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Evaluating Practicality of the Volunteer Engagement Model for Emergency & Disaster Management Developed in the Context of Pakistan

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ABSTRACT: Pakistan having a diversified geographic landscape, more frequently faces small and medium scale emergencies like urban flooding, road traffic accidents and residential or industrial fires than large scale catastrophic disasters. These frequently occurring emergencies cause sustained pressure on the under-resourced Emergency Management Services (EMS) of the country. In order to enhance community resilience and to address these recurring challenges, a context-specific Volunteer Engagement (VE) Model has been developed that integrates Community Emergency Response Teams (CERTs) with the EMS command structures, while addressing VE in all Phases of disaster management (DM) (Abid & Haq 2025). This study evaluates the practicality of the VE Model using a structured assessment conducted by 25 senior District Emergency Officers (DEOs) from Punjab. The model was tested against established practicality criteria and a six-dimensional framework assessing operational clarity, training feasibility, cultural relevance, coordination capacity, scalability, and resource demands. Results show that the model received an average score of 3.68 out of 4 (92%), placing it in the "very practical" category. High scores for participatory training, community engagement, and cultural alignment confirm the model's readiness for scaled implementation. The study concludes that the VE Model presents a viable framework for institutionalizing volunteerism in Pakistan by developing sustainable CERT-EMS coordination. The model integrates community capabilities with formal emergency and DM organization, hence adding to the resilience of the communities.

KEYWORDS: Volunteer Engagement, Community Emergency Response Team, Practicality Testing, Resilience, Sustainable CERT-EMS Coordination, Community Resilience, Emergency and Disaster Management Model

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Introduction

Background

In the existing literature, the term community has remained ambiguously defined in both academic and policy discourses, despite the fact that community sits at the core of disaster risk management (DRM). The early

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perspective tends to portray the communities as a passive collection of individuals who are reliant upon external decision makers for their survival and recovery (Islam, 2013). This type of framing legitimized top-down DRM architecture in which local actors are treated as mere dependent beneficiaries rather than as active partners.

However, contemporary scholars have repositioned communities as autonomous entities gifted with dense social networks, indigenous resources, and adaptive capacities (Campbell & Shackleton, 2001). This dichotomy is explicit in Pakistan because of the fact that rural mountain villagers can mobilize improvised search & rescue within hours, as witnessed during the 2005 Kashmir earthquake. The dwellers of urban slums remain dependent upon the assistance from the government or NGOs during floods (Maqbool, Hussain & Khan, 2017). Bridging these divergent realities requires a hybrid DRM approach, which can couple the community-driven, community-led drive with structured institutional frameworks. A context-specific Volunteer Engagement (VE) Model, embedded in CERTs within EMS command structures has recently been developed by Abid and Haq (2025), emphasizing the role of volunteers in all phases of DM to bridge the capacity gap.

Context and Problem Statement

In Pakistan, Small and medium scale emergencies like road traffic crashes, urban flooding, and house & industrial fire incidents occur far more frequently than headline-catching catastrophic disasters. These emergencies cause continuing pressure on the under-resourced EMS. From 2010 to 2020, more than 70 percent of the emergencies recorded in Pakistan were "everyday events" such as flash floods, fires, and road accidents (National Disaster Management Authority [NDMA], 2021), whereas high impact catastrophes prompt periodic surges of attention and donor funding. These low-intensity events cumulatively imposed greater social as well as economic costs, particularly to vulnerable communities (Simsa et al., 2019). Despite that, the EMS and other DM agencies remain both structurally and fiscally concerned with large-scale disasters, leaving persistent operational voids at the neighborhood level (Whittaker, McLennan, & Handmer, 2015).

Purpose and Significance

International evidence demonstrates that institutionalizing grassroots volunteerism, particularly through the CERT of FEMA program in the United States (FEMA, 2020) and the Integrated Community-Based Disaster Management (ICBDM) model of Taiwan, can reduce response times (Chen et al., 2006), close capability gaps, and improve recovery outcomes (Simsa et al., 2019). However, the previously existing models have not been systematically adapted to the diverse terrain, decentralized governance, and entrenched resource constraints of Pakistan. This confirms the practicality of a culturally attuned VE Model, which is a prerequisite for national rollout and policy endorsement.

Figure 1

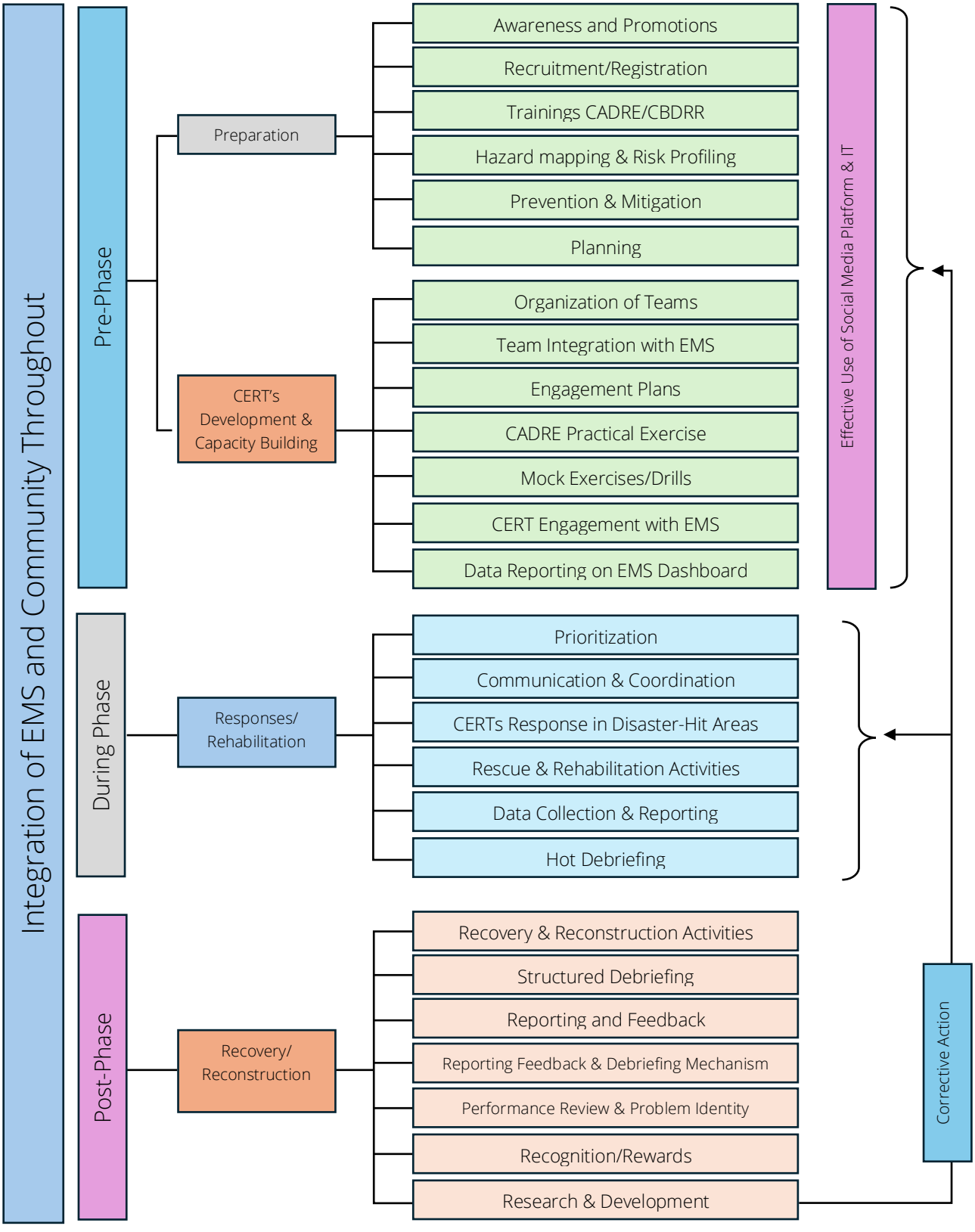

Figure 1 shows the hybrid logic. It depicts a three-phase Volunteer Engagement (VE) model during the Pre, during, and Post-disaster, anchored in continuous corrective action and real-time integration with EMS. Each

of the phases weaves together recruitment, hazard mapping, CADRE/CBDRR training, CERTEMS integration, field mobilization, debriefing, and research & development loops, which are supported by a digital dashboard and social media channel.

Rationale of the Study

In the existing literature, there is a wider consensus that the volunteers can transform community resilience. But still, there exist major gaps in the strategic integration of the volunteers with local EMS (Whittaker, McLennan, & Handmer, 2015). Any one-off training, without a linkage with an intra-volunteer hierarchy or EMS coordination mechanism, can only deliver a little value when a crisis strikes (Simsa et al., 2019). Therefore, the International Federation of Red Cross & Red Crescent Societies advocates establishing management frameworks which can facilitate volunteer recruitment, organization, training & refresher drills and day-to-day co-response to emergencies with official EMS (IFRC, 2020).

The community and volunteers are callers to EMS in case of any emergency, first responders to everyday incidents, and a reserve force for large-scale crises (Abid et al., 2016). In a recent study, Abid and Haq (2025) developed a Community-Based Disaster Management (CBDM) framework that embeds CERTs within the EMS command structure. Their model is grounded on Community Resilience Theory (Mancini & Bowen, 2009). Abid and Haq (2025) have urged for testing of their model for 'Practicality' and effectiveness. So, this study aims to bridge this research gap by undertaking a practicality test of the said model.

Problem Statement

Existing DRM models prioritize headline disasters while neglecting the institutionalization of VE for routine emergencies, despite the fact that house fires, road traffic accidents, and flash floods account for over 70 % of recorded incidents in Pakistan between 2010 and 2020 (NDMA, 2021). International frameworks like the CERT of FEMA, Taiwan's ICBDM, and the Vulnerability Assessment Framework (Smit & Wandel, 2006) have proved to be effective in their native contexts but transfer poorly to sociopolitical complexities, heterogeneous terrain, and under-resourced EMS infrastructures of Pakistan.

Moreover, volunteerism in Pakistan remained informal and sporadic; most of the trained persons receive no refresher courses, no cross-community coordination is maintained, and they operate independently without an EMS command system (Kapucu & Garayev, 2011). Theoretical discourses also relegate VE to a peripheral role and overlook its potential to be a continuous training ground for resilience (Whittaker, McLennan & Handmer, 2015). This type of oversight contradicts evidence that sustained engagement and social cohesion are the foundations of preparedness (Patel et al., 2017). Therefore, there is a need for a holistic, context-sensitive CBDM model for Pakistan that can harness VE for both everyday emergencies and large-scale disasters, has the ability to integrate CERTs with EMS through a formal coordination mechanism, and adapt to the international variability in hazards, vulnerabilities, and capacities.

The present study addresses this gap by evaluating the practicality of the volunteer engagement model shown in Figure 1, by theorizing its utility as a scalable bridge between grassroots volunteers and the formal EMS structures.

Research Question

- How do experienced (DEOs) EMS officers assess the practicality of the VE Model on Borg and Gall's (1989) scale and Rozi et al.'s (2021) six-dimensional framework?

Objective

- To evaluate the practicality of the volunteers' engagement Model in the emergency and disaster management context of Pakistan.

Integrated Literature Review

The literature review synthesizes global scholarship and Pakistani evidence on volunteer engagement, community resilience, and the practicality of the model. It merges and expands the existing fragmented reviews to present a coherent analytical base.

Theoretical Foundations

The contingency theory suggests that the effectiveness of an organization hinges on fitting its structures to the environmental conditions (Donaldson, 2001). When applied to emergency and disaster management, EMS organizations need to evolve a flexible mechanism, such as integrated volunteer teams (CERTS), to match the dynamic hazard contexts. Moreover, the Community Resilience Theory discusses that adaptive capacities, social cohesion, and continuous local engagement are foundational to disaster preparedness, response, and recovery (Cutter, Burton, & Emrich, 2010). These perspectives converge on the need for institutionalized, culturally embedded volunteer participation through the model developed in the context of Pakistan. To further enhance the utility of the model developed by Abid and Haq (2025), it is imperative to check the practicality of the said model as pointed out by the authors.

Global Models of Volunteer Engagement

The CERT framework institutionalizes local training of the volunteers and their formal integration with EMS, generating documented advantages in the response speed as well as coordination (Simsa et al., 2019). Likewise, ICBDM of Taiwan embeds volunteers in the local governance structure, emphasizing iterative training & drills and multi-stakeholder coordination for emergency and disaster preparedness (Whittaker et al., 2015). The meta-analyses by Rozi and colleagues revealed that success hinges on socio-cultural adaptation, sustained resource flow, and clearly defined legal mandates (Rozi et al., 2021).

Volunteerism and Community Resilience in Pakistan

Pakistan hosts many large volunteer initiatives like Rescue 1122 volunteers, Pakistan Red Crescent Society (PRCS), and Aga Khan Agency for Habitat (AKAH), with the networks ranging from 36,000 to 1.8 million volunteers (AKAH, 2022; PRCS, 2023). Despite their reach, these programs often operate parallel to formal EMS, limiting real-time volunteer-EMS coordination. Some empirical studies have also underscored regional inequalities, such as the mountainous regions experience slower response times due to terrain challenges and limited EMS coverage (Community World Service Asia [CWSA], 2021).

Positioning the Present VE Model

The proposed VE Model distinguishes itself by:

Structurally Embedded: CERTs are located within EMS command hierarchies, ensuring authority alignment and resource access.

Practicality Validation: A 92 percent score on Borg and Gall's (1989) scale categorizes the model as very practical.

Cultural Calibration: Training modules integrate local expressions, gender responsive strategy, and faith-based motivational prompts, operationalizing the sociocultural adaptation emphasized by Rozi et al. (2021).

Collectively, the literature confirms both the necessity and the novelty of a rigorous evaluation of the contextually tailored volunteer engagement framework for Pakistan.

Methodology

Design and Instruments

A quantitative research design was employed, and the practicality ratings were captured through:

Practicality Scale: The study followed five five-point semantic distinctions from 'not practical (≤ 0.8) to very Practical (> 3.2)'.

Six-Dimension Checklist: A six-dimensional checklist was adopted from the published research of Rozi et al. (2021), including operational feasibility, training demands, resource implications, coordination mechanisms, cultural appropriateness, and scalability.

Sample: Purposive sampling selected 25 DEOs from Punjab EMS, each with a minimum command experience of seven years, aligning with expertise development thresholds (Ericsson et al., 2007).

Practicality Test Method and Criteria

To assess its usability, clarity, and cultural relevance in real-world settings, the practicality test for the VE Model was conducted. Based on the practicality criteria developed by Borg and Gall (1989), a structured questionnaire was administered to 25 District Emergency Officers (DEOs) of the Punjab Emergency Service (Rescue 1122). Each of these officers has a minimum of 7 years' experience in emergency and DM. They represented a diverse sample from the EMS framework of Punjab, including field emergency responders, coordinators, facilitators, and community-level practitioners. The strategy used to obtain the sample was Purposive sampling. 25 DEOs from the Punjab Emergency Service having at least 7 years operational command experience were selected. The requirement of a minimum of seven years of experience was determined based on the following three well-supported factors from the literature. First, studies conducted on the development of expertise suggested that achieving mastery in complex fields such as disaster management generally demands 5 to 7 years of deliberate practice (Ericsson et al., 2007). Second, research on the competency of emergency personnel is indicative of this timeframe corresponding to their shift from operational proficiency to strategic thinking (Flin, 2008). Thirdly, the Career Progression Model in Emergency Services shows that this specified period typically relates to the transition to leadership and supervisory roles (McLennan et al., 2024). The practicality test aimed to assess the capacity of the model for bridging theoretical design with practical applicability.

Results

Practicality Test

The practicality test for the CBDM model was conducted by facilitators and community members to determine its usability & understandability. This assessment was crucial to check that the model can effectively address problems encountered during its implementation. The test utilized a simple questionnaire based on the practicality criteria proposed by Borg and Gall (1989), where responses were categorized as per Table 3:

Table 1

Practicality Test Categorization of Responses

S.No	Practicality	Scores
1	Very Practical	average > 3.20
2	Practical	2.40 < average ≤ 3.20
3	Quite practical	1.60 < average ≤ 2.40
4	Less practical	0.80 < average ≤ 1.60
5	Not practical	average ≤ 0.80

The questionnaire was distributed to 25 District Emergency Officers from the EMS who had extensive experience and expertise in DM, with a minimum of seven years of field experience. They represented a diverse cross-section of practitioners, disaster activists, observers, and community users, providing a broad perspective on the practical application of the CBDM model. Respondents evaluated the model based on 10 statements, with options to agree or disagree. The data was analyzed using the formula for practicality percentage:

$$\text{Practicality} = \frac{\text{Average Score}}{\text{Maximum Score}} \times 100\%$$

Table 3 presents the results of this practical test. The CBDM model received a total score of 230, with an average score of 3.68, translating to 92.0% in the "very practical" category. Consequently, the model is considered highly practical and suitable for implementation in community DM efforts.

Table 2

Results of the Practicality Test

S. No	Statement	No of Responses	Average		Category
			N	%	
1	The developed module has elements that can attract the attention of the community.	24	3.84	96.0	VP
2	The use of matrices can help the community understand the module.	22	3.52	88.0	VP
3	The simulation activities in the module can facilitate the community in knowing, adapting, and understanding the cultural values that exist in DM.	23	3.68	92.0	VP
4	The needs assessment activities in the module can facilitate the community in understanding the module.	24	3.84	96.0	VP

5	The planning activities in the module can facilitate the community in understanding the module.	22	3.52	88.0	VP
6	The activities and participation cycles of the community in the module are easy to understand.	23	3.68	92.0	VP
7	The developed module contains values that enhance CR that are practical and operational in DM.	24	3.84	96.0	VP
8	The developed module contains the values of VE that are practical and operational in DM.	23	3.68	92.0	VP
9	The use of a module can help the facilitator to improve the community capacity.	21	3.36	84.0	VP
10	Overall, the developed model offers practical and actionable solutions for enhancing CR in DM.	24	3.84	96.0	VP
Total		230	**3.68**	**92.0**	**VP**

Table 2 shows the results of this practicality test, which shows the CBDM model received a total score of 230, with an average score of 3.68, translating to 92.0% in the "very practical" category. Consequently, the model is considered highly practical and suitable for implementation in community DM efforts.

Interpretation of the Results

All of the ten items received scores that place them in the "Very Practical" (VP) category. The highest score/ agreement was observed for the developed module has elements that can attract the attention of the community (3.84 averages). This indicated strong resonance with the principles of Community Resilience theory (Mancini & Bowen, 2009). The slightly lower score on the VE Specific value-integration (3.52) indicates a need for strengthening the facilitator orientation during capacity-building phases regarding core VE principles.

These results strongly support the usability, feasibility, and scalability of the VE Model for emergency & disaster management in Pakistan. It justified policy endorsement and replication at a wider scale. The results are also in line with the fact that Collaborative efforts among the local communities, government agencies, and international partners are critical in the mitigation of disaster impact and in enhancing community resilience (Abid et al., 2019).

Discussion

The 92% practicality rating highlights congruence between the model design and operational realities of Pakistan. DRM strategies address both structural inequities and environmental hazards (Abid et al., 2023). The findings of the study validate the assertion of Community Resilience Theory that structural adaptation embedded in CERTs, in this case, enhances organizational fit to environmental contingencies (Mancini & Bowen, 2009). This finding is also consistent with Abid et al. (2016) on the critical role of community first responders in Pakistan. The Model has both clarity and accessibility, being user-friendly matrices that clarify technical concepts for diverse literacy levels of the community, echoing global CERT best practices (Simsa et al., 2019). The model also provides operational bridging through integration of community volunteers with

EMS, creating a real-time coordination channel which has previously been absent in the literature pertaining to emergency management and disaster management in Pakistan. The model inherently has an incremental approach to the volunteer role in DM, starting from CERT-EMS co-response in day-to-day emergencies and building the capacity of the community to be connected, trained, and resourceful enough to play their vital role in DM while working with or independently in any DM phase. From the effectiveness perspective, the model has highlighted the need and provided a basis whereby the community comes forward to help save lives in daily occurring emergencies, identify and reduce hazards & vulnerabilities to mitigate risks. This shall slowly but surely empower the community and create strong and sustainable bonding among CERTs, EMS, and other stakeholders, enabling them to be better prepared, capable of effective response, and contribute to sustainable development, hence to become a healthy, safer, and resilient community.

Conclusion

The VE Model achieved a very practical rating (92 %) when evaluated by seasoned EMS commanders using Borg and Gall's (1989) criteria and Rozi et al.'s (2021) framework. The cultural calibration, operational clarity, and structurally embedded design position this framework as a viable bridge between grassroots-level community capability and EMS. For future research, immediate next steps include pilot testing through limited trials at the district level and extensive trials at the divisional level in Punjab province, Pakistan Moreover, resource mobilization and regulatory integration to facilitate rollout at the national level to transform episodic volunteerism into a scalable, institutionalized pillar of the emergency and disaster management architecture of Pakistan.

Future Research

Although the model has been found to be very practical in terms of its operational understanding in the present research, there is a need for a comprehensive evaluation regarding its effectiveness through limited and extensive trials.

References

Abid, S.K., & Haq, M. A. ul. (2025). Strengthening Community Resilience: Developing Community-Based Model for Sustainable Volunteer Engagement in Emergency and Disaster Management in Pakistan. *Qlantic Journal of Social Sciences, 6*(2), 119-137. https://doi.org/10.55737/qjss.vi-ii.25351

Abid, S. K., Hussain, M., Raza, M., Haq, R., Naseer, R., Durrani, M., Ali, S., Mannan, A., Sajid, S. A., & Ejaz, A. (2019). Non Emergency Calls-Depression Coupling in Call Handlers of Rescue 1122 Punjab, Pakistan. *Pakistan Journal of Psychological Research, 34*(1), 43–55. https://doi.org/10.33824/pjpr.2019.34.1.3

Abid, S. K., Hussain, M., Rizwan-ul-Haq, H., Ali, S., Iqbal, N., Raza, M., ... & Ejaz, A. (2016). Phone caller of Punjab Emergency Service (Rescue 1122) as 1st responder: A novel paradigm. *Asian journal of social sciences & humanities, 5*(4), 68-76. http://www.ajssh.leena-luna.co.jp/AJSSHPDFs/Vol.5(4)/AJSSH2016(5.4-07).pdf

Abid, S. K., Rafique, N., & Raza, M. A. (2023). Leadership Styles Impacting Innovative Work Behavior with Moderating Role of Job Satisfaction. *Journal of Management Sciences, 10*(1), 41–56. https://doi.org/10.20547/jms.2014.2310103

Aga Khan Agency for Habitat. (2022). *Annual resilience report 2022*. AKAH Pakistan.

Borg, W. R., & Gall, M. D. (1989). *Educational research: An introduction* (5th ed.). Longman.

Campbell, B., & Shackleton, S. (2001). The organizational structures for community-based natural resources management in Southern Africa. *African Studies Quarterly, 5*(3), 73-86. https://journals.flvc.org/ASQ/article/view/136416

Chen, L. C., Liu, Y. C., & Chan, K. C. (2006). Integrated community-based disaster management program in Taiwan: a case study of Shang-An village. *Natural hazards*, 37, 209-223. https://doi.org/10.1007/s11069-005-4669-5

Community World Service Asia. (2021). *Inclusive disaster risk reduction initiatives in Punjab and Sindh*. Community World Service Asia. https://www.cwsa.net/resource/inclusive-disaster-risk-reduction-initiatives-in-punjab-and-sindhConcern

Cutter, S. L., Burton, C. G., & Emrich, C. T. (2010). Disaster Resilience Indicators for Benchmarking Baseline Conditions. *Journal of Homeland Security and Emergency Management, 7*(1). https://doi.org/10.2202/1547-7355.1732

Donaldson, L. (2001). *The Contingency Theory of Organizations*. Sage Publications.

Ericsson, K. A., Charness, N., Feltovich, P. J., & Hoffman, R. R. (Eds.). (2007). *The Cambridge handbook of expertise and expert performance*. Cambridge University Press.

FEMA. (2020). *Community Emergency Response Team (CERT)*. Federal Emergency Management Agency. https://www.ready.gov/cert

Flin, R. (2008). *Safety at the sharp end: A guide to nontechnical skills*. Ashgate.

International Federation of Red Cross and Red Crescent Societies. (2020). *World Disasters Report 2020: Come heat or high water – Tackling the humanitarian impacts of the climate crisis together*. Geneva, Switzerland: IFRC. https://www.ifrc.org/document/world-disasters-report-2020

Islam, A., Ghosh, S., Barman, S. D., Nandy, S., & Sarkar, B. (2022). Role of in-situ and ex-situ livelihood strategies for flood risk reduction: Evidence from the Mayurakshi River Basin, India. *International Journal of Disaster Risk Reduction*, 70, 102775. https://doi.org/10.1016/j.ijdrr.2021.102775

Islam, K. F. (2013). *Community based disaster management in Bangladesh*. Khulna University Bangladesh, Dhoha.

Kapucu, N., & Garayev, V. (2011). Collaborative Decision-Making in Emergency and Disaster Management. *International Journal of Public Administration, 34*(6), 366–375. https://doi.org/10.1080/01900692.2011.5

Mancini, J. A., & Bowen, G. L. (2009). Community resilience: A social organization theory of action and change. *Pathways of human development: Explorations of change*, 245-265.

Maqbool, M. Y., Hussain, S., & Khan, M. B. (2017). National framework of disaster risk management in Pakistan: Issues, challenges & policy recommendations. *Abasyn J. Soc. Sci*, *10*, 182-192.

McLennan, J., Hayes, P., Bearman, C., Penney, G., Butler, P., & Flin, R. (2024). Training to improve emergency management decision-making: what the research literature tells us. *Australian Journal of Emergency Management, 10.47389/39*(No 4), 33–45. https://doi.org/10.47389/39.4.33

National Disaster Management Authority. (2021). *Annual emergency report 2010–2020*. Government of Pakistan.

Norris, F. H., Stevens, S. P., Pfefferbaum, B., Wyche, K. F., & Pfefferbaum, R. L. (2007). Community Resilience as a Metaphor, Theory, Set of Capacities, and Strategy for Disaster Readiness. *American Journal of Community Psychology, 41*(1-2), 127–150. https://doi.org/10.1007/s10464-007-9156-6

Pakistan Red Crescent Society. (2023). About PRCS volunteers. https://prcs.org.pk/

Patel, S. S., Rogers, M. B., Amlôt, R., & Rubin, G. J. (2017). What Do We Mean by "Community Resilience"? A Systematic Literature Review of How It Is Defined in the Literature. *PLOS Currents Disasters*, 9. https://doi.org/10.1371/currents.dis.db775aff25efc5ac4f0660ad9c9f7db2

Rozi, S., Ritonga, A. R., & Januar, J. (2021). 'Local community-based disaster management'The transformation of religious and local wisdom values in preparation to deal with natural hazards in West Sumatra, Indonesia. *Jàmbá: Journal of Disaster Risk Studies, 13*(1), 1-7. https://doi.org/10.4102/jamba.v13i1.1020

Simsa, R., Rameder, P., Aghamanoukjan, A., & Totter, M. (2018). Spontaneous Volunteering in Social Crises: Self-Organization and Coordination. *Nonprofit and Voluntary Sector Quarterly, 48*(2_suppl), 103S-122S. https://doi.org/10.1177/0899764018785472

Smit, B., & Wandel, J. (2006). Adaptation, adaptive capacity and vulnerability. *Global Environmental Change, 16*(3), 282–292. https://doi.org/10.1016/j.gloenvcha.2006.03.008

Whittaker, J., McLennan, B., & Handmer, J. (2015). A review of informal volunteerism in emergencies and disasters: Definition, opportunities and challenges. *International Journal of Disaster Risk Reduction, 13*, 358–368. https://doi.org/10.1016/j.ijdrr.2015.07.010