter of human rights (Article 25 of the Universal Declaration of Human Rights) establishes the right to adequate housing as an essential to human right, the housing infrastructure of an urban region is necessary for the social steadiness and economic competitiveness of regions (Yan, 2012). As Zhang and Peacock (2010) suggest that housing recovery is key to revitalizing communities following a major disaster. The level of community resilience to natural disasters is not only a function of the physical built condition, but it is also affected by the degree to which social systems can absorb and adjust to systematic stresses introduced by natural phenomena (Kamel, 2004). The phase of post disasters reconstruction remains inefficient and less manageable even though the numbers of experience in managing this issue are increasing (Halvorson and Hamilton, 2010, Lloyd-Jones, 2006, Sawyer et al., 2010).

1.2.2 Background of flood in Kelantan

East coast peninsular Malaysia has received more than usual amount of rain in December last year. The monsoon season has worsened the situation and the area has been hit by the massive flood. The sea level becomes higher than usual, and water from the land was not able to travel back into the sea..From the 10 territories in Kelantan, 8 of them were affected by the massive flood from December 26, 2014 until January 2, 2015. 232,913 evacuees had registered at various evacuation centers across Peninsular Malaysia due to the massive flood (MERCY, 2014). The observation from the disasters survivors shows that, everyone in downstream and upstream area is affected by the flood. Unusual tragedy happen when the upstream area that never affected during previous flood are affected this time. Their house has been swept by the massive flood and the remaining house is covered with huge amount of clay (Azuhan, 2015).

1.2.3 NSC Directive 20

In Malaysia, we have NSC Directive 20 which is a policy and mechanism of national disaster management and relief created by the Prime Minister Department (JPM) functioning under the National Security Division (BKN). It is some sort of mechanism to administer movements to be taken by rescue agencies and Special Malaysia Disaster Assistance and Rescue Team (SMART) during major disaster occur to ensure all actions are carried out smoothly, effective and efficiently. (Directives National Security Council, 1997). This directive covers any incident which causes damage to a land property and the loss of many lives and such incident could occur in public areas and building such as housing estate or airport while air disaster shall be divided with the Department of Civil Aviation (Directives National Security Council, 1997). In this directive, it explains types of disasters that being covered including flood, fire, land slide and nuclear and radiology disaster. The disaster management is being divided into three levels; Level 1 (controlled and manage by District area), the committee ensures coordinated actions, with sufficient asset and human resources, in relation to the media. Level II (controlled and manage by State area), must provide to the District assistance such as financial aid, assets and human resources. Level III (controlled and manage by National), the committee must determine the national disaster management policy, finance, assets and human resources.

Directive 20 also outlines the agencies and organizations and their responsibilities at various administration levels to ensure effective coordination and mobilization of resources when handling disasters (M. Sukeri & Shazwani K., 2015).

It is complemented by other sectoral legislation in forming a comprehensive framework, including the Land Conservation Act; Environmental Quality Act; Town and Country Planning Act; Irrigation and Drainage Act; and Uniform Building by Law. The Directive prescribes the management mechanism according to the level and complexity of disaster and determines the roles and responsibilities of various agencies

to ensure effective coordination and mobilization of resources when handling disasters (National Progress Report 2011-2013, 2013).

1.2.4 Hyogo Framework

The Hyogo Framework for Action 2005-2015 (HFFA): Building the Resilience of Nations and Communities to Disasters (UN/ISDR, 2005) in 2005 and the establishment of the Global Platform for Disaster Risk Reduction in 2006 is the “first plan to explain, describe and detail the work that is required from all different sectors and actors to reduce disaster losses. It was developed and agreed on with the many partners needed to reduce disaster risk - governments, international agencies, disaster experts and many others - bringing them into a common system of coordination”. (UNISDR, 2005). In spite of efforts made to achieve this goal, the five year period between 2005 and 2010 has seen an increased number in major disasters. (Yan, 2012).

1.2.5 *Projek Rumah Kekal Baharu (RKB)*

There are four phases of housing recovery which encompass of emergency sheltering, temporary sheltering, temporary housing and permanent housing (Patricia Marr Cole, 2003). This study will focus on the permanent housing stage for the victims of Kelantan massive flood in 2014. According to the Head of Project Team, Pn Samini Omar there were 2094 houses need to be reconstruct and JKR is the agency responsible representing the Federal Government to rebuild 1141 houses in Kelantan. The massive flood in 2014/2015, did not just hit Kelantan, but other places including Lipis and Jerantut Pahang, Terengganu and Perak. However, Kelantan was hit the worst especially in Kuala Krai and Gua Musang (Persidangan Pengurusan Bencana Banjir, 2015).

1.3 Significance of study

Previous evidence shows that when media and public attention has retreated in the consequence of an event, the survivors in disaster-affected areas are left with significant challenges of recovering from disaster (Yan, 2012). In Directive NSC 20, there is no specific term, policy or guidelines for the after event which is post-disaster recovery. It is basically a framework before and during the event of rescue. This may happened because Malaysia is hardly ever hit by monstrous disaster that caused loss of 25lives, 2,094 loss of houses and 5594 houses in need of repair. The impact of the flood has caused RM878 million. During the event. there was neither system or organizations in control clearly about the reconstruction of casualties' of homes nor any specific current worldwide data in regards to post-catastrophe lodging is fundamental to suit with national circumstance in Malaysia (Roosli & O'Keefe, 2013). Previously it was *Majlis Keselamatan Negara* (MKN) under the Prime Minister Office who oversees any disastrous event in Malaysia. However, according to W. Ibrahim & Abdurahman, S.M. (2015) even after six months of the monstrous flood, there are still families of victims living in tent. Thus, the impact of this monstrous disaster has resulted in the establishment of *Agensi Pengurusan Bencana Negara* (NADMA) in September 2015. The government set up the National Disaster Management Agency (NADMA) to coordinate and manage disaster relief in countries with more organized and effective.

1.3.1 Importance of Post-disaster Housing Recovery and Reconstruction

Housing, as an integral part of the built environment, is a unique phenomenon and has its unique political, economic, and social connections with humans (Clapham, 2009). Aside from the fact that the United Nations charter of human rights (Article 25 of the Universal Declaration of Human Rights) establishes the right to adequate housing as an essential to human right, the housing infrastructure of an urban region is necessary for the social steadiness and economic competitiveness of regions (Yan, 2012). As Zhang and Peacock (2010) suggest that housing recovery is key to revitalizing

communities following a major disaster. The level of community resilience to natural disasters is not only a function of the physical built condition, but it is also affected by the degree to which social systems can absorb and adjust to systematic stresses introduced by natural phenomena (Kamel, 2004).

Updated until June 2016, 844 houses has been successfully completed, and given to the victims, with 243 is still under construction. Therefore it is an urgent need for us to further explore the execution stage of this project and to find the issues and challenges faces that cause the project to be incomplete.

1.3.2 Project Management in Post-Disaster Reconstruction

Project management is defined as a temporary process to make a unique product, services or result (PMI, 2008). Every project management has the specifics beginning time and specific ending time. Every project is different and unique from one and another. According to PMI (2008) there are several applications that need to be implemented in the project activities to meet the project requirement such as application of knowledge, skills, tools and technique. Initiating, planning, executing, monitoring and controlling, and closing are the five processes in the project management.

According to Moe and Pathranarakul (2006) the post disaster project can be categorized in a construction project. Every post-disaster project is unique because of it has different circumstances, it has a features and it has several scopes. According to smith et al (2008), project life cycle will be register with a different number from the range of two to twelve and also with different name. However, PMI (2008) stated that the life cycle of the project must comprise with: starting the project, organizing and preparing, carrying out the project work, and closing the project, without judging the complexion of the project.

For the post disaster project, it is a combination of project management and disaster management (Moe and Pathranarakul, 2006) as shown in Figure 1.3.

Project Life Cycle Phases	Disaster Management Phases	Time	Activities	Approach
Initiation	Prediction	Before	Mitigation	Pro-active
Planning			Preparedness	
Executing	Warning	During	Response	Reactive
	Emergency Relief			
	Rehabilitation (short-term)			
Completing	Reconstruction (long-term)	After	Recovery	

Figure 1.3 A comparison of project life cycle and disaster management

1.3.3 Project Implementation & Execution

"Implementation is about people doing what you have listed in your plan and checking their actions off the 'to do' list. True execution is about measuring the impact of those actions on the results you want for your company." (Mead, 2011). In this research, the term execution will be used to measure the results of the *Projek Rumah Banjir* for the 2014 flood victims. Particular attention during Project Execution is important to update interested parties with project status, dealing with procurement and contract management issues, assisting in quality control, and monitoring the project risk. It said by National Audit Office, UK (2013) that government policy initiatives were delivered through major projects. Successful project delivery is therefore essential to government delivering its promises and objectives, which in this case the RKB Project.

1.3.4 Critical Success Factors in Reconstruction

Critical project management success factors has been identified by few authors. All the success factors varies and there is no consistency for assessing the success as the there is no standard guideline in this field yet (Ahmed 2011). (Ophiyandri et al. 2013) found twelve factors that considered for project success. The critical success factors (CSFs) therefore are: “transparency and accountability; appropriate reconstruction policy/strategy; understanding the community-based method; gathering trust from the community; facilitator capacity; good coordination and communication; sufficient funding availability; implementer capacity; significant level of community participation/control; involvement of all community members; successful beneficiary identification”; and government support.

Other researchers had different sets of factors contribute to a successful project management in PDR housing which include; resource availability for reconstruction (Chang et al. 2010a), “owner driven” approach to construct the house (Karunasena & Rameezdeen 2010), proper planning (Tatum & Terrell 2012), coordination among the contractors (Patel & Hastak 2013), effective time management (Norling 2013), active stakeholder participation (Crawford et al. 2013), and the recovery agency’s link with communities, community participation during the recovery process, and agency supervision during reconstruction (Jordan & Javernick-Will 2014).

(Wardak et al. 2012) examines case studies of failed reconstruction projects across the world and listed factors of failure including lack of community participation, relocation issues, fraudulent use and waste of project funds, and ignoring local needs and culture. The author believes that the factors listed if carefully managed could contribute to the success project management. Therefore, it is part of this research to find the issues and challenges of the *Projek Rumah Kekal Baru* Reconstruction which could identify the success factors and to propose the guideline for best practices.

1.4 Objective of the Study

As stated in the earlier part, Malaysia rarely hit by monstrous disaster, however every year during the monsoon season, flood hits the East-Coast of Malaysia. In 2014 Malaysia was hit by massive flood and it was an unfortunate event which at least 21 people had been killed and almost a quarter of a million people had been displaced. (AFP, 2014).

Up to date, from approximately more than 1000 houses destroyed, 844 have been successfully completed. The disaster was taken place in December 2014 and the reconstruction process began in January 2015.

There is still lack of research focusing on the execution stage of the post-disaster reconstruction project. Therefore, the objective of this research is to explore the issues and challenges in execution stage of the post-disaster reconstruction and recovery *Projek Rumah kekal baharu* (RKB).

1.4.1 Research gap

Reconstruction should be defined, planned, and implemented in stages (Roosli, Vebry, Mydin, & Ismail, 2012). Yi & Yang (2014) suggested that Post-Disaster Reconstruction (PDR) require existing tools or new tools to be adapted, that if not well planned and implemented, can create further vulnerabilities in a disaster-affected community (Chang, Wilkinson, Potangaroa, & Seville, 2010b). Planning for reconstruction from a disaster must be realistic and reflective. Without a plan, it is impossible to predict or expect a successful recovery (Ye & Okada, 2002). Most of the time, the central government will apply any direction showed by the international agencies, for example, the SPHERE PROJECT, Oxford Committee for Famine Relief (OXFAM) and United Nations High Commissioner for Refugees (UNCHR) in overseeing housing and urban “sprawl” after catastrophe strike. Unfortunately, these

universal guidelines just present the legitimate setting for the execution of emergency housing “responses” but don't speak to or tie as a law (Roosli & O’Keefe, 2013).

There is no actual policy to follow except for the NSC Directive 20 which does not outline the delivering process or procedures of PDR projects. Hence, during the massive flood that hit Kelantan in 2014, the responses were chaotic and according to the report from New Straits Time, (2015) after six months of the monstrous flood there are still families of victims living in tent. Since there is still lack of scholarly articles concerning the event therefore researcher depends with the national newspaper and NGOs report. the researcher finds Malaysia is still lacking policies regarding the implementing of post-disaster reconstruction. Most of the time, the central government will apply any direction showed by the international agencies, for example, the SPHERE PROJECT, Oxford Committee for Famine Relief (OXFAM) and United Nations High Commissioner for Refugees (UNCHR) in overseeing housing and urban sprawl after catastrophe strike. Unfortunately, these universal guidelines just present the legitimate setting for the execution of emergency housing “responses” but don't speak to or tie as a law (Roosli & O’Keefe, 2013). Not many has been focus on the reconstruction of houses. USM in collaboration with Universiti Malaysia Kelantan (UMK), Federal Development Department of Kelantan (JPPK) and the State Secretary Office of Kelantan (SUK) took the initiative to organize a stakeholder meeting, the Kelantan Flood Disaster Management Conference in 2015 and proposed the resolution. However, even in the resolution of the recovery stages does not highlight much on the reconstruction of permanent houses. It is only said in 7.1.7 “*Find the best housing model to be placed in the event of recovery*”. It does not have a clear concept of project management and how the process in going to be delivered.

Therefore, it is important to investigate the issues and challenges and find a concrete solution to overcome the complexity and uncertainties of PDR. Hence, the objective of this research is to explore the issues and challenges in execution stage of the post-disaster reconstruction and recovery of sustainable and livable houses.

1.5 Research Questions

The objective of this research is to explore the issues and challenges in execution stage of the post-disaster reconstruction and recovery of sustainable and livable houses. In order to address the objective above, these research questions will be explored:

- i. What are the issues and challenges with regards to project execution in terms of scheduling in the implementation stage of the post-disaster housing reconstruction and recovery?
- ii. What are the issues and challenges with regards to resources in the implementation stage of the post-disaster housing reconstruction and recovery?
- iii. What are the issues and challenges with regards to coordination in the implementation stage of the post-disaster housing reconstruction and recovery?
- iv. What are the issues and challenges with regards to authority in the implementation stage of the post-disaster housing reconstruction and recovery?

1.6 Conceptual Framework

According to Miles and Huberman (1994), a conceptual framework aims to explain the main concepts of the research, its key factors, its variables and its relationships, either graphically or in narrative form. In this section, the way to structure the conceptual framework will be discuss briefly. Conceptual framework is the interrelationship between the main concept and the literature review.

1.6.1 Main Concept

As discussed above, the key issues in this research is the importance of post-disaster reconstruction and critical success factors in post-disaster reconstruction project as part of project management. The housing reconstruction has become the main programs in the reconstruction project and the basic criteria to determine the success of this project are time, cost and quality. Atkinson (1999) stated that the criteria as 'iron triangle'. Basically, the success of the project is determined by the project completion in the specific time given without additional cost needed.

1.6.2 Interrelation

This research combines two different environments, disaster management and the practices of project management in the construction industry. Past research has found the issues and challenges arise in the post-disaster reconstruction (PDR) and therefore in this research would like to find the interrelation of the issues with the project execution of the reconstruction. Wardak et al. (2012) examines case studies of failed reconstruction projects across the world and listed factors of failure including lack of community participation, relocation issues, fraudulent use and waste of project funds, and ignoring local needs and culture. The author believes that the factors listed if carefully managed could contribute to the success project management. Thus, in this research, researcher would like to find the problems and issues raised during the execution stage of *Projek RKB* that will lead to successful project delivery.

Figure 1.4 show the Interrelation of the conceptual framework between Project Management and Post-Disaster Reconstruction.

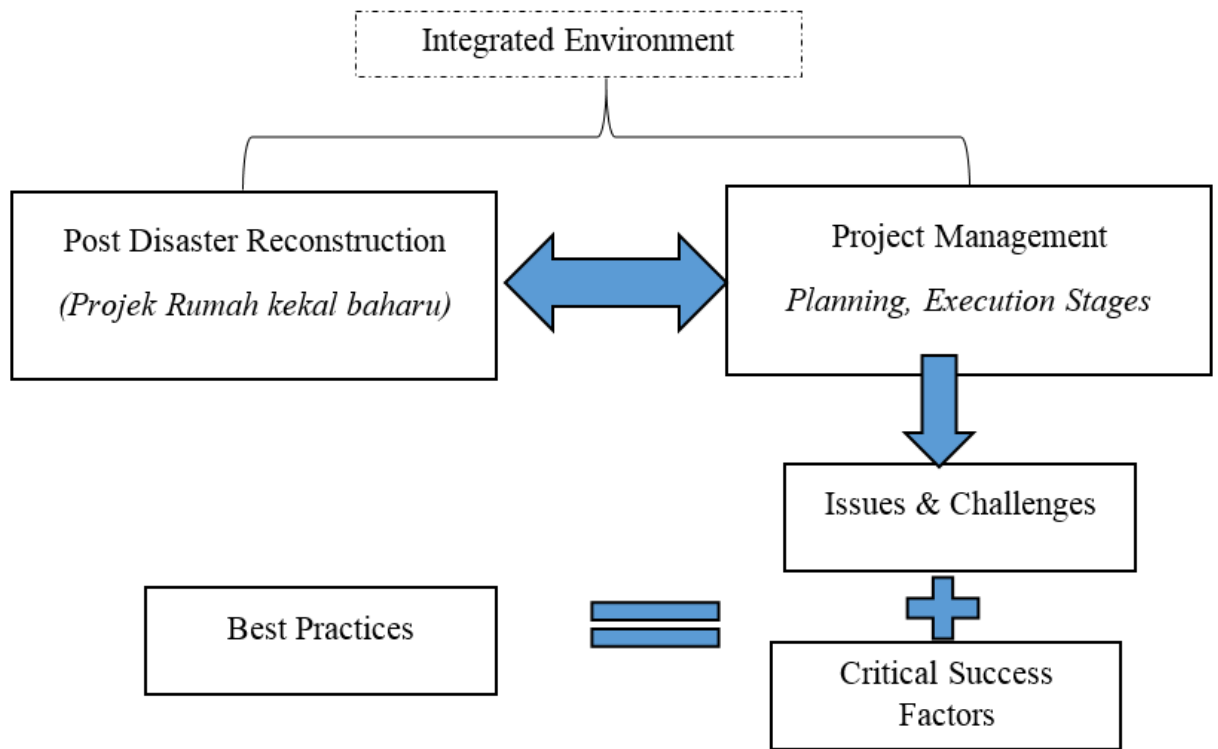


Figure 1.4 Interrelation of the conceptual framework between Project Management and Post-Disaster Reconstruction

Figure 1.5 shows the conceptual Framework for this research adopted from Jayaraman et al (1997) and Moe and Pathranarakul (2006)

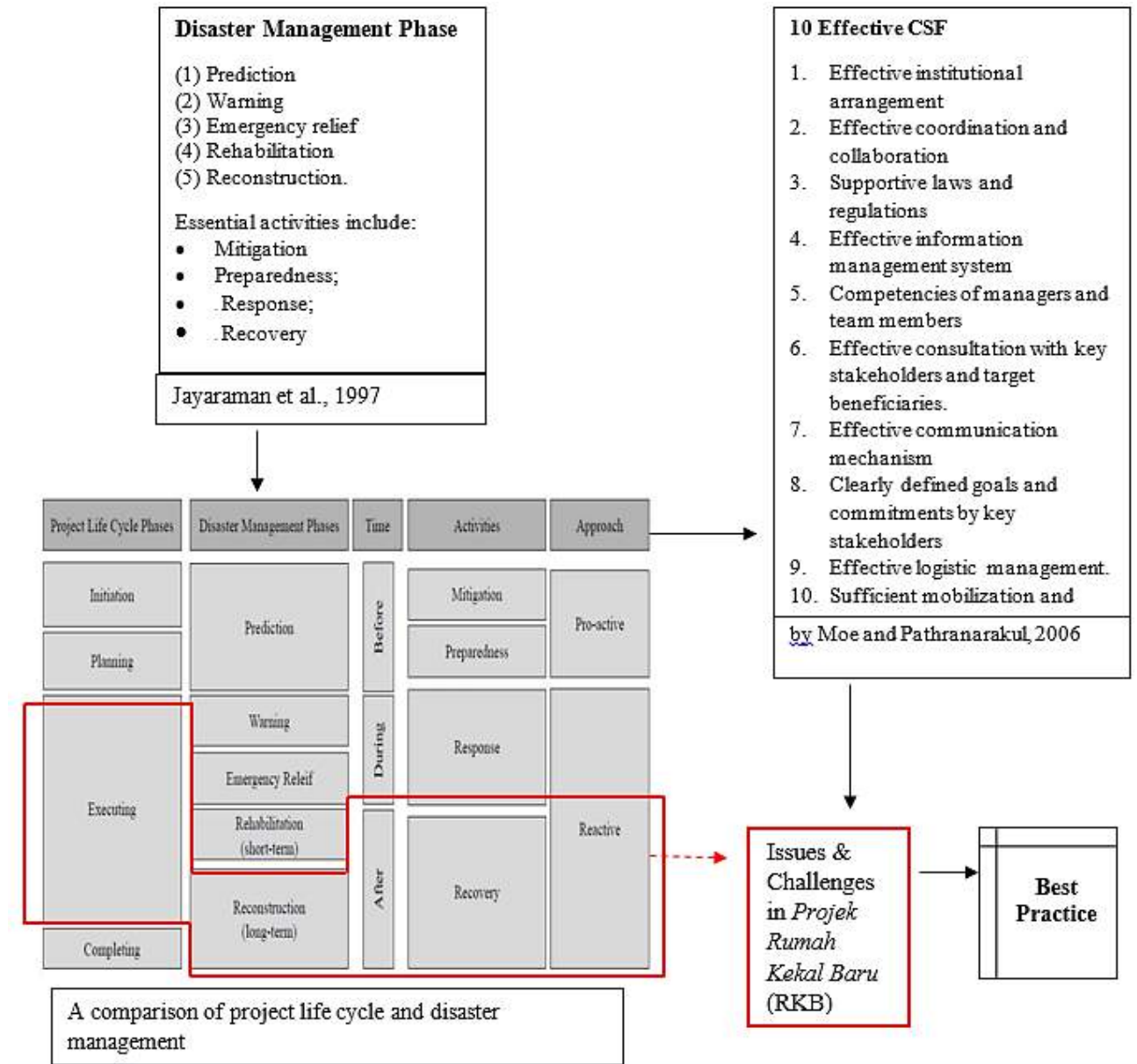


Figure 1.5 Conceptual Framework

1.6.3 Complexity Theory

Complexity theory is an interdisciplinary theory that grew out of systems theory in the 1960s (Grobman, 2005). Complexity theory emphasizes interactions and the accompanying feedback loops that constantly evaluate and change systems. While it proposes that systems are unpredictable, they are also constrained by order-generating rules (Burnes, 2005). There has been a dramatic increase in interest in the application of complexity theory in organisational science since the 1996 Organisation Science Winter Conference which focused on the application of complexity theory to organizations. A Y Lewin (1999) states that many ideologically rooted management advices like empowerment now emerge from the theoretical foundations of complexity, and thus this reframing of perspective promises to offer a great deal to organization science. These interrelated concepts is shown into a conceptual framework which broadly integrates tools and techniques that is relevant in the context of the applicability of complexity theory to organizations as shown in Figure 1.6.

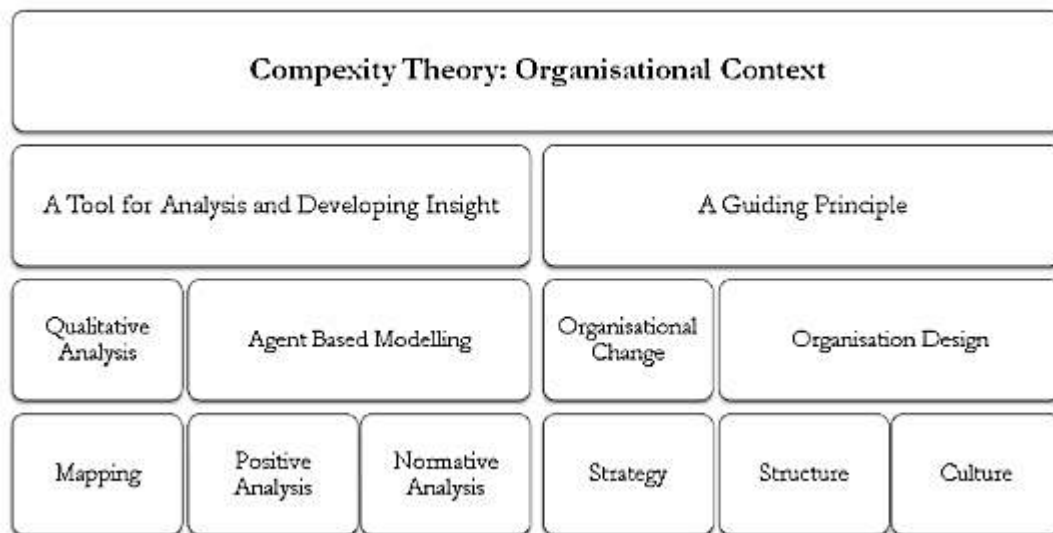


Figure 1.6 Complexity Theory in Organizational context

1.7 Operational Definition

1.7.1 Disaster management:

The entire process of planning and intervention to reduce disasters as well as the response and recovery measures. It is a neglected element of development planning. (D&E Reference Center 1998). The body of policy and administrative decisions and operational activities which pertain to the various stages of a disaster at all levels. (UN 1992, 22)

1.7.2 Disaster Risk Management:

“The systematic process of using administrative decisions, organization, operational skills and capacities to implement policies, strategies and coping capacities of the society and communities to lessen the impacts of natural hazards and related environmental and technological disasters. This comprises all forms of activities, including structural and non-structural measures to avoid (prevention) or to limit (mitigation and preparedness) adverse effects of hazards.” (UN/ISDR, Terminology: Basic Terms of Disaster Risk Reduction, March 31, 2004)

1.7.3 Rebuilding and reconstruction:

Rebuilding and reconstruction efforts are distinguished from shorter-term recovery efforts not only by the length of time involved, but also by the scope and nature of the incident, the complexity of efforts required to regenerate infrastructure, and the effect on the social fabric of the community and region.

1.7.4 Recovery:

The restoration, and improvement where appropriate, of facilities, livelihoods and living conditions of disaster-affected communities, including efforts to reduce disaster risk factors (UN/ISDR, 2009).

1.7.5 Project Execution:

Measuring the impact of those actions on the results you want for your company." (Mead, 2011). In this research, the term execution will be used to measure the results of the Projek Rumah Banjir for the 2014 flood victims.

1.7.6 Response:

“Conducting emergency operations to save lives and property, including positioning emergency equipment and supplies; evacuating potential victims; providing food, water, shelter, and medical care to those in need; and restoring critical public services.” (FEMA, 2002)

REFERENCE

- Ahmed, I. (2011). An overview of post-disaster permanent housing reconstruction in developing countries. *International Journal of Disaster Resilience in the Built Environment*, 2(2), 148–164.
- Alexander, D. (2004). Planning for post-disaster reconstruction. Paper presented at the I-Rec 2004 *International Conference on 'Improving Post-Disaster Reconstruction in Developing Countries'*, Coventry, UK.
- Alexander, David. 2012. "An evaluation of medium-term recovery processes after the 6 April 2009 earthquake in L'Aquila, Central Italy." *Environmental Hazards* 12 (1): 60-73. Accessed February 26, 2016. doi: 10.1080/17477891.2012.689250.
- American Planning Association. (2005). *Policies for Guiding Planning for Post-Disaster Recovery and Reconstruction*.
- Andrew, SimonA, Sudha Arlikatti, Laurie C Long, and James M Kendra. 2013. "The effect of housing assistance arrangements on household recovery: an empirical test of donor-assisted and owner-driven approaches." *Journal of Housing and the Built Environment* 28 (1): 17-34. Accessed February 26, 2016. doi:10.1007/s10901-012-9266-9.
- Atkinson, R. (1999). Project management: cost, time and quality, two best guesses and a phenomenon, its time to accept other success criteria. *International Journal of Project Management*, 17(6), 337-342.
- Atmanand. (2003). Insurance and disaster management: the Indian context. *Disaster Prevention and Management*, 12(4), 286–304. <http://doi.org/10.1108/09653560310493105>
- Ayres, Lioness. 2008. "Semi-Structured Interview". In *The SAGE Encyclopedia of Qualitative Research Methods*, edited by Lisa M. Given. Thousand Oaks, CA: SAGE Publications, Inc.
- Azuhan Mohamed (2015). 2014. *Kelantan floods divine vs anthropogenic causes*. Paper presented at National Geoscience Conference 2015 (NGC 2015), Kota Bharu, Kelantan Darul Naim, Malaysia on 30th July – 1st August 2015. Accessed 28 April 2016,

http://geology.um.edu.my/gsmpublic/NGC2015/Program%20Book/Raw/Keynote%20speaker/Keynote%20speaker/Key%20note%20Speaker%202_Azuhan%202014%20Kelantan%20Floods.pdf

- Bang, H.N. (2012), Disaster management in Cameroon: the Lake Nyos disaster experience, *Disaster Prevention and Management: An International Journal*, Vol. 21 Iss 4 pp. 489 - 506 <http://dx.doi.org/10.1108/09653561211256189>
- Barakat, S. (2003) Housing reconstruction conflict after and disaster, Retrieved from <http://www.odihpn.org>, accessed 28 April 2015.
- Bassioni, H.A., Price, A.D.F. and Hassan, T.M. (2004) Performance measurement in construction. *Journal of Management in Engineering*, 20(2), 42–50.
- Bauni, H. (2006). *Reconstruction through Collaboration Negotiation of the Housing Process in Disaster Recovery*. University of California, Berkeley.
- Bello, W. (2006). The Rise Of The Relief-And- Reconstruction Complex. *Journal of International Affairs*, 59(2), 281–297.
- Berg, S. (1988) Snowball sampling, in Kotz, S. and Johnson, N. L. (Eds.) *Encyclopaedia of Statistical Sciences Vol. 8* Accessed December 23, 2015. <http://www.adpc.net/IRC06/1988/4-6/TBindo1.pdf>.
- Berke, P. R., J. Kartez, and D. Wenger (1993) "Recovery after disaster: Achieving sustainable development, mitigation and equity". *Disasters* 12(2): 94-109.
- Berke, P. R., and T. Beatley (1997) *After the Hurricane: Linking Recovery to Sustainable Development in the Caribbean*, The Johns Hopkins University Press, London.
- Boano, C., & García, M. (2011). Lost in translation? The challenges of an equitable post-disaster reconstruction process: Lessons from Chile. *Environmental Hazards*, 10(3-4), 293–309.
- Boen, T and R Jigyasu. 2005. "Cultural considerations for post disaster reconstruction post-tsunami challenges." Paper presented at the UNDP, Thailand. Asian Disaster Preparedness Centre (ADPC). Accessed December 23, 2015. <http://www.adpc.net/IRC06/2005/4-6/TBindo1.pdf>.
- Boen, T. (2006). Building A Safer Aceh , Reconstruction Of Houses , One Year After The Dec . 26 , 2004 Tsunami. In *40th Anniversary of Trisakti University, "Answering the Challenges in Today's Civil Engineering"*, 26 January 2006.

- Burnes, B. (2005). Complexity theories and organizational change. *International Journal of Management Reviews* 7.2: 74
- Brown, D., Saito, L., Spence, R., 2008. Indicators for Measuring, Monitoring and Evaluating Post-disaster Recovery. 60th International Workshop on Remote Sensing for Disaster Applications. Pavia, Italy, pp. 11–12
- Canny, B. (2005). A Review Of Ngo Coordination In Aceh Post Earthquake / Tsunami. International Council of Voluntary Agencies (ICVA) (pp. 1–11).
- Caymaz, E., Akyon, F. V., & Erenel, F. (2013). A Model Proposal for Efficient Disaster Management: The Turkish Sample. *Procedia - Social and Behavioral Sciences*, 99, 609–618. <http://doi.org/10.1016/j.sbspro.2013.10.531>
- Chang, Y., Wilkinson, S., Potangaroa, R., & Seville, E. (2010a). Resources and capacity: lessons learned from post-disaster reconstruction resourcing in Indonesia, China and Australia. *The Construction , Building and Real Estate Research Conference of the Royal Institution of Chartered Surveyors Held at Dauphine Université , Paris , 2-3 September 2010*. Retrieved from www.rics.org/cobra
- Chang, Y., Wilkinson, S., Potangaroa, R., & Seville, E. (2010b). Resourcing challenges for post-disaster housing reconstruction: a comparative analysis. *Building Research & Information*, 38(3), 247–264
- Chang, Y., Wilkinson, S., Brunson, D., Seville, E., & Potangaroa, R. (2011). An integrated approach: managing resources for post-disaster reconstruction. *Disasters*, 35(4), 739–65.
- Chua, D.K.H., Kog, Y.C. and Loh, P.K. (1999) Critical success factors for different project objectives. *Journal of Construction Engineering and Management*, 125(3), 142–150.
- Comerio, M. C. (1998) *Disaster Hits Home: New Policy for Urban Housing Recovery*, University of California Press, Berkeley and Los Angeles, California.
- Comerio, M. (2014). Disaster Recovery and Community Renewal : Housing Approaches. *Cityscape: A Journal of Policy Development and Research*, Vol.16, No 2
- Cooper, D.R., and Emory, W. (1995). *Business research methods*, New York: Irwin.
- Corbin, J. and Strauss, A. (1990). Grounded theory research: procedures, canons, and evaluative criteria. *Qualitative Sociology*, 13,

- Davidson, C. H., Johnson, C., Lizarralde, G., Dikmen, N., & Sliwinski, A. (2007). Truths and myths about community participation in post-disaster housing projects. *Habitat International*, 31,100e115.
- Disaster Management Division National Security Council Prime Minister's Department. (2011). *Brief Note on the Roles of the National Security Council, Prime Minister'S Department As National Disaster Management Organisation (Ndmo)*
- EMA. 1998. Australian emergency management glossary. (Australian emergency manual). Emergency Management Australia (EMA), Canberra, Australia
- Edgington, D. W. (2010), *Reconstructing Kobe: The Geography of Crisis and Opportunity*, Vancouver, UBC Press.
- Edgington, D. W. (2011). Viewpoint: Reconstruction after natural disasters: the opportunities and constraints facing our cities. *Town Planning Review*, 82(6), v–xii. <http://doi.org/10.3828/tpr.2011.35>
- El-Anwar, O., El-Rayes, K., and Elnashai A. 2010. “Maximizing Temporary Housing Safety after Natural Disasters.” *Journal of Infrastructure Systems* 16(2): 138- 148.
- Emerson, R. M., R. I. Fretz, and L. L. Shaw (1995) *Writing Ethnographic Field notes*, University of Chicago Press, Chicago.
- EPC, TCG, & LLC. (2004). *Participatory Planning Guide for Post-Disaster Reconstruction*. EPC-Environmental Planning Collaborative, TCG International, LLC (pp. 1–22). Ahmedabad, India.
- Flick, U. (2006). *An Introduction to Qualitative Research*. London: Sage.
- Freeman, P. K. (2004). Allocation of post-disaster reconstruction financing to housing. *Building Research & Information*, 32; no 5. pp.427-437.
- Fothergill, A., E. G. Maestas, and J. D. Darlington (1999) "Race, ethnicity and disasters in the United States: A review of the literature". *Disasters* 23(2): 156-173.
- Gakh, M., & Vegas, L. (n.d.). Curriculum Recommendations for Disaster Health Professionals. *Public Health Law in Disasters*, 1–29.
- GAO. (2011). HAITI RECONSTRUCTION: *Factors Contributing to Delays in USAID Infrastructure Construction*. Report to Congressional Committees (pp. 1–51). USA.

- Ghafory-Ashtiany, M., & Hosseini, M. (2008). Post-Bam earthquake: recovery and reconstruction. *Natural Hazards*, 44(2), 229–241.
- Godschalk, D.R. and Beatley, T. (1999) *Natural Hazard Mitigation : Recasting Disaster Policy and Planning*. California: Island Press.
- Hamnett, s. (ed.) (2006), ‘Learning from Urban Disasters’, Special Volume, *Built Environment*, 32, 349–446.
- Henderson, L. J. (2004). Emergency and Disaster: Pervasive Risk and Public Bureaucracy in Developing Nations. *Public Organization Review*, 4(2), 103–119. <http://doi.org/10.1023/B:PORJ.0000031624.46153.b2>
- Haas, J. E., R. W. Kates, and M. J. Bowden (1977) *Reconstruction Following Disaster*, MIT Press, Cambridge, MA.
- Hayles, C. S. (2010), "An examination of decision making in post disaster housing reconstruction", *International Journal of Disaster Resilience in the Built Environment*, Vol. 1 Iss 1 pp. 103-122 <http://dx.doi.org/10.1108/17595901011026508>
- Hidayat, B., & Egbu, C. (2010). A literature review of the role of project management in post-disaster reconstruction, (September), 1269–1278. Retrieved from <http://usir.salford.ac.uk/10144/>
- Hosseini, M., & Izadkhah, Y. O. (2008). Lessons Learnt From Shelter Actions And Reconstruction Of Bam After The Destructive Earthquake Of December 26, 2003. In *The 14 World Conference on Earthquake Engineering October 12-17, 2008, Beijing, China*. Beijing, China.
- Huggins, L.J. (2007). *Comprehensive Disaster Management and Development: The Role of Geoinformatics and Geo-Collaboration in Linking Mitigation and Disaster Recovery in the Eastern Caribbean*. The Graduate School of Public and International, University of Pittsburgh.
- Hyväri, I. (2006). “success of projects in different organizational conditions.” *Project Management Journal*. 37 (4): 31-41.
- Inam, A. (2005) *Planning for the Unplanned: Recovering from Crises in Megacities*, Taylor & Francis Group, New York.

- Ingram, J. C., G. Franco, C. R.-d. Rio, and B. Khazai (2006) "Post-disaster recovery dilemmas:
 challenges in balancing short-term and long-term needs for vulnerability reduction". *Environmental Science and Policy* 9(7-8): 607-613.
- International Recovery Platform (2007) *Learning from Disaster Recovery: Guidance for Decision Makers*. edited by I. Davis, United Nations International Strategy for Disaster Reduction (UNISDR).
- Ismail, D., Majid, T. A., Roosli, R., & Samah, N. A. (2014). A Review On Post-Disaster Reconstruction Project: Issues And Challenges Faced By International Non-Governmental Organisations (INGOs). In *Proceeding of International Post-Graduate Seminar (IPGS 2014), "Engineering Challenges Towards Better Life and Humanity"* (p. 72). Shah Alam: Universiti Teknologi MARA
- Iwai, T., & Tabuchi, S. (2013). Survey: Housing projects delayed for more than 10,000 evacuees. *The Asahi Shimbun*.
- Jones, T. L. (2006). *Mind the Gap ! Post-disaster reconstruction and the transition from humanitarian relief*. RICS, University of Westminster (pp. 1–105).
- Jordan, E. & Javernick-Will, A., 2014. Successes and Failures of the Post-Tsunami Housing Reconstruction Program in Tamil Nadu, India. *American Society of Civil engineering (ASCE)*, (Construction Research Congress 2014), pp.1199–1208.
- Kandelousi, N. S., Ooi, J., & Abdollahi, A. (2011). Key Success Factors for Managing Projects. *World Academy of Science, Engineering and Technology*, 59, 1826–1830
- Karunasena, G. & Rameezdeen, R., 2010. Post-disaster housing reconstruction: Comparative study of donor vs owner-driven approaches. *International Journal of Disaster Resilience in the Built Environment*, 1(2), pp.173–191.
- K.N. Kim, J. Choi. (2013). Breaking the vicious cycle of flood disasters: Goals of project management in post-disaster rebuild projects. *International Journal of Project Management* 31 147–160.
- Keraminiyage, K., Jayasena, S., Amaratunga, D., & Haigh, R. (Eds.). (2008). *Post disaster recovery challenges in Sri Lanka*. CIB Task Group 53 (Postgraduate Research training in Building and Construction) and CIB Task Group 63 (Disasters and the Built Environment) (pp. 1–84). Salford, UK.

- Khan, M. S. A. (2008). Disaster preparedness for sustainable development in Bangladesh. *Disaster Prevention and Management*, 17(5), 662–671. <http://doi.org/10.1108/09653560810918667>
- Kumar, R. (1996) *Research Methodology: A Step-by-step Guide for Beginners*, Addison Wesley Longman Australia Pty Limited, Melbourne, Australia.
- Manavazhi, M.R. and Adhikari, D.K. (2002) Material and equipment delays in highway projects in Nepal. *International Journal of Project Management*, 20, 627–632.
- Masurier, J.L., Wilkinson, S., Shestakova, Y., 2006. An analysis of the alliance procurement method for reconstruction following an earthquake. Proc. 8th U.S. Nat. Conf. Earthquake Eng. April 18-22, San Francisco, CA, USA.
- Matsumaru, R., Nagami, K., & Takeya, K. (2012). Reconstruction of the Aceh Region following the 2004 Indian Ocean tsunami disaster: A transportation perspective. *IATSS Research*, 36(1), 11–19.
- Maxwell, J. A. (2005) *Qualitative Research Design: An Interactive Approach*, Sage Publications, Thousand Oaks, London, New Delhi.
- May, P.J. (2003) Performance-based regulation and regulatory regimes: The saga of Leaky buildings. *Law and Policy* 25(4): 381-401
- McEntire, D.A. (1997) Reflecting on the weaknesses of the international community during the IDNDR: Some implications for research and its application. *Disaster Prevention and Management* 4(6): 221-233.
- Mead, D. (2011). What's the difference between execution and implementation? in Mead's Issues and Growth. Accessed April 14, 2016 <http://davemead.blogspot.my/2011/01/whats-difference-between-execution-and.html>
- MERCY. (2015). *Malaysian Flood Rehabilitation & Reconstruction Donor Report 2015 January 2015*.
- Meyer, S., Henry, E., Wright, R. E. and Palmer, C.A. (2010), 'Post-Disaster Redevelopment Planning: Local Capacity Building Through Pre-Event Planning', *Journal of Disaster Research*, 5, 552–64.

- Mitchell, J.K. (2006) The primacy of partnership: Scoping a new national disaster recovery policy. *The ANNALS of the American Academy of Political and Social Science* 604(1): 228-255.
- Moe, T. L., and Pathranarakul, P. (2006) An integrated approach to natural disaster management: Public project management and its critical success factors. *Disaster Prevention and Management*, 15(3), 396-413.
- Moin, C., (2007). *Disaster Mitigation Support and Management in Malaysia*. Prime Minister Department Malaysia: Malaysia Nasional Printing.
- Moloney, A. (2014). Haitians still homeless , “ suffering in despair ” 4 years after quake - Amnesty. *Thomson Reuters Foundation*, pp. 4–6.
- Mutugi, M. W., & Maingi, S. G. (2011). Disasters in Kenya : A major public health concern, *Journal of Public Health and Epidemiology* Vol. 3(1), pp. 38-42, January 2011. Available online at <http://www.academicjournals.org/jphe>.
- National Security Council of Malaysia. (1997). *Directive No. 20 0: Policy mechanism of national disaster management and relief*. National Security Division, Prime Minister's Department, Malaysia.
- Nazara, S., & Resosudarmo, B. P. (2007). *Aceh-Nias Reconstruction and Rehabilitation : Progress and Challenges at the End of 2006*. Asian Development Bank Institute. Tokyo.
- N.A. (2015, June 29). Six months of tragedy still living in tents. *New Straits Times*.pp7.
- Norling, B., 2013. Effective Time Management in Post-Disaster Reconstruction. *In Australian and New Zealand Disaster and Emergency Management Conference*. Australia, pp. 1–10.
- Ochiai, C., & Shaw, R. (2009). Reconstruction In Urban Areas In Aceh. *In Urban Risk Reduction: An Asian Perspective* (Vol. 1, pp. 233–252). Emerald Group Publishing Limited.
- Olshansky, R. B. (2005) *Toward a theory of community recovery from disaster: a review of existing literature*. Paper presented at the 1st International Conference on Urban Disaster Reduction. Kobe, Japan.
- Ophiyandri, T. et al., 2013. Critical success factors for community-based post-disaster housing reconstruction projects in the pre-construction stage in Indonesia.

- International Journal of Disaster Resilience in the Built Environment*, 4(2), pp.236–249.
- Osti R., Tanaka S., Tokioka T.(2009). The importance of mangrove forest in tsunami disaster mitigation. *Disasters*. 33(2):203-13. Retrieved February 24, 2016 from doi: 10.1111/j.1467-7717.2008.01070.x.
- Othman, S. H., & Beydoun, G. (2013). Model-driven disaster management. *Information & Management*, 50(5), 218–228. <http://doi.org/10.1016/j.im.2013.04.002>
- Özerdem, Alpaslan and Gianni Rufini. 2013. "L'Aquila's reconstruction challenges: has Italy learned from its previous earthquake disasters?" *Disasters* 37 (1): 119-143. Accessed January 9, 2016. doi: 10.1111/j.1467-7717.2012.01296.x.
- Patel, S., Hastak, M. (2013),"A framework to construct post-disaster housing", *International Journal of Disaster Resilience in the Built Environment*, Vol. 4 Iss 1 pp. 95-114 [http:// dx.doi.org/10.1108/17595901311299026](http://dx.doi.org/10.1108/17595901311299026)
- Peterson, C. (2006). Be safe, be prepared: Emergency system for advance registration of volunteer health professionals in disaster response. *Online Journal of Issues in Nursing*, 11(3), 3. <http://doi.org/10.3912/OJIN.Vol11No03Man02>
- Pinoncely, V. (2014). Post disaster reconstruction in Japan and the role of planning. Retrieved September 24, 2015 from <http://www.rtpi.org.uk/briefing-room/rtpi-blog/post-disaster-reconstruction-in-japan-and-the-role-of-planning/>
- PMI (Project Management Institute). 2008. A guide to the project management body of knowledge (PMBOK guide). 4th ed. Newtown Square, Pa: Project Management Institute.
- Quarantelli, E.L., (1995). Patterns of Shelter and Housing in US Disasters. *Disaster Prevention and Management*, 3(4): 43-53.
- Ratusan rumah bantuan tidak layak huni (9 Mei 2006). Retrieved from <http://www.acehkita.com>; Ada yang dapat rumah enam unit (15 Mei 2006). Retrieved from <http://www.acehkita.com>
- Randall, J., & Jowett, E. (2010). Green Recovery and Reconstruction: Training Toolkit for Humanitarian Aid. The Green Recovery and Reconstruction Toolkit (GRRT). World Wildlife Fund, Inc. and American National Red Cross, California, USA.

- Rautela, P. (2006). Redefining disaster: need for managing accidents as disasters. *Disaster Prevention and Management*, 15(5), 799–809. <http://doi.org/10.1108/09653560610712748>
- Reliefweb (2014). Floods kill 21 in Malaysia, waters recede. From <http://reliefweb.int/report/malaysia/floods-kill-21-malaysia-waters-recede>
- Roosli, R. O'Brien, G. (2011), Social learning in managing disasters in Malaysia, *Disaster Prevention and Management: An International Journal*, Vol. 20 Iss 4 pp. 386 - 397 From <http://dx.doi.org/10.1108/09653561111161716>
- Roosli, R., Vebry, M., Mydin, A. O., & Ismail, M. (2012). Building And Planning Of Post-Disaster Rehabilitation And Reconstruction. *International Journal of Academic Research*, 4(1), 194–199
- Roosli, R., O'Keefe, P. & Mydin, M.A.O., (2013). Post-disaster housing and management in Malaysia: a literature review. *International Journal of Disaster Resilience in the Built Environment*, 4(2), 168–181. <http://doi.org/10.1108/IJDRBE-06-2011-0022>
- Rubin, C. B., M. D. Saperstein, and D. G. Barbee (1985) Community Recovery from a Major Natural Disaster. Boulder, CO, University of Colorado Natural Hazards Research and Applications Information Center.
- Sabur, a. K. M. a. (2012). Disaster Management System in Bangladesh: An Overview. *India Quarterly: A Journal of International Affairs*, 68(1), 29–47. <http://doi.org/10.1177/097492841106800103>
- Sandink, D. and Fuller, C. (2009), 'Planning for Disasters, Climate Change, and Sustainable Development', *Municipal World* (online journal, Canada), January, 27–30, <http://www.municipalworld.com/index.php>
- Schilderman, Theo. 2010. "Putting people at the centre of reconstruction." In Building Back Better, edited by Michal Lyons, Theo Schilderman and Camillo Boano, 7. London: Practical Action. Accessed March 29, 2016. <http://practicalaction.org/docs/ia3/building-back-better-lyonsschildermann.pdf#page=19>.
- Schwab, J., K. C. Topping, C. C. Eadie, R. E. Deyle, and R. A. Smith (1998) *Planning for Post-Disaster Recovery and Reconstruction*, American Planning Association, Chicago.

- Shaluf, I. M. (2008). Technological disaster stages and management. *Disaster Prevention and Management*, 17(1), 114–126. <http://doi.org/10.1108/09653560810855928>
- Shaw, R. (2006) Indian Ocean tsunami and aftermath: need for environment-disaster synergy in the reconstruction process. *Disaster Prevention and Management*, 15(1), 5-20.
- Silva, J. da. (2010). *Lessons from Aceh: Key Considerations in Post-Disaster Reconstruction*. Disasters Emergency Committee, ARUP. Warwickshire, UK: Practical Action Publishing.
- Soelaksono, A. (2009). NGO and Donor Coordination to Speeds up Reconstruction and Avoid NGO Competition. In *4th Annual International Workshop & Expo on Sumatra Tsunami and Recovery in Banda Aceh* November 24, 2009. Banda Aceh.
- Steinberg, F. (2007). Housing reconstruction and rehabilitation in Aceh and Nias, Indonesia-Rebuilding lives. *Habitat International*, 31(1), 150–166.
- Sun, C., & Bi, R. (2010). Study on disaster reconstruction project performance evaluation based on fuzzy analytic network process. In 2010 International Symposium on Computer, Communication, Control and Automation (3CA) (Vol. 1, pp. 338–341). IEEE. Retrieved from <http://ieeexplore.ieee.org/lpdocs/epic03/wrapper.htm?arnumber=5533813>
- Sun, C., & Xu, J. (2011). Estimation of Time for Wenchuan Earthquake Reconstruction in China. *Journal of Construction Engineering and Management @ASCE*, 179–187.
- Taylor, P., et. al. (2013). Disaster knowledge factors in managing disasters successfully. *International Journal of Strategic Property Management*, 14(January 2013), 376–390.
- Tucker, S., Gamage A., and Wijeyesekera C. , (2014), Some design aspects of sustainable post- disaster housing, *International Journal of Disaster Resilience in the Built Environment*, Vol. 5 Iss 2 pp. 163 - 181 from <http://dx.doi.org/10.1108/IJDRBE-06-2012-0019>
- Tootle, D. M. (2007) "Disaster recovery in rural communities: A case study of southwest Louisiana". *Southern Rural Sociology* 22(2): 6-27.

- Tukel, O.I. and Rom, W.O. (1998) Analysis of the characteristics of projects in diverse industries. *Journal of Operations Management*, 16(1), 43–61.
- Uchiyama, T. (2011). Bungaku teki na Granddezain wo: Fukko no Shiso toha Nanika [A philosophical grand design: Thoughts on recovery]. In Nobunkyo (Ed.), *Fukko no Taigi: Hisaisya no Songen wo Fuminijiru Shin Jiyu Syugi teki Fukko ron Hihan* [Justice in recovery: Critiques of neo-liberal approaches to recovery that trump the dignity of victims] (pp. 42 –48). Tokyo: Nobunkyo.
- United Nations. (2008). Transitional settlement and reconstruction after natural disasters: Field Edition. Shelter Centre and UN/OCHA.
- Vale, L.J. and Campanella, T.J. (2005) *The Resilient City: How Modern Cities Recover From Disaster*. Oxford University Press, New York.
- Vogt, W. P. (1999) *Dictionary of Statistics and Methodology: A Nontechnical Guide for the Social Sciences*, London: Sage.
- Wan Ibrahim and Sharif Muhidin (2015). Kelantan Flood 2014: Reflections from Relief Aid Mission to Kampung Kemubu, Kelantan. *Mediterranean Journal of Social Sciences*, 6 pp340-344
- Wardak, Z. S., Coffey, V., & Trigunaryah, B. (2011). Post-disaster Housing Reconstruction: Challenges for community participation. In *International Conference on Building Resilience: Interdisciplinary approaches to disaster risk reduction, and the development of sustainable communities*.
- Wardak, Z. S., Coffey, V., & Trigunaryah, B. (2012). Rebuilding Housing after a Disaster: Factors for Failure. In *8th Annual International Conference of the International Institute for Infrastructure, Renewal and Reconstruction (IIIRR)*, (2012) (pp. 292–300).
- Wooldridge, J. M. (2003) *Introductory Econometrics: A Modern Approach*, Thompson, Washington DC.
- World Bank. (2004). *Project Performance Assessment Report: Armenia Earthquake Reconstruction Project. Sector and Thematic Evaluation Group Operations Evaluation Department*, World Bank (pp. 1–31).
- Yan, C. (2012). *Resourcing for Post-disaster Housing Reconstruction*. PhD submitted to University of Auckland.

- Ye, Y., and N. Okada (2002). "Integrated relief and reconstruction management following a natural disaster", *Second Annual IIASA-DPRI Meeting, Integrated Disaster Risk Management: Megacity Vulnerability and Resilience*, Luxemburg, Australia.
- Ye, Y., & Okada, N. (2002). Integrated Relief and Reconstruction Management Following a Natural Disaster. *Second Annual IIASA-DPRI Meeting, Integrated Disaster Risk Management: Megacity Vulnerability and Resilience, IIASA, Laxenburg, Austria 29-31 July 2002*.
- Yeo, K.T. and Ning, J.H. (2006) Managing uncertainty in major equipment procurement in engineering projects. *European Journal of Operational Research*, 171, 123–134.
- Yeo, K. T., and J. H. Ning (2002) "Integrating Supply Chain and Critical Chain Concepts in Engineer-Procure-Construct (EPC) Projects". *International Journal of Project Management* 20: 253-262.
- Yi, H., & Yang, J. (2014). Research trends of post disaster reconstruction: The past and the future. *Habitat International*, 42, 21–29.
- Yin, R. (1984) *Case study research*, Sage Publications, Beverly Hills, California, USA.
- Yin, R. K. (2003) *Case Study Research: Design and Methods (3rd ed.)*, Sage Publications, Thousand Oaks, California.
- Ying, S. (2009) "Post-earthquake reconstruction: Towards a much more participatory planning". *Theoretical and Empirical Research in Urban Management* (1S): 27-37.
- Zaidah Zainal (2007). Case study as a research method. *Jurnal Kemanusiaan*, 9.
- Zuo, K., Potangaroa, R., Wilkinson, S., & Rotimi, J. O. B. (2009). A project management perspective in achieving a sustainable supply chain for timber procurement in Banda Aceh, Indonesia. *International Journal of Managing Projects in Business*, 2(3), 386–400.