

Stakeholders and Their Significance in Post Natural Disaster Reconstruction Projects: A Systematic Review of the Literature

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Abstract

Significant increase in number of natural disasters during past decades has triggered huge investments in reconstruction projects. Typical post-natural disaster reconstruction (PDR) projects are different from routine construction projects due to certain additional challenges. Understanding the wide range of individuals and groups that have direct or indirect stakes, interests and expectations from a PDR project is vital for its success. However, research on PDR with special emphasis on stakeholders and their significance in success and sustainability of the projects is limited. This paper provides a systematic literature review (SLR) to amalgamate and synthesise research in this area. It focuses on the identification of the stakeholders and significance of their engagement in PDR activities for a more sustainable and resilient built environment. Research papers published in peer reviewed academic journals from 2000 to 2014 were identified through three major research databases, using T/A/K search options. The selected research papers were reviewed and critically analysed to identify the stakeholders and mechanism of their identification. This research revealed that contemporary research is unable to identify a commonly agreeable scientific method for identification of stakeholders and their interests. This research has outlined an exhaustive list of stakeholders that have been identified by the researchers. Based upon systematic review, this research has also provided background information, recent trends and a future direction for research in the specific field of stakeholder engagement in PDR projects.

Keywords: natural disasters, disaster management, project management, post natural disaster reconstruction, stakeholder

1. Introduction

Disaster is a situation of distress (Moe & Pathranarakul, 2006) and it disturbs the normal functioning of our society (Kumar, 2000). It is an event that causes massive destruction, damage and human losses (Amaratunga & Haigh, 2011a) and the victims face the situation of collective suffering and physical and psychological trauma (Finau, 1987). The occurrence of natural disasters is beyond the control of human kind (Athukorala, 2012). United Nations Office for Disasters Risk Reduction (UNISDR) has categorized disasters into two main origins; (1) natural disasters and (2) technological disasters. Natural disasters are further specified into three sub-groups i.e. (i) hydro-meteorological disasters (floods, droughts, storms, and wave surges), (ii) geophysical disasters (earthquake, volcanic eruptions and tsunamis) and (iii) biological disasters (epidemics and insect infestations). The technological disasters are categorized into (i) industrial (chemical spills, collapse of industrial infrastructures, explosions, fires, gas leaks, radiation etc.), (ii) transport (air, road, water or rail crash or accidents) and (iii) miscellaneous accidents (collapse of domestic/non-industrial structure, explosions, fires) (Moe & Pathranarakul, 2006; Tun Lin, Fritz, Stefan, & Marc, 2007; UNISDR, 2002). Disasters and crisis are two different but often related events (Shaluf & Said, 2003). The magnitude of a crisis may be lower than disasters but still affects the core functioning of business systems while disasters result in significant human suffering (Warren, 2010). Various types of disasters are mentioned in the literature, however, the most generic classification of disasters are (i) natural and (ii) man-made disasters (Shaluf & Said, 2003). Shaluf and Said (2003) further described natural disasters as having no human control, whereas man-made disasters are triggered by human, organizational, infrastructural and technical factors (ibid, 2003) and include infrastructure collapse,

explosions, fire, chemical spills, radiation, gas leaks, poisoning (Coleman, 2006).

Natural disasters are hitting humankind more frequently than ever before (Hayles, 2010; Shafique & Warren, 2015; Warren, 2010) and physical and financial losses from disasters are rising exponentially (Khan & Rahman, 2007). Although, disasters may destroy the built environment and take many human lives, the survivors in a disaster area often do not opt to leave their dwellings or home region (Thurairajah & Baldry, 2010). Thus, the need for reconstruction arises and may also provide the opportunity to build back better (Labadie, 2008). In comparison with routine construction projects, post disaster reconstruction is more complex, dynamic and unpredictable (Alexander, 2004; Berke, Kartez, & Wenger, 1993; Birkland, 2006) and there is a paradigm shift from emergency management to sustainable development (Guarnacci, 2012).

The 21st Century is developing to be more stakeholder focussed (Davis, 2014), and many researchers have identified the significance of stakeholder engagement in reconstruction projects (El-Gohary, Osman, & El-Diraby, 2006; Newcombe, 2003; Olander & Landin, 2005; Shafique & Warren, 2015; Yang, Shen, Ho, Drew, & Chan, 2009). In comparison with routine construction projects, post disaster reconstruction is more complex, dynamic and unpredictable (Alexander, 2004; Berke et al., 1993; Birkland, 2006); thus this study aims to identify the stakeholders, their interests and the significance of their effective engagement in post natural disaster reconstruction projects through a critical review of contemporary research.

2. Research Background

Natural Disasters are one of humankind's oldest concerns (Kumar, 2000). Natural hazards caused disasters such as floods, earthquake, and drought are a major global problem (Benson, Twigg, & Myers, 2001) and about 250 natural and 125 human made disasters occur each year (Alexander, 2004). The number of natural disasters and the consequential damage to human kind is steadily increasing (Alexander, 2004; Liu, Xu, & Han, 2013; UNISDR, 2004; Warren, 2010). The United Nations Office for Disaster Risk Reduction (UNISDR) has reported that during the ten year period (2005-2014), about 1.7 billion peoples were directly affected by natural disasters (CRED, 2015). These natural disasters took the death toll to about 0.82 million people during this period and severely damaged the urban structure, thus loss to the economy of the world during this period has been estimated at US\$1.4 Trillion (ibid, 2015).

Table 1. The economic and human impact of disasters in the last 10 years

Year	No. of natural disasters occurred	Damage (US\$ Billion)	People affected (million)	People killed
2005	490	214	160	93115
2006	462	34	126	29893
2007	450	74	212	22422
2008	393	190	221	242189
2009	388	46	201	16016
2010	435	132	160	329998
2011	361	364	212	34143
2012	370	156	111	11526
2013	355	119	96	22225
2014	344	98	141	19882
Total	4048	1430	1746	821409

Source: (CRED, 2015)

Some of the factors which contribute towards increased loss of life in disasters are rapid urbanization, environmental degradation, unplanned growth and social marginalization (McEntire, Fuller, Johnston, & Weber, 2002). Benson et al., (2001) have pointed out that in the developing countries, poor communities are forced to live in the areas particularly prone to natural disasters due to reasons such as economic, social, cultural, and political, thus they often suffer greater damage. Statistics for natural disasters occurred during the last decade shows that approximately 88 per cent of the total affected population are from the Asian region and where majority of the countries are developing.

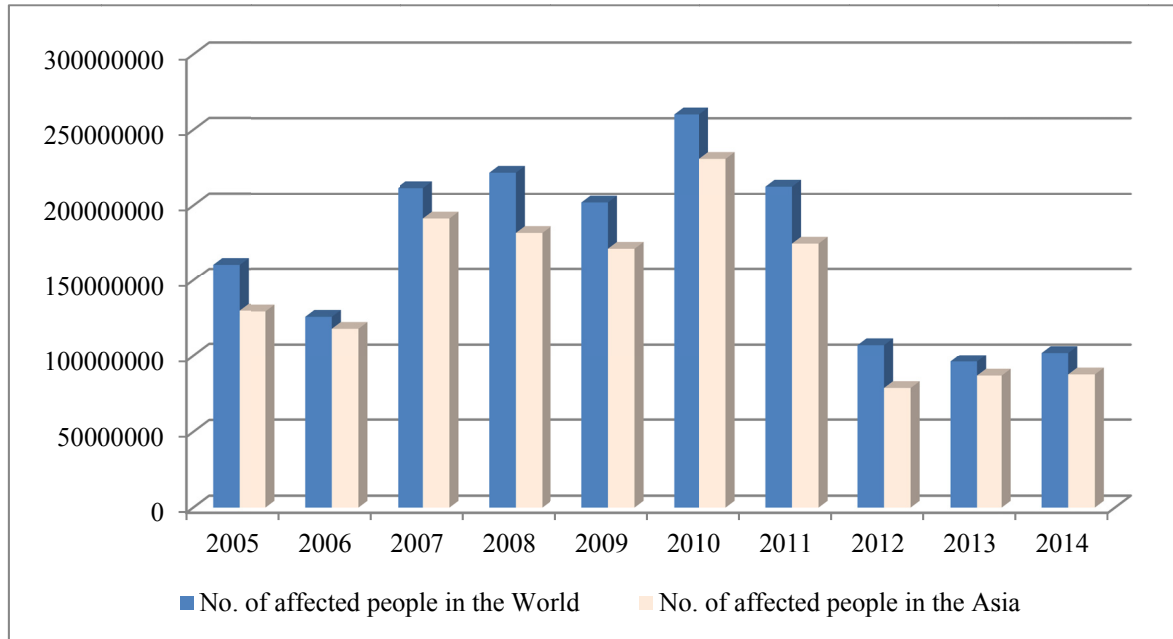


Figure 1. Natural disasters affected people in the World and Asia - Source: (CRED, 2015)

The developed countries sustained less human losses; however, damage to the economy of the developed world is about two times that in the developing countries (CRED, 2015).

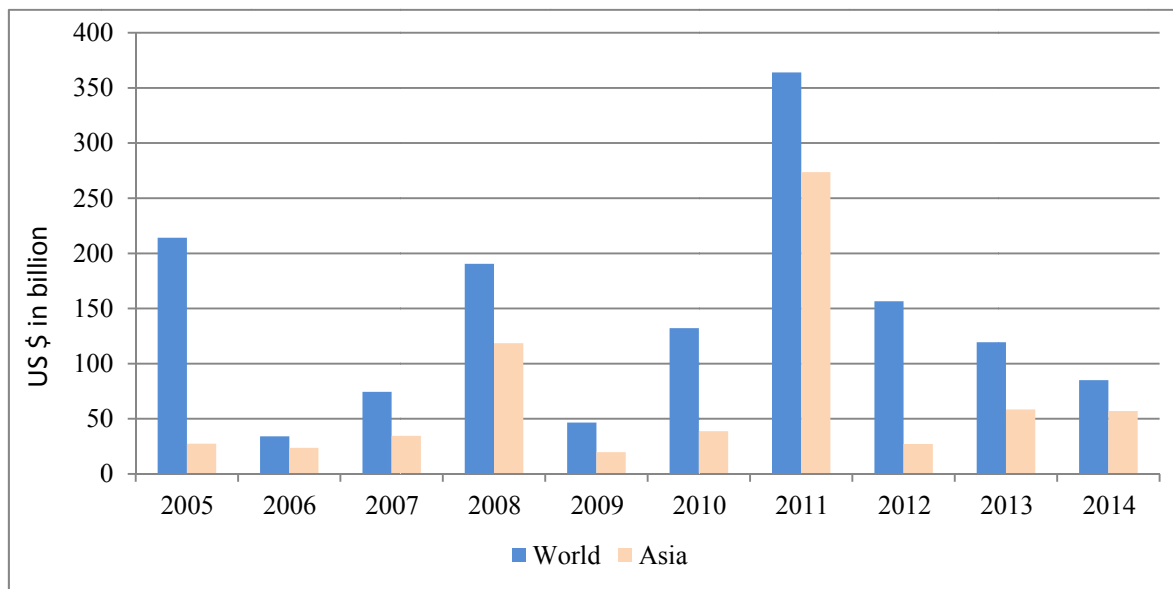


Figure 2. Loss of economy to the World and Asia due to natural disasters - Source: (CRED, 2015)

The adverse effect of natural disasters cannot be totally prevented, but it is possible to minimize the damage through an integrated approach (Chang, Wilkinson, Brunson, Seville, & Potangaroa, 2011; Moe & Pathranarakul, 2006; Tun Lin et al., 2007). Lettieri et al. (2009) have defined disaster management as a set of operational activities, policy and administrative decisions, and the actors and technologies that relates to the various stages of a disaster. The disaster management process has five phases (1) prediction, (2) warning, (3) emergency relief (4) rehabilitation and (5) reconstruction (Moe & Pathranarakul, 2006). Post natural disaster reconstruction activities aim at full restoration of services and infrastructures, and the revitalization of economic

and societal life (Omidvar, Zafari, & Khakpour, 2011). This process is long term (Johnston, Becker, & Paton, 2012) and involves intense decision making (Guarnacci, 2012), huge resources (Johnston et al., 2012; Tun Lin et al., 2007; Yan, Suzanne, Erica, & Regan, 2010; Yan, Suzanne, Regan, & Erica, 2012) and engagement of stakeholders (Chang et al., 2011; Hayles, 2010; Ophiyandri, Amaratunga, Pathirage, & Keraminiyage, 2013; Vojinovic & van Teeffelen, 2007).

Stakeholders are defined as, any identifiable individual or group which can affect the objectives of the organization or who can be affected by the achievement of objectives of the organization (PMI, 2001; Jing Yang, Shen, & Ho, 2009). Many researchers (e.g. (Jonas & Beringer, 2013; Kaiser et al., 2013; Littau & Jujagiri, 2010; Missonier & Loufrani-Fedida, 2014; Savage, Nix, Whitehead, & Blair, 1991; Winter, Smith, Morris, & Cicmil, 2006) have highlighted the importance of stakeholder involvement in projects. Large-scale projects usually contain more complexity (Lamers, 2002) and depending upon the nature of the projects, there could be a large number of stakeholders including local, national and international governments, national and international NGOs, industry and academic professionals, local communities end users, media etc. (Siriwardena & Haigh, 2011). These stakeholders usually have diverse interests and expectations on a project (ibid, 2011). In the post natural disaster reconstruction scenario the interests and participation of particular individuals or organizational stakeholders can be more intense due to the project complexity and urgency (Chang, Wilkinson, Seville, & Potangaroa, 2010). Participation of stakeholders is important for effective disaster management (Karanci & Aksit, 2000) and the sustainability of the outcomes (Ross-Jordan, 2004).

Emergency managers are now placing more emphasis on sustainable reconstruction (Labadie, 2008) which is a global and long term phenomenon and takes a variety of stakeholders into consideration (Kramar, 2014). Sustainable reconstruction acknowledges the necessity of both the challenges; disaster response and culture of prevention from future disasters (Guarnacci, 2012). Comprehensive preparedness for future disasters is also an integral element in PDR (Chang et al., 2010; Yan et al., 2010). Long term sustainable development emphasizes the necessity of engaging stakeholders in the process of reconstruction (Jigyasu, 2013).

Post disaster reconstruction, viewed in a positive light, may be considered as an opportunity for the stakeholders to build back better. Many researchers has identified a large number of stakeholders; however, it is very difficult to prepare an exhaustive list of all stakeholders involved in any PNDR project (Amaratunga & Haigh, 2011b). This context has instigated the need for a systematic literature review to achieve the objective; “preparation of comprehensive list of stakeholders in PNDR projects” and to answers these research questions; i) how important is the stakeholder engagement in success and sustainability of the PNDR projects? ii) who are the most significant stakeholders in PNDR projects? and iii) is there any scientific method available in the research to identify the stakeholders, their roles and relative importance? This research through a Systematic Literature Review (SLR) process aimed at finding the answers to these questions. In the following section authors have detailed the method used to identify and review and evaluate the literature and in subsequent section findings of the SLR are presented.

3. Methodology Used for Systematic Literature Review

This study has reviewed research literature using a Systematic Literature Review (SLR) process. According to Lettieri et al. (2009) SLR is different from the traditional narrative review of literature being more rigorous and not susceptible to researchers’ bias (Lettieri, Masella, & Radaelli, 2009). SLR is a transparent, pragmatic and reproducible methodology for analysing existing literature (Cook, Mulrow, & Haynes, 1997; Denyer & Tranfield, 2009). It gives a clear understanding about; (i) how the researcher carried out the review (ii) what types of records (papers, documents, books, reports, etc.) have been reviewed and (iii) where these records were found (Lettieri et al., 2009). Systematic Review involves following five stages (i) planning (ii) identification of literature (iii) extraction of required / relevant data (iv) reporting of findings and (v) utilization of findings for conclusion and recommendations (ibid, 2009).

The research adopted the SLR process recommended and adopted in various studies including Denyer and Tranfield (2009), Macpherson and Jones (2010), Yi and Yang (2014) and Nolan and Garavan (2015). Figure 3 provides a summary of the SLR process utilized to conduct this research study.

At the outset, research objective and question were outlined to restrict the research study within required conceptual boundaries. Furthermore, contextual boundaries of the research were also defined to accumulate background knowledge of relevant fields. This research study has a specific focus on natural disasters, their effects and contemporary practices of disaster management. Predefined inclusion and exclusion criteria also helped to focus the analysis on the objectives of the research and facilitated in the identification of relevant research. Clearly defined inclusion and exclusion criteria also helped to collect the most relevant research from

electronic databases. Three major international databases, Scopus, ScienceDirect and Web of Science were utilized to search for research papers to ensure that the review was broad based and the results could be generalized.

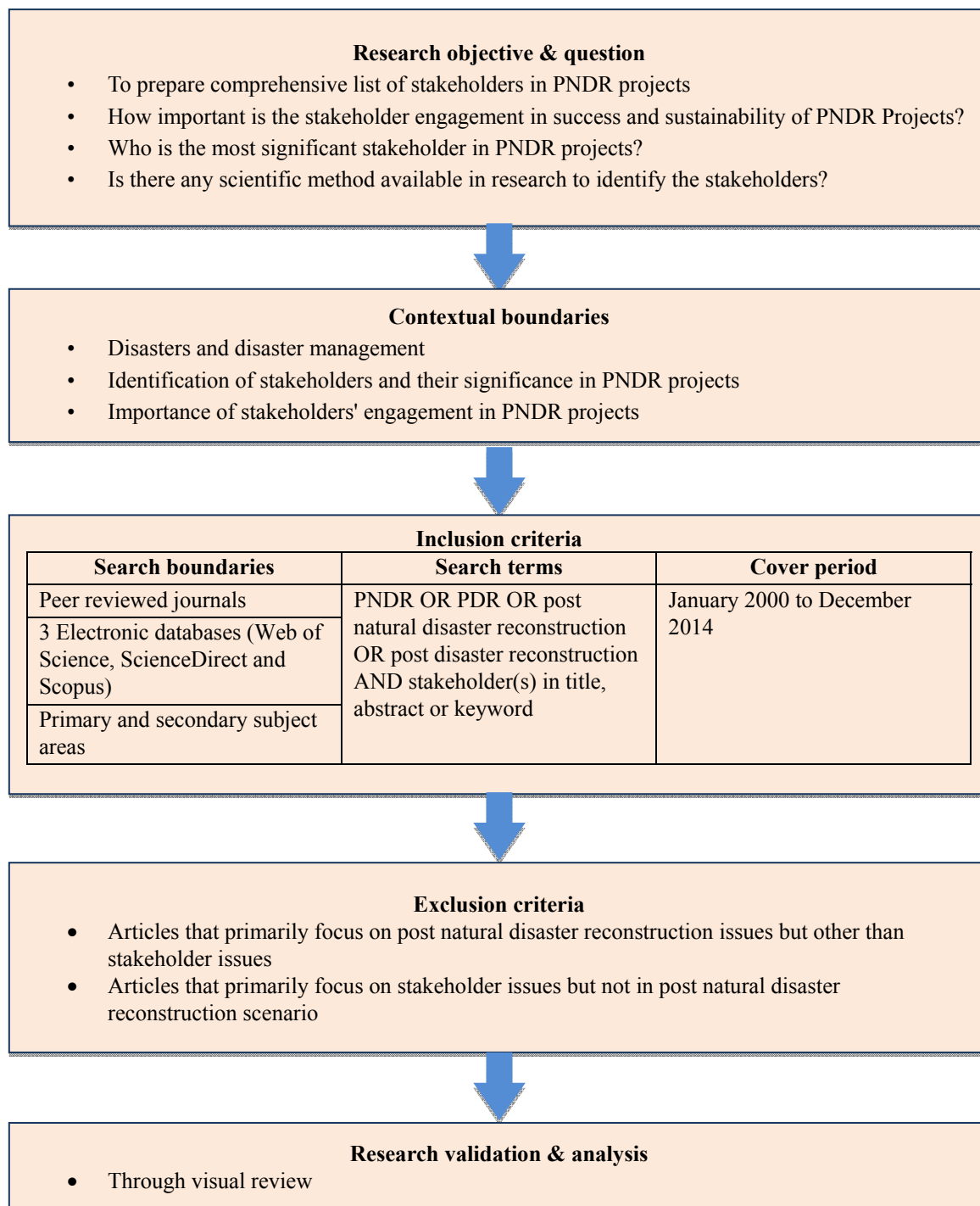


Figure 3. Summary of SLR process

Scopus is a search engine and database owned by the publisher Elsevier and given the coverage and accuracy, of the database, many researchers have found Scopus more useful than other search engines (Falagas, Pitsouni, Malietzis, & Pappas, 2008). Scopus has a broad spectrum of journals and construction researchers also prefer Scopus over other search engines (Ke, Wang, Chan, & Cheung, 2009; Yi & Yang, 2014). Web of science originated in the United States and is considered to provide better graphics and details for citation analysis than

any other database (Falagas et al., 2008). ScienceDirect is also owned by Elsevier and provides access to a large number of academic journals, mainly from Physical, Life, Health and Social Sciences. Considering the distinctive features of each database and to ensure the inclusion of all relevant research, all three databases were searched during July 2015. Research papers published in peer reviewed research journals during the year 2000 to 2014 using Title, Abstract and Keyword (T/A/K) fields were identified. Searched articles were subjected to a through preliminary review to eliminate redundancy, as it was expected that a few research papers may be include in search results of more than one database. Through preliminary review, research papers were selected for detailed analysis by implementation of already defined inclusion and exclusion criteria.

3.1 Search Results

T/A/K search in three research databases provided a list of 205 research papers (Table 2).

Table 2. Number of target papers searched

No. of Papers			
Scopus	Web of Science	Science Direct	Total
67	94	44	205

Year wise distribution of published papers is shown in Figure 4.

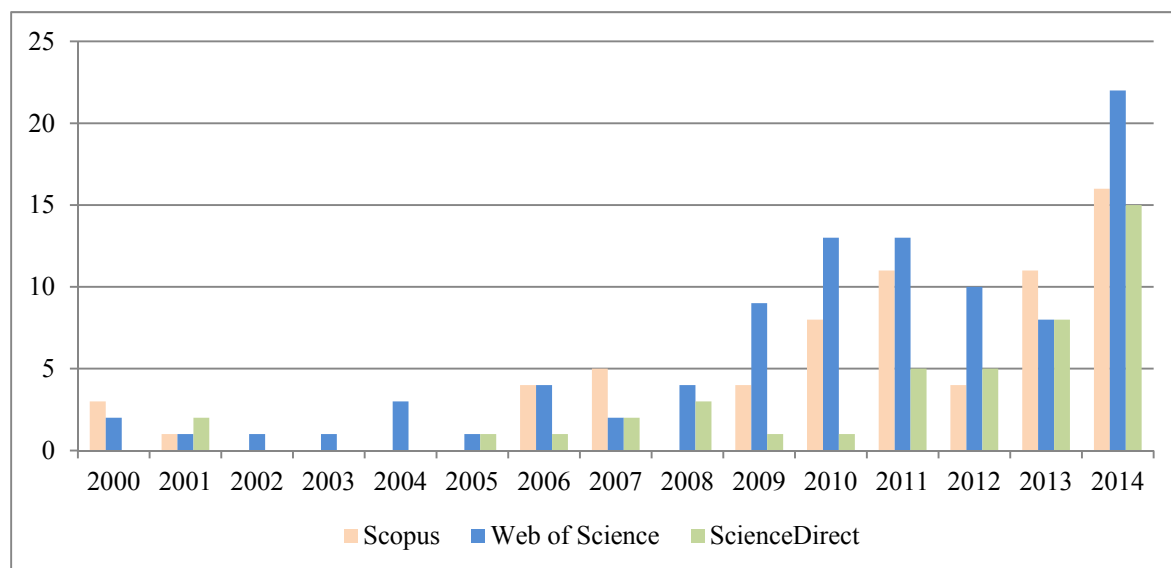


Figure 4. Year wise distribution of target research papers

Year-wise publication details shown in Figure 4 indicate that over time the number of publications in this research area is increasing however, research journals that are publishing in the field of disaster management; especially post natural disaster issues are still very limited in number. List of journals that have published 2 or more research papers during the period from 2000 to 2014 are given in Table 3.

Preliminary literature review revealed that developing countries are facing severe destruction due to natural disasters, however research on disaster related issues in developing countries is not well established. Due to poverty, high population density, illiteracy and lack of infrastructure, developing countries are more susceptible to disasters (Moe & Pathranarakul, 2006) and have suffered more damage in preceding years, however, the majority of the research carried out during the period from 2000 to 2014 in the field of disaster reconstruction has originated from developed countries. More than 90% of researchers (n=185) doing research in the field of disaster reconstruction are working in developed countries.

Table 3. Journals that produced two or more target papers

Web of Science		Scopus		ScienceDirect	
Title of Journal	No. of Papers	Title of Journal	No. of Papers	Title of Journal	No. of Papers
Disasters	20	International Journal of Disaster Resilience in the Built Environment	9	Procedia Economics and Finance	7
Open House International	11	Archnet Ijar	5	Habitat International	5
International Journal of Strategic Property Management	7	Open House International	5	Social Science & Medicine	4
Journal of Mountain Science	7	Disasters	3	International Journal of Disaster Risk Reduction	3
Journal of the American Planning Association	6	Planning Theory and Practice	3	Journal of Asian Earth Sciences	2
Environmental Hazard Human and Policy Dimensions	5	Environmental Hazards	2	Procedia – Social and Behavioral Sciences	2
Habitat International	5	Habitat International	2		
Building Research and Information	4	Building Research and Information	2		
Proceedings of the Institution of Civil Engineers	2	International Journal of Strategic Property Management	2		
		Construction Management & Economics	2		
		Natural Hazards Review	2		
		Proceedings of the Institution of Civil Engineers Urban Design and Planning	2		

Table 4. Research origin of published target papers (two or more papers)

Web of Science		Scopus		ScienceDirect	
Origin	No. of Papers	Origin	No. of Papers	Origin	No. of Papers
United States of America	25	United Kingdom	12	China	11
United Kingdom	18	United States of America	12	United Kingdom	6
China	12	New Zealand	10	United States of America	5
Canada	9	Australia	9	Japan	4
New Zealand	9	Canada	7	Australia	2
Australia	6	Japan	7	New Zealand	2
Turkey	4	China	6	Portugal	2
Netherlands	3	Iran	4		
Norway	3	India	2		
Switzerland	2				

Certain universities and researchers have published a significant number of publications thus these have been developed as a research centres. Analysis of target papers listed in databases revealed that the top three researchers have contributed more than 30% of the total research output.

Table 5. Researchers involved in two or more target papers

Web of Science		Scopus		ScienceDirect	
Name of Author	No. of Papers	Name of Author	No. of Papers	Name of Author	No. of Papers
Wilkinson S.	8	Wilkinson S.	10	Amaratunga D.	2
Potangaro R.	7	Potangaroa R.	8	Wickrama K.	2
Chang Y.	5	Chang Y.	7		
Seville E.	5	Seville E.	7		
Amaratunga D.	3	Von Meding J.	4		
Kelman I.	2	Johnson C.	3		
Leon E.	2	Lizarralde G.	3		
Liu Y.	2	Boano C.	2		
Lyons M.	2	Ahmad I.	2		
Zhang Y.	2	Davidson C.H.	2		
		Asgary A.	2		
		Oyedele L.	2		

It is also an interested observation that most of the researchers who are working in developed countries are exploring the issues of developing countries through various empirical studies. Detailed analysis reflects that 63 papers have been published by the researchers of developed countries while exploring specific empirical studies from China, India, Indonesia, Sri Lanka, Pakistan, Vietnam, Haiti, Lebanon, Bangladesh, Tunisia, Iran and Turkey. A large number of these case studies (n=22) selected to explore the aftermaths of Indian Ocean Tsunami that occurred in 2004.

Table 6. Target papers that explored empirical studies from developing countries (5 or more papers only)

Country	Web of Science	Scopus	ScienceDirect	Total
China	2	7	-	9
India	4	3	-	7
Indonesia	1	5	1	7
Sri Lanka	1	5	-	6

Disaster management is a multidiscipline research area thus a large number of researchers from different research backgrounds have published their research during the period from 2000 to 2014. Major contribution in the disaster management field has been made from Environmental Sciences and Engineering fields that have direct concern with disaster management. Other vital areas include Social Sciences, Business and Economics, Project Management and Public Administration.

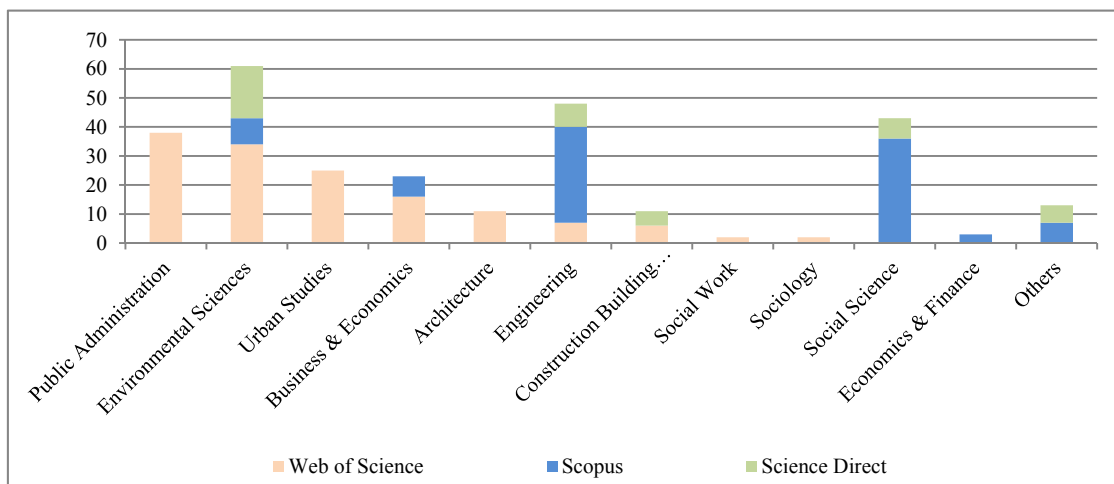


Figure 5. Major research areas of target papers

The main purpose of above analyses conducted in the preliminary phase of this study was to identify the level of attention that researchers has given to PNDR research as a distinct research field. This initial phase of study provided a broader range of research papers, which were further scrutinized through implementation of predefined inclusion and exclusion criteria.

Initial review of target papers in accordance with the inclusion and exclusion criteria resulted in categorization of target papers into three categories. The papers that have only passing reference to the disasters on their way to focus on other research fields such as, health, economics and psychology were categorized as not-relevant. The papers that focused on disasters, but discussed issues other than stakeholders were categorized as relevant; however, papers with special emphasis on stakeholder related issues were selected as the most relevant and were taken onto the next phase for detailed analysis.

Table 7. Categories of target papers

	Scopus	Web of Science	ScienceDirect	Total
Most Relevant	31	13	8	52
Relevant	24	59	16	99
Not relevant	12	22	20	54
Total	67	94	44	205

A very limited number of publications in PNDR having emphasis on stakeholders during the selected period indicate that researchers have paid little attention towards this research area. In the next phase, the most relevant research papers were critically analysed to answer the research questions.

4. Critiques on Stakeholders and Their Engagement

Contents of most relevant papers were critically analysed and described under following themes.

4.1 Stakeholders

In the perspective of post natural disaster reconstruction, many researchers have identified various stakeholders. Table 8 reflects the stakeholders identified by various researchers.

Table 8. Stakeholders identified in previous studies

Stakeholder	Description	Identified by
Affected community / residents	Local inhabitants affected by the disaster	(Chang, Wilkinson, Potangaroa, & Seville, 2010; Dixon & McGregor, 2011; Dorosh, Malik, & Krausova, 2010; Kaiser et al., 2013; Mannakkara & Wilkinson, 2013; Vojinovic & van Teeffelen, 2007; Wilson, 2009; Yan et al., 2012)
Government	Public and semi-public entities and line agencies at village, district, state and national levels including planning and policy making bodies & forums	(Chandrasekhar, 2012; Chang et al., 2011; Dorosh et al., 2010; Hayles, 2010; Khan & Rahman, 2007; Mannakkara & Wilkinson, 2013; Ophiyandri et al., 2013; Samaratunge, Coghill, & Herath, 2012; Vojinovic & van Teeffelen, 2007) (Ophiyandri et al., 2013; Tyler & Singh, 2011; Wilson, 2009) (Brun & Lund, 2010; Tyler & Singh, 2011)
Non-government organizations (NGOs)	International & National NGOs, voluntary associations, civic groups	(Brun & Lund, 2010; Chandrasekhar, 2012; Y. Chang et al., 2010; Hayles, 2010; Jigyasu, 2013; Khan & Rahman, 2007; Ophiyandri et al., 2013; Samaratunge et al., 2012)
Community based organizations (CBOs)	Community based organization at village and district levels	(Brun & Lund, 2010; Chandrasekhar, 2012; Khan & Rahman, 2007; Tyler & Singh, 2011)
Media	International and national print and electronic media	(Amaratunga & Haigh, 2011a; Khan & Rahman, 2007)

Professionals	Consulting and construction firms & suppliers	(Ophiyandri et al., 2013; Vojinovic & van Teeffelen, 2007)
Academia	Researchers	(Khan & Rahman, 2007; Ophiyandri et al., 2013)
Private and corporate sector	International & National business and industrial groups	(Chang, Wilkinson, Potangaroa, & Seville, 2012; Khan & Rahman, 2007; Mannakkara & Wilkinson, 2013; Samaratunge et al., 2012; Yan et al., 2012)
Donors	International & National funding agencies	(Jigyasu, 2013; Khan & Rahman, 2007; Mannakkara & Wilkinson, 2013; Wilson, 2009; Yan et al., 2012)
Beneficiaries & End users	Direct or indirect beneficiaries & users of the facilities	(Hayles, 2010; Tyler & Singh, 2011)
Religious fundamentalists	Religious based groups and parties	(Brewer, McVeigh, & Meding, 2013)

According to Amaratunga and Haigh (2011) nature, objectives and context of any specific PDR project determine its stakeholders. These stakeholders have their specific roles and interests in the project. Based upon their interests and roles, researchers have divided stakeholders into various groups.

Chandrasekhar (2012) has divided stakeholders into; Government agencies (including state, district and village level administration), NGOs (international, national and regional), CBOs (including market groups) and effected community. Chang et al. (2011) divided stakeholders into 'principal' and 'primary' stakeholders, while Amaratunga and Haigh (2011) classified typical stakeholder groups encountered on a post-disaster reconstruction project as primary stakeholders and secondary stakeholders. The primary stakeholders are those who are essential for the project and without their participation the project could not proceed such as, donor agencies, governments, and regulatory bodies. The secondary stakeholders are not essential but they have influence or are influenced by the project, such as, local community, media and academia (Amaratunga & Haigh, 2011a). Brun and Lund (2010) also considered the effected community as 'primary or principal stakeholders' and all others including NGO, government officials, CBOs and other partners as 'other stakeholders'.

Rotimi et al. (2006) divided stakeholders into asset owners (private or public business community), civil defence and emergency management (CDEM) agencies (national, territorial and local government departments, fire brigade, relief and welfare agencies, safety and health personnel), insurance companies, non-governmental agencies (donor and charities) and construction and reinstatement organizations. Davis (2014) has classified stakeholders into:

Senior management: Board, directors, portfolio director, executive management, investors, executives, project executives, senior management, programme director, owner

Project core team: Project leader, manager, personnel, project team and its leader, other organizational involvements

Project recipients: Consumers, customers, clients, end users, users

Chang et al. (2011) identified three construction approaches for disaster reconstruction; (i) contractor-driven approach (ii) donor-driven approach (iii) owner-driven approach and mentioned that United Nations Disaster Relief Organization (UNDRO) has recommended community participatory / owner driven approach for reconstruction. Researchers believe that the local community is not a passive recipient (Jigyasu, 2013) and a community based approach involves a high level of community participation in a particular project (Ophiyandri et al., 2013). This approach inculcates a strong sense of ownership among the community (Ganapati & Ganapati, 2009). Community is a group who shares common characteristics and in PDR context, community is defined as a group of people directly affected by a disaster (Brewer et al., 2013; Dixon & McGregor, 2011; Ophiyandri et al., 2013; Wilson, 2009).

Since the PDR projects are very complex and urgent in nature, identification and engagement of stakeholders is extremely important, but a very difficult task (Amaratunga & Haigh, 2011b). The interests of the stakeholders are mainly based upon their expectations from the project and each stakeholder has its own interest and viewpoint about success or failure of the project. The PDR projects involve lots of financial and human resources thus they need to be more sustainable and resilient to potential future disasters, to avoid repeated investment. Clearly identified stakeholders and their interest will augment the chances of success of a project.

Comprehensive review of published papers revealed that researchers have identified a large number of stakeholders, based upon specific case studies and expert opinions; however, scientific approach to identify the stakeholder is still missing. Without identification and considering the interests of key stakeholders the success of PDR project will remain uncertain.

4.2 Stakeholder Engagement

The 21st century is more stakeholder focused (Davis, 2014) and stakeholder participation and engagement in PDR projects is critical (Chandrasekhar, 2012; Omidvar et al., 2011). Stakeholders should be engaged in the reconstruction in a variety of ways (Dorosh et al., 2010) ranging from planning and designing (Chang et al., 2011; Hayles, 2010; Jigyasu, 2013) to its implementation and completion (Khan & Rahman, 2007; Vojinovic & van Teeffelen, 2007). Furthermore, stakeholder engagement has been included in the mission statements and organizational philosophies of a large number of non-governmental organizations and international aid organizations (Daly & Brassard, 2011).

Reconstruction activities receive a large influx of economic resources (Guarnacci, 2012) and invokes interest from various international, national and local stakeholders (Guarnacci, 2012; Rautela, 2006). Relationships among various stakeholders determines effective governance (Samaratunge et al., 2012) which is an important aspect to satisfy their potentially conflicting interests (Chang et al., 2012). Some researchers also emphasised the need to eliminate any clash of interests and improved coherence between stakeholders for better results (Haigh & Sutton, 2012; Rautela, 2006). The stakeholders should improve coherence (Haigh & Sutton, 2012) and the level of engagement (Jigyasu, 2013) to achieve perceived objectives. Kog and Loh (2012) have identified communication with stakeholders and analysing their needs as a most significant factor for stakeholder management. Improvement of efficiency in PDR is subject to the clear understanding of each stakeholders' roles, effective coordination among all stakeholders and their participation in the process (Mannakkara & Wilkinson, 2013). There could be several ways of participation of stakeholders such as participation through information provision, participation by consultation, participation through provision of resources such as material, funds, labour or any other resource, passive or interactive participation and by taking other initiatives (Daly & Brassard, 2011). Stakeholders' consultation at planning and design stage is key to optimize its functionality (Hayles, 2010). Yang et al. (2009a) also identified that communication with stakeholders and determination of their needs underpins the project success.

There are five aspects of participation of community, i) manipulation, ii) information, iii) consultation, iv) collaboration, and v) empowerment (Ophiyandri et al., 2013). The empowerment of community establishes full control by the community over the project (ibid, 2013). Stakeholders participation is a critical aspect, however, its dynamics and processes still need to be explored (Chandrasekhar, 2012). Participation of community in post disaster housing projects must be ensured (Hayles, 2010) and it is the community who knows what they need and what is the best for them (Ophiyandri et al., 2013). Involvement of all stakeholders including government, NGOs / CBOs, media, private sector, academia and professionals is important for the success of the project (Khan & Rahman, 2007; Tyler & Singh, 2011) and they should strive to improve coherence among all stakeholder groups to achieve the project objectives (Haigh & Sutton, 2012).

The researchers has determined that that stakeholders engagement is very important for success of a project, however practical approach based on scientific research for engagement of stakeholders in project still needed to be formulated. Sustainability of the PDR projects could be ensured by engagement of stakeholders, especially the community. Participation of community and other stakeholders in PDR project will lead the project to success.

5. Findings and Discussion

SLR conducted in this paper has revealed that post natural disaster reconstruction projects are different from routine construction projects due to their complexity and nature. Post natural disaster reconstruction, as a discrete research area, is gaining in importance and a few research groups in universities are publishing papers quite frequently, but still this research area needs due attention of researchers. The statistics shows that natural disasters have affected developing countries the most, beside mainstream researchers in the field of post natural disaster reconstruction are from developed countries. The PDR research comprises a number of different sub-topics, however, keeping in view the objectivity of this research, the papers published in the specific area of 'stakeholders' were examined. Clearly identifying and defining stakeholders groups and managing their interests are crucial for the project success (Davis, 2014), however research is unable to find any scientific method for identification of stakeholders and their interests (Yang et al., 2009). It is very difficult to draw a boundary between the interests of the various stakeholders as these are often overlapping each other. It is sometimes,

useful to ask obvious or identified stakeholders to point out other stakeholders creating a snowball effect to stakeholder identification. The content analysis of selected papers revealed that a large number of stakeholders have been identified by the researchers, however a few have pointed out that it is almost impossible to prepare an exhaustive list of stakeholders due to the fact that PDR projects are complex and uncertain.

Previous research, based upon case studies and empirical evidences, have also divided stakeholders into different groups. Kate Davis (Davis, 2014) has come up with the most adequate group of stakeholders i.e. i) senior management, ii) project core team, and iii) project recipient, however, still some stakeholders could not be associated in any of these groups, such as media and academia. Chandrasekhar (2012) also identified some groups however still, professionals, media and academic are not defined as a member of any of these groups. Primary and secondary stakeholders classified by Amaratunga and Haigh (2011) seems appropriate, however, these groups needs further clarification and deliberations in terms of its constituents. Some of the secondary stakeholders such as the local community might not have a mandatory role in the project, however, researchers (Brun & Lund, 2010; Jigyasu, 2013) have identified that community has a primary role and is not a passive actor in PDR projects. Despite the significance of community participation in PDR projects, recent experiences confirm this theory is not translated into practice (Daly & Brassard, 2011). Muller and Jugdev (2012) also mention that the judgement about any project is subjective based entirely on the individuals' perspectives and interests.

Application of good governance practices are very crucial for effective PDR projects (Daly & Brassard, 2011) and engagement of stakeholders, conscious efforts of identifying their needs and interest guarantee its success (Hayles, 2010). Although Chang et.al (Chang et al., 2011) has identified a donor driven approach as one of the widely applied approach in PDR, however, when it comes into practice Daly and Brassard (2011) through case study research, have identified serious problems in its application. Research conducted in various sectors have identified a positive relationship between ownership of the development processes and local beneficiary involvement, with project efficiency and beneficiary satisfaction (Daly & Brassard, 2011). Davis (2014) through systematic literature review of different stakeholder groups and their perception for project success conducted in the field of project management has identified several groups of stakeholders based on their common interests and concluded that the project manager, client and end users are the most cited stakeholders.

Stakeholders' engagement is an important aspect for the success of PDR project, but contemporary research has paid very little attention to it. Project failure is not only the result of inefficiency or lack of resources but the more common aspect is inappropriate interaction between the project stakeholders (Missonier & Loufrani-Fedida, 2014). The researchers are agreed that literature on stakeholder analysis and engagement suffers limitations (ibid, 2014), and thus needs more attention and importance. Researchers have identified a few theories for stakeholders engagement, however, it is revealed that these theories are not practically implemented on the ground.

The systematic review of contemporary research revealed that most of the research carried out in the field of post natural disaster reconstruction projects are case study based and have identified stakeholders in a specific scenario. There is no specific method outlined by the researchers to identify the stakeholders and their interests. There are several bases to divide stakeholders into groups; however, it is also imprecise and dubious. The researchers have emphasized on engagement of stakeholders in PDR projects, but still there is no specific methodology or framework for their engagement. Sustainability of the PDR projects is very important and could be incorporated by involvement of stakeholders but, unfortunately, has got very meagre attention of the researchers.

6. Conclusion & Future Research

Natural disasters are one of the major challenges faced by the human kind since ages and increase in frequency of these disasters have been witnessed in recent times, which is the most worst effect of climate change. The devastation caused by natural disasters is compelling to find out ways and means to improve the efficiency and effectiveness of post-disaster activities. The researchers has emphasized not only to restore normal life in disaster stricken areas but also to take the situation as an opportunity to create a safer, sustainable and resilient built environment. Sustainability and resilience in the built environment are attracting more attention of researchers and some inspiring studies (Bornstein, Lizarralde, Gould, & Davidson, 2013; Yan Chang et al., 2010; Davis, 2014; Guarnacci, 2012) have concluded that engagement of stakeholders is very crucial to achieve this goal.

Post natural disaster reconstruction is a relatively new field of research and steadily drawing attention of researchers. Numbers of publications in PNDR with special emphasis on stakeholder related issues are increasing with the passing years, which is an encouraging trend. Systematic review of publications from the last decade revealed that mainstream researchers working in this field are from developed countries and are paying

attention to the problems more frequently faced by the developing countries. It is also divulged that most of the research carried out during the past decade in the field of PDR projects in connection with stakeholder engagement are case study based and have provided empirical evidences.

Almost all researchers have emphasized identification of 'stakeholders' and their engagement in PDR projects and have listed a number of stakeholders in their publications. Most of these publications are case study based and identifies the stakeholders in a specific project or scenario. A large number of stakeholders have been identified by the researchers and are listed in Table-8; however, this could not be considered an exhaustive list of stakeholders for PDR projects. Each PDR project has specific objective and stakeholders and their interests depend upon this peculiar objective should be clearly identified beforehand, but there is no commonly agreed scientific method outlined in the research for identification of stakeholders and their interests. A generally agreed scientific method for identification of stakeholders is needed to be outlined and tested in various scenarios for its suitability and adaptability.

Similarly, researchers are emphasizing a need to engage the stakeholders in the reconstruction activities and have outlined various approaches to engage them; however, these approaches have not been implemented on the ground in its true letter and spirit. Hence, a widespread methodological approach is needed for identification of stakeholders, their interests and to engage them to ensure more sustainable and resilient PDR project. While the significance of stakeholders and their engagement have been largely emphasized by the researchers, future research efforts are likely to be on formulating a method for identification of stakeholders and their interests in PDR projects. Clear identification of stakeholders and their interests will facilitate to divide them into interest based groups as well as to fulfil their expectations. Ultimately this effort will provide more sustainable and resilient PDR projects.

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