



**Airbel Impact Lab**  
Research & Innovation at the IRC



# Blending Tradition and Modernity for Disaster Risk Reduction at the Epicenter of Crisis:

The Case of Afghanistan and Somalia



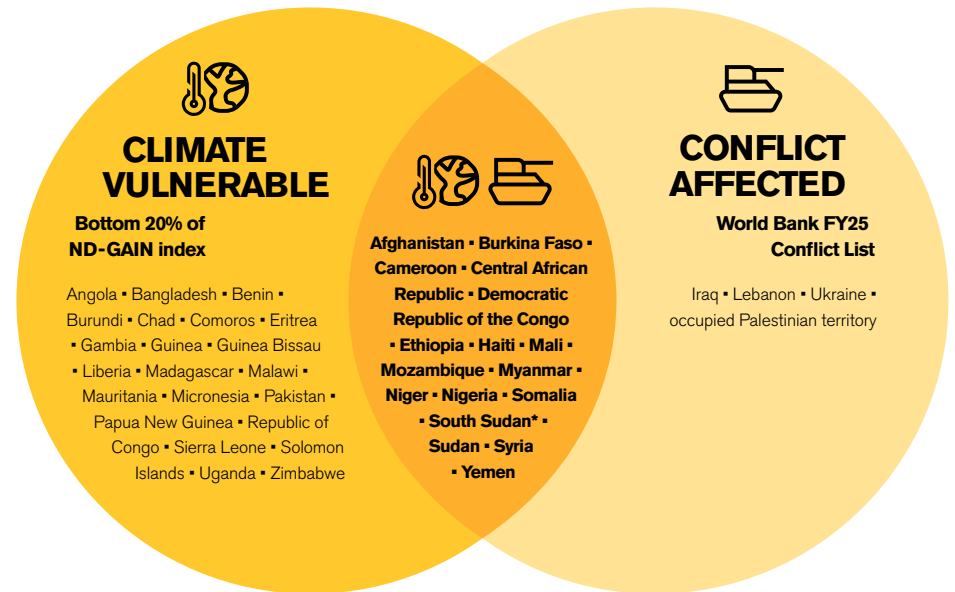


Dry soil in the remote Sang-e-Atash district, Badghis province, Afghanistan. Residents have no access to water at all if it doesn't rain—even for drinking. Photo funded by the European Union.

The three global challenges of climate change, poverty and conflict are converging to form a new epicenter of crisis in just 17 countries (**Figure 1**). Despite the urgency of need, effective approaches to prepare for, respond to and recover from disasters are absent within the most climate-vulnerable and conflict-affected communities. This gap leads to increased community vulnerability, promotes a cycle of environmental degradation, poverty and conflict and perpetuates and exacerbates an already dire situation. Today, we estimate that there are over 52 million farmers living below the poverty line<sup>1</sup> and 114 million people experiencing food insecurity in their communities<sup>2</sup> across the epicenter of crisis. These communities contribute the least to climate change but bear its worst impacts. They have been neglected by global leaders and often excluded from conventional climate action strategies, which tend to focus on more stable settings.

The Airbel Impact Lab, IRC's Research & Innovation Unit, and IRC's Country Teams, in coordination with farmers and local stakeholders, are currently conducting exploratory human-centered design research as a first step to generate, test, and scale Disaster Risk Reduction (DRR) solutions for agro-pastoral communities across the epicenter of crisis. The aim of this research is to integrate local, indigenous and traditional knowledge (LITK) with emerging technology to promote holistic and adaptable DRR solutions that span preparation, response and recovery under dynamic climatic and conflict conditions. We are beginning this work in partnership with the IRC's Afghanistan and Somalia Country Teams, given the large proportion of

**FIGURE 1:** Intersection of Climate, Poverty and Conflict



\*Notes countries that are extremely climate vulnerable but are not ranked on index. Source: UNEP

1 Estimate produced by applying national poverty levels to the number of people working in agriculture in each country, according to World Bank data.

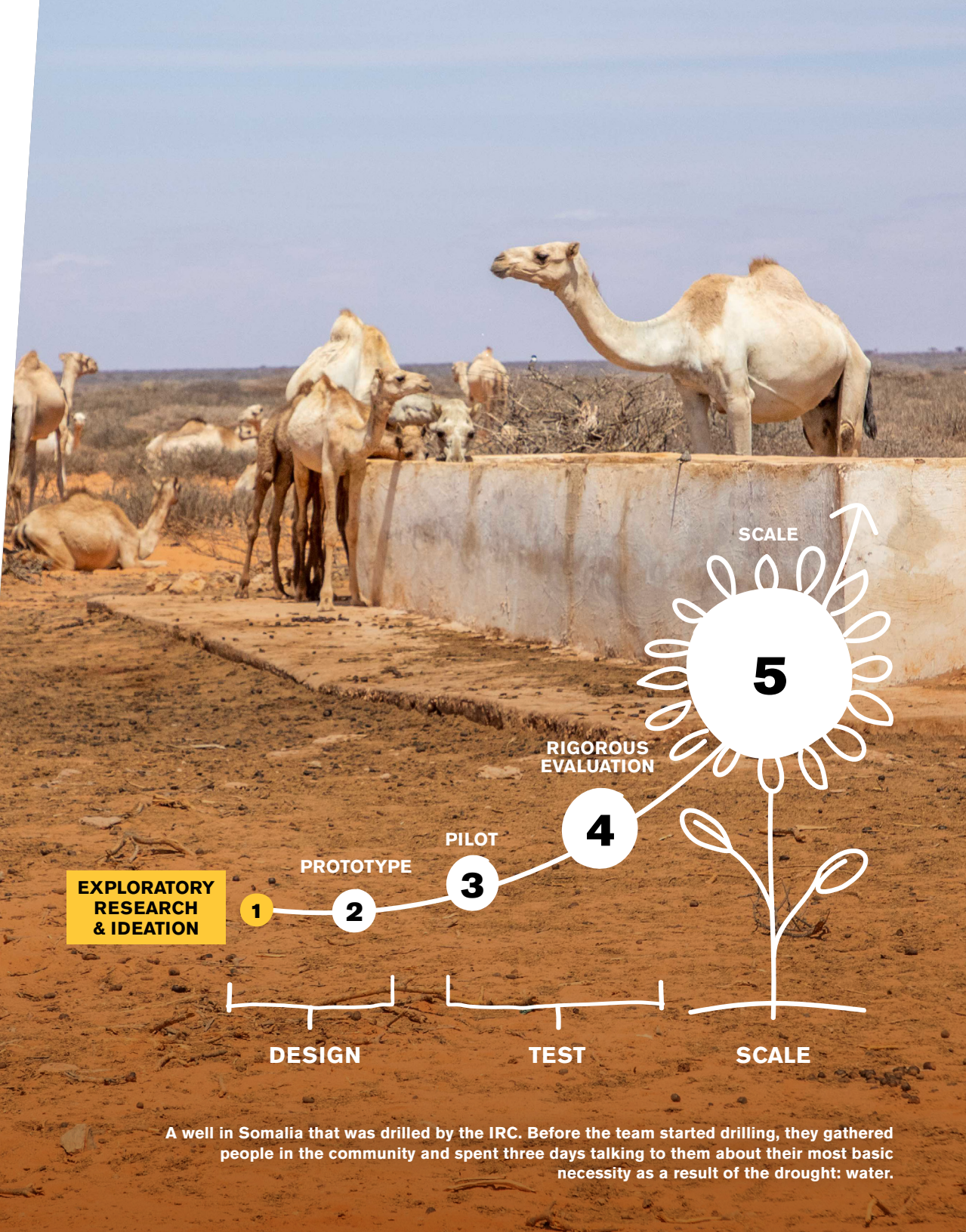
2 Estimate produced by applying IPC's national food insecurity rates to the number of people living in rural locations in each country, according to the United Nations Department of Economic and Social Affairs, Population Division data.



humanitarian need and significant impact of disasters within rural locations in both countries. Together, we have generated a bank of early solution ideas, previewed herein, the most promising of which we will continue to develop in the year ahead. A concerted effort by a coalition of governments, multilateral bodies, peer organizations and funders is needed to invest in the full range of conflict-sensitive solutions to transform climate resilience in the epicenter of crisis.

## RESEARCH OBJECTIVES, METHODS AND SCOPE

In 2023, as part of a global research and innovation priority focused on climate-resilient livelihoods, the IRC launched a new exploratory research and design initiative in Afghanistan and Somalia with the aim of enhancing farmers' access to holistic and adaptable DRR. The objective of this research is to analyze the issues and barriers impeding DRR in both countries and identify opportunities and potential solutions to mitigate these limitations. Methods include evidence reviews and desk reviews; key informant interviews with local and global experts representing governmental agencies, nongovernmental organizations (NGOs) and intergovernmental organizations (IGOs); focus group discussions with agro-pastoralists (both male and female); and a series of design workshops with the IRC's country-based agricultural livelihoods and governance technical teams as well as the agro-pastoralists. We applied several strategic and forecasting frameworks to our findings to understand the root causes of the problem, as well as emergent challenges to mitigate and opportunities to capitalize on.



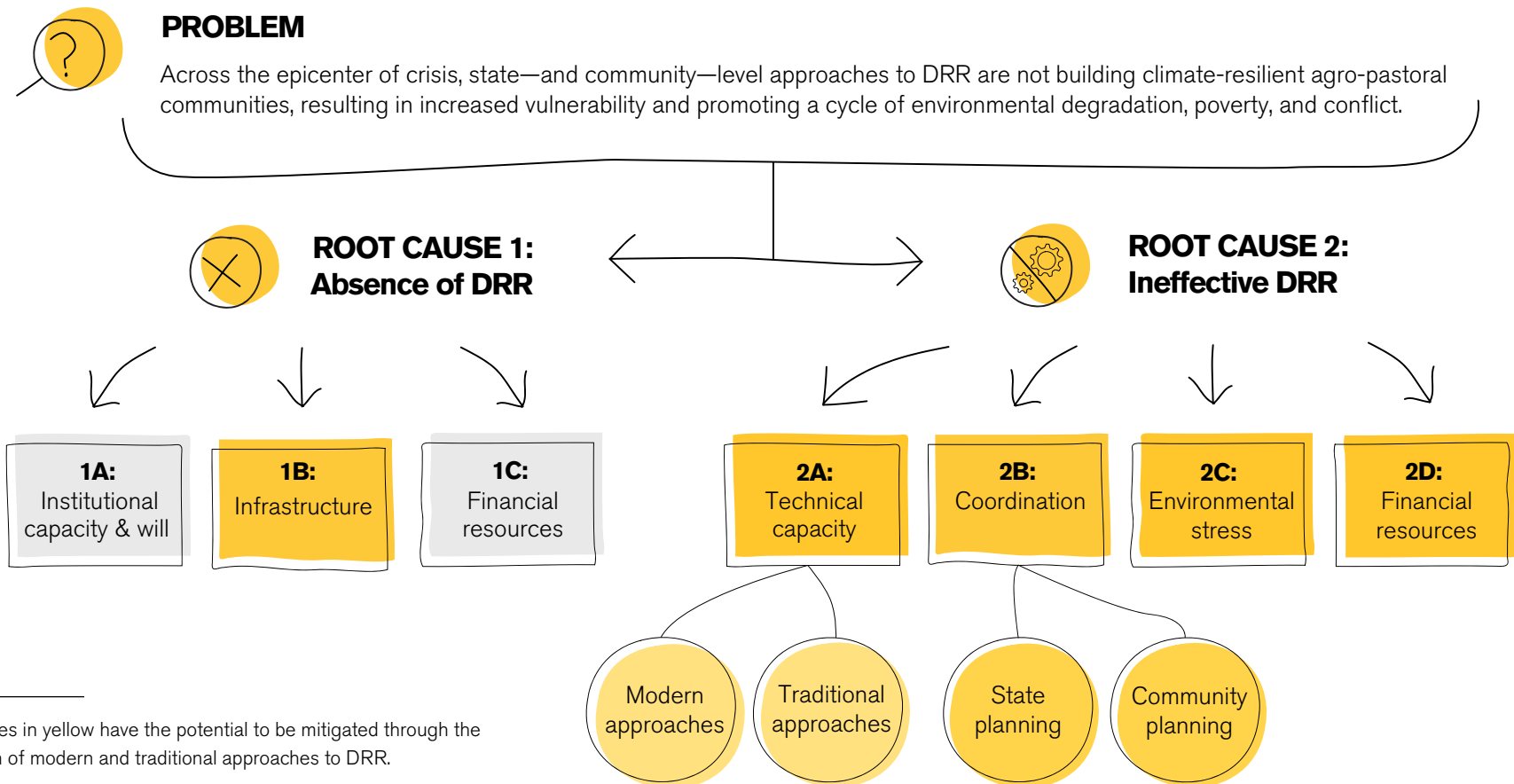
A well in Somalia that was drilled by the IRC. Before the team started drilling, they gathered people in the community and spent three days talking to them about their most basic necessity as a result of the drought: water.

## STARTING GLOBAL

To ensure that we are working toward solutions with scale potential across the 17 countries at the epicenter of crisis, we started our analysis with a global lens. We found common challenges to the implementation of DRR across the most climate-vulnerable and conflict-affected countries (**Figure 2**). Within these countries, two primary issues impede effective DRR: the complete **absence of DRR approaches** in many agro-pastoral communities, and the **ineffectiveness of existing DRR approaches** where they are implemented. The absence of DRR in agro-pastoral communities relates directly to the challenges of active and post conflict, which limits the state's institutional

capacity, will, infrastructure and resources to provide holistic DRR solutions to remote agro-pastoral communities. The ineffectiveness of the limited existing approaches currently implemented arises from limited technical capacity to perceive and respond to risk in both modern and traditional approaches. This is exacerbated by poor coordination among stakeholders and compounded by ongoing environmental and financial stress. Collectively, these factors constrain comprehensive DRR options among vulnerable agro-pastoral communities. At the global level, traditional funding mechanisms are not effectively providing the resources needed to improve the implementation of DRR in agro-pastoral communities (see page 14-16).

**FIGURE 2**



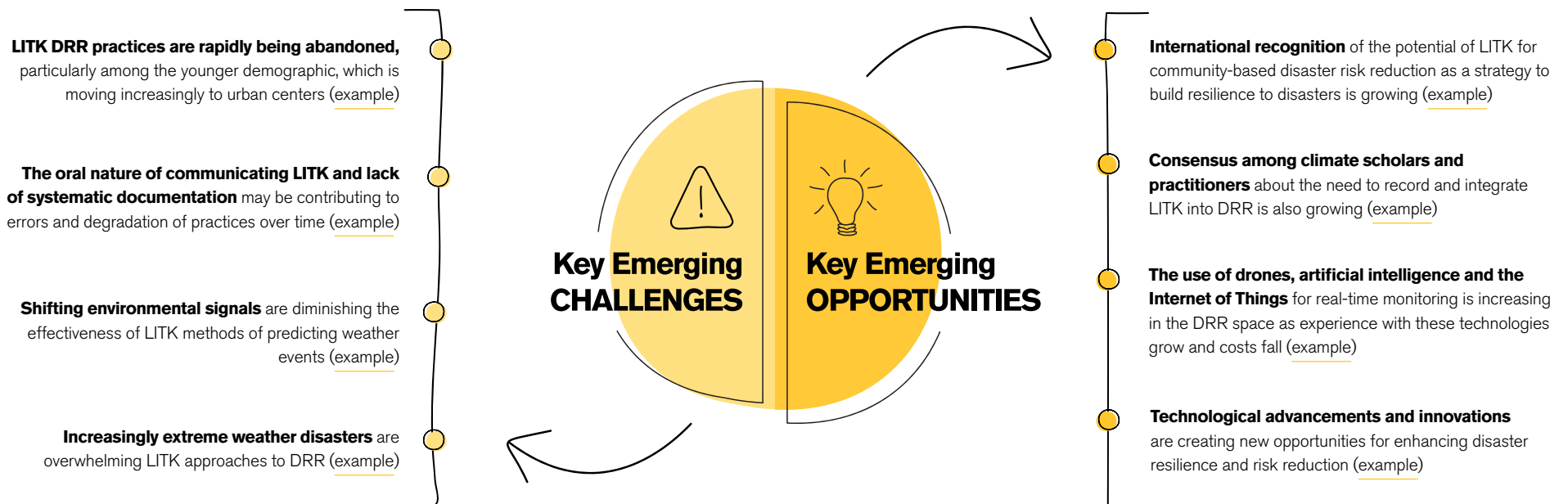


Additionally, the research uncovered a range of relevant trends that provide insight beyond the current problem and into emerging problems and opportunities we expect to encounter increasingly in the near future. The highest-priority trends, as identified by IRC Innovation, Technical and Country Team staff, are outlined below. Challenges pertain to decreasing effectiveness and application of LITK, whereas opportunities pertain to growing recognition of the importance of LITK and technological advancement in the DRR space **(Figure 3)**.

In reviewing these emergent challenges and opportunities alongside the root causes of the problem, the integration of LITK and modern technological approaches to DRR surfaced as a promising avenue of exploration. Combining advanced predictive and data-driven technologies with the rich,

context-specific knowledge of traditional practices may help ensure the preservation, continued relevance and application of LITK methods while improving access to technologies that enable timely action. This approach can enhance **technical capacity (2A)** and **coordination (2B)** among various actors, ensure responsiveness to escalating **environmental stress (2C)**, fill **infrastructure gaps (1B)** and support households to **safeguard their assets and financial resources (2D)**. This blend of modernity and tradition leverages the strengths of both systems for a more resilient DRR strategy that considers the unique challenges of conflict-affected settings like Afghanistan and Somalia. However, to understand the full scope of these challenges, and therefore identify more specific potential solutions, it is crucial to examine how they manifest in each country.

**FIGURE 3:** Key Emerging Challenges and Opportunities





## GOING LOCAL: AFGHANISTAN



- **3rd highest risk** of humanitarian crises and disasters in the world<sup>1</sup>
- **6th most climate-vulnerable** country in the world<sup>2</sup>
- **5.7M people** are internally displaced (IDMC 2024)
- **1.4M people** have been affected by disaster annually since 2000 (EM-DAT)
- **14.2M people** are facing severe food insecurity (IPC level 3 or higher) (IPC 2024a)

Rozama, 27, at a river in the Sabzaab Bala village, Bamiyan province, Afghanistan, to collect water. Like many of her neighbors, her family relies on farming potatoes and wheat to make a living. Photo funded by the European Union.

Afghanistan, a landlocked nation in south/central Asia characterized by its semi-arid to arid climate and mountainous terrain, is at the epicenter of intersecting crises involving climate change, conflict and extreme poverty, rendering it highly vulnerable to complex disasters. The nation has endured decades of conflict, culminating in 2021 when the Taliban (or De Facto Authority [DFA]) took control, stabilizing active conflict but precipitating an economic crisis. This shift has led to a reduction in conflict-driven displacement, though economic migration has surged. Afghanistan remains highly susceptible to natural disasters. The El Niño conditions of 2023-2024, for example, brought below-average rainfall and resulted in a third straight year of drought, following the worst drought in 30 years in 2021/2022, thereby severely affecting agriculture and deepening food insecurity (IRC 2024a; FAO & OCHA, 2024; OCHA, 2023). Drought risk is further compounded by heightened risk of other natural disasters in the country, including earthquakes, landslides and flooding. In October 2023, a particularly severe earthquake affected millions of Afghans, and it was followed by a string of earthquakes in early 2024 and major flooding in March 2024, which claimed 250 lives (Essar et al. 2024; IRC, 2024b).

Despite various efforts by local and international actors to fortify Afghanistan's resilience to climate change, the reduction of disaster risk remains challenging due to a number of interrelated root causes at the community, national and global levels. In Afghanistan, as in many other climate vulnerable, conflict-affected states, the challenges to mitigating disaster risk stem from a complete absence of DRR initiatives in many regions, coupled with ineffective DRR practices in areas where they do exist.

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1 According to INFORM's 2024 risk index, which ranks the generalized risk of crisis in 191 countries based on structural conditions. INFORM—a collaboration of the Inter-Agency Standing Committee Reference Group on Risk, Early Warning and Preparedness and the European Commission—is a multistakeholder forum consisting of humanitarian, development and donor organizations and technical partners for developing shared quantitative analysis relevant to humanitarian crisis and disaster management.


2 According to the 2023 Notre Dame Global Adaptation Initiative Index (ND-GAIN), which assesses a country's vulnerability and readiness to adapt to climate change.



## ROOT CAUSE 1: Absence of DRR

At the national level in Afghanistan, the absence of effective DRR strategies is deeply entrenched due to severe limitations with respect to **institutional capacity (1A)**, the result of decades of persistent conflict. This prolonged instability has severely hampered economic growth and institutional development, consequently constraining the government's involvement in DRR efforts and broader developmental initiatives (Sajid, 2024; Seerat, 2023). While Afghanistan has endeavored to enhance its DRR policies and institutional framework since 2003, including through an updated national disaster management plan, a 2011 law on national disaster response, management and preparedness, a strategic national action plan and the Afghanistan Disaster Risk Reduction National Strategy, implementation has been hampered by limited resources and weak institutions. Most recently, severe economic and institutional challenges have been exacerbated by the DFA's assumption of power in 2021, which precipitated an economic collapse and the loss of crucial development funding that covered approximately 75% of public expenditures (Giffin, 2022). The DFA's 2022 prohibition on women in roles at NGOs worsened the crisis, prompting major donor withdrawals and program suspensions by international organizations (Giffin, 2022; IRC 2024a; UNDRR 2020). Economic growth stagnated throughout 2023, compounded by sanctions and international restrictions that isolated Afghanistan and froze its central bank assets, severely limiting foreign financial inflows (Giffin, 2022). The DFA's policies and the related economic crises have significantly diminished institutional capabilities, particularly in DRR and postdisaster relief and reconstruction (D'Souza, 2024; Al Jazeera, 2022; IRC 2024a).

Degraded **infrastructure (1B)** further exacerbates Afghanistan's disaster vulnerability. Transportation, communication, and other critical infrastructure are strained by flooding, landslides, earthquakes and drought, which has disrupted aid delivery and exacerbated humanitarian crises (IRC, 2024a). Infrastructure limitations intensify challenges in both urban and rural DRR. While our research is focused on agro-pastoral communities and therefore rural contexts, it's also important to acknowledge that Afghanistan's urban communities, which include many internally displaced persons residing in informal settlements, face heightened disaster risks due to inadequate access to essential infrastructure (OCHA, 2023). Meanwhile, the deterioration of roads and other critical infrastructures in remote rural areas amplifies their vulnerability during and after natural disasters.

A photograph of a man walking away from the camera on a dirt path that is a dry river bed. The landscape is arid with rolling hills and a few small buildings in the distance. The man is wearing a dark vest over a light shirt and carrying a large orange container. A large black text box is overlaid on the right side of the image.

**Transportation, communication, and other critical infrastructure are strained by flooding, landslides, earthquakes and drought.**

Muhammad Sadiq, 25, walks through a dry river bed to find water for his family. He makes his living herding livestock and growing pistachios, but extreme winter drought prevents his crops from having a good yield and the livestock from having enough water. Photo funded by the European Union.



Finally, **limited financial resources (1C)**, worsened by economic collapse and international sanctions, remain a critical barrier to effective DRR. Severe cuts to social spending and frozen central bank funds further restrict the country's ability to mitigate disaster impacts and support vulnerable populations (IRC, 2022; Giffin, 2022).

## ROOT CAUSE 2: Ineffective DRR

In the instances where DRR programming is available, it is often ineffective or does not reach the most vulnerable communities. A primary driver of ineffective DRR is a **lack of technical capacity (2A)** in both modern and traditional approaches. In **modern approaches to DRR**, the massive exodus of academics and practitioners — especially women since 2022 — has intensified the longstanding flight of human capital in Afghanistan, depleting the institutional and technical knowledge that is crucial to successful implementation (Kumar, 2024). Compounding this issue, the education systems essential to promoting awareness and resilience are severely compromised by frequent disruptions caused by disasters. This is exacerbated by inadequate funding and unsafe infrastructure. Consequently, there is a scarcity of skilled workers, which further undermines the delivery of essential services both during and after disasters (UNDRR, 2020). On the other hand, **LITK approaches to DRR** have been largely abandoned due to pervasive poverty and displacement (Barez, 2024). Displaced communities often find themselves far from their traditional lands and lack the necessary political agency to effectively employ these methods, given the often informal or precarious nature of their residence. Living in informal settlements without secure land tenure or access to basic services further obstructs displaced communities' ability to implement these traditional practices, leaving them especially vulnerable during and after disasters.

**Limited coordination (2B)** among stakeholders exacerbates the challenges of implementing effective DRR. Weak governance and inadequate land-management practices have intensified disaster risks, compounded by the DFA's reduced spending on social services and insufficient prioritization of DRR efforts since 2021 (IRC, 2022; Kumar, 2024; Seerat, 2023).

**Environmental stress (2C)**, including rising temperatures and erratic weather patterns, amplifies the frequency and severity of droughts and floods, further undermining community resilience and exacerbating vulnerabilities, particularly in remote areas lacking resources and awareness

(UNDRR, 2020; OCHA, 2024; ARC, 2016). This concern is heightened by the fact that approximately 60% of the population depends on rain-fed agriculture, making the country highly susceptible to recurrent droughts exacerbated by climate change (CAP 2024; OCHA 2024). A **lack of financial resources (2D)** at the household level, marked by widespread poverty and insecure employment, hinder resilience-building efforts as well, leaving vulnerable populations highly exposed to disaster impacts (IRC, 2022; Cities Alliance, 2021). Concurrently, rapid urbanization driven by conflict and natural disasters has led to the proliferation of informal settlements that lack essential infrastructure and services, heightening urban vulnerability to disasters (UNDRR 2020; OCHA, 2023). Finally, social vulnerabilities further compound disaster risk, rendering access to effective DRR especially difficult for women, youth, people with disabilities, ethnic minorities, and other marginalized groups.



Khan Agha, 35, and his daughter Zarmina, 7, stand outside their damaged home in the Mitaram district, Laghman province, Afghanistan. Nearly 3,000 homes were destroyed or damaged during heavy rains and flash floods experienced across Afghanistan in April 2024.



## GOING LOCAL: SOMALIA



- **2nd highest risk** of humanitarian crises and disasters in the world<sup>9</sup>
- **7th most climate-vulnerable** country in the world<sup>4</sup>
- **3.9M people** are internally displaced (IDMC, 2024)
- **1.5M people** affected by disaster annually since 2000 (EM-DAT)
- **4M people** face severe food insecurity (IPC level 3 or higher) (IPC 2024b)

Fartun, 27, lives in Dhusamareb, Somalia, where 1.7 million children under 5 are facing acute malnutrition as a result of the prolonged drought. When her youngest of five children began showing clear symptoms of severe malnutrition, she carried him to an IRC-supported hospital where he received treatment.

Somalia, an arid country in the Horn of Africa, recently faced its worst drought in four decades, resulting in the deaths of 43,000 people, displacing more than 1 million, and causing the loss of 3.8 million livestock (TRT Afrika, 2024). Additionally, flooding poses a significant disaster risk across the country. The 2023 Deyr floods displaced 1.2 million people and caused over USD\$176 million in loss and damage. Intense flooding in 2024 has triggered a cholera outbreak, severely impacting vulnerable populations, particularly children (UNDP, 2024; IRC, 2024). Somalia's cumulative vulnerabilities heighten food and water insecurity and public health crises and disproportionately affect marginalized groups, including women and girls, ethnic minorities and people with disabilities (USAID, 2024).

Moreover, Somalia's economy heavily depends on agriculture, employing 80% of the population and making it highly vulnerable to natural disasters and climate shocks. Pastoralism and livestock farming, critical to the economy, face threats from drought, locust infestations and land conflicts, which exacerbates food insecurity and vulnerability (FAO, 2022; Wong, 2023).

Despite efforts by the Somali government and various development actors to fortify the country's resilience to climate change, reducing disaster risk remains challenging due to interrelated root causes on both a national and global scale. In Somalia, as in many other climate-vulnerable, conflict-affected states, the challenges to mitigating disaster risk stem from the absence of DRR initiatives in many regions and ineffective DRR practices in areas where they do exist.

### ROOT CAUSE 1: Absence of DRR

Decades of civil war and instability have severely limited Somalia's **institutional capacity (1A)**, rendering monitoring, early warning and delivery of services (essential to DRR) a challenge (USAID, 2024). Moreover, while Somalia has endeavored to enhance its DRR policies and institutional framework since ratifying the Kyoto Protocol in 2010—including through committing to the Sendai Framework for Disaster Risk Reduction, submitting its first Nationally Determined Contribution (NDC) to the UNFCCC and, most notably, establishing the Ministry of Environment and Climate Change (MoECC) in 2022—, implementation has been hampered by limited



institutional capacity and resources. Land disputes, compounded by weak institutional frameworks, have led to unequal access and displacement of smallholder farmers and pastoralists (USAID, 2024; Adelphi, 2022; de Zoysa & Tye, 2023). This is especially true in southern Somalia, which is mostly controlled by the insurgent group Al Shabaab and where the majority of the country's agriculture is concentrated, mobility is limited and public services are especially fragmented (Arush, 2024; Ali, 2024; USAID, 2024).

Ongoing conflict and frequent natural disasters in Somalia have severely degraded existing **infrastructure (1B)** — from transportation to communications to agricultural systems — and prevented maintenance and new infrastructure development, particularly in remote and rural areas (Verhoeven, 2024; Adelphi, 2022). Climate change projections indicate that intensifying natural disasters will further strain Somalia's infrastructure, exacerbating disaster risks (Adelphi, 2022). The country faces significant challenges with its road network: only 13% of roads are paved, and 90% of those are in poor condition. This hinders access and isolates communities during floods and rainy seasons (ITA, 2024; Adelphi, 2022). Somalia also lacks critical monitoring infrastructure, such as weather stations and data systems, limiting access to accurate weather information and preparedness across most of the country (Quevedo et al, 2023). Although our research is focused on agro-pastoral communities and, therefore, rural contexts, it is also necessary to acknowledge that Somalia's rapid urbanization poses new challenges as displaced populations migrate to cities like Mogadishu, Boorama and Baidoa in search of safety and opportunity (Cities Alliance, 2021; Adelphi, 2022; Arush, 2024). This further complicates effective DRR in Somalia, as informal settlements in expanding cities strain municipal services (Abdi Sheikh & Weingartner, 2022; Taruri et al, 2020). The urban influx further heightens tensions over land tenure and access to essential resources and complicates the management of host and displaced population needs. **Financial constraints (1C)** further impede DRR efforts: Somalia struggles to secure the national and international funds needed for climate adaptation and resilience-building initiatives, often having to prioritize investment of scarce funds in short-term responses over long-term solutions (de Zoysa & Tye, 2023; Quevedo et al., 2023).

## **ROOT CAUSE 2: Ineffective DRR**

Inadequate **technical capacity (2A)** hampers both modern and traditional approaches to DRR in Somalia, contributing to ineffective programming that often fails to reach vulnerable communities. Specifically, deficiencies in the state meteorological department and early warning systems hinder timely disaster alerts, fostering distrust among affected communities (Abdi Sheikh & Weingartner, 2022; Mohamed & Scoones, 2023). Limited data collection further undermines **modern approaches to DRR**, particularly in disaster-prone areas that rely on them, while **LITK approaches** are hindered by a lack of intergenerational knowledge transfer. All of this is further exacerbated by displacement and climate change-induced uncertainties (UNDRR, 2024; Ali, 2024; Nasib, 2024).

**Limited coordination (2B)** among government and other actors at different levels further challenges effective DRR implementation in Somalia, despite its robust policy framework for climate preparedness. Limited institutional capacity and coordination, coupled with limited community-centered adaptation-planning, render DRR largely ineffective (de Zoysa & Tye, 2023; Verhoeven, 2024). Security risks in southern Somalia further impede mobility, obstructing effective coordination and DRR (Arush, 2024; Ali, 2024; Abdi Sheikh & Weingartner, 2022). **Environmental stress (2C)**, including increasing natural disasters and rising temperatures, exacerbates DRR challenges: crucial rivers, including the Juba and Shabelle, face threats from lack of rainfall and upstream dam construction in Ethiopia, potentially escalating water conflicts (Sagliocco, 2024; USAID, 2024; Adelphi, 2022). Finally, lack of **financial resources (2D)** at the household level severely limits DRR, with poverty- and conflict-affected families unable to build resilience, leading to maladaptive practices, such as charcoal production and overgrazing, that further degrade natural resources and increase vulnerability to drought and desertification (Cities Alliance, 2021; Njenga, 2024; Ali, 2024; Adelphi, 2022). For example, according to the United Nations Convention to Combat Desertification (UNCCD), approximately 8.2 million trees were cut down for charcoal production in Somalia between 2011 and 2017 alone (Kahiye, 2021).

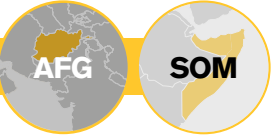


## TOWARD HOLISTIC & ADAPTABLE DRR

To determine how we might integrate traditional and modern approaches to DRR to promote holistic and adaptable climate resilience for agro-pastoral communities in Afghanistan and Somalia, we started by landscaping what already exists. Through rigorous desk research, key informant interviews with local and global experts and the use of an online crowdsourcing challenge, we surfaced a wide range of technology-based as well as LITK approaches to DRR. We then prioritized these approaches based on their 1) relevance

to the contexts of Afghanistan and Somalia; 2) their application to flood, drought, erratic rainfall and heatwaves; and for technology solutions only, 3) their potential to document, promote, or enable LITK. Finally, through a series of design workshops with IRC's Technical, Innovation, and Afghanistan and Somalia country teams, we mixed and matched prioritized tech and LITK approaches to arrive at a bank of six early solution ideas (**Figure 4**) which each address different root causes of the problem (**Figure 2**). Below is an overview of our solutions bank to date:

**FIGURE 4:** Bank of Early Solution Ideas

1	<b>Solution Idea:</b> Tech interpretation of LITK and elders' observations (*also a process to be integrated into other solutions)	<b>RELEVANT TO:</b> 
<b>What it solves</b>	LITK observations of weather and climate changes are highly localized and not compiled and analyzed in real time to supplement technological predictions and analysis.	
<b>How it works</b>	Designated holders of LITK document their observations and predictions, which are sent to a tech hub to be compiled, analyzed and cross-referenced with remote imaging by a technological system. Data is then relayed back to communities and/or integrated into disaster response actions.	
<b>Outputs</b>	Documentation and coordination of LITK ▪ More accurate predictions of catastrophic weather events ▪ Actionable data to be integrated into other DRR approaches	
<b>Outcomes</b>	Strengthened DRR framework with integrated LITK ▪ Reduced loss of livelihoods and assets due to disasters	
<b>Root cause addressed</b>	(2A) Ineffective DRR - Technical capacity (modern & traditional)	
<b>Sample research questions for next phase</b>	<ul style="list-style-type: none"> <li>▪ What kind of data is most likely to be collected from elders?</li> <li>▪ What are the conditions under which elders might share their predictions and knowledge?</li> <li>▪ How might we cross-reference the inputs from elders with technological analyses to ensure reliability in a changing environment?</li> </ul>	



2

**Solution Idea:** Pastureland management through remote sensing and alternative fodder for livestock

RELEVANT TO:

AFG

SOM

<b>What it solves</b>	Current approaches to pasture rotation and cultivation of cover shrubs and trees are leading to degradation of pastoral land and inadequate fodder for livestock. This is further exacerbated by conflict and extreme climate events such as droughts and landslides.
<b>How it works</b>	Accessible pastureland is assessed through remote sensing, discounting areas where the land is degraded or inaccessible due to insecurity, and using forecasting to monitor vegetation (pasture) dynamics. In cases where pastureland is not anticipated to support livestock needs, communities are alerted to switch to or supplement grazing with alternative fodders, such as hydroponic fodder which pastoralists are supported to produce.
<b>Outputs</b>	Safer movement of animals and people ▪ More available and sustainable pastureland ▪ Less stress on livestock ▪ Additional fodder sources
<b>Outcomes</b>	Greater access to pastureland ▪ Increased access to pastoral inputs ▪ Increased household income ▪ Reduction in loss of livestock due to disasters ▪ Reduction in loss of livelihoods due to disasters ▪ Reduced land degradation due to migration and disasters
<b>Root cause addressed</b>	(2A) Ineffective DRR - Technical capacity (modern & traditional) (2B) Ineffective DRR - Coordination (community level) (2C) Ineffective DRR - Environmental stress
<b>Sample research questions for next phase</b>	<ul style="list-style-type: none"> <li>▪ How might this solution affect communal governance of resources and how might we anticipate and prevent conflict over resources?</li> <li>▪ What information do communities want to inform their decision-making?</li> <li>▪ What trees and shrubs are best suited for fodder alternatives?</li> </ul>

3

**Solution Idea:** Integration of DRR into culture

RELEVANT TO:

AFG

SOM

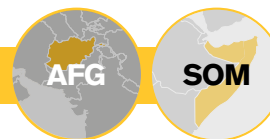
<b>What it solves</b>	Loss of LITK DRR practices due to poor intergenerational knowledge transfer and migration resulting in inadequate preparation and response
<b>How it works</b>	Community keepers of LITK, cultural leaders and youth groups collaborate to integrate indigenous knowledge into cultural practices, celebrations, artifacts and modern cultural touchpoints for youth.
<b>Outputs</b>	Deployment of songs, textiles and practices that teach or demonstrate LITK DRR triggers and best practices
<b>Outcomes</b>	Increased preservation of LITK on DRR ▪ Increased application of LITK on DRR ▪ Reduction in loss of livelihoods due to disasters
<b>Root cause addressed</b>	(2A) Ineffective DRR - Technical capacity (modern & traditional) (2B) Ineffective DRR - Coordination (community level)
<b>Sample research questions for next phase</b>	<ul style="list-style-type: none"> <li>▪ What cultural touchpoints should be prioritized to ensure broad relevance to community members?</li> <li>▪ What intergenerational cultural differences should be considered?</li> <li>▪ How might technology be leveraged to promote the integration of DRR into culture?</li> </ul>



4

**Solution Idea: Smart triggers for drought action**

RELEVANT TO:



<b>What it solves</b>	Loss of harvest and resources due to poor forecasting of drought conditions and ineffective, poorly timed responses
<b>How it works</b>	When drought is predicted through remote sensing and LITK analyses, communities are prompted to take specific actions based on the risk type, available response time and cost-efficiency. Communities invest in costly crop protection measures, like natural biostimulant sprays, water reservoirs or seed priming, only if an algorithm deems it the most cost-effective action. Cost-effectiveness is assessed through community preferences, social identity considerations, market prices and other stakeholder-identified factors.
<b>Outputs</b>	More effective use of drought mitigation strategies to reduce crop loss ▪ More efficient and sustainable use of ecological resources ▪ More cost efficient use of household resources ▪ Increased adaptive capacity
<b>Outcomes</b>	Reduction of crop loss ▪ Increased access to adaptive resources ▪ Increased household income ▪ Reduction in loss of livelihoods due to disasters
<b>Root cause addressed</b>	(2A) Ineffective DRR - Technical capacity (modern & traditional) (2B) Ineffective DRR - Coordination (community level) (2D) Ineffective DRR - Financial resources (household level)
<b>Sample research questions for next phase</b>	<ul style="list-style-type: none"> <li>▪ What drought-related anticipatory actions are feasible for this initiative?</li> <li>▪ How can we ensure community trust in recommendations?</li> <li>▪ What financial mechanisms, existing or new, are needed to support effective action in response to alerts?</li> </ul>

5

**Solution Idea: Forests for families**

RELEVANT TO:



<b>What it solves</b>	Frequent landslides and floods, insufficient and/or uncoordinated watershed management
<b>How it works</b>	Strategic cultivation and management of forests, like pistachio forests in Afghanistan, are crucial for watershed management, absorbing excess water and stabilizing land. Technology identifies optimal planting locations and supplemental measures for watershed management. Families in the program receive saplings and plant the forests. Harvested pistachio nuts are certified as "climate-smart" and sold at a premium in Western markets to offset forestry costs.
<b>Outputs</b>	Creation of natural DRR infrastructure ▪ Introduction of additional revenue streams for local communities ▪ Natural filtration for local water resources ▪ Establishment of a sustainable, multigenerational income stream for participating families
<b>Outcomes</b>	Reduction in soil erosion ▪ Reduction in surface runoff ▪ Increased groundwater recharge ▪ Reduced incidence of landslides and flooding ▪ Increased household income ▪ Reduction in loss of livelihoods due to disasters
<b>Root cause addressed</b>	(1B) Absence of DRR - Infrastructural (2A) Ineffective DRR - Technical capacity (modern & traditional) (2D) Ineffective DRR - Financial resources (household level)
<b>Sample research questions for next phase</b>	<ul style="list-style-type: none"> <li>▪ What inputs are needed for the community to be successful?</li> <li>▪ What proportion of proposed forest sites are in places where floods and landslides threaten human habitation and livelihoods?</li> <li>▪ What market linkages are available/necessary for pistachio sales to be viable?</li> </ul>



<b>What it solves</b>	Scarcity of water and poor water storage and distribution during prolonged dry periods (drought), overexertion of groundwater resources by farmers and livestock, and inefficient water use and watershed management
<b>How it works</b>	Rehabilitation of traditional water intakes and distribution canals is prioritized based on precise watershed production and human/animal use calculations. Local water committees use land use maps, soil sensors, water gauges and remote sensing to decide on infrastructure rehabilitation and construction priorities as well as the targeted water storage volume. AI provides recommendations for efficient water conservation technologies, which are subsidized by DRR actors.
<b>Outputs</b>	Development of more effective and optimized water reservoirs for agropastoral households and communities
<b>Outcomes</b>	Increased water access and availability ▪ Reduction in loss of livelihoods and assets due to disasters ▪ Increased water use efficiency ▪ Reduction in conflict over water resources ▪ Increased capacity of agropastoral communities to mitigate climate related disasters like drought
<b>Root cause addressed</b>	(1B) Absence of DRR - Infrastructure (2A) Ineffective DRR - Technical capacity (modern & traditional) (2C) Ineffective DRR - Environmental stress
<b>Sample research questions for next phase</b>	<ul style="list-style-type: none"> <li>▪ What traditional infrastructure is still relevant to communities today?</li> <li>▪ How might they be optimized to more sustainably meet both human and agricultural (livestock and plant) needs?</li> <li>▪ What work, resources and social contracts are necessary to rehabilitate and manage these structures?</li> </ul>

In the next phase, we will develop simple and tangible prototypes of solution ideas to test with clients and local stakeholders in agro-pastoral communities in Afghanistan and Somalia with the aim of both refining existing ideas and generating new ones. Our key areas of inquiry include clients' experiences of the problem, how they currently address (or do not address) it, their DRR preferences and needs and how conflict dynamics may interact with our ideas. Additionally, we will engage with partners who have implemented similar technological solutions in analogous contexts to leverage their experiences and inform our work. Finally, we will develop hypotheses for pathways to scale and estimate the scale and impact potential of each idea; we will then leverage this data, alongside client and partner feedback and existing evidence, to identify the most promising solutions to progress forward. It's important to note at this stage these concepts are very early and low fidelity, likely representing a wide range of scale and impact potential. Our aim is to generate a large quantity of ideas to which we can then apply rigorous analysis to identify which subset are of greatest quality.

Through this process, we are blending rigorous evidence, technical and contextual expertise, a strategic and future-oriented mindset and user-centered design to generate and identify community-led solutions that prioritize the preferences and needs of communities at the epicenter of crisis.

## THE NEED FOR GLOBAL ACTION

While Afghanistan and Somalia face significant localized challenges to DRR, a core issue is a lack of international funding for adaptation in the most vulnerable locations. Overcoming these challenges to continue to develop and ultimately implement the solution ideas described here depends on addressing major barriers to global funding. Currently, adaptation in climate-vulnerable, conflict-affected countries is critically underfunded due to several interrelated obstacles. On average, these countries receive just one-third of the adaptation funding that non-conflict affected countries receive (Crisis Group, 2024). Understanding these barriers is crucial for mobilizing the global support needed to enhance DRR efforts in Afghanistan, Somalia and other countries at the epicenter of crisis.



On a global scale, the predominant challenges exacerbating disaster risk in the epicenter of crisis stem from an **absence of funding (3)**, driven by **risk aversion (3A)** and divergent **funding priorities (3B)**. This results in limited financial resources allocated to DRR efforts, particularly in contexts where short-term impacts are difficult to measure and returns on investment are perceived as uncertain. Additionally, global funding priorities pose a challenge to Afghanistan, Somalia and other conflict-affected countries seeking to access funding for climate adaptation. On the one hand, DRR is typically categorized as a “development” priority, while projects in conflict-affected states are often classified as “humanitarian” and, therefore, do not qualify. On the other hand, humanitarian funding falls short in addressing DRR needs due to limited resources, competing priorities and a lack of integration with long-term development strategies. As a result, these states

are underserved by both funding streams, leading to critical adaptation gaps and heightened vulnerability to disasters (UNEP, 2023). Even when funding is available, it is often **rendered ineffective (4)** by **centralized structures (4A)** and **restrictive funding scopes (4B)**, which prioritize short-term humanitarian responses over long-term resilience-building measures, perpetuating vulnerabilities rather than addressing underlying systemic risks (IRC, 2022; Quevedo et al., 2023). Additionally, most climate funds must be accessed through centralized, state-organized structures, which is especially challenging in conflict-affected states like Afghanistan and Somalia, where coordination with the government is complicated by conflict and geopolitical issues and significant portions of the population live in areas outside of government control. This is why expanded partnerships for climate finance are critical so resources can reach communities who most need them.

**FIGURE 5**

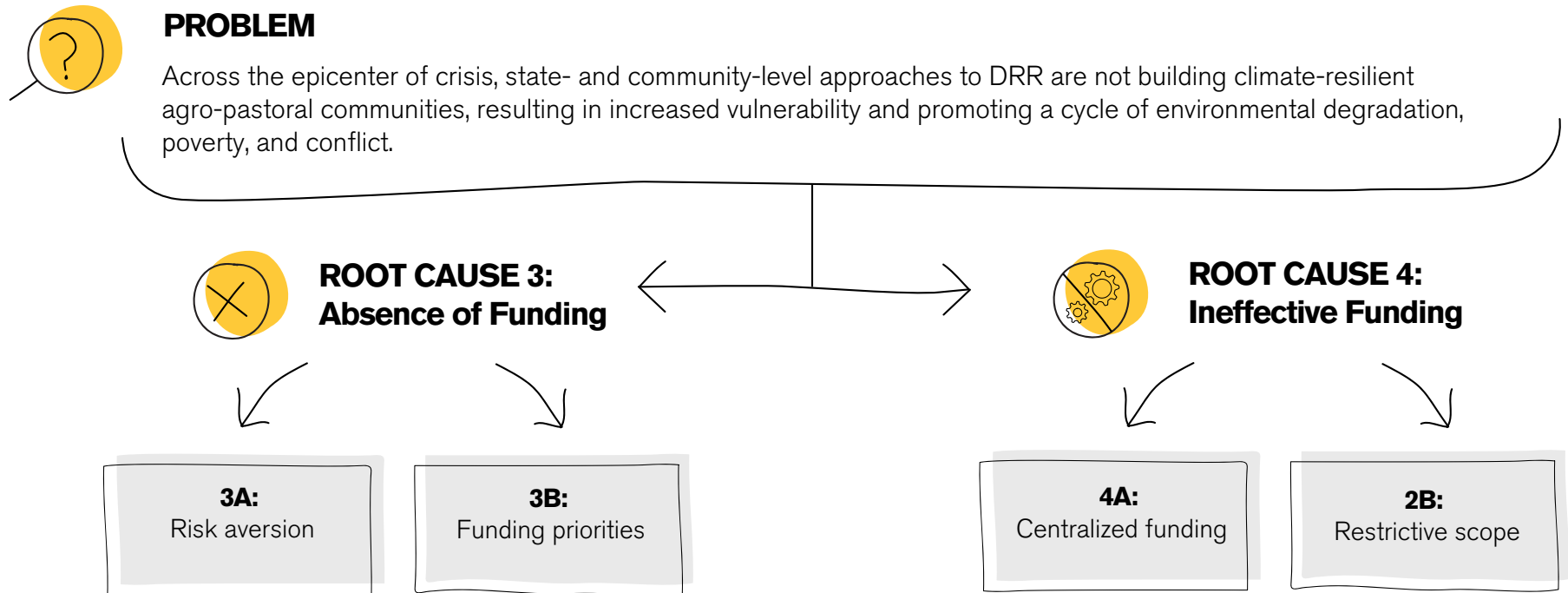


Figure 5 expands on Figure 2 (presented on page 4)



Ultimately, the lack of effective DRR funding on a global scale for climate-vulnerable, conflict-affected states like Afghanistan and Somalia — countries that disproportionately suffer the effects of the climate crisis despite contributing the least to it — translates to a lack of effective DRR programming at the national and community levels. This funding gap perpetuates a cycle of vulnerability, hindering communities' ability to build resilience and exacerbating the impacts of climate change and conflict dynamics. To break this cycle and achieve global climate justice, world leaders must commit to shifting power to communities at the epicenter of the crisis. This requires:

- Improving mapping of intersecting climate and conflict risks down to the local level to target action where it is most needed
- Investing in innovative and conflict-sensitive adaptation and resilience through localized and community-led approaches like those proposed within this case study, which require meaningful non-governmental partnerships
- Making climate finance more equitable and accessible to adequately resource action

By prioritizing these strategies, international donors can ensure that communities at the epicenter of crisis have the resources they need for effective adaptation and resilience-building. Moving beyond short-term relief to sustainable solutions is crucial for supporting local communities to withstand and recover from disasters. Only through a concerted collaborative effort can we enhance DRR efforts in Afghanistan, Somalia and other countries at the epicenter of crisis, ultimately fostering a more resilient and equitable future.

**To break this cycle and achieve global climate justice, world leaders must commit to shifting power to communities at the epicenter of crisis.**



**80-year-old Hawo, a nomadic pastoralist, knows the impact of Somalia's three consecutive failed rainy seasons all too well. It meant losing her only source of income: her animals. "Droughts are not new to me, but to my experience, this is the worst I have ever seen," Hawo said.**

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