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Analysing community needs and skills for enhancing disaster resilience in the built environment

Abstract

Purpose – A better cooperation among all the stakeholders working towards enhancing the disaster resilience of societies can only be achieved if the expectations or the needs of each stakeholder are understood. This study attempts to outline the needs of communities affected by disasters for the purpose of aligning the needs and skill requirements with the abilities of built environment professionals serving these communities. Therefore, the study aims to identify and describe community needs and skill requirements for enhancing disaster resilience.

Design/methodology/approach – The study adopted literature review and semi-structured interviews. The semi-structured interviews were conducted with key members of some communities affected by disasters as well as some of the professionals that participated in the restoration/reconstruction of those communities. Data obtained were analysed using Nvivo 10.

Findings – The study revealed the current and emerging needs and skills of communities related to the built environment professionals towards enhancing disaster resilience. Thus, twenty nine classifications of skill and needs were derived and classified under five major disaster resilience dimensions to include social, economic, technological, environmental and institutional.

Research limitations/implications–This study focuses only of the needs and skills of the ‘community’, which is the major stakeholder that are basically the receiver of all what other stakeholders in disaster resilience have to offer.

Practical implications – This study would be beneficial to the built environment professionals involved in disaster resilience to be aware of the specific needs and skills of the communities affected by disasters for the purpose of developing their competences.

Originality/value – The study findings would be useful for both the built environment professionals and higher education institutions (HEIs). Since it is important for professionals to update and upgrade their knowledge towards enhancing their capabilities and meeting the expectations of stakeholders towards enhancing societal resilience to disasters across all domains of resilience.

Keywords: building resilience, built environment, communities, competencies, disaster resilience

Paper type Research paper

1 Introduction

The need for all stakeholders’ contribution towards building disaster resilience was clearly emphasised by the Hyogo framework for action 2005 – 2015 (UNISDR, 2005) as well as many other authors. The community is one of the important stakeholders under the theme of disaster resilience; other stakeholders are local and national government, NGOs and international agencies, academia and research organisations, and the private sector. It should be noted that in all activities that require the participation of several parties, expectations and desires of each party usually vary but needs to be converged. Boshier *et al.* (2007a) attempted

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3 to align Disaster Risk Management (DRM) activities with design-construction-operation
4 process (DCOP) and the expected inputs from key stakeholders for each stage of the DRM
5 and the DCOP. The study provided a visual representation of the link between stakeholders,
6 DRM activities and DCOP. It therefore helps one to visualize how DRM activities can be
7 built into the construction process as well as how the design, construction, operation process
8 can be used to enhance the political, economic, social, technological, environmental and
9 institutional resilience of a community. Similarly, a number of authors have identified the
10 need for professionals involved in the development of the built environment to adopt and
11 actively engage in the implementation of all strategies relating to disaster risk reduction
12 (DRR) for resilience (Benson and Twigg, 2007, Boshier *et al.*, 2007b).

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15 Having established the fact that a number of stakeholders are relevant to the disaster
16 resilience theme, this study focuses on the community group alone. Issues relating to other
17 stakeholder groups will be reported in other publications. According to Twigg (2009), ‘in
18 conventional emergency management, communities are viewed in spatial terms: groups of
19 people living in the same area or close to the same risks’. The habitants of any community
20 execute their day to day activities by simply interacting with each other and both the natural
21 and the built environment. The natural and the built environment should therefore be
22 prepared to satisfactorily manage stressors. At times, communities lead the development
23 process of the built environment at the pre-or post-disaster, this is called community driven
24 development. Community-driven development (CDD) as it is referred to are programs that
25 emphasize the engagement of beneficiaries in the design and management of development
26 projects, this is done by giving communities direct control over major project decisions
27 (Fearon *et al.*, 2008). Even when the community is not leading the development process, it
28 still has a direct link with the development process (i.e. the property cycle) via the
29 identification of property needs of the community, planning, provision of full or part funding,
30 and provision of technical and non-technical expertise during preparation, design,
31 construction, use, and reconstruction among others. A number of authors have described what
32 should be in communities to make it resilient (Twigg, 2009); some others have described
33 probable indicators of resilience of communities, researches and definite submissions on how
34 to achieve these indicators are limited, none has actually observed things through the eyes of
35 respective stakeholder groups and with adequate focus on a specific area of practice – built
36 environment.

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39 This study intends to fill the identified gap by identifying the specific expectations of the
40 community stakeholder group that should be aligned and embedded with the activities and
41 services of built environment professionals. The understanding of these needs and its
42 entrenchment in the capabilities of construction professionals will enhance professionals’
43 performance while serving communities in disaster situations. This will increase the
44 satisfaction of members of disaster affected communities and as well assist in enhancing
45 disaster resilience. This study will also help in reducing the impact of future disasters on
46 communities if some of the needs relevant to new constructions are met.

47 48 49 **2 Disaster resilience**

50 Resilience has been described as an overloaded concept by many authors; this is because its
51 meaning depends to an extent on the discipline in which it is being considered. Holling
52 (1973) used the word resilience to describe a “measure of the persistence of systems and
53 their ability to absorb change and disturbance and still maintain the same relationships
54 between populations or state variables”. Resilience was defined as “the capacity to cope with
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3 unanticipated dangers after they have become manifest, learning to bounce back'' by
4 Wildavsky (1991). Several authors have presented series of definitions and descriptions
5 afterwards, the existence of varieties of definitions prompted the position of Twigg (2009),
6 the study decided to settle for broad definitions and easily understood characteristics after
7 describing the existence of large number of definitions as confusing. Manyena (2009)
8 described disaster resilience as the ability to 'bounce forward' on following a disaster, but the
9 definition left another ambiguity as the real meaning of bouncing forward needs to be
10 explained further, it is currently being perceived by different stakeholders to mean different
11 things. The confusing nature of the several definitions was also mentioned by Sapountzaki
12 (2007). Alexander (2013) acknowledged the multidisciplinary nature of the term resilience
13 and this has been supported by a number of researchers. The multidisciplinary nature of the
14 term definitely has a role to play in the seeming confusion in its definition. However,
15 UNISDR (2009) defined disaster resilience as the ability of a system, community or society
16 exposed to hazards to resist, absorb, accommodate and recover from the effects of a hazard in
17 a timely and efficient manner, including through the preservation and restoration of its
18 essential basic structures and functions. The UNISDR (2009) definition is being adopted in
19 this study because it is perhaps among the most popular and most acceptable definitions.
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22 The term 'Resilience' like a number of other principles and concepts can be described by
23 some different characteristics. As a result, Authors have established the existence of several
24 dimensions to resilience and some went ahead to establish indicators or probable measures
25 with for the different dimensions. Burton (2012) attempted to develop a set of indicators for
26 community resilience, as a result, some domains or dimensions of resilience were identified,
27 these set of domains called variable are social, economic, institutional, infrastructure,
28 community capital, and environmental resilience. Similarly, Cutter *et al.* (2008) in a study
29 that aimed to develop a place based disaster resilience model identified six dimensions of
30 resilience under which the study developed candidate variables (indicators), the dimensions
31 used by Cutter *et al.* (2008) ecological, social, economic, institutional, infrastructure, and
32 community competence. In a similar manner, Seneviratne *et al.* (2010) while discussing
33 knowledge factors grouped the knowledge factors under technological, social, environmental,
34 legal, economic, functional, institutional, political factors. Some other authors have other
35 classifications. It is evident from the work of the authors above among others that a theme of
36 issues exists within the context of disaster resilience. A careful consideration of the decisions
37 of the above mentioned author among others with respect to dimensions of resilience resulted
38 in the adoption of five dimensions or domains of resilience in this study, the dimensions used
39 are economic, environmental, institutional, social, technological dimensions. The choice
40 dimensions practically cover all the issues covered by the chosen dimensions of all other
41 authors.
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45 **2.1 Community as a stakeholder group**

46 According to Twigg (2009), 'in conventional emergency management, communities are
47 viewed in spatial terms: groups of people living in the same area or close to the same risks'.
48 Although, this definition is silent on other probable dimensions of 'community' i.e. values,
49 common interests, activities, structures, social, occupational, religious, or other
50 characteristics, it is indeed very appropriate for the disaster resilience theme. Disaster
51 resilience is significantly increased by active planning and preparation for protecting human
52 and properties. People living in the same area or close to the same risks should therefore
53 know and be involved in local community disaster management arrangements as it is all
54 about them. The community should simply lend her 'voices and choices' to the development
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other stakeholder groups as mentioned in the research method section will be synchronised with existing international policy documents and moulded into modules for a professional doctorate programme.

References

- Alexander, D. E. (2013), "Resilience and disaster risk reduction: an etymological journey", *Natural Hazards and Earth System Sciences*, Vol. 13, pp. 2707-2716.
- Benson, C. & Twigg, J. (2007), "Tools for mainstreaming disaster risk reduction: Guidance notes for development organisations", Geneva: International Federation of the Red Cross and Red Crescent Societies/The ProVention Consortium.
- Bosher, L., Dainty, A., Carrillo, P., Glass And, J. & Price, A. (2007a), "Integrating disaster risk management into construction: a UK perspective", *Building Research & Information*, Vol. 35 No.2, pp. 163-177.
- Bosher, L., Dainty, A., Carrillo, P. & Glass, J. (2007b), "Built-in resilience to disasters: a pre-emptive approach", *Engineering, Construction and Architectural Management*, Vol. 14 No.5, pp. 434-446.
- Burton, G. C. (2012), "The development of metrics for community resilience to natural disasters", PhD thesis, University of South Carolina, United States.
- Cacioppo, J. T., Reis, H. T. & Zautra, A. J. (2011), "The value of social fitness with an application to the military", *American Psychologist*, Vol. 66 No.1, pp.43 - 51.
- Cutter, S. L., Barnes, L., Berry, M., Burton, C., Evans, E., Tate, E. & Webb, J. (2008), "A place-based model for understanding community resilience to natural disasters", *Global Environmental Change*, Vol.18, pp.598-606.
- Fearon, J., Humphreys, M. & Weinstein, J. (2008), "Community-driven reconstruction in Iloilo county: impact assessment", available at: <http://www.alnap.org/resource/8192> (Accessed 28 April 2015).
- Flick, U. (1998), *An Introduction to Qualitative Research*. Sage Publications: London.
- Holling, C. S. (1973) "Resilience and stability of ecological systems", *Annual Review of Ecology and Systematics*, Vol. 4, pp. 1-23.
- Hossain, M. A. (2013), "Community participation in disaster management: role of social work to enhance participation", *Antrocom Online Journal of Anthropology*, Vol. 9 No. 1, pp. 159 - 171.
- Jo da Silva, Lubkowski, Z., Batchelor, V. & Kabir, R. (2010), *Lessons from Aceh: Key Considerations in Post-Disaster Reconstruction*. Practical Action Publishing: United Kingdom.
- Manyena, S. B. (2009), "Disaster resilience in development and humanitarian interventions", PhD thesis, Northumbria University, UK.
- Sapountzaki, K. (2007), "Social resilience to environmental risks", *Management of Environmental Quality: An International Journal*, Vol. 18 No.3, pp.274-297.
- Sekaran, U. (1992), *Research Methods for Business*. John Wiley & Sons: New York.
- Seneviratne, K., Baldry, D. & Pathirage, C. (2010), "Disaster knowledge factors in managing disasters successfully", *International Journal of Strategic Property Management*, Vol. 14 No. 4, pp. 376-390.
- Thuraiajah, N., Palliyaguru, R. & Williams, A. (2010), "Incorporate disaster management perspective into built environment undergraduate curriculum", available at: http://www.orbee.org/images/stories/paper_building%20resilience%20conference%202011.pdf (Accessed 28 April 2015).

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2
3 Twigg, J. (2009), "*Characteristics of a Disaster-resilient Community (Version 2)*.
4 Department for International Development: UK.

5 UNISDR (2005), "Hyogo framework for action 2005-2015: building the resilience of nations
6 and communities to disasters, available at:
7 http://www.unisdr.org/files/1037_hyogoframeworkforactionenglish.pdf (Accessed 28
8 April 2015).

9 UNISDR (2009), "UNISDR terminology on disaster risk reduction", available at:
10 http://www.unisdr.org/files/7817_UNISDRTerminologyEnglish.pdf (Accessed 28
11 April 2015).

12 Wildavsky, A. (1991), "*Searching for Safety*. Transaction Publishers: New Brunswick.
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List of Tables

Table I: Classification of needs and skills for enhancing economic resilience

No.	Classifications	Resilience Dimension	Property lifecycle stages				
		Economic Resilience (ER)	PS	DS	PCS	CS	US
1	Budgeting & financial planning	x	x	x	x	x	x
2	Quantification & costing of construction works	x	x	x	x	x	
3	Supply chain management	x	x	x	x		
4	Consultancy services	x	x	x	x		x
5	Procurement & contract administration/practice	x			x		
6	Health & safety	x					x
7	Work progress & quality management	x	x	x		x	x
8	Team working	x	x		x	x	x
9	Business planning	x	x	x	x	x	x
10	Environmental assessment	x	x	x			x
11	Management of the built environment	x	x	x		x	
12	Insurance	x	x	x	x	x	x
13	Communication & negotiation/Information systems	x	x				
14	Project audit & reporting	x	x		x	x	
15	Project management	x	x	x	x	x	x
16	Asset/Resource management	x	x	x	x	x	x
17	Disaster management	x		x			
18	Risk management	x		x			x

Table II: Classification of needs and skills for enhancing environmental resilience

No.	Classifications	Resilience Dimension Environmental Resilience (EvR)	Property lifecycle stages				
			PS	DS	PCS	CS	US
1	Building regulation & planning	X	X	X		X	
2	Health & safety	X	X				X
3	Work progress & quality management	X	X	X	X	X	X
4	Governance	X	X	X	X	X	X
5	Environmental assessment	X	X	X	X	X	X
6	Management of the built environment	X	X	X		X	X
7	Disaster management	X	X				
8	Continuing professional development	X	X	X	X	X	X
9	Quality leadership and people management	X		X			

Table III: Classification of needs and skills for enhancing institutional resilience

No.	Classifications	Resilience Dimension Institutional Resilience (IR)	Property lifecycle stages				
			PS	DS	PCS	CS	US
1	Supply chain management	X			X		
2	Consultancy services	X	X	X	X	X	X
3	Procurement & contract administration/practice	X			X		
4	Building regulation & planning	X	X	X	X	X	X
5	Legal/Regulatory compliance	X	X	X	X	X	X
6	Health & safety	X	X				
7	Work progress & quality management	X	X	X		X	X
8	Quality leadership & people management	X	X	X	X	X	X
9	Team working	X	X	X	X	X	X
10	Governance	X	X	X	X	X	X
11	Stakeholder management	X	X	X	X	X	X
12	Business planning	X	X	X		X	X
13	Environmental assessment	X	X	X		X	X
14	Management of the built environment	X	X	X		X	X
15	Insurance	X	X		X		X
16	Time management	X	X	X	X	X	
17	Communication & negotiation/Information systems	X	X	X	X	X	X
18	Project audit & reporting	X	X				
19	Management & dispute resolution procedures	X	X	X	X	X	X
20	Cross cultural awareness in global resilience	X	X	X	X	X	X
21	Project management	X	X	X	X	X	X
22	Asset/Resource management	X				X	X
23	Risk management	X					X
24	Continuing professional development	X					X
25	Emergency management	X		X			

Table IV: Classification of needs and skills for enhancing social resilience

No.	Classifications	Resilience Dimension	Property lifecycle stages				
		Social Resilience	PS	DS	PCS	CS	US
1	Supply chain management	x	x	x	x	x	x
2	Consultancy services	x	x	x		x	x
3	Procurement & contract administration/practice	x	x		x		
4	Building regulation & planning	x	x	x		x	
5	Health & safety	x	x	x	x	x	x
6	Work progress & quality management	x	x	x		x	x
7	Quality leadership & people management	x	x	x	x	x	x
8	Team working	x	x	x	x	x	x
9	Governance	x	x	x	x	x	x
10	Stakeholder management	x			x		
11	Business planning	x	x		x	x	
12	Environmental assessment	x	x	x	x	x	x
13	Management of the built environment	x	x	x		x	x
14	Insurance	x	x				
15	Time management	x	x	x	x	x	
16	Communication & negotiation/Information systems	x	x	x	x	x	x
17	Cross cultural awareness in global resilience	x	x	x	x	x	x
18	Project management	x	x	x	x	x	x
19	Asset/Resource management	x	x	x	x	x	x
20	Disaster management	x		x			
21	Continuing professional development	x					x
22	Emergency management	x	x	x		x	x

Table V: Classification of needs and skills for enhancing technological resilience

No.	Classifications	Resilience Dimension	Property lifecycle stages				
		Technological Resilience (TR)	PS	DS	PCS	CS	US
1	Supply chain management	x	x	x	x	x	
2	Consultancy services	x	x	x	x	x	x
3	Building regulation & planning	x	x	x	x	x	x
4	Health & safety	x	x				x
5	Work progress & quality management	x	x	x	x	x	x
6	Governance	x	x	x	x	x	
7	Environmental assessment	x	x	x	x	x	x
8	Management of the built environment	x	x	x		x	x
9	Communication & negotiation/Information systems	x	x	x	x	x	x
10	Asset/Resource management	x		x	x	x	
11	Risk management	x	x	x			x
12	Continuing professional development	x					x
13	Construction technology & environmental services	x	x	x	x	x	x

Table VI: Final set of Classifications

No.	Classifications	Resilience dimensions					Property lifecycle stages				
		ER	EvR	IR	SR	TR	PS	DS	PCS	CS	US
1	Budgeting & financial planning	x					x	x	x	x	x
2	Quantification & costing of construction works	x					x	x	x	x	
3	Supply chain management	x		x	x	x	x	x	x	x	x
4	Consultancy services	x		x	x	x	x	x	x	x	x
5	Procurement & contract administration/practice	x		x	x		x		x		
6	Building regulation & planning		x	x	x	x	x	x	x	x	x
7	Legal/Regulatory compliance			x			x	x	x	x	x
8	Health & safety	x	x	x	x	x	x	x	x	x	x
9	Work progress & quality management	x	x	x	x	x	x	x	x	x	x
10	Quality leadership & people management			x	x		x	x	x	x	x
11	Team working	x		x	x		x	x	x	x	x
12	Governance		x	x	x	x	x	x	x	x	x
13	Stakeholder management			x	x		x	x	x	x	x
14	Business planning	x		x	x		x	x	x	x	x
15	Environmental assessment	x	x	x	x	x	x	x	x	x	x
16	Management of the built environment	x	x	x	x	x	x	x		x	x
17	Insurance	x		x	x		x	x	x	x	x
18	Time management			x	x		x	x	x	x	
19	Communication & negotiation/Information systems	x		x	x	x	x	x	x	x	x
20	Project audit & reporting	x		x			x		x	x	
21	Management & dispute resolution procedures			x			x	x	x	x	x
22	Cross cultural awareness in global resilience			x	x		x	x	x	x	x
23	Project management	x		x	x		x	x	x	x	x
24	Asset/Resource management	x		x	x	x	x	x	x	x	
25	Disaster management	x	x		x		x	x			
26	Risk management	x		x		x	x	x			x
27	Continuing professional development		x	x	x	x	x	x	x	x	x
28	Emergency management			x	x		x	x		x	x
29	Construction technology & environmental services					x	x	x	x	x	x

Key:

Preparation Stage – PS, Design Stage – DS, Pre-Construction Stage – PCS, Construction Stage – CS, Use Stage – US and Economic Resilience – ER, Environmental Resilience – EvR, Institutional Resilience – IR, Social Resilience – SR, Technological Resilience – TR.

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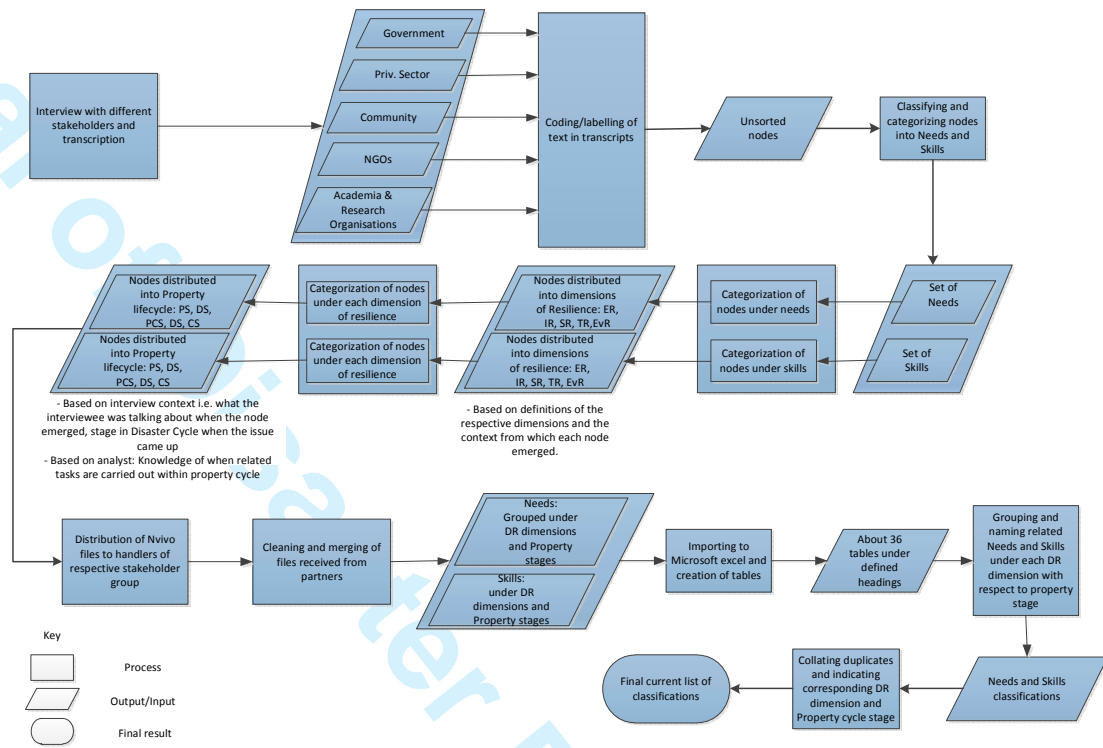


Figure I: Summary of data collection and analysis process

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