

# Management of Post-Flood Disaster Housing Reconstruction in Lokoja Metropolis, Nigeria

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## ABSTRACT:

In any flooding, buildings are the components that is mostly affected, and represents the greatest portion of the damages in the overall impact of a disaster on the individual and national economy. In October 2012, a flood devastated more than 10 states in Nigeria that included Kogi State where safe actions on victims vulnerability were taken through post-flood disaster housing reconstruction developments. However, the implementations of some of the resolutions was inadequately done due to non availability of basic guidelines for the reconstruction processes. This research aim to develop a framework for post-flood disaster housing reconstruction for flood victims in Lokoja Kogi state, Nigeria. One hundred and fifty nine questionnaires were administered to the construction professionals working with Kogi state Ministry of works Housing and urban development out of which one hundred and thirty constituting 81% was valid for analysis using SPSS. The findings reveals planning housing reconstruction and organizing housing reconstruction are the most effective management processes. Furthermore, the research focuses on the challenges of Post-flood disaster housing reconstruction, resource mobilization strategies and level of Post-flood disaster housing reconstruction effectiveness.

**Keywords** – Management, Post-flood, Disaster, Housing, Lokoja - Nigeria

## I. INTRODUCTION

The term “natural disaster” is used in reference to an event or situation that overwhelms people and local capacities to cope and even deal with it (Anderson, 2000). A disaster is defined as a serious disruption of the functioning of a community or a society at any scale due to hazardous events interacting with conditions of exposure, vulnerability and capacity, leading to one or more of the following: human materials, economic and environmental losses and impacts (UNISDR, 2014). Some of these disasters include

floods, droughts, wildfires, pests and pestilences, epidemics, earthquakes and hurricanes. Whilst few are attributed to natural variations, many of these are human induced (UNEP, 2007). There is no doubt that globally, natural disasters is on the increase, over the past two decades, the economic losses and the number of people who have been affected by flood disasters have increased more rapidly(UNEP, 2007). Globally more than 150million people were affected by the flood in the 1990s with about USD63 billion lost in terms of market value of damaged properties (World Bank, 2002). In terms of human lives lost, between 1980 and 2012, flood disasters caused about 200,000 deaths worldwide (Ruiz & Peduzzi, 2005). About 75% of the world population lives in areas at least once affected by these disasters (Ruiz & Peduzzi, 2005).

Sustainable development and disaster reduction and prevention are therefore essential precondition for each other. Pandey and Okazaki (2005) indicated that effective disaster management can fully benefit humanity because it will impact on the environment, serve as a human intervention for sustainable development and improve food security. Furthermore, current development studies prove that assistance in times of disasters and after disasters can serve as a tool for national development. This is exemplified in countries such as Botswana and Zambia in which emergency relief interventions become stepping stones for long-term development projects (Buchanan-Smith & Maxwell, 1994). Natural disasters are actually no longer annual events but can almost be considered as chronic conditions that persist throughout the year (Kyung & Jae-ho, 2012). Nigeria is not immune to the socio-economic and the negative developmental impacts of natural disasters.

Post-disaster housing construction therefore, can be used as a development opportunity or as a tool to help reduce disaster risks by paying particular attention to various vulnerabilities (Shaw, 2006). Reconstruction

activities are those activities in recovery and rehabilitation phase of disaster risk management, actions taken to restore and if possible improve pre-disaster living condition of the affected communities (Hidayat&Egbu, 2010). Post-disaster housing reconstruction can be conceptualized as a dynamic process in which the roles of various stakeholders are significantly overlapped and various project resources such as labour, materials and equipment are concentrated in a limited time and space (Kyung & Jae-ho, 2012). Post-disaster housing reconstruction requires a fundamental re-think of skill sets, management processes, risks and constraints (Prieto&Whitaker, 2011). Post-disaster housing reconstruction is heavily tagged with expectation to provide better housing (Hidayat&Egbu, 2011). However, the nature of the housing reconstruction is quite different, commonly with the addition of chaotic conditions, rarity of resources and many simultaneous projects at the same time (Haigh&Ingirige, 2009).

Housing is often the most valuable social and economic asset (Ahmed & Charles, 2014). It is a significant loss component in flood disasters and particularly in developing countries (Ahmed, 2011; Lindell, 2013; Lyons, 2009), its loss result in affected communities becoming susceptible to homelessness and severe humanitarian conditions. This research aim to develop a framework for effective management of post flood disaster housing reconstruction in Kogi State. The following research objectives were formulated to achieve the stated aim.

1. To determine the management processes involve in post flood disaster housing reconstruction.
2. To identify the challenges of post flood disaster housing reconstruction.
3. To determine the resource mobilization strategies adopted in study area.
4. To determine the level of effectiveness of post flood disaster housing reconstruction.
5. To propose a framework for effective management of post flood disaster housing reconstruction.

## II. POST-DISASTER HOUSING RECONSTRUCTION

Post-disaster housing is defined by United Nations Disaster Relief Organization (UNDRO, 1982) as “housing policies and applications following a disaster for meeting the urgent, temporary and permanent sheltering needs of the survivors of the disaster”. The construction of post-disaster housing is a process separate from the construction of housing in normal times, since the

process consists of actions to be realized in times of major crisis in the aftermath of disasters (Quarantelli, 1997; Quarantelli, 2000; Barakat, 2003).

Various architects, designers and other technical actors have mistakenly considered housing only as a product, but it is definitely a process. Therefore, post-disaster housing is also a process and the post-disaster dwelling is the product of a “long chain of social, economic, technological, environmental, political and other interactions” (UNDRO, 1982). This interaction combines social consciousness, highly developed technology, and economic systems with the participation of the affected community (Norton, 1980; UNDRO, 1982; Aysan& Davis, 1993; Barakat, 2003).

The post-disaster housing reconstruction process consists of four different periods: pre-disaster period, immediate relief period, rehabilitation period and reconstruction period (UNDRO, 1982). The pre-disaster period is the phase when major policies are decided and database is formed. The immediate relief period is significant for the damage and needs assessments which should be realized directly after the disaster. The rehabilitation period is where all the critical decisions about the detailed implementation plan are made. The construction, implementation and evaluation period of the permanent post-disaster houses is termed the reconstruction period (UNDRO, 1982).

The actions and measures defined in the process also fall into four categories; policy-making, organization, implementation, and evaluation and follow-up (UNDRO, 1982). Actions related to policy-making and various actions about organization are realized in the pre-disaster period and the remaining actions are realized in the post disaster phases. On the other hand, the process of post-disaster housing is a cycle.

Consequently, actions, especially the ones in the pre-disaster period and reconstruction period, may overlap.

### 2.1 Management Processes Of Post-Flood Disaster Housing Reconstruction

The oxford dictionary defines the word ‘management’ as “the process of dealing with or controlling things or people”. According to Wren (2005), the word ‘management’ means ‘the art of arranging physical and human resources towards purposeful ends’. Strategic management, as Armstrong (2009) explains, involves adopting a broader and/or longer term view of what need to be done and ensuring that the activities are carried out and contribute to achieving those strategic goals.

Management process therefore is a systematic way of doing things and achieving strategic goals and purposes require. Strategic management is now mostly accepted and employed in various organizations in public and private sector and business administration because organizations must perform well in the present to succeed in future. As Hanaggan (2002) highlights, strategic management is about a sense of purpose, looking ahead, planning, positioning, strategic fit, leverage and stretching. It needs creativity and innovative thinking to make sense of organizing, supervising and controlling. Strategic management consist of strategic analysis which is concerned with the expectation and purpose of an organization, its resources and capabilities. It includes strategic choice, which is a question of considering options, evaluating and selecting. It also includes strategic implementation which is about organizational structure and design, resource allocation, control and managing strategic change.

The management of housing reconstruction process following a major disaster presents massive and often unprecedented challenges to any country, especially those with limited or no prior experience with such situations (World Bank, 2010). In either case, assistance may be needed to put the reconstruction management arrangements in place and to establish an effective system of coordination among government and non-governmental entities.

**The guiding principles for post-disaster housing reconstruction management are:**

- **Government should lead the effort to define reconstruction policy and should coordinate its implementation. These policy decisions must be properly communicated to the public.**
- **Best practice is to establish a reconstruction policy and an institutional response structure, including one for housing and community reconstruction, before a disaster.**

- The institutional arrangements for managing reconstruction should reflect reconstruction policy. The agency put in charge should be provided with a mandate, a workable structure and a flexible operational plan.
- The reconstruction agency, even if it is new or temporary, must work closely with existing line ministries and other public agencies to provide efficient and effective post-disaster reconstruction.
- Mechanisms are needed to coordinate the actions and funding of local, national and international agencies involved in reconstruction and to ensure that information is shared among them.
- Funding must be allocated equitably and should stay within agreed limits broad controls and good monitoring of all sources minimizes corruption (World Bank, 2010).

### III. RESEARCH METHODOLOGY

The methods employed for this study embrace extensive searching of relevant literatures connecting to the study such as journals, textbook, magazines and of course the internet. The sample frame for this study comprised of Quantity surveyors, Architects, Civil Engineers and Builders. 159 questionnaires were administered to the respondents (Quantity surveyors 40, Architects 39, Civil Engineers 30, and Builders 50), after selecting them by means of a simple random sampling techniques. On the whole, a total of 130 (81%) questionnaires were returned completed in a usable format. After primary analysis of data, the screened questionnaires for analysis accounted for 35 from Quantity surveyors; 27 from Architects; 23 from Civil Engineers; 45 from Builders. Data analysis were undertaken using descriptive statistics by the application of Microsoft Excel and statistical packages for social sciences (SPSS) where frequency mean and percentages were employed to interpret the results.

### IV. RESULTS AND DISCUSSION

This session presents the findings for this study.

**Table 1: Educational Specialization Type**

Category	Group	Number of Respondents	Percentage (%)
Specialization	Architecture	27	20.8
	Building Technology	45	34.6
	Quantity Surveyor	35	26.9
	Engineering	23	17.7
	<b>Total</b>	<b>130</b>	<b>100</b>

- The demographic data of the 130 respondents is presented in Table 6. The table reveals that majority of the respondents specializes in building, followed by quantity survey, Architecture and engineering.

**Table 2: Level of Educational Qualification**

Category	Group	Number of Respondents	Percentage (%)
Qualification	ND	19	14.6
	HND	39	30.0
	BSc/B.Tech	47	36.2
	MSc	17	13.1
	PhD	9	6.9

- The research findings reveal that registered professionals with ND qualification account for 14.6%, HND account for 30%, BSc account for 36.2%, MSc account for 13.1%, PhD account for 6.9% and others whose professional institution were not captured in the survey account for 12%.

**Table 4: Professional Institutions**

Category	Group	Number of Respondents	Percentage (%)
Professional Institution	NIA	37	28.5
	NIOB	32	24.6
	NSE	29	9.2
	NIQS	28	21.5
	Others	12	22.3
<b>Total</b>		<b>130</b>	<b>100</b>

- This is an indication that majority of the professionals have requisite qualification and training for efficient delivery of responsibilities. Also, they are in a better position to offer professional advice with regards to the management of housing reconstruction.

**Table 5: Years of Experience**

Category	Group	Number of Respondents	Percentage (%)
Years of Experience in construction Industry	Less than 5 years	27	20.8
	5 – 11 years	42	32.3
	12 – 17 years	27	20.8
	17 – 23 years	26	20.0
	Over 20 years	12	9.2
	<b>Total</b>		<b>130</b>

- Table 2.3 reveals that majority of respondents have between 5 to 11 years' experience with an aggregate percentage of 32.3%. Most of the respondents are between 12-17 years and less than 5 years each representing 20.8%. In addition 17-23 years' experience accounted for 20% while those with above 20years accounted for 9.2%. This implies their possession of valuable knowledge in the building industry placed them on a better position to contribute meaningfully in management of housing facility.
- In addition, most of the respondents were at lower management level representing (28.5%) followed by those at the middle management level accounting for 25.4%. Furthermore, top management level, trade supervision and others represented 10.0%, 17.7%, 18.5% respectively.

**Table 6: Management Processes of post Flood housing reconstruction**

S/N	Management Processes	Mean	Std. Deviation	Rank
1	Planning reconstruction housing	3.73	1.01	1 <sup>st</sup>
2	Organizing reconstruction housing	2.65	1.04	2 <sup>nd</sup>

3	Communication and coordination	2.05	0.75	3 <sup>rd</sup>
4	Leading	2.27	0.74	4 <sup>th</sup>
5	Controlling/ Supervising	2.51	0.97	5 <sup>th</sup>

Table 6 presented the level of effectiveness of post-disaster housing reconstruction management processes with planning housing reconstruction processes ranked 1<sup>st</sup> with mean value of 3.73 as the most effective management process, followed by organizing housing reconstruction, communication and coordination, Leading, controlling/supervising with

the means values of 2.65, 2.51, 2.27, 2.05, respectively. Organizational actions are the first but fundamental steps to prepare an organizational model for post-disaster housing reconstruction at the regional and local level (UNDRO, 1982; Aysan and Davis, 1993; Conerio, 1998, UN-HABITAT, 2001; Prestipino, 2004).

**Table 7: Challenges of Post- Flood Disaster Housing Reconstruction**

S/N	Challenges	Mean	Std. Deviation	Rank
1	Fraud, corruption and waste of project fund	3.14	1.21	1 <sup>st</sup>
2	Inadequate availability of resources	2.82	1.16	2 <sup>nd</sup>
3	Insufficient capacity of the construction industry	2.78	1.14	3 <sup>rd</sup>
4	Lack of community participation	2.68	1.12	4 <sup>th</sup>
5	Supply chain and logistics	2.71	1.15	5 <sup>th</sup>
6	Ignoring local needs culture	2.60	1.14	6 <sup>th</sup>
7	Organizational behavior	2.29	0.94	7 <sup>th</sup>

With regards to the challenges of post-flood disaster housing reconstruction, Fraud, corruption and waste of project fund ranked 1<sup>st</sup>, inadequate availability of resources, Insufficient capacity of the construction industry, Lack of community participation, Supply chain and logistics, ignoring local needs culture, Organizational behaviour ranked 2<sup>nd</sup>, 3<sup>rd</sup>, 4<sup>th</sup>, 5<sup>th</sup>, 6<sup>th</sup>, and 7<sup>th</sup>, respectively. This is an indication that

the respondents are well informed of the challenges of the management of post-flood disaster housing reconstruction based on their knowledge and information gathered. Bilau, et al. (2017) in their study asserted that post-disaster housing reconstruction depend on the effective delivery of required supplier and relies on a high degree of logistics and expertise.

**Table 8: Resource Mobilization Strategy on Post-flood Disaster Housing Reconstruction**

Category	Mobilization Strategies	Mean	Std. Deviation	Rank
Financial Mobilization	Bilateral funding arranging	2.94	1.16	1 <sup>st</sup>
	Multilateral agencies	2.88	1.33	2 <sup>nd</sup>
	Grants and grants-in-aid	2.86	1.08	3 <sup>rd</sup>
	Lending & banking servicing	2.64	1.13	4 <sup>th</sup>
	Microfinance Institution	2.46	1.20	5 <sup>th</sup>
Land Provision	Housing need assessment	2.51	1.19	1 <sup>st</sup>
	Assessment of land availability	2.28	1.07	2 <sup>nd</sup>
	Land allocation planning	2.15	1.05	3 <sup>rd</sup>



	Titling	2.03	0.87	4 <sup>th</sup>
Labour Mobilization	Mobilization & recruitment of local manpower	2.41	0.99	1 <sup>st</sup>
	Recruitment & importation of expert	2.26	1.03	2 <sup>nd</sup>
	Engagement of construction industry actors	2.22	1.06	3 <sup>rd</sup>
Material Mobilization	Stratification of Material Procurement	2.94	1.16	1 <sup>st</sup>
	Establish Material Procurement Qualification criteria	2.88	1.33	2 <sup>nd</sup>
	Logistic and Supplies	2.64	1.13	4 <sup>th</sup>
	Utilization of e-procurement system	2.46	1.20	5 <sup>th</sup>

- With regards to resource mobilization strategy used on the effectiveness on post-flood disaster housing reconstruction in the study area, the result is presented in three categories (see Table 13). Financial mobilization strategy has five strategies with bilateral funding ranked 1st with mean value of 2.94 is termed effective strategy for resource mobilization in the study area. The table also revealed that multilateral agencies and Grant and grants-in-aid are the 2nd and 3rd strategy in ranking with mean values of 2.88 and 2.86 respectively while lending & banking servicing and microfinance institution is ranked 4th, 5th respectively with their corresponding mean values of 2.64 and 2.46
- Subsequently, financial provision strategy has four mobilization strategies with housing need assessment ranked 1st with mean value of 2.51 is termed effective strategy for resource mobilization in the study area. The table also showed that assessment of land availability and land allocation planning with titling are ranked 2nd, 3rd and 4th are fairly effective resource mobilization strategy with mean values of 2.28, 2.15 and 2.03 respectively.

**Table 9a: Level of PfdHR Effectiveness**

S/N	PfdHR Variables	Mean	Std. Deviation	Rank
1	Reconstruction Period	3.14	1.28	1 <sup>st</sup>
2	Rehabilitation Period	2.71	1.23	2 <sup>nd</sup>
3	Pre-disaster	2.68	1.14	3 <sup>rd</sup>
4	Immediate Relief Phase	2.60	1.13	4 <sup>th</sup>

Table 9a shows the level of effectiveness of immediate relief phase, rehabilitation period, pre-disaster and reconstruction period on post-flood disaster housing reconstruction in the study area. Reconstruction period ranked first, followed by rehabilitation period second, then Pre-disaster

ranked third and lastly immediate relief phase ranked fourth. The results show that reconstruction period and logistic and rehabilitation period are the major variables that influence the effectiveness of post-flood disaster housing reconstruction in the study area.

**Table 9b: Level of PfdHR Effectiveness Reconstruction Approach**

S/N	Reconstruction Approaches	Mean	Std. Deviation	Rank
1	Owner-driven reconstruction	2.67	1.34	1 <sup>st</sup>

2	Agency-driven	2.55	1.25	2 <sup>nd</sup>
3	Community cash approach	2.46	1.16	3 <sup>rd</sup>
4	Unconditional Cash Approach	2.40	1.14	4 <sup>th</sup>

he Table 9b shows the level of effectiveness of the reconstruction approach on post-flood disaster housing reconstruction in the study area. The results revealed that owner-driven reconstruction ranked first, agency-driven ranked second, community cash approach, and unconditional cash approach ranked fourth. The results show that owner-driven reconstruction and agency-driven are more effective than community cash approach and unconditional cash approach in terms of post-flood disaster housing reconstruction.

### V. CONCLUSION

Post-disaster housing reconstruction represents a significant portion of properly investment yet the management of housing reconstruction programmes has often proved to be ineffective. While the Post-disaster context admittedly makes the management challenge greater than it is for normal housing construction ,it also offers exceptional opportunities to invest in and develop a more resilience built environment. Thus there is an urgent need to improve the management of reconstruction programmes.

### REFERENCES

- [1]. Alexander, D. (2000). *Confronting Catastrophe*. New York Oxford University press.
- [2]. ALNAP (2002). *Annual review. Humanitarian, Acutrim: Improving performance through improved learning*; ODI: London, UK.
- [3]. ALNAP (2003). *Humanitarian Action: Improving monitoring to Enhance Accountability and learning*. London: ODI: London UK
- [4]. Aysan, Y & Davis.I., (1993). *Rehabilitation and Reconstruction: UN disaster management training programme module*, Washington D.C., United Nations Development programme and United Nations department of Humanitarian Affairs publication
- [5]. Barakat, S. (2003). *Housing reconstruction after conflict and Disaster; Network papers; Humanitarian Policy Group: 43, 1-40*
- [6]. Barenstein, J.D. (2006). *Housing Reconstruction in post-Earthquake*
- [7]. Barenstein, J.D., Pitter, D. (2007). *Post-disaster housing Reconstruction: Current Trends and sustainable Alternatives for Tsunami Affected communities in Coastal Tamil Nadu*; institute for Applied sustainability to the Built Environment, University of Applied Science of Southern Switzerland.
- [8]. Bitau, A.A, &Lill, E. (2007). *Analysis of measures for managing issues in post-disaster housing reconstruction*. Building 7(2): 29
- [9]. BRE (1998). *Cyclone-resistant Houses for Developing Countries*, BRE Watford
- [10]. Carr, A.S.& Pearson, J.N. (1999). *Strategically managed buyer-seller relationships and performance outcomes*. *Journal of Operation Management*, 17,497-519.
- [11]. CERA (2012). *Economic recovery programme for greater Christchurch: a foundation for economic recovery and growth in greater Christchurch*. Christchurch Canterbury Earthquake Recovery Authority (CERA)
- [12]. Chang-Richards, Y., wilkmison, S., PontagareA, R., Seville, E. (2013). *Resource challenges for housing reconstruction longitudinal study of the Australian bush fires*, *Disasters* 35:739-765.
- [13]. Davidson, C.H., Johnson, C., Lizarralde, G.,Dikmen, N. S. (2007). *Truths and myths about community participation in post-disaster housing projects*. *Habitat International*,31(1) 100-115.
- [14]. Dyar, J.H. (2000). *Collaborative Advantage: Winning through Extended Enterprise Supplier Networks*. New York: Oxford University press.
- [15]. Fengler, W., Ihsan, A., Kaisar, K. (2008). *Managing post-Disaster Reconstruction finance; world Bank publications; Washington DC, U.S.A*
- [16]. *Flood protection Act of (2012).Amendment to flood disaster protection Act*.[www.ballardspahr.com](http://www.ballardspahr.com)

- [17]. Freman, P.K. (2007). Allocation of post-Disaster Reconstruction financing to housing, *Building Research and Information* 32(5) 427-437.
- [18]. Ganapati, N.E & Ganapati, S. (2009). Enabling participatory planning after disasters: a case study of the world Bank's housing reconstruction in Turkey. *Journal of America planning Association*, 75(1) 41-49.
- [19]. Greenbiott, K. (2007). Shelter programming learning from Asia Tsunami Response world vision, London.
- [20]. Hadayat, B. & Egbu, C. (2010). Literature Review of the role of project Management in post-Disaster Reconstruction projects in: Egbu, C and Lou, E.C.N (Eds) proceeding.
- [21]. Haigh, R; Amaratunga, D. (2010). An integrative review of the built environment discipline's role in the development of society's resilience to disasters. *International Journal of Disaster Resilience in the Built Environment*, 1(1) 11-24
- [22]. Hayles, C.S. (2010). An examination of Decision making in post-disaster housing reconstruction. *International of Journal of Disaster Resilience in the Built Environment*, (1) 103-122.
- [23]. IFRC (2010), World Disaster Report- International Federation of Red Cross and Red Crescent societies. Geneva
- [24]. Karunasena, G., Remeezdeen, R. (2006). Post-disaster housing reconstruction international *Journal of Disaster Resilience in the Built Environment*. 1(2), 173-191.
- [25]. Kennedy, J., Ashmore, J., Babister, E., Kelman I, Zarins, J. (2008). In water and urban Development paradigms, Disaster mitigation Lessons from "Build back" better" following the 26 December 2004 Tsunamis, Feyen, J., Shannon, K., Neville., Eds., Taylor and Francis Group London UK, 2009; 297-302/SBN 978-0-415-48334-6.
- [26]. Kothari, C.R. (2009). Research methodology methods and techniques. (2nd Revised Edition), New Age International Publishers.
- [27]. Kyung, N.K. and Jae-ho, C (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.
- [28]. Lewis, J., (2003). Housing construction in Earthquake-prone places: perspectives, priorities and projection for development. *The Australian Journal of Emergency management*, (18)2, 35-44.
- [29]. Lowe, L. (1997). Earthquake Resistance Housing in Peru. Rudby: Intermediate Technology Development group.
- [30]. Mitchelle, J.K (1999). Mega-cities and Disasters in Transitions, Tokyo: The united in transitions, Tokyo: The United Nations university.
- [31]. Myburgh, D., Wilkerison, S & Sevilk, E. (2008). Post-Disaster Reconstruction Research in New Zealand: An Industry update: Resilience organizations
- [32]. National Emergency Management Agency. (NEMA). Industrial and Commercial buildings fire in Nigeria, NEMA, 2006
- [33]. National Housing Development Authority (NHDA) (2005). Guidelines for Housing Development in Coastal Sri Lanka, ministry of Housing and Construction Colombo.
- [34]. Niazi, Z., Anand, C. (2010). Post-tsunami reconstruction in south in south india: Lessons for habitat development, in Lizaralde, G, Jigyasu, R., Vasavada, R., Havelka, S, DuyneBarenstein, J. (Eds) Proceedings of the I-Rec 2010 conference on participatory Design and Appropriate Technology for post-disaster Reconstruction, 15-20. Ahmedabad, India. Montreal: Groupe de redierche if, GRIF, Universitedemontreal, 110-122.
- [35]. O'Brien, D.J. and Ahmed, K.I (2008). Housing Reconstruction in Aech: Relationship between house type and Environmental sustainability, in Lizaralde, G, David son, C., Pukteris, A and De Bois, M. (Eds). Building Abroad; procurement of construction and Reconstruction Projects in the international context. Universite de Montreal, Montreal. Pp. 361-370
- [36]. Pandey, O. (2005). Community Based disaster management: Empowering communities to cope with Disaster Risks Retrieved on 22<sup>nd</sup> may, 2018 from <http://www.tarmrackcommunity.ca/g3s86.html> Accessed.
- [37]. Practical Action (2006). Infopacks: Rebuilding Homes and Livelihood. Practical action Colombo Quarantelli, E.L (1982). Sheltering and Housing after major community Disasters: Case studies and observations, Ohio State University.
- [38]. Quarantelli, E.L. (1997). Ten criteria for evaluating the management of community



- Disasters: Environmental Safety, 21(1), 39-56.
- [39]. Quarantelli, E.L. (2000). Emergencies, Disasters and catastrophes are different phenomena. Dover USA: University of Delaware press.
- [40]. Rawal, V., Prajapati, D. & Joshi, B. (2006). A people's guide to building damages and disaster safe construction UNNATI, Ahmedabad.
- [41]. Rotimi, J. O.B., Lemasurier, J. & Wilkinson, S. (2005). The regulatory framework for Effective Post-disaster reconstruction, in New Zealand-Resilient Organizations
- [42]. Ruiz, P., & Peduzzi, P. (2005). The environmental times: identifying Human vulnerability. Retrieved on 22<sup>nd</sup> may, 2018 from: <http://www.environmentimes-net/edition.cfm>
- [43]. Schilderman, T. (2004). Adapting traditional shelter for disaster mitigation and reconstruction: experiences with community-based approaches: Building Research and information, 32 (5) 414-426.
- [44]. Seville, E., and Metcalfe, J. (2005). Developing a Hazard Risk Assessment framework for New Zealand State Highway Network. Land Transport New Zealand and Research Report 276. Cantebuty New Zealand.
- [45]. Singh, B. and Wilkinson, S. (2008). Post-Disaster Resource Availability following a wellington Earthquake: Aggregates, concrete and cement. Resilient Organization [www.resorogs.org.nz](http://www.resorogs.org.nz) (Accessed September 2019).
- [46]. Skinner, R. (1990). Peru: Low-income housing. Mimar, (38) 52-55.
- [47]. Sphere project (2004). The sphere Handbook Humanitarian charter and minimum standards in disaster response sphere project office, Genera.
- [48]. Steinberg, F. (2007). Housing reconstruction and rehabilitation in Aceh and Nias, Indonesia-rebuilding lives. Habitat International, 31(1) 150-166.
- [49]. Trim, P.R. (2004). An integrative Approach to Disaster management
- [50]. United Nations Disaster Organization (1982). Shelter after Disaster, Guidelines for Assistance New York: Gillys Publishers Ltd.
- [51]. United Nations Environment programme (2007). Global Environmental outlook EO04: Environment for Development United Nations Environment programme Nairobi, 45, 60-68, 370.
- [52]. United Nations- HABITAT (2008). State of the world cities 2008/2008. Harmonious cities. London Earthscar press
- [53]. United Nations International Strategy for Disaster Reduction (2014). Global Assessment Report on Disaster-reduction Revealing risk, redefining development 2011.
- [54]. United Nations-HABITAT (2001). Guidelines for operational programme formulation in post-Disaster situations. A resource Guizle. Nairobi, Kenya: John publications Ltd.
- [55]. Wilderspin, I. Barham, J., Gill.G., Ahmed, I., & Lockwood, H. (2008). Evaluation of disaster risk reduction main streaming in DG ECHO's Humanitarian Actions Agua consult, Wivenhoe.
- [56]. World Bank (2002). Financing Rapid Onset National Disaster losses in India: A risk management Approach. Washington, DC Report No. 26844.
- [57]. World Bank (2010). Natural Hazards, Unnatural Disasters: The Economic of effective prevention. Retrieved form <http://www.gfdrr.org/gfdrr/nhud-home> (Accessed 3rd October, 2018).
- [58]. Zuo, K., Potangra, R., Wilkinison, S. & Rotimi, J.O.B., (2009). A project management prospective in achieving a sustainable supply chain for timber procurement in Banda Acch, Indonesia. International Journal of Managing Project in Business, 2, 386-400.