

Integrating Indigenous perspectives and community-based disaster risk reduction: A pathway for sustainable Indigenous development in Northern Pakistan

Tahir Ali^{a,*}, Douglas Paton^a, Petra T. Buergelt^b, James A. Smith^c, Noor Jehan^d, Abubaker Siddique^e

^a College of Health and Human Sciences, Charles Darwin University, Darwin, Australia

^b Faculty of Health, University of Canberra, Canberra, Australia

^c Menzies School of Health Research, Darwin, Australia

^d Centre for Disaster Preparedness and Management, University of Peshawar, Pakistan

^e Holistic Understanding of Justified Research and Analysis (HUIJRA), Pakistan

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ABSTRACT

UN Sustainable Development Goals and the Sendai Framework of Action 2015–2030 place great importance on including Indigenous communities in disaster risk reduction (DRR) planning through community-based strategies. However, working with Indigenous communities requires developing a holistic understanding of the complexities of Indigenous worldviews, knowledges, and practices that influence Indigenous DRR. To date, efforts to do so have been limited. To fill this gap, we combined systems theory and symbolic interactionism as holistic philosophical lens to explore the complex interactions of individual and contextual factors that influence DRR in a remote Pakistani Indigenous community. A synergy of critical Indigenous methodology, grounded theory, case study and ethnography as research methodologies led to employing conversations, yarning circles and participant observation as data collection methods. The data from nineteen participants were collected, interpreted and analysed with the help of a local Indigenous co-researcher over the period of four months. The emerged grounded theory identified eleven categories pertaining to the facilitators and barriers of community' DRR. The local culture *Pukhtunwali* and its components, Islamic teachings, good physical health, NGOs, community organisations and community's adaptive capacities facilitated DRR; whereas, lack of community-based DRR structure, inadequate welfare services, some religious beliefs, poverty and climate change hindered DRR of the community. The categories were weaved together to generate a core category that indicates that development agencies specialising in different areas need to work with Indigenous communities in interdependent and complementary partnerships for sustainable development in Pakistan. We offer our recommendations to accomplish genuine interdependent and complementary partnerships.

1. Introduction

While disasters are a worldwide phenomenon, their impacts are more severe in lower-income countries [1]. From 1994 to 2013, higher-income countries experienced 56% of a total of 6873 disasters, but only 32% of the total 1.35 million lives lost. In contrast, lower-income countries experienced 44% disasters but 68% of lives lost [2]. This disparity reflects differences in how socio-economic factors mediate the relationship between hazardous events and the physical, social, economic, and political contexts in which these events interact

with citizens. For example, lower socio-economic members of societies face challenges in organising available societal and organisational resources and mobilising them in ways that support their disaster risk reduction (DRR) capabilities [1]. The ensuing absence or inadequacy of DRR capabilities and policies thus magnify the losses observed in lower-income countries [3,4]. Moreover, these gaps considerably undermine civic and citizens' approaches to anticipating and taking responsibility for DRR.

Further complications arise in lower-income countries because the risks deriving from the aforementioned DRR limitations are not evenly

* Corresponding author.

E-mail address: tahirali@students.cdu.edu.au (T. Ali).

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distributed throughout the population; in countries whose population comprises Indigenous members, these groups face a disproportionate level of hardship due to the legacy and ongoing consequences of colonisation and neo-colonisation that includes massacres, displacement from ancestral lands, the spread of deadly diseases, forced labour, slavery, ecological destruction, and cultural genocide [5–7]. These legacy factors have, over long periods of time, progressively suppressed and extinguished many traditional aspects of Indigenous lives [7,8]. These aspects include beliefs, knowledges and practices that constitute DRR capabilities such as those that facilitate co-existing with natural process due to having been living for thousands of years in harmonious and connected relationships with nature [5,8].

Researchers have argued that, if marshalled and applied appropriately, this cultural orientation can play pivotal roles in recovery and regeneration processes, and can allow Indigenous populations to do so either independently of any formalised funded agency help [8,9] or in ways in which communities and agencies play interdependent and complementary roles in DRR. However, if the beneficial application of these resources is to be realised, it is essential that the Indigenous knowledge, practices, and capacities required to support DRR planning for sustainable development, such as community-based approaches are articulated and their *modus operandi* understood [10–16]. An under researched issue in this context derives from the importance of understanding how colonial and neo-colonial processes intersect with Indigenous social, cultural and environment capacities to undermine DRR capabilities and what needs to be done to ensure that non-Indigenous agencies and their beliefs and practices (which reflect a colonial legacy) can be developed to complement and support the regeneration of Indigenous DRR capacities.

In order to gain the understanding of complex and interconnected phenomenon of Indigenous DRR, research must adopt a holistic approach to explore the multifaceted and interdependent historical, cultural, social, political, economic, and environmental factors and processes whose dynamic interaction is fundamental to Indigenous lives and their DRR mechanisms and are paramount to be included in DRR policy and planning through appropriate strategies [5,8,9]. This is an area of research in which knowledge is sparse. We address this gap through our holistic research approach which is the subject of this paper. To do so we next describe current Indigenous DRR research and gaps in the current discourse that we attempt to cover through our study, followed by the research design we adopted, findings, discussion, and conclusion.

1.1. Current Indigenous DRR research

Indigenous peoples' competence to cope with disasters came into limelight after 2004 Asian Tsunami when the Moken communities of Surin island in Thailand, the Simeulueans in Indonesia, and many island populations of Nadaman and Nicobar successfully predicted Tsunami and employed their traditional strategies to effectively survive it [5,12]. For example, while 200,000 people were killed in the rest of Indonesia, only 7 out of 78,000 Simeulueans lost their lives in Tsunami [5]. These Indigenous knowledges and practices are very sophisticated as they are built upon gradual observations of environment, adaptation to the changing environmental patterns, and learning from mistakes spanning over millenniums and passed over generations [8,11–16]. Since 2004, a plethora of research has been conducted in the Indigenous DRR domain mainly revolving around Indigenous knowledges, how these knowledges inform reading and responding to early warning signs, and how these knowledges can be integrated into Western scientific knowledges to broaden the evidence-base of understanding hazards and risks [12,14,16].

With the passage of time, as Indigenous culture generally emerged as underpinning DRR and resilience, the push for exploring and identifying specific Indigenous practices and the ways they facilitate DRR gained momentum [12]. Consequently, a number of studies focused on the

strong kinship networks characteristic of collectivist cultures as vital strategy Indigenous peoples use to strengthen collective actions and efficacy, and minimise reliance on external support [13,15,16]. Some studies identified Indigenous elders' wisdom, respect and authority facilitating decision making, assigning roles and responsibilities, and communication between peoples and agencies [8,17]. Other studies identified religious institutions such as mosques, temples and churches as supporting DRR because they are offering central communal platforms for participation, communication and coordination in peace and emergencies [18]. Research has also identified that Indigenous unified, egalitarian, reciprocal and relational spiritual worldviews are at the source of Indigenous peoples living in connected and harmonious relationships with nature that enabled them to reduce the occurrence of extreme natural process and likelihood of turning them into disasters [8,16,19]. Since all these constructs are Indigenous-specific, they have not been recognised, appreciated and included by Western academics, researchers and scholars in DRR theories, models, policies, and practices. This is evident from the fact that ground-breaking DRR studies like Norris et al. [20] that make significant contribution in advancing the agenda of development of community-level DRR adaptive capacities, do not include analysis of local culture in their community-based development frameworks.

As research has increasingly uncovered the value of Indigenous worldviews, knowledges and practices for informing DRR, there have been growing calls to include Indigenous perspectives into policy formulation and implementation at local, national and international levels [12,21]. However, much Indigenous DRR research traditionally conducted by non-Indigenous researchers has primarily employed quantitative research and theories based on positivistic, reductionistic, anthropocentric and secular worldviews [5,7]. As a result, Indigenous DRR research has not holistically explored Indigenous DRR and examined how interactions between historical and contemporary Indigenous-specific aspects such as impact of colonialization on Indigenous cultural capacity to reduce the risk of, predict, respond to, recover from and adapt to extreme natural events [5,21].

A holistic approach is vital in DRR research that recognises that disasters are not a natural process but rather an outcome of interaction of natural events with peoples in ways that exceeds peoples' socio-economic capacity to cope with them [22,23]. With this recognition, there is a significant focus on an integrated approach to understand people's social, economic, political, cultural and environmental contexts that interact to impede or facilitate disaster preparedness and reduction and addressing them through community based approaches [22–25]. Such integrated and holistic research approaches have greater implications for Indigenous research not only to facilitate understanding and addressing multifaceted socio-economic inequities (e.g., the health and education disparities arising from colonial histories of dispossession, oppression, dominance, exclusion and disempowerment) that not only create and perpetuate vulnerability but also how to support peoples' capacity to sustainably regenerate and use implicit, culturally specific Indigenous adaptive capacities. Doing so requires a holistic Indigenous DRR research approach (e.g., exploring how family, community, tribal, social-environmental, historical, spiritual, livelihood, and governance processes can be regenerated) that creates outcomes that empower the application of traditional worldviews, knowledge, and practices to facilitate the (re)building of the individual and collective adaptive capacities that can inform the development and implementation of Indigenous DRR [10,12,13].

One strategy to facilitate achieving this outcome is through creating genuine partnerships between Indigenous and non-Indigenous stakeholders [21]. These partnerships can be instrumental to bridging gaps among Indigenous peoples and non-Indigenous stakeholders such as academics, scientists, and policy-makers for conceptual and practical articulation of DRR knowledge production, sharing and integration [15,16,26]. Establishing these partnerships require greater partnerships and collaborations with Indigenous peoples to understand Indigenous DRR

perspectives from their own viewpoints and non-Indigenous stakeholders appreciating, valuing and including these perspectives in research and policy. However, very little guidance is available in the literature regarding how to establish such partnerships and how to facilitate their effective functioning [26]. Rather, a body of research supports the view that Indigenous peoples have not been provided with sufficient opportunities to participate in DRR research, design, implementation, monitoring and evaluation with their Western counterparts [26,27]. Hence, the goal of developing new forms of knowledge by integrating diverse fields of knowledge across cultures and disciplines in ways that afford new approaches to addressing novel environmental challenges remains unfulfilled.

To start addressing these gaps we set out to research in partnership with a remote Indigenous community in Northern Pakistan to holistically explore and understand Indigenous DRR perspectives and practices. To the best of our knowledge, this is the first study to holistically examine DRR and community development strategies adopted among the Indigenous peoples of Northern Pakistan.

1.2. Indigenous peoples of Pakistan

Pakistan gained its independence from Britain in 1947 following the termination of formal colonialist government in India after 90 years (India, Pakistan, and Bangladesh were a part of the Indian Sub-Continent, formally colonised by the British from 1857 to 1947). However, in reality, as a neo-colonial state, Pakistan's economic and political systems retain a significant degree of external direction. Neo-colonialism entails indirect control of cultural and economic means by capitalist nations and corporations under the guise of freedom in developing countries [28]. Neo-colonialism has been identified as a significant influence on Pakistan's failure to develop and implement its traditionally practised, indigenously conceived, and self-planned development models and to remain over-reliant on non-local and alien development models and policies [28]. Such models have failed to address local needs and perpetually marginalised Pakistani communities, especially the Indigenous communities. Consequently, Pakistani Indigenous peoples experience poverty; land loss; inadequate livelihood skills and resources; threatened culture; environmental degradation; gender inequalities; illiteracy; shortage of water, sanitation, health, educational and infrastructure facilities; and lack of participation in decision-making [29,30]. Furthermore, forced construction of large dams, corporate agricultural plantations, commercial logging, and large-scale mining led to Pakistani tribes losing their rights and access to lands and natural resources [29]. In addition to the loss of agency over key resources, the Pakistani government's failure to formally recognise its Indigenous peoples made additional contributions to the continuing erosion of their diverse socio-cultural identities and distinctions, further perpetuating the devastating impacts of colonisation on the risk faced from natural hazards [30].

The devastating disadvantages and impacts Indigenous peoples and communities experience in Pakistan mirror those of Indigenous peoples worldwide including Canada, Australia, and New Zealand. Displacement from their lands, disassociation from traditional resources, and the imposition of Western systems have weakened the individual and collective spiritual, physical, and cultural adaptive capacities of Indigenous peoples, substantively eroding and reducing their capacity to call upon traditional socio-cultural beliefs and practices to prepare for and respond to extreme natural events [5,8].

In order to understand Indigenous DRR in a holistic way, we attempted to explore the historical and contemporary two-way interactions between psychological, environmental, cultural, social, spiritual/religious, economic, legal, and political dimensions across different system levels which influence DRR and community development processes and outcomes. In particular, we examined how Indigenous worldviews, knowledges, and cultural practices contribute towards facilitating individual and collectivistic adaptive capacities and

reducing the risk of disasters in this remote tribal community. Finally, we investigated how the factors that facilitate DRR in tribal communities could be embedded in DRR planning through community-based approaches to facilitate sustainable community development as per directives of Sendai Framework of Action. The objective of this research was to develop a holistic and all-hazards Indigenous DRR theory that is grounded in the experiences and interpretations of Pakistani tribal peoples from their perspectives.

Against this backdrop, our qualitative research combined Ecological Systems Theory [31] and Symbolic Interactionism [32] as an overarching philosophical/theoretical lens capable of capturing the social, cultural, and environmental complexities of Indigenous DRR capability. The combination of both frameworks enabled examining Indigenous DRR as a whole system, and the interactions between the parts of the system over time, from the perspectives of Indigenous peoples. This philosophical framework also provided a useful lens for exploring how people interpret their experiences and how they act/interact based on their interpretations. A detailed discussion of how merging Ecological Systems Theory and Symbolic Interactionism as an overarching philosophical/theoretical lens facilitated our research with Indigenous peoples and communities is presented elsewhere [33].

2. Research design

To examine how the experiences, interpretations, and actions/interactions of people regarding DRR interact across the diverse systems over time, we used a critical Indigenous research methodology within the qualitative research paradigm [34]. Qualitative research enabled us to undertake a holistic and interpretive approach to gaining an understanding of the complexities and dynamics of the socio-cultural and historical context [34] in which Indigenous DRR perspectives are constructed and enacted. Within the qualitative research approach, we selected and merged three methodologies: case study, ethnography and grounded theory. The case-study methodology guided us to explore the complexities and dynamics of DRR in a real-life context as they occur within one carefully sampled Indigenous community [35]. Ethnography directed us to deeply immerse ourselves into the every-day lives of the participants to experience and see the world from the perspective of the participants [36]. Grounded theory gave us a systematic and rigorous iterative process for developing a theory grounded in the data [37].

In line with this synergy of research methodologies, data were collected using methods appropriate for research with Indigenous peoples, namely conversations, yarning circles, and participant observations.

Conversational methods afforded the researchers and the participants to become interconnected through reciprocation to understand the socially constructed world of DRR in the participant communities [38]. Conversations with 19 participants were conducted one-on-one or through yarning circles depending upon the choices of the participants (see Table 1). Yarning circles are more informal and relaxed group conversations in which the researcher and participants build and develop a relationship to explore the topics of research together [39]. Participant observation is also a culturally appropriate method for research with Indigenous peoples and it complements conversations and yarning circles in diverse ways [40]. Specifically, participant observations enabled gaining insights into actions/interactions as they are happening in the course of everyday living in people's natural context [36].

We selected a remote Indigenous community Badalai in the Swat Valley locate in Khyber-Pakhtunkhwa (KPK) in Pakistan as a case study community. Badalai has experienced multiple disasters in recent years. Badalai (Fig. 1) is located at the bank of the Swat River in the Hindu Kush Mountains. The closest town, Madyan, is 3 km away. The Swat River originates from the glaciers of Kalam, some 30 km from Badalai, and regularly floods. In the past, the floods have been small. However, in 2010 and 2011, the floods were unexpectedly and unprecedentedly large

Table 1
Overview of research participants and data collection.

| Participation details | No. | Participants names |
|------------------------------------------|---------|------------------------------------|
| Total Participants | 19 | Community members males |
| Males | 13 | |
| Community members | 8 | i. SanaUllah |
| Community members from NGOs | 4 | ii. Usman |
| District Disaster Management Unit (DDMU) | 1 | iii. Shehzada |
| | | iv. Taj |
| | 6 | v. Noor |
| Females | 2 | vi. Sher |
| Community members local | 4 | vii. Shahid |
| councillors | | viii. Abubaker |
| Housewives | | Community members females |
| Types of participation | | |
| Males | | i. Toseer |
| One-to-one conversations | 9 | ii. Tajmahal |
| Yarning circle (1) | 4 | iii. Saeeda |
| | | iv. Bhagbhari |
| Females | | v. Bakhti |
| Yarning circle females 1 | 3 | vi. Akhtar |
| Yarning circle females 2 | 3 | Community members from NGOs |
| Duration of conversations | | |
| Males | | i. Shafiq |
| One-to-one conversation | 89 min | ii. Khursid |
| <i>Maximum</i> | 39 min | iii. Israr |
| <i>Minimum</i> | 101 min | iv. Riaz |
| Yarning Circle | | DDMO office |
| Females | 45 min | Saleem |
| Yarning circle 1 | 58 min | |
| Yarning circle 2 | | |

and resulted in substantial loss and damage. Badalai also experienced two earthquakes of 7.6 and 7.5 magnitudes in 2005 and 2014 respectively. In addition to these 'natural' disasters, the community also suffered human-made disasters resulting from Taliban and subsequent anti-Taliban military operations from 2008 to 2010.

To ensure a culturally appropriate research process [34,41], a three-member Indigenous community steering committee was formed in consultation with the community. To ensure diversity and inclusivity, these members were selected from both tribes living in the community. However, females could not be included in the steering committee due to cultural considerations (see below). An Indigenous community member, AS, with DRR knowledge due to extensive employment experience in the not-for-profit DRR sector was engaged as a co-researcher. The first author lived in Badalai for over four months from September to December 2018 to build trust and relationships, observe and participate in daily practices, and engage in informal conversations and collect other ethnographic data [36]. He participated in daily practices such as sharing meals, shopping, and playing sports. Observations of and participation in daily practices were recorded by TA as fieldnotes in a daily research journal.

In line with the grounded theory, participants were purposefully and theoretically sampled based on diversity and on their ability to provide relevant information. The sample included community members, local councillors, community members working for NGOs, and a government official (Table 1). The conversations and yarning circles started by introducing the research topic to the participants and then by giving them the freedom to share their stories. All conversations were conducted in the local language, recorded, transcribed, and interpreted by TA and AS. All the participants consented to the use of their real names in presenting the data (rather than pseudonyms), which is consistent with emerging Indigenous research practices [34,41]. The backgrounds of the participants and the details of the conversations and yarning circles are provided in Table 1.

The data were analysed using constructivist grounded theory

techniques [37] and with the help of the qualitative analysis software Atlas.ti.

3. Findings

From the analysis of the data, a grounded theory emerged that identifies the diverse factors at different levels of the system and how these factors interacted to support or hinder the DRR of the community (see Fig. 2). The emergent codes were grouped into eleven categories that influence DRR in the community (facilitators in green boxes and barriers in red). Next, the categories were weaved together into a coherent whole for an analytical narrative (core process) which is "development agencies specialising in different areas needing to work with Indigenous communities in genuine interdependent and complementary partnerships for sustainable development" (yellow box in Fig. 2). We will now turn to present the different elements across system levels and how they facilitate or inhibit DRR in Badalai. This will be followed by the discussion section to elaborate on how these elements can be addressed through community-based approaches.

3.1. Enablers of DRR

It was argued above that researching Indigenous DRR through a culturally-centred, holistic lens that accommodates the interdependent influences of individual, societal and contextual processes involves exploring the culture-specific processes that exist and how they can be mapped onto DRR processes [10]. This study finds that the major enablers of the Badalai's DRR originate from local culture *Pukhtunwali* (blue boxes in Fig. 2). This includes *Ashaar* (working together), elders, the local institutions of *Hujras* (male socialisation place) and mosques, strong connections with the lands, and traditional ecological knowledge. These DRR capacities are further complemented by Islamic beliefs, good physical health, Community-based Development Organisations (CBDOs), and NGOs and developed adaptive capacities. These findings highlight how culture illustrates both the existence of processes with DRR implications (e.g., *Ashaar* encompasses process such as community participation and collective efficacy) and the importance of understanding how these are embedded in socio-cultural fabric of community life. These cultural resources are explored in more detail in subsequent sections, starting with *Pukhtunwali* and how it illustrates the importance of adopting a holistic approach.

3.1.1. *Pukhtunwali* supporting DRR

The people of Badalai, locally known as *Pukhtuns*, belong to two main tribes of KPK: *Kohistani* and *Yousafzai*. Both tribes share a common tribal culture called *Pakhtunwali*. *Pakhtunwali* is based on a standard code of actions which have been constructed historically, shared, and agreed upon to be followed collectively and that underpins the local world-views. It entails the practices of cooperation, generosity, hospitality, respect for elders, courage, dignity, and revenge. The religion of Islam strongly influences the social structure and the ideological formation of *Pukhtunwali* and religious precepts and rituals are a significant part of their culture [42]. These practices are enacted and sustained through *Pukhtun* institutions including *Ashaar*, elders, *Hujras*, and mosques, which emerged as the vital pillars of the community's DRR.

Pukhtunwali promotes strong trusting relationships and social bonds between people, families, neighbours, and both tribes in ways that support people's collective ability to solve their problems by mutually helping each other in their everyday lives. *Pukhtunwali* thus is a complex cultural foundation of several DRR outcomes (e.g., trust, social bonds) that reflect implicit social processes that are applied in all aspects of daily lives. This is fundamentally different from Western individualistic settings that reflect these measures as personal choices and people adopting them to achieve personal objectives independent of social situation [43]. Consequently, Western theories focus on developing these characteristics (e.g., trust, social bonds) separate to implicit social

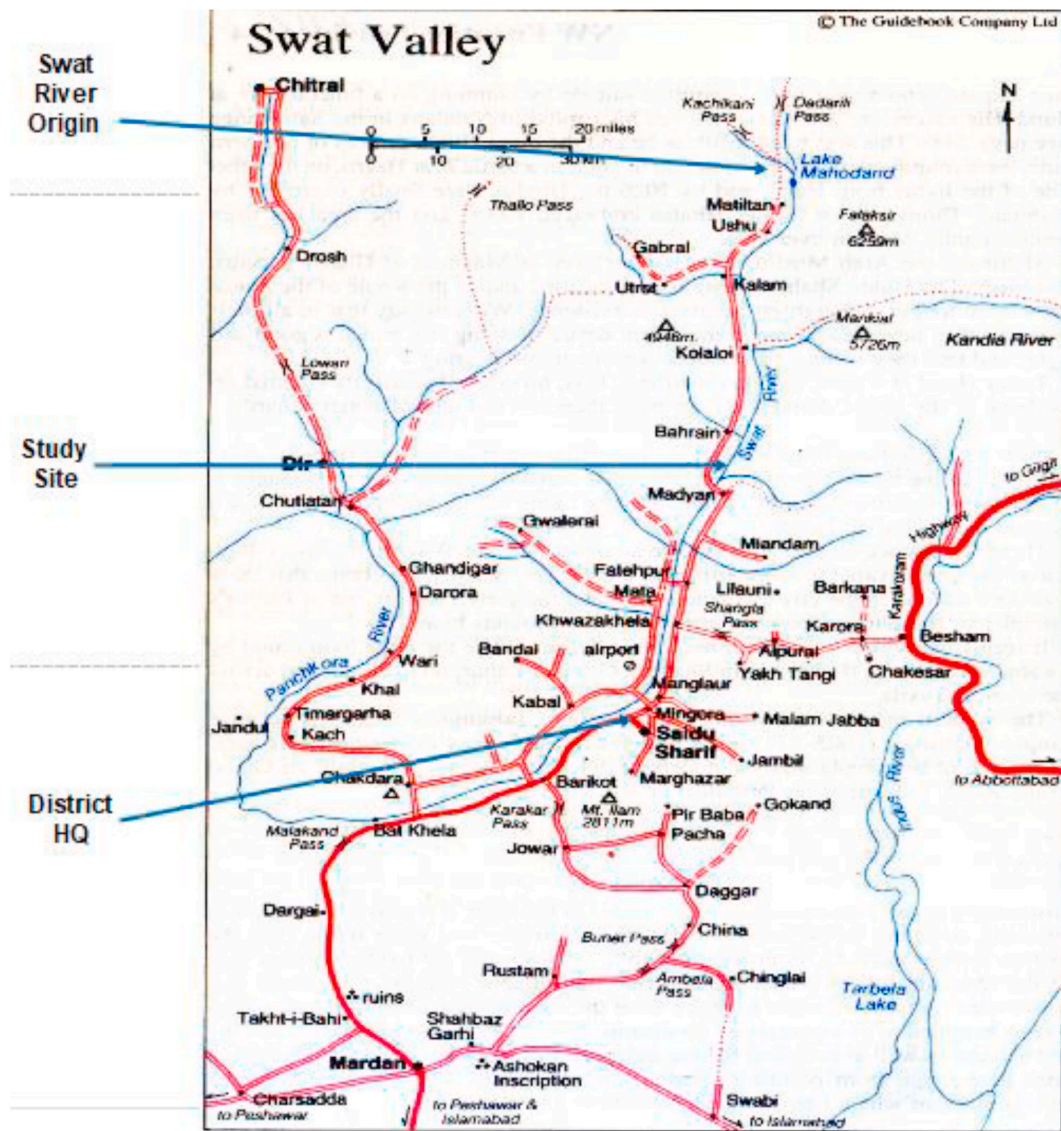


Fig. 1. Map of Badalai.

process to influence risk management outcomes [43]. Hence, *Pukhtunwali*, offers insights into how cultural constructs linked to DRR, (e.g., *Ashaar* facilitating collective efficacy-see below) can be better understood through a socio-cultural lens.

The fact that strong social cohesion is a resource intrinsic to and influential in everyday life highlights the benefits of integrating DRR and community development through strengths-based approaches at the community level. For instance, in the 2010 floods, Noor and Taj told a story when the community rescued a fellow villager who was trapped in flood after the army had refused to rescue him due to the lack of proper equipment:

After Army left, we tied a stone with a rope and threw it towards him. He tied the rope around his body. We were thinking he is almost dead but at least we can have his dead body. We prayed to Allah and started pulling the rope. We managed to pull him to the bank safely.

3.1.1.1. *Ashaar* promoting cooperation. The strong bonding of the community is the result of one specific traditional cultural practice of *Pukhtunwali* called *Ashaar*. Traditionally, *Ashaar* entails people helping each other during the collective crop harvesting season. However, over time, *Ashaar* has been applied to other aspects of life and is deeply

embedded in the everyday lives of the people in Badalai, promoting enduring cooperation among people both during everyday life and emergencies. Communal activities, such as transporting wood, installing windmills, carrying patients and/or dead bodies to hospitals, and constructing homes are accomplished by community members through *Ashaar*. This reciprocal helping is evident in that if any activity is beyond the physical or financial capacity of an individual, community members are voluntarily working together in the spirit of *Ashaar*. Usman shared the following example of *Ashaar*:

I have just built the rooftop of my one room. This was done through *Ashaar* with the help of village fellows in an hour. There were around 20–25 people. This is very common and for every work. Besides financial help, it promotes relationships. If someone helps me with my work today, I will help him tomorrow.

Ashaar, served as the main coping strategy for villagers when responding to, recovering from, and regenerating after earthquakes and floods:

People helped me to dismantle my Ara machine [wood-cutting machine] during the flood and safeguarded it (Taj). People helped me to evacuate my livestock before the flood could hit my house (Noor).

Ashaar is so embedded in the society that a disabled participant,



Fig. 2. Influencing factors of the community DRR approach and relationship between them.

Shehzada, abided by it by vacating his room for the flood victims: “I vacated my room for a family during the flood for a week and shifted to my uncle’s room (Shehzada)”. In the recovery phase, people, in partnerships with NGOs, helped each other to support the collective rebuilding of damaged houses through *Ashaar*. By facilitating the collective response to challenges, *Ashaar* supports collective efficacy. These findings demonstrate the intertwined cultural processes of mutual social obligation and cooperation that create a suite of DRR outcomes and capacities.

3.1.1.2. Elders being the source of wisdom and authority. Elders are a main pillar of *Pukhtunwali* and one that provides an enduring foundation for effective community functionality during peace and emergencies. Elders are respected due to their wisdom and knowledge. This respect affords elders their authority and leadership. Elders serve as heads of their families and are the final decision-makers for internal and external family matters and community issues. Fig. 2 shows that elders particularly facilitated the emergency preparedness, response, recovery, and regeneration from disasters.

Participants shared that community elders with their traditional local knowledges supported the preparedness phases. Elders were able to predict rains and their potential threats during floods: “Our *Masharan* [elders] know the rains. My father, with his experience and wisdom, predicted the floods on the 2nd day of *Baran* and told us to evacuate, which later saved us (*Sana*). The elders’ experience and traditional knowledges were particularly helpful in guiding the response strategies during sudden disasters like earthquakes: “The 2005 earthquake was the first big earthquake in the area in several decades we did not know how to respond. My father advised us to evacuate the house and rush towards playground

(*Shafiq*)”. NGOs participants commented that during recovery operations, they involved elders because people respect, listen to, and obey them.

A vital role of male elders as community leaders is conflict resolution through a decision-making institution called “*Jirga*”. *Jirga* is a temporary body comprised of local male elders selected by communities to resolve a particular dispute between relevant individuals, families, extended families, clans, and tribes [44]. Because the decisions are made by respectable elders, community members honour the decisions of *Jirga*. This cultural practice plays an important role in maintaining harmony and peace in society.

As a local governance structure, *Jirgas* can be vital for promoting and implementing DRR regulations, collective actions, and community engagement. However, *Jirgas* that are highly respected and have proven their worth have never been integrated into DRR at local or state levels. Furthermore, women do not have access to the *Jirgas* due to cultural restrictions. In *Pukhtunwali*, the protection of women is a vital part of honour. This protection is ensured through *Purdah* (veil) which places strict restrictions on women’s involvement in out-of-home activities. As a result, women’s role is mainly confined to household activities and looking after families. These restrictions hinder both women’s voices from being heard and their involvement in decision-making processes.

3.1.1.3. Hujras and mosques promoting togetherness. Another two important components of *Pukhtunwali* that make and uphold the shared traditional values of togetherness and govern the behaviour of the people regarding communication, collaboration, relationships, and inheritance are *Hujras* and mosques. These collectively shared rules are fundamental to developing, strengthening, and sustaining harmony and

agency among people in the community. Their importance was evident in their making substantial contributions towards managing the consequences of floods.

Hujra is one of the oldest traditions in *Pakhtunwali* and it makes an important contribution to promoting unity and togetherness among people. The people, who can afford to, build *Hujras* (a separate 1–2 room building) adjacent to their houses, for males' daily social gatherings, activities, and discussions on mutual issues on a daily basis. *Hujra* is open to anyone regardless of financial status and respect is given according to age and experience rather than wealth. *Hujra* is a vital way for male elders to transfer the traditional knowledges and cultural practices they hold from one generation to the next. In *Hujra gatherings*, *Masharan [elders] discuss the issues and tell stories while Zwanan [youngsters] listen to them carefully and respectfully (Abubaker)*.

Mosques possess a central place in Islam. Muslim men gather in mosques five times a day to offer obligatory prayers in congregations. People usually sit down after the prayers to discuss and resolve their social and economic issues and mutual conflicts. The decisions taken in the mosque as a holy place are generally abided by the people. Their significance in a DRR context became evident during the flood event.

Participants mentioned that the 2010 flood was their first major disaster experience because up to that point extreme natural events did not occur for a combination of reasons (see below). Thus, community members had no experience of flood events of this magnitude and did not know how to respond. In this context, the mosques and *Hujras* became vital places to exchange risk information and plan response strategies with other community members: *"After Zuhar prayer (noon prayer), we sat down in the mosque and planned that flood level is increasing and we should start evacuating the livestock from the houses near the river (Noor)*. The information exchanged in social interactions with fellow community members through these local institutions helped people to make sense of the threat and motivated people to take actions.

As the most frequented places, *Hujras*, and mosques, also facilitate links between the community and external agencies. For instance, NGO participants mentioned that they used these community spaces as a coordination point to distribute food. Besides facilitating response and recovery, mosques play an important role in disaster preparedness. For example, community participants discussed how during the monsoon season, they use the mosque loudspeakers to make announcements regarding potential threats, especially during the nights.

Hujras and mosques also provide local community-based leadership. *Hujra* owners (usually tribal heads) and mosque leaders (Imams) are generally very respected and considered as popular and undisputed leaders. Their leadership motivates and facilitates community members to participate in community activities hence play roles in empowering community members. *"Owners of Hujras and Imams have significant respect in the community. Their involvement persuades and motivates others to participate in community activities (Israr)"*. However, they are not necessarily available to all.

Similar to *Jirgas*, women do not have access to *Hujras* and mosques. These cultural considerations hinder women from becoming involved in several of the DRR capacities these local institutions offer to men, including their being involved in decision-making and activities such as disseminating risk information and developing response strategies.

3.1.1.4. People having strong connections with each other and the land.

The strong cohesion among the people has contributed to keeping the community intact through generations, which, in turn, has developed strong emotional connections among people and between people and the land. These strong connections with the land especially helped to keep the community unbroken during the disasters and formed one of the greatest DRR strengths. Despite all the risks, all participants strongly opposed leaving their families, relatives, and the local area, should a disaster occur. Participants viewed disaster threats as a shared problem and stressed the importance of dealing with them collectively while

staying with their families on their lands: *"If we move, we might become safer, but we cannot have our brothers, sisters, uncles, relatives, and lands (Bakhti)"*. The strong cohesion and getting through the disasters together further strengthened the connections among the people and between people and the land: *"We have been through to lots of crises together in the last few years and we did not leave our relatives and lands, how can we leave them now (Akhter)"*. While such particular outcomes (e.g., social cohesion) can be mapped onto constructs in Western DRR theories, such as community engagement theory [10], it is important to appreciate the need to understanding the deeper, holistic influence of local Indigenous processes and not to assume that the meaning, development and enactment of constructs are the same across all cultures.

Participants shared the stories of a few people who shifted to other safer places outside the village after the 2010 flood, but they were never very happy: *"These people used to come to the village and sit on their abandoned places every day (Noor)*. *These people were like birds who lost their nests and were wandering everywhere homeless (Taj)*. *It is better to die with your people rather living alone (Toseer)"*.

By mobilising a strong commitment to people staying together in their home locale, strong connections (place attachment) with the land coupled with *Ashaar*, can link to the availability of the physical and emotional social support that can help manage a disaster. Moreover, people's strong connections to the lands can be capitalised upon to increase participation in collective actions for protecting, securing, and improving their communities. However, it is important to appreciate that this sense of place attachment can also have damaging effects and may undermine the community's adaptive capacities. For example, strong connections to lands prevented people from moving to safer places. However, overall, respondents' views suggested that the positives of place attachment outweighed the negatives. One underlying reason for this is people's deep knowledge of the land.

3.1.1.5. *People knowing the land and the rains*. People's strong connections to the land have led to the development of extensive and nuanced ecological knowledges, including that of rain and its benefits. These knowledges have been transferred through generations. Importantly, these knowledges are regularly used to predict several natural events. For example, participants mentioned that they know diverse types of rain during monsoon and which types of rain can create danger. People distinguish three-, five- and seven-day rain spells, which they call *"Jhari"*. The local knowledge of *"Jharis"* facilitates the preparedness of the community as certain types serve as warning signs for community members; *"When it is five or seven days "Jhari", we start to prepare for a flood (Sana & Sher)"*.

The sophistication and great value of traditional knowledges for DRR are, for instance, evident in a traditional story about floods shared by elders in a *Hujra* gathering. When flooded, the Swat River brings small to large pebbles from the mountains, which then scatter across the valley. The local people hold that the pebbles are the eggs of water and water will come back to its eggs one day. This implies that wherever these pebbles are found that area has been flooded in the past and is likely to flood again. All the community participants stressed that the knowledge shared via this story was confirmed in the 2010 flood. This flood reached the higher residential and agricultural areas, which residents had not witnessed flooding before but where pebbles were found as Usman shared:

We live on the mountain, up there. Before the 2010 flood, we were drilling in our house for sewerage and we found the Khanri [big pebbles] under eight feet. My father said that these are eggs of the water and this area must have been flooded before and would flood again. In 2010, the flood reached our house level on the mountain (Usman).

The 2010 flood spread pebbles throughout the valley and local people believe that flooding will return to those areas sooner or later.

Whilst the traditional knowledges tell people that the valley is flood-prone and thus vulnerable places should not be used to build houses, due to several factors, including poverty and absence of regulatory functions, people continued to build homes in the same places before and after the 2010 floods which perpetuated the risk.

Another interesting example of the value of traditional local DRR knowledge was a story about the villagers predicting when it rains based on the position of clouds and sunlight on the mountains: *Whenever there is a deep shadow on the peaks of the mountains at the front, we know it is going to rain and we make our preparations (Noor and Taj)*. Abubaker revealed the reason for rain in this scenario. He explained that the high mountain peaks in front of the village block the air to form clouds and the clouds block the sunlight, which creates the shadow on peaks and later rain.

However, conversations with participants uncovered that this knowledge has never been formally considered as valuable and included by DRR agencies at either local or national levels. Furthermore, the dominance of technology such as mobile phones, radio, and televisions, has further contributed to undermining the use of traditional knowledges. Consequently, the external forces of exclusion and modernisation are contributing to the rapid erosion of traditional knowledge. Nevertheless, a more enduring source of knowledge derives from Islamic teachings.

3.1.2. Living in accordance with Islamic teachings

As Islamic beliefs substantially underpin *Pukhtunwali*, the influence of these beliefs on people's interpretation of disasters emerged from the conversations. Several participants believed that disasters occur because people have become disobedient to Allah and his teachings. That is, people interpreted disasters as Allah's punishment or a curse for not following the religious teachings and not being careful in their actions as this quote exemplifies:

Our deeds are not good, so we get these floods and earthquakes. Our forefathers used to sleep here on the bank of the river, but they never got any harm, because they were pious. We are not on the path of Allah and Allah is unhappy with us and sends these Azab [punishment] upon us (Bakhti).

According to this view, the foremost safety measures that prevent disasters are not man-made structures but being (or becoming) true Muslims who have a good relationship with Allah and obey his teachings. *"Some people think protection walls are the most important safety measure, but I say it is a good relationship with Allah (Usman)*." These beliefs are vital to the goal of developing a virtuous, healthy, and safe society and can be adapted to the core principles of DRR. For example, as Abubaker expressed: *"the Quranic teachings of protecting the environment and other living beings can be used to persuade people to protect forests"*.

In addition to these beliefs, the Islamic teachings of *Zakat* and *Khairat* (charity and donations) surfaced as significant facilitating resources during disaster response and recovery. *Zakat* requires sharing one's wealth (1/8th portion) with the poor annually, in Islam. *Khairat* means donating and helping each other as a religious obligation to please God. As a result of these religious beliefs and practices, rich people from the community and outside donated and helped extensively when disasters occurred:

During the past floods and earthquakes, after the international aid, the second biggest help was through charities, donations, and alms. There were hundreds of trucks loaded with relief items and millions of rupees donated anonymously (Abubaker and Shafiq).

These belief systems were not the only influence on DRR. The latter was also linked to people's good physical health.

3.1.3. People being physically very healthy

Observations during the fieldwork revealed that community members generally enjoy very good health. Participants commented that

good health is attributed to two reasons; a clean and healthy environment, and an active lifestyle. People including children, youth, women, and elders walk long distances in the mountains to get to schools, markets, jobs, collect wood in the forests, and look after livestock grazing. Physical fitness served as an individual as well as a collective, coping capacity during the disasters. People actively helped each other in preparedness, response, and recovery activities, such as, house repairs and reconstruction, which in turn, contributed to their social cohesion and bondedness.

However, psychologically, it was evident that people experienced considerable distress from several sources, including poverty, unemployment, the lack of availability of safe lands, and inappropriate infrastructure. Consequently, mental health issues make additional contributions to increasing the disaster vulnerabilities of community members. There are, however, other social factors that ameliorate these issues. Among them, the prominent are the roles played by Community-Based Development Organisations (CBDOs) and the NGOs in Badalai, which will be discussed next.

3.1.4. CBDOs facilitating culturally appropriate DRR

After the 2010 floods, an international NGO, locally referred to as the *"Project-people"*, created separate CBDOs for males and females following consultation with the community to facilitate community participation in rehabilitation. The gendered nature of the CBDOs is due to *Pakhtunwali* traditionally prohibiting males and females from interacting (see above).

These CBDOs partnered with NGOs in all the developmental projects in Badalai which facilitated the integration of the community's perspectives in the development processes in culturally sensitive ways (e.g., separate DRR training for males and females). The CBDO office is used as a communal space to discuss and plan community issues and welfare programs. These partnerships helped implementing development programs using social and cultural aspects of *Pukhtunwali* (e.g. *Ashaar* is infrastructure construction), which not only increased their cost-effectiveness but also contributed towards community empowerment. The male's CBDO also holds two special meetings every year to plan their DRR ahead of monsoon and snowfall events (e.g., planning evacuation routes and assembly points). However, female participants shared that they do not hold such meetings and they are dependent on information from the males in their homes.

Nevertheless, the analysis identified some constraints that reduced the performance of CBDOs. Prominent here was the unofficial legal status of CBDOs and the consequent fact that CBDOs do not get any financial assistance from the government and they run solely on community donations. Due to widespread poverty, these donations are very small and thus the CBDOs have an extremely limited financial capacity. CBDOs are also typically not involved in DRR or governmental development planning due to a lack of community-based DRR structure that encompasses communities and CBDOs. This creates a disconnect between community and government and so excludes community perspectives, needs, and resources from planning processes and the development of locally-relevant strategies for implementing community-based DRR processes. The exclusion exacerbates disaster risks and impacts as responding, recovering, and regenerating become more ad hoc when disaster strikes.

The need to strengthen the female CBDO is critical, since women do not have access to *Hujras*, mosques, and *Jirga* and are not involved in all the important DRR community decision-making and capacity building practices, as discussed above. Consequently, levels of female disaster preparedness were considerably lower compared to their male counterparts, and their vital resources and needs are not integrated into DRR. For example, female participants were unaware of the community evacuation routes and assembly points during monsoon and snowfall. Female participants shared that they were not involved in the bi-annual DRR planning and decisions made by the male CBDO were not communicated to them.

The issue of women's empowerment surfaced as a complicated issue during the study. *Pukhtunwali* is a men-dominating society that gives a dominating role to men over women in the society and restricts women involvement in community activities in observance of *Purdah* (veil) [42]. On one hand, female participants took pride in the *Purdah* and the way it offers protection and honour to them. On the other hand, they raised their voices against the excessive restrictions that arise due to *Purdah*: *Women are just sitting useless here. The biggest desire of my life is to see women driving around so that they can go to hospitals and markets when males are not home (Tajmahal)*". "*Women should be employed in police and hospitals (Akhter)*". Furthermore, male participants also considered women's participation in community activities as being anti-cultural. However, they expressed their trust and acceptance for female CBDO as it engaged women in DRR and community activities in observance of *Purdah*. This finding implies that female CBDO possesses a huge potential which, if utilised effectively, could significantly help to increase not only women's participation and the development of their adaptive capacities but also contribute to the collective capacities in the village, thus reducing the risk of disasters for the whole community. The CBDO competency highlights a need to understand and include other non-government entities, such as *Project-people*, in comprehensive conceptualizations of DRR.

3.1.5. NGOs being the main driver of the community's DRR activities

As can be seen in Fig. 2, another facilitator of DRR was the role *Project-people* played in supporting DRR activities in the community. After the anti-Taliban operations and floods in 2010, several local and international *Project-people* have worked with the communities in Swat. Participants shared that the prominent reasons for the magnitude of the 2010 flood damage included people's lack of awareness of risk and its sources and the lack of adequate response strategies since such large floods had not occurred in the past. Upon identifying this gap by the people and consultation with the CBDOs, *Project-people* provided specialised DRR training (e.g., evacuations during floods and earthquakes, use of emergency toolkit) to the community. Their work increased awareness of preparedness needs and response strategies, enhanced livelihood capacity, and improved structural mitigation among the people. These training sessions helped in timely evacuation and response during the 2011 flood and the 2015 earthquake and resulted in fewer losses:

The training from *Project-people* helped us to understand what to do before and during disasters. We saved two people from the flood in 2017 using the training, tools, and equipment provided by *Project-people* (Sana and Shahid).

Besides providing specialised DRR training, *Project-people* incorporated DRR in other infrastructure development and livelihood enhancement projects which increased the adaptive capacities and resilience of the community. For instance, some *Project-people* constructed mitigation structures such as protection walls and check-dams along the Swat River. All the community participants perceived protection walls as their biggest safety preparedness/mitigation measure. These infrastructure projects not only increased the structural resilience but also economic capacity through generating employment for community members. For example, some sustainable agricultural livelihood projects included the construction of terraces protecting against landslides and rockfalls. Some of the livelihood enhancement projects provided community members with livestock (e.g., goats, sheep, poultry), honeybees, and seeds. Women were provided first aid, embroidery, sewing, kitchen gardening, and orchid plantation training. A few embroidery centres equipped with sewing machines were also established by *project-peoples*, which enabled women to use their embroidery skills for income generation.

The construction of a micro-hydropower project (MHPP) in the community was seen by participants as the most prominent achievement

of the NGOs. To save the high costs of providing electricity to very remote areas, the KPK government in partnerships with local *Project-people* and communities is building several MHPPs across the whole province to generate electricity at the village level. One such plant has been under construction in Badalai over the last three years in partnership with the community, which contributed towards employment generation and restoring people's trust towards government:

MHPP is a genuine effort by the government to provide cheap electricity and to generate local employment opportunities. The government should start more projects like this to build schools and hospitals at the community level (Usman).

The above discussion has highlighted several factors that can contribute to emergent DRR capabilities. It is also relevant to consider pathways to their being used to facilitate sustainable adaptive capabilities.

3.1.6. Pathways to reviving and sustaining adaptive capacities

Following the 2010 flood experiences and training sessions from *Project-people*, community members developed several adaptive capacities (e.g., hazard identification, risk communication, safety and evacuation responses, and use of DRR toolkits) and took steps to embed them in their routine practices using their culture-specific processes introduced above (e.g. *Ashaar*). For example, people developed a collective commitment to stay awake on a rotation basis during nights and watch the river level in the monsoon season. The fact that these capacities built upon dynamic socio-cultural processes embedded deeply in *Pukhtunwali* reflects the need to understanding such cultural-specific constructs using holistic approach.

Importantly, people created flood stories and are telling these stories to their children to pass on their knowledge. These stories contain information related to flood risks, predictions, responses, and coping strategies. With increased awareness, people who can afford to do so started building their houses on the safer and higher ground using new structural designs, such as concrete structures with beams and pillars. While this practice can contribute to increased risk disparity within the community, it might also facilitate identifying and targeting the most vulnerable (e.g. people with sludge houses) for future preparation and response activities that can accommodate their unique needs.

However, the sustainable integration of these adaptations in people's daily lives is challenged due to several reasons. Participants shared that despite having the awareness, some people still select vulnerable places for building their houses. This is attributable to poverty as well as lack of reinforcement of sustainable actions by DRR agencies and the infrequent nature of large-scale flood events. Another key example of adaptive capacities that were not sustained after the 2010 floods, NGOs trained and developed a team of volunteers who played a valuable helping role in the 2011 floods. However, their capacity has not been maintained due to the absence of an appropriate community DRR structure: *The training we provided to the people are unsustainable due to the absence of any formal mechanism at the community level, to reinforce and further expand the learning (Khurshid)*. These gaps have also resulted in a barrier to further expand training to vulnerable fractions of the community including women and people with disabilities. For instance, Shehzada, a disabled participant, informed that he was never provided any training. As a result, he was unaware of any response strategy during earthquakes, landslides, or rockfall events.

Taken together, *Pukhtunwali*, Islamic beliefs and practices, strong connections to lands, traditional knowledge, good health, the role of CBDOs and NGOs, and developed adaptive capacities contribute to facilitating DRR in Badalai. However, these vital community resources that reduce the risk of disasters are undermined when they intersect with neo-colonial practices and with socio-economic vulnerabilities resulting from these practices. This draws attention to the importance of including a government-level analysis in discussions of facilitating the

emergence of holistic DRR capability. These findings will be discussed next.

3.2. Barriers to DRR

The systematic analysis of data indicates that the government has been failing to address the underlying sources of vulnerabilities of Badalai. A major reason for this failure is the lack of a community-based DRR governance mechanism which leads to a disconnect between government departments responsible for community development (e.g., employment generation or poverty alleviation), and for DRR at the community level. As a result, several structural gaps are created which escalate the community's risks and warrants a holistic approach to understanding them. These gaps include lack of development of local DRR regulations and implementation of national DRR policies, inadequate necessary community services, poverty, misperceived Islamic beliefs, and impacts of climate change (see Fig. 2).

3.2.1. Community-based DRR mechanism is lacking

A prominent reason for the ineffective local DRR process is the government's inability to devolve DRR planning and implementation at the community level as per the country's National Disaster Management Ordinance (NDMO) directive. This failure precludes DRR processes from being incorporated into the broader community development processes. To understand the reasons behind this failure in more detail, it is necessary to look into the NDMO in more detail.

The NDMO directive was formulated in 2006 to provide an institutional framework for decentralising the disaster risk management (DRM) structures from the federal to the community level (Fig. 3). According to the NDMO, the National Disaster Management Authority (NDMA) is the peak body for Pakistan's DRM policymaking. Under NDMA, Provincial Disaster Management Authorities (PDMAs) in each province are responsible for regional DRM planning and implementation based on NDMA policies. A major responsibility of PDMAs is to establish District Disaster Management Authorities (DDMAs) in all districts. DDMAs in collaboration with PDMAs are responsible for creating and facilitating towns, union councils, and community level committees decentralising the DRM planning and implementation.

However, we found that in Swat the lowest established unit is DDMA, and towns, unions, and village level DRM structures have not been created yet due to financial, technical, and human resource shortages at the DDMA level. According to NDMO, the DDMA needs to be headed by

a permanent District Disaster Management Officer (DDMO). However, due to financial constraints, the Assistant Commissioner (AC) of the district headquarters in Swat has been given the additional role of DDMO. Saleem argued that due to the high workload associated with other administrative matters, DRR has never been a priority of ACs since the inception of DDMA, leading to inefficient and ineffective performance:

There is no separate budget for the DRR operations, and we try to get finances from other departments which puts them under extra financial burden. Due to lack of funding, management, and expertise, we only plan for floods and other frequent disasters like earthquakes and landslides are not covered (Saleem).

Analysis suggests that an ineffective DDMA and lack of community-based DRM creates several governance issues related to the development and implementation of DRR regulations which trigger several disaster risks for the community (see orange boxes in Fig. 2).

3.2.1.1. DRR regulations are not being developed and implemented. The ineffective and inadequate local DRM structure has failed to develop local DRR regulations as per guidelines laid out in national DRR laws and policies. This translates into increasing the likelihood of people violating safety laws and land use regulations designed to reduce the risk of disasters. For instance, being a tourist destination, most of the hotels and restaurants have been constructed on riverbanks and at high altitudes to attract tourists but doing so in ways that ignore relevant safety codes and standards. *Project-people* commented that people ignore safety standards because of the widespread poverty, high population, and lack of availability of safe lands, people are forced to choose these locations because they are cheap. However, building in these places increase the risk of disasters. The biggest consequence of such violations of the law is the massive deforestation in Swat over the past decade.

3.2.1.2. Deforestation being the main reason behind 2010 floods. In 2009, when the Taliban took over the area, they cut trees commercially to finance their activities. The participants were unanimous that the main cause of the 2010 and 2011 floods was the massive deforestation that has occurred since 2009. After the anti-Taliban operations in 2011, people adopted the practice of commercial deforestation and timber-smuggling to generate income due to widespread poverty and unemployment. Israr commented that people have been using forest wood for centuries to meet their energy needs, but it had never previously

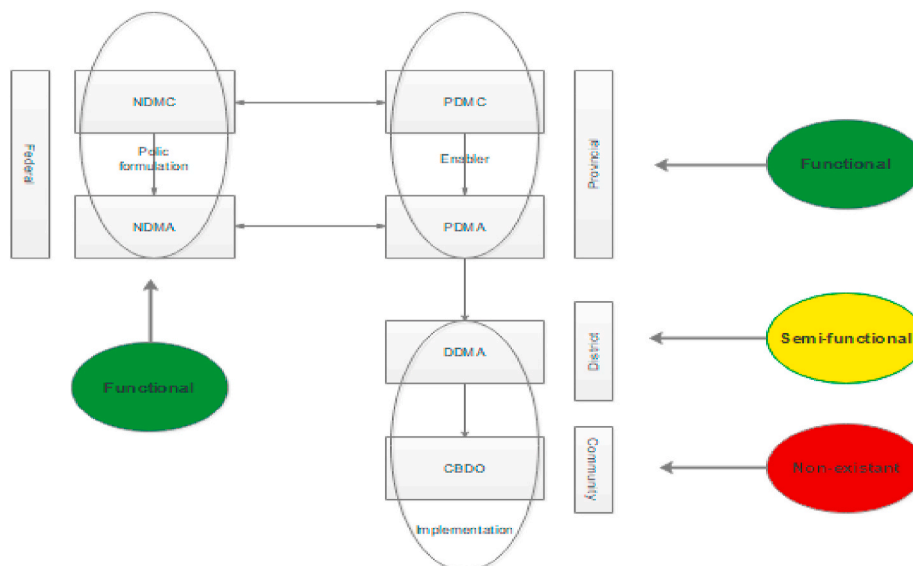


Fig. 3. Pakistan's national disaster management structure.

occurred on the commercial scale that is causing contemporary deforestation. From the conversations with community participants, it also emerged that while people realise the importance of forests to reduce the risks of floods and landslides, they consider tree felling a right, due to their poverty and lack of affordable energy resources. This finding highlights the need for social policy initiatives to be developed in tandem with DRR strategies at the local level with the help of community-based DRR structures.

However, to address the issue, recently, the KPK government started implementing two initiatives – one to stop deforestation and another to restore the forests in the area. The government has imposed heavy financial and imprisonment penalties for illegal tree felling. This has contributed to reducing deforestation. All participants confirmed that there has been a significant decrease in tree felling due to the introduction of these strict penalties. Nevertheless, according to participants, some covert commercial deforestation is continuing by some influential people due to corruption in the Forest Department. Nonetheless, local people are strictly disallowed to cut trees to meet their domestic needs, which is causing great frustration among the people.

The KPK government also initiated the “billion tree tsunami” project, which led to one billion trees being planted over the five years from 2013 to 2018 to restore 350,000 ha of forests in KPK. This initiative has significantly helped reforestation in KPK, thus reducing the risks from floods and landslides. However, participants, commented that while they are appreciating both projects, they have not been implemented in partnership with the community, resulting in adverse consequences. For example, participants shared that due to the absence of community-based DRR and an inefficient Forest Department there is no mechanism to look after the plants. This resulted in most of the young plants dying without timely and adequate watering. Water is naturally scarce in the area and no system was created either.

To prevent these adverse consequences from happening in the future, participants suggested that government agencies develop partnerships with their community to develop and implement initiatives. These partnerships could include, for example, numbering the trees and employing community people as forest guards. Such initiatives could be used to rectify other identified community welfare issues as well.

3.2.2. Community welfare services provided by the government being inadequate

Due to the absence of community-based DRR, structural contributions to increasing the risk of disasters could not be addressed and incorporated in community development processes, increasing civic vulnerability accordingly. For example, the streets in the village are paved but are very steep. They become very slippery in the monsoon season and thus can become an obstacle during emergency evacuations. The dirt road leading from Madyan to Badalai being unpaved and the sludge bridge over the river being frequently damaged by flooding become hurdles in response and recovery activities, such as transporting patients to the hospitals or delivering relief goods and equipment to the community.

The ability to transport patients to Madyan is vital for the community in the absence of local medical facilities. Similarly, because there is no secondary school in the community, children need to go to Madyan for secondary schooling which is challenging due to the unavailability of local transport. Access to higher education in Madyan and other cities is particularly inhibited due to poverty. Although the availability of primary schools has resulted in 90% enrolment of school-aged children in Badalai, this percentage drops drastically after primary education. Lack of secondary education is reducing individual as well as community capacities, and undermining children learning the knowledges, skills, and attitudes regarding ways to reduce the risks of disaster and enhance sustainable development. Moreover, the absence of medical and secondary educational facilities in the community means that women who cannot easily travel due to *Pukhtunwali* have less access to health and education facilities:

My granddaughter wanted to go for higher studies in Madyan but her father did not allow her due to the veil (Akhter). Sometimes, the sick people in our homes die because a male is not present at the home and women cannot go alone to hospitals in the town (Bakhti).

Badalai is a highly populated community due to its geographical position. Being located between the narrow passage on the bank of the Swat River and mountains, the availability of plain and safe lands is minimal. Due to the shortage of safe land on plains, the cost of this land is higher and unaffordable for the poorer people in this region. These challenges contributed to people avoiding moving out to new places after damages to their houses from floods, in addition to preferring to stay close to their extended families for support. If people decide to move, the scarcity of safe plain lands coupled with lack of land-use policy leads people to choose cheap but vulnerable places for their houses, such as riverbanks or higher altitudes prone to floods, rockfalls, and landslides. The damaging impact on these interactions is illustrated in the experience of Bakhti and her family. Her house on the riverbank was destroyed in the 2010 flood. Her family being poor meant that they could only build the new house in the same place and as a result, her new house was damaged again in the 2011 floods.

The high population density further adds to hazard-related risks by worsening sanitation problems, unemployment, and poverty. For instance, participants shared that due to the high population numbers and density, they have recently started suffering water contaminations. People have been using the river water for generations not only for drinking but for other domestic purposes, such as for washing clothes and utensils, and sewerage. However, due to the stark increase in population these practices are now resulting in contamination of the water, which is increasingly causing diarrhoea and skin diseases in the community, undermining the good health of the community and their capacity to respond to disasters.

3.2.3. Poverty being the main driver of disaster risks

The findings reveal that the community’s biggest risk factor, and one that is underlying all other risk factors, is poverty. Most of the community practices that increase the risk of disasters, such as choosing unsafe places for houses, building fragile house structures, felling trees to generate income, and not being able to stockpile resources before the monsoon season, are the direct consequences of poverty. At the same time, the foremost identified reason for widespread poverty was the interaction of the natural (2010 and 2011 floods) and human-made disasters (Taliban and anti-Taliban military operations) in Swat over the preceding ten years. These disasters created significant economic consequences for the community in the form of the rise of unemployment and business recession and a decline in tourism. These consequences were further compounded by government failure to generate employment for community members, reducing their economic capacity to reduce the risk of future disasters:

There is big poverty here. Income, survival, and livelihood are the top priorities of the people who dominate all the disaster preparedness decisions like moving to safer places or constructing disaster-resilient homes (Abubaker).

In addition to a need for the development of an effective DRR strategy to address these livelihood and economic concerns, belief issues that can impede DRR also require consideration.

3.2.4. Religious beliefs increasing disaster risks

Although religious beliefs appeared as a significant DRR facilitator (see above), sometimes these beliefs increase the likelihood of people perceiving preparedness as acts that interfere with Allah’s will, thus undermining people’s perceptions of preparedness needs. Some people think that if Allah has decided to send a disaster, then preparing for the disaster would further displease him:

Sometimes in Marakha [communal meetings], when people are told about the potential disaster and safety measures, some people get offended and take it as an intrusion in Allah's matters, so we avoid talking about disaster preparedness (Shafiq).

Some other religious beliefs were also found to contribute to increasing the risk of disasters. For example, some participants commented that in the 2005 and 2015 earthquakes, residents rushed towards the mosques. People believed that the mosque is the house of Allah. Thus, they perceived the mosque as a safe place and one in which they would be safe, or that if they would die in the mosque, they would be fortunate: "*Mosque is the house of Allah and it would remain safe in any disaster (Usman)*". "*I rushed towards the mosque because I would be fortunate if I die in the mosque (Sher)*". The selection of the mosque as a first choice of evacuation during disasters could be utilized by designing and building disaster-resilient structures of mosques at the central locations of the community.

The issues canvassed above are highly relevant in the context of the hazards the community can anticipate experiencing. However, their importance is elevated by the likely increase in exposure that will accompany climate change.

3.2.5. Climate change increasing disaster risks

The analysis revealed that one of the main reasons for the severe losses in the 2010 flood was the unprecedented nature of large-scale floods in the history of the area. Although the Swat River used to flood in the past, these were always minor and never caused any threat to the community. All the participants reiterated that the 2010 flood was the first of its kind in the recorded history of Swat and that they could never have expected such a huge flood:

Even our forefathers never experienced or talked about a flood like this (Akhter and Saeeda). My father died at the age of 105 in 2013 and he used to say he had never seen or heard of a flood, like this from his forefathers (Noor).

Before the 2010 floods, floods were rather seen as an opportunity to generate some income which made considering flood mitigation and preparedness more challenging. A common practice for people was to catch wood from floodwaters and sell them at the market before 2010 floods. "*We used to pray and wait for the flood to catch woods (Shafiq)*. *We were busy catching woods from floods and only started evacuating on the third day when the water reached our houses (Sana)*".

The massive alterations in weather patterns in Swat due to climate change have triggered unusual events and is contributing to increasing the risk of dangerous floods in the area [39]. All the participants discussed how the traditional 3, 5, and 7 days "*Jharis*" used to be "thin" but continuous. Now, they are infrequent but "thick," increasing the risk of flash flooding. Participants also reported increases in average temperature. The increasing temperature is causing the rapid melting of long-frozen glaciers on the mountains in the summer, with this compounding the flood risk as a result of more frequent and larger flood events.

The objective of the above discussion was to articulate the factors that could be used to inform the development of an Indigenous DRR program. How these can be integrated is discussed next.

4. Towards a holistic Indigenous DRR theory

Based on the systematic analysis of a diverse range of community members living in the remote Indigenous community of Badalai in Pakistan regarding DRR, this study developed a holistic Indigenous DRR theory. This theory identifies multiple factors and how they interact to influence the resilience and vulnerability of the Badalai community in Pakistan.

Fundamental to DRR beliefs and practices are *Pukhtunwali* and Islamic beliefs and practices, including *Ashaar*, local institutions of elders,

Hujra, and mosques, connections to the lands, and Indigenous knowledge. These factors promote an implicit bond between the people that make the community stronger and self-reliant to manage the disaster risks. In collectivist societies, the social bond is often the first means to deal with any adversity in daily lives and emergencies by providing shelter for each other, actively collaborating to rebuild homes, and sharing food and medicines ahead of any civil society or government action [4,13,14,18]. In the post-recovery phase in Badalai, the experience of the 2010 flood coupled with the community's social cohesion has resulted in emergent outcomes of preparedness, which have become durably embedded in the daily lives of people. For example, the way people developed a collective commitment to stay awake on a rotation basis during nights and watch the river level in the monsoon season. Thus, DRR in Badalai rests upon interdependent relational, spiritual and cultural factors that contribute to the holistic perspective of Indigenous DRR. This interdependence and the way it lays the foundation for the culture specific processes for the outcomes that inform DRR can only be understood within a context of the deeper level cultural processes.

However, these adaptive capacities have been weakened mainly by inadequate, inappropriate, and poorly funded government institutional and policy mechanisms, with some of this reflecting the historical influence of colonial beliefs and practices. These inadequacies have led to the government failing to address the underlying conditions that make substantive contributions to increasing disaster risks in Badalai. These conditions involve poverty, unemployment, population density, lack of infrastructure, educational and health services, and inability to decentralise DRR at the community level. For example, as NGOs participants informed the practice of staying awake at nights to watch river level diminished over the time as it hindered people's livelihood activities during daytimes. Moreover, government inaction in a range of areas and failure to take appropriate actions to rectify risk issues, especially regarding the lack of policies, practices, and regulations to counter deforestation, has greatly contributed to the natural processes of the river flooding turning into disasters for the community. That is, both floods were not natural but man-made disasters, and thus they were preventable.

The findings suggest that the capacities of the Badalai community originating from *Pukhtunwali* and the supporting role of CBDOs and NGOs to deal with disasters are idiosyncratic at the community level and that there is a lack of mutual/reciprocal integration in DRR and community development planning. For example, mosques, *Hujras*, and CBDOs have never been formally included in DRR planning but these institutions effectively facilitate response and recovery operations when disasters strike. A failure to mutually integrate these capacities means that the societal response resources made available to support community DRR are being ineffectively deployed. Integrated DRR is thus cost-effective and increases options for applying scarce and limited resources when disaster strikes. To ensure the integration of these capacities in DRR planning through community-based approaches, we propose a partnership-oriented community-based DRR (CBDRR) theory that builds on an inter-sectoral engagement approach (Fig. 4).

According to this theory, to develop a sustainable DRR in Badalai and Northern Pakistan, a multidimensional and multidisciplinary collaboration that encompasses actions from micro to macro levels is required among stakeholders including, local government, DDMA, NGOs, and CBDOs, genuinely working together in interdependent and complementary partnership with the community at the community level (see Fig. 2). Such approaches approach entails the institutional partnerships among communities and development agencies that shift from a managerial approach to a participatory, bottom-up, collective, and interactive decision-making and resource sharing DRR approach [46]. Partnerships with these characteristics facilitate developing and applying strength-based approaches by integrating the identified existing adaptive capacities of the community for sustainable development, including cultural capabilities, practices and local knowledges in DRR planning, increasing local societal capabilities for resource allocation

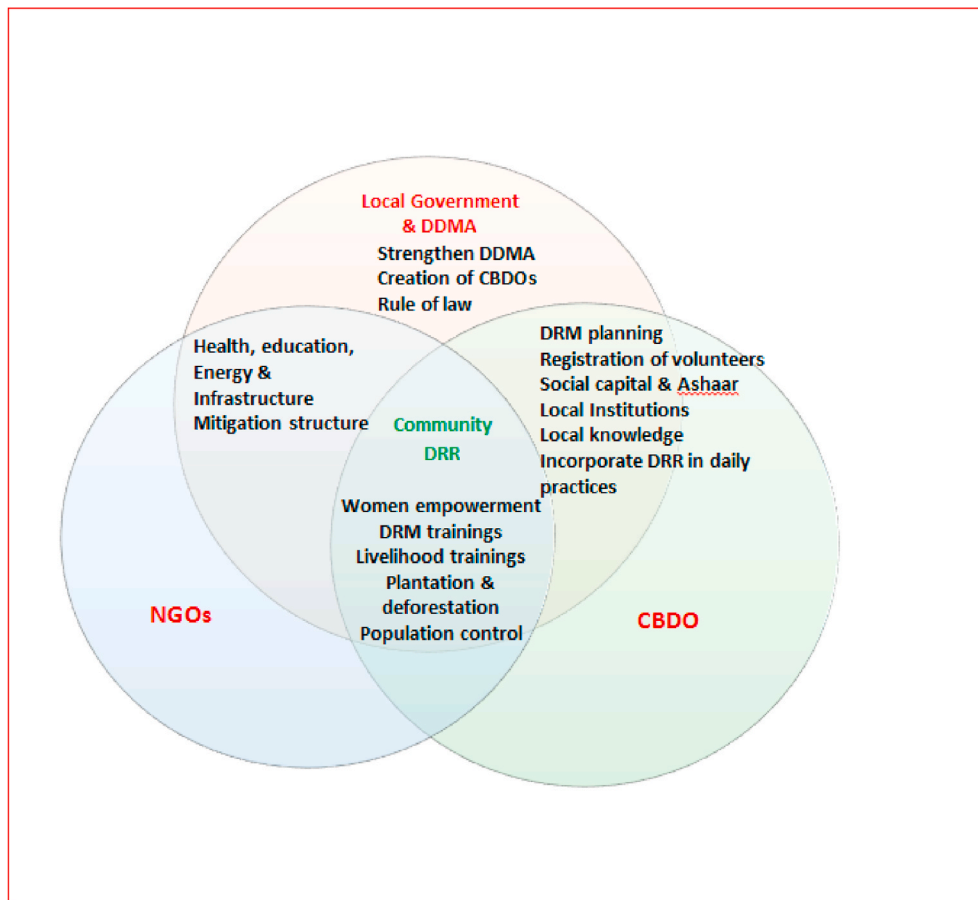


Fig. 4. An Indigenous CBDRR theory for Badalal, Northern Pakistan.

and distribution, supporting social capital to be used in everyday lives and emergencies, cost-effectiveness, reducing the duplication of work among departments and so on. Such integrated CBDRR approaches can simultaneously reduce the challenges and enhance the effectiveness of the DRR of Indigenous communities [8,15,16].

To achieve meaningful inter-sectoral partnerships and make them successful (Fig. 4), the theory suggests that the foremost requirement is to focus on addressing the governance issues that influence the DRR of the community (Fig. 2). An effective strategy to address governance issues can be through strengthening the DDMA and decentralising the DRR structures to the community level. According to our CBDRR theory, to achieve this objective, the existing CBDO structures in remote Indigenous villages in Pakistan could be better utilised.

If CBDOs are officiated and registered as the lowest tier of DRR, they can partner with other government departments and help to address the governance issues at the community level that influence people's DRR, such as, rule of law; implementation of building codes and standards; vegetation management; land use planning; control of population density; information dissemination; designation of evacuation routes; replacement of vulnerable structures; active participation of women and disabled and sharing experiences with other communities [45,47,48]. Decentralisation through CBDOs would also validate the directives of NDMO and provide the future framework to decentralise the DRR at the community level in Pakistan.

Our theory corroborates the view that CBDOs are of particular importance in Indigenous communities. In Indigenous settings, CBDOs can significantly facilitate the two-way communication as these organizations are embedded in people's lives, and thus in the best position, to gain sufficient understanding of the complex factors and processes that influence Indigenous DRR [49,50]. In Badalal, the partnership with

CBDOs can provide culturally and socially appropriate solutions capable of addressing salient issues, as highlighted in Fig. 4. This is evident in how the female CBDO collaborated with NGOs to provide a culturally safe and secure platform for female DRR and livelihood training in Badalal. Such role models can be adapted to address other sensitive societal issues in ways acceptable to the community, such as partnering with local religious leaders to convince people to take greater responsibility of their preparedness to mitigate risks of disasters instead of viewing it as intrusion in God's affairs. Similarly, as disasters are widely considered to occur as a result of people not following the religious teachings to live in harmony, reinforcing the religious teachings to promote righteous and virtuous deeds in the community through partnerships, could significantly contribute to developing healthy, harmonious and capable communities.

Partnerships with CBDOs, and their working in complementary ways with government and NGOs, can also help to identify and include Indigenous-specific capacities, such as Indigenous and local knowledges, social and governance structures, and cultural practices in DRR strategies. Furthermore, such partnerships can increase the likelihood that DRR planning is locally relevant and that people are more committed, empowered, and responsible for its implementation and maintenance. In contrast, maintaining the top-down, centralised, and status quo strategies will lead towards one-size-fits-all approaches and consequent failure to meet most local needs and goals, exclusion of Indigenous peoples and their inherent capacities in DRR planning, reduce trust, lessen commitments, and so on.

Besides strengthening adaptive capacities, partnerships among CBDO, NGOs, and the government can ensure the integration of DRR into the broader community development process on a sustainable basis [51]. The value of this integration has been shown in Micro-Hydro

Power Project (MHPP), which was implemented in partnership with the government, an NGO, and CBDO. The partnership through MHPP has generated local job opportunities, filled the energy gaps, and facilitated the community's communication with the local government, which restored trust between the two, and has empowered the community to take responsibility for MHPP construction, maintenance, and functioning [52]. The MHPP partnership can be followed as an example to address other underlying issues of disaster vulnerability of the community, including education, health, infrastructure, and deforestation. This partnership-model will not only bring employment opportunities to the community but will also promote a sense of ownership and responsibility in the community. However, the findings suggest that these partnerships are only possible if local government and DDMA are strengthened and community-based DRR structures are created in ways that create genuine interdependent and complementary partnerships.

These partnerships approaches, as in Fig. 4, are also vital if DRR is to draw upon resources, leadership, and expertise offered by the local institutions including elders, *Hujras*, and mosques. The inclusion of these institutions ensures the involvement of people's organisations and ensure that core community leaders can work to achieve development outcomes that are more community-centred and meaningful [18] and more likely to be sustained during periods of hazard quiescence. Although these institutions have been enduring and self-sustaining in *Pukhtunwali*, the findings show that their capacity has been undermined and excluded when Western-based DRR theories and models are applied. For example, the elder's wisdom about DRR can only be utilised if they are formally included and consulted in DRR planning. This underscores the importance of including all these institutions in DRR planning and implementation through partnerships and community-based approaches which can provide strong material and moral support, facilities, and networks to the community [53].

This research identified several examples of why and how local (Indigenous) knowledge is of great relevance and importance in reducing the risks of disasters. The findings reinforce that Indigenous peoples have used their knowledge for centuries when dealing with disasters [5,8,12,14,16]. This traditional knowledge can be very useful if integrated with the advanced early warning systems through CBDRR approaches [12–16]. Indigenous ecological knowledges can play important roles in enhancing community capacity to adapt to the escalating climate change risks over the coming decades in Pakistan (e.g., predicting rain and pebbles indicating flood-prone areas). Moreover, such integrations are also important because of increasing unpredictability, variability and intensity of natural events that have impacted the traditional indicators to predict natural events hence moderating their effectiveness to solve escalating disaster risks. In this milieu, interdependent and complementary approaches can facilitate greater interactions and integrations of both knowledges at the local, national, and global levels in ways that can complement each other to increase the accuracy and reliability of local forecasting and support the goal of reducing exposure to natural hazards [6,8,15].

5. Conclusion

Implementing a holistic qualitative approach that brings together Ecological Systems Theory and Symbolic Interactionism as conceptual frameworks, and which uses an explicit Indigenous research methodology, has identified a raft of micro to macro-level factors that interact to influence DRR over time in a tribal community in Badalai, Pakistan. Identification of these factors (Fig. 2) has led to the development of a unique Indigenous CBDRR theory that is grounded in the lived experience of Indigenous peoples (Fig. 4).

In Badalai, the individual and collective capacities to survive disasters exist predominantly in the form of diverse cultural and religious practices supported by CBDOs, and non-Indigenous national and international NGOs. However, these adaptive capacities operate in isolation during peace times and emergencies. Non-Indigenous systems intersect

these capacities and undermine them and have never integrated into DRR planning and implementing processes. This lack of integration is largely due to ineffective government systems, which has failed to decentralise DRR at the community level to address the factors that increase vulnerabilities and to draw more meaningfully upon the local capacities that increase DRR.

The Indigenous CBDRR theory that emerged from our research, suggests that for sustainable community development in Northern Pakistan, agencies specialising in different areas, from the community to state to national levels, need to genuinely work together interdependently and complementarily with communities to facilitate respecting, empowering and integrating local Indigenous perspectives, knowledges, cultural practices and other community resources in DRR planning through CBDRR approaches. Together, these integrations and partnerships would help build and sustain resilient communities capable of averting disasters and minimizing the social and economic disturbance for the long-term sustainable development of tribal communities of Northern Pakistan.

While other studies in Pakistan have adopted the psychological, micro perspectives [45,53–55], and sociological, macro perspectives of DRR [18,42,44], none have modelled them holistically by examining either the interdependencies between them, or the diverse impacts that different system levels have upon the outcomes experienced. Noting this research gap, we believe our findings provide new and unique insights into developing functional and holistic approaches to Indigenous CBDRR in Pakistan. This work also makes an important contribution to a broader global discourse relating to Indigenous CBDRR. However, we recognise that the variables we identified in our research may be limited to a specific community and may vary across other communities [20]. That is, Indigenous cultures and realities are heterogeneous and build upon local and contextual histories, values, belief systems, and world-views [6,8]. These variations can lead to different outcomes in different communities in terms of how they perceive, prepare, respond, and recover from disasters [20]. Acknowledgement of this phenomenon underscores the need for future individual qualitative case studies in other Indigenous communities to examine their particular responses to DRR. It is envisaged that our study has provided the foundation for generating further in-depth, contextual, and holistic theorising of Indigenous CBDRR research not only in Pakistan but around the globe.

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Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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Tahir Ali: Ali is a Ph.D. student from Pakistan, currently studying at Charles Darwin University, Darwin, Australia. Ali is associated with Indigenous disaster risk reduction research since 2014. His research is aiming to develop a template with standardised information on broad categories of disaster risks preparedness and response which can be applicable to the Indigenous communities of the world.

Petra T. Buergelt: Buergelt is a mid-career researcher, who has been developing an active international, translational, interdisciplinary, and industry-related research program at the nexus of social change, Indigenous knowledges, and transformation. Her Scopus h-index is 8 (308 citations) and her Google Scholar h-index is 10 (707 citations).

Douglas Paton: Paton is a Professor in the College of Health Sciences/Discipline of Psychology specialising in disaster risk reduction and recovery. He is interested in researching all-hazards and cross-cultural aspects of disaster risk reduction and disaster recovery. More specifically, his work examines the development and testing of universal theories that have international applicability. Paton has published 23 books, 132 book chapters, and 182 peer-reviewed journal articles. Paton's Scopus h-Index is 32, with a citation total of 3764 and his Google Scholar metrics are: h-index – 58, Citations – 12354.

James A. Smith: Smith is a Father Frank Flynn Fellow and Head of the Alcohol and Other Drugs program at Menzies School of Health Research. James has won a range of accolades for his work in Indigenous education, research, health promotion, health policy, community engagement, and men's health.

Noor Jehan: Jehan is a senior researcher and serving as the first Women Professor & Director of the Centre of Disaster Preparedness and Management, University of Peshawar, Pakistan. She has special interests in Environmental Geology, Occupational Health & Safety & GIS/SRS in the field of Earth, Environmental & Health Sciences in Academia. She

presented 35 research articles at National & International Platforms. She has at her credit 56 research publications in National & International Peer-Reviewed Journals and also contributed to 4 International Monographs and 03 Book Chapters. She has published quality research carrying with total Impact factor 61 & Citation Index 460.

Abubaker Siddique: Siddique has worked with various national, international, and UN organisations with more focus on Program Operations in emergencies, rehabilitation & developmental phases of the Disaster Management Cycle.