

Title: Resilience from a Lived-Experience Perspective in the Regional Context of Dumfries and Galloway, Scotland

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SM Table 1: Systematic Review of Literature identifying Attributes of Resilience between 2013 and 2017

Authors	Aim of research	Conceptual/Empirical	Summary	Identified attributes of resilience
Lama, Becker, and Bergstrom (2017)	Assessing the relationship between adaptation and resilience in two Nepalese villages	Empirical	Caution against any claim that suggest that certain adjustments are adaptive or maladaptive. Identifies three aspects of the relationship between adaptation and resilience: Values, goals and aspirations, scale of analysis and defined time period.	Values, goals and aspirations
Rakib, Islam, Nikolaos, Bodrud-Doza, and Bhuiyan (2017)	Examined the consequences of flooding within the traditional social concepts of the Char-land communities	Empirical	Women play a bigger role than the male counterparts in the different stages of disaster management	Gender, knowledge, information sharing system and access to resources before, during and after a disaster
Sidle, Gallina, and Gomi (2017)	The impact of the different hazard types on risk reduction and mitigation	Conceptual/Empirical	The need to incorporate risk assessments in planning process within its local context	Generational experience
Hoffmann and Muttarak (2017)	Examined the role of education in disaster preparedness	Empirical	Formal education increases tendency to prepare against disasters.	Education and prior disaster experience
Connon (2017)	The impact of rural demographic and socio-cultural diversity in rural responses weather-related hazard	Empirical	Disaster Risk Reduction policies need to focus more on intra-community rather than whole-community scale in rural settings to help residents better prepare for extreme weather	Previous experience, occupation and social relationships
Miao (2017)	The role of technical innovation in disaster risk mitigation	Conceptual/Empirical	Quake-proof building technologies was linked to fewer fatalities. Previous quake experiences was linked to larger mitigating effect in developed than developing countries	Knowledge and technical innovations
Alam, Alam, Mushtaq, and Clarke (2017)	Drivers of vulnerability in river-bank erosion hazard-prone rural households	Empirical	Identified livelihood strategies, access to food, water and health facilities, inaccessibility and low livelihood status as drivers of vulnerability in Erosion prone communities	Access to basic resources, accessibility and income
Hambati and Yengoh (2017)	The extent to which Mwanza City community is resilient to common natural disasters.	Empirical	Found increased awareness of risk reduction measures against common hazards. Both structural and non-structural approach are used to reducing the impact of flooding.	Experience, homesteads , socioeconomic situation of households
Torres and Alsharif (2016)	Examines how the resilience of a system between different scales and disturbance types	Empirical	Resilience planning should be placed within the local context of individuals and households that makes up a community.	Social networks and knowledge-sharing
McCallum et al. (2016)	Examined recent application of technologies in disaster risk reduction	Empirical	More effort needed to apply new technologies in the immediate period before an event (ex-ante) in disaster-prone regions.	New technologies for information sharing
Haque (2016)	Assessed the adaptive capacity of wetland communities to flash flood disasters	Empirical	Wetland communities are vulnerable to flash flood hazards	Community power structures and human agency

Lo, Cheung, Lee, and Xu (2016)	The relationship between public trust in grass root institutions and community resilience in China	Empirical	Public confidence in grassroots-level institutions is constrained due to limited resources and power	Trust in grass-root institutions
Kulig and Botey (2016)	Empirical analysis of the relationship between individual and community resilience	Empirical	Individual leadership qualities can bring about social interactions to enhance recovery and resilience in communities.	Personality, physical environment, economy, attachment to place and social interactions
Pathirage and Al-Khaili (2016)	Examines barriers to enhance resilience and how to overcome that in Emirati energy sector brought about by man-made and natural hazards.	Empirical	Terrorism, atmospheric and tectonic hazards are identified as major risk to Emirati energy sector.	Legislation, awareness and education
Hooli (2016)	Examined local residents' coping strategies to irregular flooding from socio-ecological perspective	Empirical	Resilience building should focus mainly on the broader socio-political factors that amplifies communities' vulnerability to hazards.	Local knowledge, experience
Madhuri, Tewari, and Bhowmick (2015)	The link between house perception and preparedness and their relationship with place attachment and livelihood resilience.	Empirical	Flood is not perceived to be a 'threat' due to flood acceptance brought about attachment to the place, frequent experiences of flooding, and local knowledge of available resources.	Attachment to the place, prior experiences and knowledge of available resources
Henly-Shepard et al. (2015)	To identify and measure opportunities to increase social resilience of households in Hanalei	Empirical	There are differences in coping and adaptive capacities among households based on sex of head and size of household and length of residency	Knowledge, household composition and attachment to place
Muttarak and Lutz (2014)	To develop coping strategies in the face of changing environmental change	Empirical (secondary analysis of existing study)	Educated population are better prepared for and response to the disasters. They also suffer lesser cost and recover faster.	Education
McNeill, Dunlop, Heath, Skinner, and Morrison (2013)	Examined the influence of perceived risk and perceived protection responsibility to different types of wildfire preparedness	Empirical	Perceived risk and perceived protection responsibility were positively linked with all types of preparedness	Perception of risk and responsibility
Djalante, Holley, Thomalla, and Carnegie (2013)	Aim to identify pathways to achieve adaptive and integrated disaster resilience	Conceptual	There is the need to strengthen local level multi-stakeholder collaboration. Identified 7 pathways including integrated agenda, Governance, social integration, information management, institutional learning, self-organisation and finance and risk	Multi-agency collaborations

Search Criteria using Scopus Database: Resilience* AND information* AND knowledge* AND natural AND hazards*; Resilience* AND experience* AND natural AND hazards*; Resilience* AND household* AND natural AND hazards*; Resilience* AND skills* AND natural AND hazards*; Resilience* AND expectation* AND natural AND hazards*; Adapt* AND capacity* AND knowledge* AND natural AND hazards* and; Adapt* AND capacity* AND Skills e* AND natural AND hazards

Further Criteria: Articles between 2013 and 2018 and articles that identified attributes of social resilience

SM Table 2: Categorising Attributes of Resilience

Authors	Information mechanism	Response mechanism		
	<i>Experience, information and knowledge</i>	<i>Risk Attitude</i>	<i>Skills and access to resources</i>	<i>Psychosocial factors</i>
Lama et al. (2017)				Values, goals and aspirations
Rakib et al. (2017)	Knowledge, information sharing system	Gender	Access to resources before, during and after a disaster	
Sidle et al. (2017)	Generational experience			
Hoffmann and Muttarak (2017)	Education and prior disaster experience	Occupation	Social relationships	
Connon (2017)	Previous experience,			
Miao (2017)	Knowledge and technical innovations			
Alam et al. (2017)			Access to basic resources, accessibility and income	
Hambati and Yengoh (2017)	Experience,		Socioeconomic situation of households	Homesteads
Torres and Alsharif (2016)			Social networks and knowledge-sharing	
McCallum et al. (2016)	New technologies for information sharing			
Haque (2016)			Community power structures and human agency	
Lo et al. (2016)				Trust in grass-root institutions
Kulig and Botey (2016)		Personality	Economy, and social interactions	Attachment to place
Pathirage and Al-Khaili (2016)	Awareness and education			Legislation
Hooli (2016)	Local knowledge, experience			
Madhuri et al. (2015)	Prior experiences and knowledge of available resources			Attachment to the place
Henly-Shepard et al. (2015)	Knowledge			House hold composition and Attachment to place
Muttarak and Lutz (2014)	Education			
McNeill et al. (2013)				Perception of risk and responsibility
Djalante et al. (2013)			Multi-agency collaborations	

SM Table 3: Themes and Categories from Empirical Data

Emerging themes	Categories	Codes	Supporting quotes
Information Mechanism	Knowledge and understanding of risk	Information and awareness	<ul style="list-style-type: none"> • “I wasn’t aware that it was something that ever happened here” (NSB1). • “we look at the tide timetable ourselves so that it is predictable what the tide heights are and it is a combination of tide height and wind that cause the tidal flooding” (CTR2). • “Nobody said it was better to do ABC. We were kind of left to deal with it on our own” (NSB4) • “[Provide] reliable pre warning. Too often [is a] potential problem e.g. flooding are over the top and don't occur so everyone start to ignore the warning. boy that cried wolf”
		Experience	<ul style="list-style-type: none"> • “Because I have dealt with it once, I think the second time will be slightly easier because I know the process of what to do first (NSB1). • “I have boxes of sandbags...council have provided me with inflatable sandbags which I will lay them in case of future flooding (NSR1). • “We have sand bags in the back of house in case this happens again” (NSB4) • “I have now raised the sill on my house [and] know how to block the airbrick” (survey).
Response Mechanism	Attitude	Motivation and willingness	<ul style="list-style-type: none"> • “Yeah we have done it...its good because it gives us confidence because if you apply for too much help it just drags on. So I am happy to do what I did” (NSR1) • “If somebody who was really good at controlling the floods and knowing how to protect property could come down and say that this needs to be done and that needs to be done. I would be willing to help pay but I could not afford everything.” (CTR3)
		Preference	<ul style="list-style-type: none"> • “I could spend that money [for floodgates] on something that would give me a better return over 6 months than something that would sit there doing nothing for 6, 9 months, 12 months in a year ” (NSB4) • “Too busy with other things, don't have time.” (survey)
		Commitment	<ul style="list-style-type: none"> • “I am quite a strong person [...] I just gather myself together and you pick yourself up, dust yourself down and start again.” (CTR3). • “Yes council has flood grants for domestic measures. We were slow to take up but have done post flooding 2015” (survey).
	Skills	Imagination and cognition	<ul style="list-style-type: none"> • “imagination” (survey) • “There has to be common sense in it... If all of us are running businesses, we should have enough sense each to deal with flooding issues.” (NSB4)
		Physical fitness	<ul style="list-style-type: none"> • “I am not as young as I use to be, I have retired. I am having problems getting in and out the bath. The stairs are a problem. You have to jump up on the units to open and shut your windows.” (NSR3) • “Physical fitness” (survey)
		Expertise	<ul style="list-style-type: none"> • “Get somebody knowledgeable about flooding may be from SEPA to advise us – one to one advice” (NSB5) • “The builder [who built a flood barrier] is a competent builder” (NSR1)
	Resources	Social capital	<ul style="list-style-type: none"> • “My neighbor was very good. He put my house back together” (CTR3). • “The town worked well together ... everybody can of helped each other out” (NSB4)

			<ul style="list-style-type: none"> • “I was more concerned for my neighbors... I wasn’t wiped out like some of the others... people came in to help, we actually did not need it so I said let go and see who else do need help” (NSB2)
		Material	<ul style="list-style-type: none"> • “Had they brought sandbags even to the street, so many people would not have been affected”(NSB2) • “no money in cash machine” (survey) • “Flood doors were of no use”
		Infrastructure	<ul style="list-style-type: none"> • “Even if I am smart [to have a continuity plan], people can’t get to the street because it’s closed and my stock will still be wasted” (NSB3). • “Pretty bad. Transport was a problem to go to Edinburgh and Glasgow, different businesses in Dumfries were damaged” (survey) • “...Annoyed that the phone exchange wasn’t better prepared” (survey)
		Finance	<ul style="list-style-type: none"> • “Provide financial help...even at subsidized cost [for the flood protection scheme], I just don’t have that money” (NSB1) • “I am with another firm and the insurance was about £150 less but their excess instead of being £2000 it was £200.00. Massive difference and that is why I changed my insurance” (CTR4). • “I would have like to have new rails and make it higher but I only had this three months before the flood and I couldn’t afford to put another rail on” (NSB1).
		Governance and regulation	<ul style="list-style-type: none"> • “The preparedness for it. Sand bags were difficult to get... They [sandbags] were there but there weren’t allowed to give them out because they weren’t authorized to give them” (NSB4) • “Give people the power to protect themselves. People are willing and able to protect themselves but they are stopped because of red tape and the idea that the risk could be transferred to others” (CTR2). • “[We need] procedure locally to help town and ourselves” (survey)

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