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Strengthening resilience against shocks, stressors and recurring crises in low- and middle-income countries: an evidence gap map

May 2023

Evidence
Gap Map
Report 23

Social protection



International
Initiative for
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About this evidence gap map report

This report presents the results of systematic searches to identify and map the available evidence base of impact evaluations and systematic reviews of interventions that aim to improve resilience in low- and middle-income countries. The EGM was developed by 3ie with generous support from the United States Agency for International Development's Bureau for Resilience and Food Security, via a partnership with D-Lab at the Massachusetts Institute of Technology. The content of this report is the sole responsibility of the authors and does not represent the opinions of 3ie, its donors, or its Board of Commissioners. Any errors and omissions are also the sole responsibility of the authors. Please direct any comments or queries to the corresponding author, Miriam Berretta at mberretta@3ieimpact.org

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Summary

Background and scope

The world is facing multiple threats to sustainable development and poverty alleviation due to the increasing frequency of natural disasters, epidemics, and humanitarian crises. Climate change is a “threat multiplier” and will only increase the risks and incidence of crises that already-vulnerable populations experience. As a result, the concept of resilience has been incorporated into global development agendas, as it offers a multidimensional and multisectoral approach to understanding well-being among populations experiencing intersecting vulnerabilities.

This evidence gap map (EGM) provides an up to date picture of the evidence base for programming that seeks to strengthen resilience against shocks, stressors, and recurring crises in low- and middle-income countries. It covers a broad set of intervention packages that aim to strengthen resilience in the contexts of disaster recovery; disaster preparedness; social protection programming; environmental and natural resource management; financial inclusion and livelihoods; social cohesion; and participatory and inclusive institutions. We focus on the extent to which studies examine the multidimensional nature of resilience in its absorptive, adaptive, and transformative capacities.

Objectives

1. Identify, describe, and summarize evidence on the effects of interventions on resilience-related outcomes in low- and middle-income countries.
2. Identify potential primary and synthesis evidence gaps.
3. Facilitate the use of existing evidence by making it easily available.

Methods

To identify all potentially relevant studies, we implemented a broad search and systematic screening process, covering 10 academic databases and 44 gray literature sources. We included impact evaluations (IEs) and systematic reviews (SRs) assessing the effects of interventions aiming to strengthen resilience. We extracted descriptive and bibliographic data from all included studies. For SRs, we critically appraised the methods applied and extracted the implications for policy and practice from medium- and high-confidence reviews.

Using 3ie’s EGM software, we created an online, interactive map of all included studies, displayed according to interventions and outcomes assessed in each study. The platform provides additional filters for users to further explore dimensions of interest. For example, users can search for evidence by global region, country income level, and population characteristics such as age and sex. The EGM can be viewed at: <https://developmentevidence.3ieimpact.org/egm/building-resilient-societies-in-low-and-middle-income-countries-an-evidence-gap-map>.

Main findings

Our search returned 130,942 records in total. After removing duplicates, we retained 3,189 citations for screening at title and abstract levels. Of these 2,923 studies were retained for full-text screening. In the end we included a total of 362 studies, 343 of which were quantitative IEs and 19 were SRs. The field has rapidly expanded since the early 2000s, with approximately 20–50 new studies published annually since 2014.

Interventions were primarily implemented in Sub-Saharan Africa and South Asia. Ethiopia (n = 33), Kenya (n = 28), and India (n = 28) were the most frequently studied countries in the map. There were relatively few studies in the Middle East and North Africa (n = 28), and Europe and Central Asia (n = 9). Drought (n = 147), conflict, gangs, terrorism, or war (n = 96), and floods (n = 78) were the most common covariate shocks, stressors or recurring crises occurring in the context of a given intervention. However, we found few or no evidence for the majority of shocks/stressors including wildfire, volcanic eruptions, technological disasters, and heat and cold waves.

We found no studies for most interventions categories, highlighting the need for more rigorous causal evidence in resilience strengthening programming. Among the 362 included studies, the most common types of interventions were multicomponent (n = 169), meaning that the program combines a number of different intervention strategies. The most frequent combinations at the intervention group or domain level were social protection programming interventions (n = 96), financial inclusion and livelihoods interventions (n = 68), and environmental and natural resource management interventions (n = 61).

The most studied “single” interventions were cash transfers (n = 69), and technological solutions (non-infrastructure) for environmental mitigation strategies such as drought-resistant seeds, fertilizers, water harvesting, or recycling (n = 34); and microinsurance, contingent credit, and portfolio-level insurance against disasters (n = 31). Other common categories relate to financial inclusion such as microcredit (n = 13), and financial education and business training (n = 7). However, several interventions were evaluated as part of a package or in combination with other intervention activities, particularly capacity building for civil society or public decision makers, and disaster prevention and response policies.

The most common outcome categories examined were income, savings, and asset ownership (n = 199) in the financial (absorptive/adaptive) domain, and the use of coping strategies (n = 112) in the psychological (adaptive/absorptive) domain.

The most frequently reported equity dimensions were those targeting vulnerable populations, as this EGM's inclusion criteria require that an intervention is applied in the contexts of shocks, stressors or recurring crises. The second most common equity dimension was conducting subgroup analyses by participants' sex or socioeconomic status (n = 62).

Most of the included IEs used quasi-experimental method evaluation strategies (n = 209). The remaining were randomized controlled trials (n = 134). Less than a third of included studies used mixed methods approaches (n = 90).

Of the 19 included SRs, we assessed 7 as high confidence, 1 as medium confidence, and 11 as low confidence, with the final review ongoing. We identified two synthesis gaps (clusters of evidence where no medium- or high-confidence SRs exist but should be commissioned): the impact of cash transfers and technological solutions (non-infrastructure) on coping strategies outcomes. Moreover, all but one of the medium- and high-confidence SRs are out of date (i.e., five years or more since publication).

Conclusions and implications

This study represents the first comprehensive attempt at mapping IEs and SRs that evaluate the effects of interventions aiming to strengthen resilience. We identify a moderate and growing collection of studies, with 343 IEs and 19 SRs.

However, there is an uneven distribution of the evidence base across interventions and outcomes. Most studies are focused on cash transfers, technological solutions (non-infrastructure), and microinsurance; contingent credit; and portfolio-level insurance against disasters. There were large gaps in coverage of other interventions, such as disaster risk policies and business continuity and disaster recovery systems.

Overall, the EGM provides a useful starting point to inform future research and facilitate the use of evidence to inform decisions, but it also highlights the lack of research in this sector. It is essential to address the most critical evidence gaps through a coordinated approach by funders, implementers, and researchers. In the following section, we outline implications for decision makers, researchers, and commissioners.

Implications for policymakers

While EGMs provide a snapshot of the evidence landscape, they do not directly indicate which interventions work better. However, policymakers can consult identified high-confidence systematic reviews for findings on the effectiveness of certain interventions.

The seven medium- and high-confidence SRs indicate that cash programs may increase household savings and assets, and food security. Psychosocial interventions implemented in humanitarian emergencies were also found to reduce some (though not all) outcomes relating to psychosocial capacity – such as the degree to which individuals feel empowered or have agency to manage shocks, stressors, and recurring crises. However, the evidence is limited and mixed across the two reviews. Some studies found positive effects of technological solutions such as hybrid seeds and use of better fertilizers on income, but the evidence is limited.

If there are no high- or medium-confidence SRs synthesizing the policy of interest:

- Single studies can be consulted to learn about implementation lessons, but the results should be interpreted with caution as they cannot be generalized.
- If there are clusters of studies on that policy, consider commissioning a mixed methods SR.
- When there is a lack of evidence for policies of interest, consider integrating an IE with program implementation while funding and designing that policy.

Policymakers, when commissioning a new policy or intervention, should determine whether there are studies reporting unintended consequences for such an endeavor. This information can be found through a filter provided in the online map.

Implications for researchers and commissioners

Apart from a small number of intervention categories – such as cash transfers, technological solutions (non-infrastructure), microinsurance, contingent credit, and portfolio-level insurance against disasters – many interventions are generally understudied. While it might be difficult to conduct IEs in challenging contexts, the existing evidence base demonstrates instances where it is possible. Future studies should focus on interventions of promise or where consistent resources are invested.

We also see a significant concentration of evidence on multicomponent interventions, that is, studies in which the intervention evaluated consisted of several discrete intervention activities. However, these studies address a wide range of combinations of intervention strategies.

This diversity of multicomponent approaches is likely driven by several factors. It may be that intervention combinations are typically tailored to specific contexts to address context-specific barriers to resilience. Alternatively, it may reflect a poorly understood theory of change for strengthening resilience, leading program designers to “shoot in all directions” and include many different types of components in the hope that one (or a combination of them) will work. Programming that explicitly targets resilience is a recent development, which may explain why “standard packages” have yet to emerge in the way we see in other sectors.

Future research should be commissioned and conducted in a more coordinated and strategic manner to ensure its most effective use, including synthesis and drawing generalizable lessons. The fragmented nature of the current evidence base, including research on multicomponent interventions, limits our ability to synthesize evidence across contexts and draw generalizable conclusions.

Conducting IEs in settings affected by shocks and stressors might be challenging. “Small n” studies may be considered when “traditional” IEs are not implementable or appropriate (White and Phillips 2012).

There is a general lack of systematic reviews; we were only able to find seven of medium and high confidence. We identified some clusters of studies for which there are no high-confidence reviews, which indicate opportunities for synthesis research. These are related to the technological solutions (non-infrastructure) intervention category. More synthesis could also be conducted to examine the impacts of cash transfer interventions on coping strategy outcomes, and to determine whether multicomponent interventions (such as social protection and financial inclusion and livelihoods programming) impact income and savings outcomes.

Finally, future research should consider adopting gender-sensitive and equity approaches and mixed quantitative and qualitative methods, collecting data using validated outcome measures, reporting cost data and unintended consequences, and measuring outcomes at different time points, including longer follow up periods.

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List of abbreviations and acronyms

EGM	Evidence gap map
IE	Impact evaluation
L&MICs	Low- and middle-income countries
MHPSS	Mental health and psychosocial support
RFS	The United States Agency for International Development's Bureau for Resilience and Food Security
SR	Systematic review
USAID	United States Agency for International Development

1. Introduction

The United States Agency for International Development (USAID)'s Bureau for Resilience and Food Security (RFS) commissioned the International Initiative for Impact Evaluation (3ie), the Massachusetts Institute of Technology, and the University of Notre Dame in 2021 to support intersectoral and bureau-wide use of evidence for programmatic decision-making. RFS is the agency's home for resilience and food security programming; it coordinates the American government's global strategies on food security and water, as well as the agency's multisectoral nutrition strategy.

RFS comprises three offices and four technical centers, which bring together programmatic and technical expertise in agriculture-led growth; water, sanitation, and hygiene; nutrition; and resilience. The RFS Evidence Aggregation for Programmatic Approaches (REAPER) project was designed to serve two primary aims. The first is to present a systematic EGM underlying the bureau's strategic approaches in its four technical areas. The second is to explore machine learning and automation methods to aggregate and accelerate the production of EGMs.

This EGM report presents the findings of a systematic search to identify and map the evidence base of IEs and SRs of interventions designed to strengthen populations' resilience to shocks, stressors, and recurring crises in low- and middle-income countries (L&MICs).

Section 1 of this report presents the background, objectives, and reasons why it is important to conduct such an EGM; Section 2 describes the EGM's conceptual framework and the scope of included studies; Section 3 describes the methods applied in the systematic search, screening, data extraction, and analysis of the identified studies; Section 4 presents findings from the map, including the gaps analysis; and Section 5 outlines implications for policy and future research and concludes the report.

1.1 Background

1.1.1 Shocks, stressors and recurring crises pose a risk to sustainable development and poverty reduction

The world is facing multiple threats to sustainable development and poverty alleviation due to increasing frequency of natural disasters and humanitarian crises. In 2020 alone, 389 climate-related disasters were recorded, affecting over 98.4 million people, and inflicting an estimated US\$171.3 billion in economic damage. (CRED and UNDRR 2021). The annual incidence of disasters is estimated to be three times higher today than in the 1970s and 1980s (FAO 2021).

In 2020, an estimated 82.4 million individuals were forcibly displaced globally due to persecution, conflict, violence, and other causes (UNHCR 2021). These threats arise from, and are interlinked with, climate change (IPCC 2021). Compounding these global challenges, the COVID-19 pandemic pushed an estimated 97 million people into extreme poverty (Mahler et al. 2021). Global humanitarian funding commitments totaled US\$31.3 billion in 2021 – an increase of US\$0.8 billion from the previous year, reflecting new and pressing global demands on the international development and humanitarian sector and governments (Development Initiatives 2022).

The effects of these global catastrophes are disproportionately felt by the world's poorest and most vulnerable and the countries where they reside. Natural disasters alone led to an estimated loss of US\$108 billion in L&MICs from 2008 to 2018, resulting in a loss of 6.9 trillion kilocalories per year, equal to the annual caloric intake of seven million adults. These losses lead to upstream risks for burdened economies, as they result in increased import expenditures along with reduced export revenues (FAO 2021), and often concurrent increased food insecurity (FSIN and Global Network Against Food Crises 2021).

Increasing trends in shocks will exacerbate and widen existing socioeconomic inequalities. Climate-driven shocks and stressors will impose severe consequences for the estimated 608 million family farmers globally (Lowder et al. 2021). Nearly one billion people living in informal housing in urban settings worldwide are unable to cope with adverse events such as destruction of slums, flooding, cyclones, and heat waves (Satterthwaite et al. 2020). Already vulnerable groups are further jeopardized by more frequent and severe shocks and stressors. Among those, Indigenous peoples – who often serve as stewards to natural resource conservation – are at the highest risk of adverse impacts from climate change and other disasters (Ford et al. 2020).

The interlinked and compounding nature of these global issues require multidimensional solutions to address intersectoral and intersectional risk. As a result, resilience – an outcome juxtaposed between development and humanitarian approaches – has emerged in global development agendas (Oxfam 2019). Broadly defined as the ability to withstand, adapt to, mitigate, or recover from shocks and stressors, resilience provides an important conceptual framework and opportunity for policy to enhance well-being in multidimensional and dynamic ways.

1.1.2 How current policy and practice is targeting resilience

As the climate crisis and man-made disasters increase global insecurity, funders and implementers have adopted resilience-focused approaches to policy and programming. These approaches appear prominently in recent global development agendas to mitigate increased risks from climate change, humanitarian disasters, and poverty and vulnerability. For example, Sustainable Development Goals 8 and 11 reflect a recognition of the interconnectedness of development challenges by focusing on the development of inclusive, safe, and sustainable cities and human settlements (Ritche et al. 2018), as well as resilience against climate change and other socioeconomic disasters.

Governments have followed up with pledges and commitments reflecting the importance of addressing these intersectoral needs. In 2015, the UK Foreign, Commonwealth and Development Office launched a £110 million Building Resilience and Adaptation to Climate Extremes and Disasters program to assist 13 countries across Asia and Sub-Saharan Africa (Leavy et al. 2018). Between 2018 and 2021, governments, private sector actors, foundations, and other institutions contributed approximately US\$215.5 million to the UN Office for Disaster Reduction (UNDRR 2019, 2020, 2021).

USAID launched the President's Emergency Plan for Adaptation and Resilience (PREPARE) in 2021 for developing countries and vulnerable populations, pledging US\$3 billion in adaptation financing annually by FY2024 (The White House 2021). Efforts to improve resilience broadly fall into the categories below.

Multisectoral and dimensional approaches to programming

Shock-sensitive social protection, livelihoods, financial inclusion, and early warnings interventions are often used to mitigate the effects of shocks and stressors. Portfolio programs that incorporate multisectoral and multicomponent approaches have been increasingly used to strengthen socioeconomic resilience. For instance, reconstruction programs are combined with cash transfers and community-based management of natural resources (Avdeenko and Frölich 2019); early warning systems with financial support and civic engagement (Béné et al. 2019); or infrastructure and reconstruction efforts with savings and micro-lending groups (Yaron et al. 2018).

Disaster risk management

Climate change, and its relationship to natural resource management, leads to new understanding of the need for systems to anticipate and prepare for disasters through institutionalization of financing and risk management policies, rather than solely through post-disaster response (Béné et al. 2012; FAO 2013; FAO-RIMA n.d.; UNDRR 2021, 2015).

Investments in infrastructure, reconstruction planning, and emergency disaster preparedness

These can mitigate losses and facilitate quicker recovery when disasters occur (Hallegatte et al. 2019). Early warning systems have been implemented at the national and regional government levels to prevent catastrophic (mostly natural) events (Clinton 2006; GFDRR and World Bank 2021). Education, information dissemination, and awareness raising can help people to identify risk factors and early signs of disasters, and thereby adjust investment behavior to reduce disaster losses (OECD 2021; GFDRR and World Bank 2021).

1.1.3 Why this EGM is important

In a context of increased global attention and resources dedicated to improving resilience, there is a need to understand the breadth of evidence on the effects of resilience programming, identify evidence gaps, and facilitate access to existing research. While resilience-focused evidence synthesis studies exist, we were unable to find any that comprehensively map evidence on the effects of resilience-related interventions and their outcomes in L&MICs.

Many of the existing systematic reviews (SRs) and EGMs are limited to specific sectors, types of interventions, and/or outcomes. For example, a critical review by Amri and colleagues (2018) systematically assessed the effectiveness of disaster risk reduction-focused education interventions for children. Two reviews by Barry and colleagues (2013) and Joyce and colleagues (2018) focused on interventions related to the psychological resilience of individuals. An EGM by Doswald and colleagues (2020) mapped climate change adaptation interventions, and an SR by Doocy and Tappis (2017) synthesized cash-based interventions in humanitarian emergencies.

Some studies include relevant resilience outcome indicators, such as SRs by Lwamba and colleagues (2022) and Sonnenfeld and colleagues (2021). Still, their interventions of interest are not directly focused on building resilience, but rather on gender equality and social cohesion. Other SRs aim to identify and categorize resilience concepts and interventions rather than looking at the effects of such interventions (Acevedo et al. 2020; McClymont et al. 2020; Mirzaei et al. 2019).

To our knowledge, this study is the first systematic effort to consolidate and map the evidence on the effectiveness of multisectoral resilience interventions in L&MICs. It draws on multidisciplinary and multisectoral evidence bases to present a comprehensive picture of the evidence landscape. The framework was developed through review and consultation with USAID technical approaches, relevant literature, and USAID and external advisory groups. As such, this study may serve as a guide for policymakers, program designers and implementers, and researchers in the design and measurement of evidence-informed programs as to what works to strengthen resilience.

1.2 Study objectives and questions

This project aims to identify, describe, and make available the existing evidence on the effects of resilience-focused programming. While it does not provide interpretation, analysis, or synthesis of what the evidence imparts, it aims to provide an entry point for understanding where evidence exists, including whether there is evidence on how the intervention affects different populations, and where more evidence may be needed prior to large-scale investment.

With this in mind, the EGM has three specific objectives:

1. To identify, describe and summarize evidence on the effects of interventions on resilience-related outcomes in L&MICs;
2. To identify potential primary and synthesis evidence gaps; and
3. To facilitate the use of existing evidence by making it easily available.

Research questions that are addressed by this study are as follows:

1. What is the extent and what are the characteristics of empirical evidence on the effects of interventions to increase resilience in adaptation, mitigation, and recovery from covariate shocks, stressors, or recurring crises in L&MICs?
2. What are the major primary and synthesis evidence gaps in the literature?
3. What intervention and/or outcome areas should be prioritized for primary research and/or evidence synthesis?

This report serves as an accompaniment to the [interactive map](#). In it we address the key research questions through analysis of the characteristics of available evidence and key trends (e.g., number of IEs published over time, geography, focus on interventions and outcomes, and targeted audiences).

2. Defining the scope of resilience programming

2.1 Conceptual framework

The scope of this EGM was derived from current and prevailing conceptual theories of resilience, USAID's definition of resilience, and a list of strategic and programmatic approaches developed by RFS. Theories of resilience have been present in fields such as ecology, psychology, and engineering since the 1970s, and have been used to understand and explain the abilities of systems to absorb change (Holling et al. cited by Barrett and Constanas 2014; Béné et al. 2016). Since then, resilience theory has evolved from its ecological and socioecological origins (Béné et al. 2015). Barrett and Constanas (2014) conceptualized resilience capacity as a reflection of well-being on a spectrum: the ability of a person, household, or higher-level units to withstand shocks and stressors and to avoid poverty or vulnerability to it.

Béné and colleagues (2015) further identify the utility of the resilience lens for understanding multisectoral approaches, such as those used to support nutrition and food security. As an outcome, resilience reflects an integrated and multidimensional understanding of vulnerability, which may provide more information than discrete or disaggregated indicators of a single dimension.

Together, these works form foundational concepts around resilience and a framework by which USAID derives its own definition of resilience:

The ability of people, households, communities, countries, and systems to mitigate, adapt to and recover from shocks and stresses in a manner that reduces chronic vulnerability and facilitates inclusive growth. — USAID 2012

Defining resilience interventions

We used USAID's definition of resilience to identify interventions of focus: first, on multilevel approaches at individual, household, community, country, and systems levels; second, on interventions with explicit objectives to increase the ability to manage, respond to, mitigate, and recover from *shocks and stressors* that may be exogenous, natural, or human-made. This may include preparedness for unanticipated future shocks or recovery once a shock or stressor has occurred.

We defined shocks as immediate, uncontrolled, and unintended events that may have a dramatic impact on people (e.g., natural disasters, conflict, market shocks, complex emergencies such as famine). Stressors are long-term pressures that may undermine the stability of a given system or context (Zselezky and Yosef 2014). We generated and adapted a comprehensive list from Holzmans and Jorgensen (2001) and the European Commission Disaster Risk Management Knowledge Center's INFORM risk management index (DRMKC-INFORM 2022).

Interventions examined in this EGM were derived from RFS' strategic and programmatic approaches, through consultations with USAID advisory groups and experts in the field (Appendix A), and by reviewing key works such as Hill and colleagues' (2021) Disaster Finance Evidence Gap Assessment. We referenced Pingali and colleagues' (2005) strategies such as strengthening diversity, rebuilding local institutions and traditional support networks, reinforcing local knowledge, and building on households' ability to adapt and reorganize.

Frankenberger and Nelson (2013) mentioned the importance of livelihood diversification and access to productive assets, institutional structures and processes, as well as disaster risk reduction and preparedness. Other relevant sector-specific interventions in agriculture and nutrition were included if deemed relevant to the scope described above.

There are many interventions with underlying conceptual importance to resilience capability, but we needed to instate practical boundaries to ensure a reasonable and implementable scope. This EGM excluded studies that do not explicitly mention shocks, stressors, or recurring crises, as well as interventions that only mention idiosyncratic shocks (i.e., where effects are isolated to single households, such as an illness or loss of a family member or unemployment).

This choice was also made to highlight responses delivered through institutional structures and country systems. In practice, many interventions that aim to increase preparedness, protection, or mitigation against covariate shocks and/or stressors are similar to interventions that address idiosyncratic shocks and/or stressors (e.g., financial inclusion, household-level risk mitigation instruments, social protection). We also omitted interventions such as basic education, public health, or water, sanitation, and hygiene.

Table 1 in Section 2.2 below details the interventions of interest in this map, and Table 2 in Section 2.3 details the outcomes of interest.

2.2 Interventions of interest: ecological levels, groups, and definitions

Interventions were grouped into seven domains based on the USAID technical approaches, relevant literature, and consultations with USAID and external advisory groups. These seven domains represent the different mechanisms and dimensions in which resilience can be strengthened – from immediate capacities during shock recovery to longer term capacities underlying the social fabric of communities and responsive, accountable institutions.

Under these premises, the seven categories are: disaster risk financing, early warning systems, environmental and natural resource management, financial inclusion and livelihoods, inclusive and accountable institutions, social cohesion and conflict resolution, and social protection programming. The domains were then disaggregated into individual intervention categories.

Table 1: Interventions included in the EGM, applicable during times of covariate shocks and stressors

Intervention domains	Interventions	Intervention definitions	Intervention examples
Disaster risk financing	Risk transfer instruments and other financial instruments	Disaster risk includes risk transfer schemes or other financial instruments, policies and regulations governing markets or public financing, and dissemination mechanisms. Intervention can be implemented at local, provincial/subnational, national, or intra-country/regional levels.	<i>Risk transfer instruments</i> Agricultural, index-based livestock or weather-based insurance (regional, country) Property catastrophe risk insurance, flood insurance Parametric risk transfer instruments, regional co-financing, and risk pooling schemes <i>Loans</i> Contingent credit, borrowing, concessional financing <i>Revenue generation/fiscal policies</i> Co-financing incentives for in-country stakeholders, financing mechanisms to facilitate quick

Intervention domains	Interventions	Intervention definitions	Intervention examples
			reimbursement or provide low-interest financing to businesses or individuals Public financing, taxation, or budgetary allocations for relief or infrastructure maintenance, rehabilitation, and restoration (e.g., Mexico's Fund for Natural Disasters [Fonden]) <i>Other</i> Trade policies
	Risk management policies	Institutional, national, subnational policies and programs that formalize roles, responsibilities, and regulations pertaining to risk management. This may also include interventions that regulate financial actors, markets, or sectors affecting risk responses.	Environmental or national risk management policies Regulations for financial institutions, including risk accounting in credit portfolios Creation of private insurance markets
Early warning systems	Data collection and analysis on adverse events	Activities conducted to collect information, identify, assess, analyze, or facilitate monitoring of risk factors and/or affected geographic areas or populations. (May be relevant as a multicomponent intervention)	Hazard/disaster data collection or updating databases Weather/disaster/famine prediction, seasonal forecasting, or modeling Risk assessments, including susceptibility to exposed elements to injury/damage
	Infrastructure construction, reconstruction, or maintenance	Infrastructure for natural disasters, shocks, and disease detection, monitoring, dissemination, or action	Installing, activating, rehabilitating, modernizing, or enhancing weather, agrometeorological, or hydrometeorological stations, observatories, or centers Systems-level early warning systems

Intervention domains	Interventions	Intervention definitions	Intervention examples
	Disaster prevention or response policies	Institutional, national, subnational policies and programs that formalize roles, responsibilities, and regulations pertaining to non-financial disaster risk management, recovery, and response	Evacuation planning Laws, policies, legislation to promote preventive practice or establish post-disaster response mechanisms Policies institutionalizing early warning systems (e.g., Famine Early Warning Systems Network)
	Communication and advocacy on risk assessment	An integrated system of hazard monitoring, forecasting and prediction, disaster risk assessment, communication and preparedness activities systems and processes that enables individuals, communities, governments, businesses, and others to take timely action to reduce disaster risks in advance of hazardous events	Climate bulletins or alerts delivered through mobile, radio, email, or traditional information campaigns; may be dedicated to subpopulations, industries, markets (e.g., fisheries)
Social protection programming	Data collection and analysis for at-risk populations	Activities conducted to collect information, identify, assess, analyze, or facilitate identification of vulnerable and at-risk populations and/or needs (may be relevant as a multicomponent intervention)	Poverty head counts or vulnerability assessments (e.g., Inter-American Development Bank's Prevalent Vulnerability Index) Data collection for targeting or design of interventions
	Cash transfers	Money payments to assist with meeting recipient needs Can be targeted to eligible populations or	Unconditional cash transfers Conditional cash transfers Cash for work programs Direct provision of credit Emergency cash transfers

Intervention domains	Interventions	Intervention definitions	Intervention examples
		universal, conditioned on meeting requirements (cash is contingent on children being enrolled in school, receiving health services, vaccination, etc.) or unconditional	
	In-kind social assistance	Direct provision of goods or services, or subsidies to increase access	Social security Provision of non-food items Commodity vouchers Agriculture recovery and restoration programs
	Food and nutrition assistance	Direct provision of food or nutrition-focused goods or services, or subsidies to increase access	Nutritional supplementation Food stamps Food assistance School feeding programs
	Employment assistance	Interventions providing cash or in-kind support for employment or during unemployment	Public works and employment guarantee schemes Unemployment assistance
	Local coordination mechanisms in support of service provision	Activities/mechanisms that bring uncoordinated and disparate actors together to collaborate on provision of services for high-risk or vulnerable populations	Referral systems to service providers (often for children and marginalized or vulnerable populations requiring services) Mobilization of public and/or private actors
	Communication and advocacy	Communication, awareness-raising, dissemination, or public campaigns to increase knowledge of, access to, or uptake of services	Social and behavioral campaigns for nutrition uptake, including improving household decision-making on food purchases
Environmental and natural resource management	Public natural resource management	Government-driven efforts to sustainably manage natural resources (including	<i>Water</i> Watershed management Irrigation water management Soil and water conservation

Intervention domains	Interventions	Intervention definitions	Intervention examples
		species), accounting for present and future needs. May pertain to resolving common pool resource issues, or to mitigate/avert environmentally driven climate risks	<p><i>Forestry, fishing, and agriculture</i></p> <p>Altering agricultural practices (crop rotating, lowering planting densities, altering harvest dates)</p> <p>Conservation of national parks, community-managed lands, game reserves, rangelands, wetlands, agricultural lands</p> <p>Mixed use or designated land for restoration</p> <p>Biodiversity, species preservation</p> <p><i>Air</i></p> <p>Emissions/pollution control</p>
	Community-based natural resource management	Interventions aimed at strengthening the community-level management of natural resources (e.g., through participatory management of forests/rangeland, or an irrigation system) This might include the involvement of local associations, and some conflict resolution practices	<p><i>Water</i></p> <p>Water user/community associations</p> <p><i>Forestry, fishing, and agriculture</i></p> <p>Community forestry, forestry management committees</p> <p>Community-based coastal, freshwater, marine fisheries management</p>
	Environmental infrastructure construction, maintenance, or reconstruction	Infrastructure for natural disasters, shocks, and disease detection, monitoring, dissemination, or action	<p><i>Flood management</i></p> <p>Dams, levees, seawalls, tidal barriers, detached breakwaters, canal lining, stilted homes, river barriers, improved drainage, and sewage</p> <p><i>Energy</i></p> <p>Hydroelectricity</p> <p><i>Erosion/land</i></p> <p>Changes to land topography (grass waterways, roughening land surfaces, windbreaks)</p> <p><i>Water purification/supply</i></p> <p>Desalination</p>

Intervention domains	Interventions	Intervention definitions	Intervention examples
	Technological solutions (non-infrastructure)	Interventions promoting the use of technological materials, processes, or practices to improve risk reduction	<i>Crop failure safeguards</i> Improved seeds (flood, salt, temperature tolerant) Fertilizers Natural pesticides Climate-smart agriculture <i>Water purification/supply</i> Water harvesting or recycling Drip irrigation
	Communication and advocacy on environmental management	Communication, awareness-raising, dissemination, or public campaigns to increase knowledge of or support for cooperation or collaboration	Mass media campaigns Natural resource conservation education Social mobilization
	Institutional planning and regulations	Introducing and enforcing appropriate land use or instituting rural/urban planning regulations, which curtail reconstruction in high-risk areas	Water use and fee policies Pollution regulations Integrated natural resource management plans <i>Flood retreat strategies</i> Establishing set-back zones, relocating threatened buildings, phasing out development in exposed areas, upland buffers, rolling easements Building code regulations and policies to increase resilience of physical assets, earthquake-resistant building designs, or raised-floor elevation in flood-prone areas
Financial inclusion and livelihoods	Savings, community-based and micro-lending groups	Providing support to create groups where participants contribute and loan their own money, eliminating the need for traditional financial institutions and sharing the risk among participants that borrowers may be unable to repay the loans	Self-help groups; rotating/accumulated savings and credit associations

Intervention domains	Interventions	Intervention definitions	Intervention examples
	Microcredit for households and business mitigation of shocks/stressors	Providing access to short- and medium-term capital for fixed assets or other loans to microentrepreneurs at a reduced or zero rate to access credit without predatory programming Recovery loans are provided soon after a disaster to help households and companies recover more quickly	Microcredit for vulnerable and marginalized groups (i.e., women, Indigenous people, or ethnic minorities)
	Microinsurance; contingent credit; portfolio-level insurance against disasters	Microinsurance is the provision of insurance services to low-income people, who typically do not have access to insurance or adequate social security services	Contingent credits which guarantee financing to a borrower in advance of a disaster Portfolio-level insurance for financial intermediaries
	Financial education and business training	Educating and informing individuals so they can make appropriate decisions in managing their money, assets, and liabilities	Training on saving, borrowing, and investing Extension services (agent-based insurance knowledge)
	Access to mobile payment services	Facilitating access to mobile payment services by providing the infrastructure at no or low cost; training potential users; or eliminating other barriers to the use of mobile money services. The aim is to boost expansion and rapid adoption of mobile money services and create an enabling environment for it	Provision of mobile money infrastructure at no or low cost, training potential users

Intervention domains	Interventions	Intervention definitions	Intervention examples
	Regulatory measures for financial inclusion	Implementing policy reforms that promote access to financial services for small businesses and informal workers	Reducing barriers to opening bank accounts
	In-kind assistance	Providing a specified transfer of an asset (non-agricultural) to a household or individual based on certain parameters	Livestock transfer, machinery transfer
	Livelihood diversification support	Providing goods or services (training, course, capacity building or technical skills development) that allow individuals, households, or communities to diversify risks from primary sources of income generation to secondary or new industries. May also include shifting from one form of agricultural production to another (e.g., from high-risk crops to drought-tolerant or lower risk crops, from farming to livestock).	Provision of drought-tolerant or resilient seeds, livestock, or in-kind assistance relating to entrepreneurship Financial support to establish a new business Creating off-farm work opportunities in the formal and informal sectors Technical and vocational education training specifically designed to create off-farm activities
	Value chain and market linkage activities	Interventions that aim to help a target population – whether producers, processors, or retailers – to derive more income from a livelihood activity (e.g., supporting them to add value to a product, helping them to access markets	Training and technical assistance to support a factory switching to selling chocolate instead of raw cacao

Intervention domains	Interventions	Intervention definitions	Intervention examples
		where there is greater demand for their product, improving quality and productivity along the value chain in the process)	
	Market infrastructure reconstruction	Reconstruction of market infrastructure and channels to connect markets (roads) during post-disaster recovery	Roads or markets Agricultural storage facilities
	Business continuity and disaster recovery systems	Interventions to enable large businesses as well as small and medium enterprises to quickly resume operations after a crisis. This might include training and the provision of a specific crisis management curriculum in the post-disaster context for technical and management staff.	An integrated and sustainable capacity- building initiative of national water utility associations and companies in a particular area (e.g., Danube Learning Partnership)
Social cohesion & conflict resolution	Intergroup dialogues	Interventions creating safe spaces for different groups (ethnic, religious, displaced and host communities, etc.) to have social interactions, and strengthening ties by engaging community leaders. They may be focused solely on dialogues, or might involve activities that allow people to collaborate between them.	Dialogue-focused meetings, sports, art, creative activities

Intervention domains	Interventions	Intervention definitions	Intervention examples
	Communication and advocacy for peace and cooperation	Interventions that aim to convey peace messages including tolerance, non-violence, cooperation, reconciliation, collective action in problem solving, and dispute resolution. This could occur through training, workshops, and using the media (TV, newspapers, social media).	Workshops on peace education might also take the form of participatory theater, peace messaging campaigns, or radio/TV dramas.
	Psychosocial interventions	Interventions that reduce and address adverse psychosocial stress, post-traumatic stress disorder, and anxiety disorders arising from shocks/stressors. They may include interventions to boost aspirations, confidence, agency, and empowered decision-making. They do not include general mental health interventions.	Mental health and psychosocial support (MHPSS)
	Preventative protection measures	Interventions that comprise non-police or security force-based efforts to reduce incidences of violence, especially sexual and gender-based violence. They include efforts to make the physical environment less conducive to such acts and minimize the	Crime prevention through environmental design intervention, installing lighting in public spaces, removing obstacles so there is better line of sight, and reclaiming spaces for positive community activities

Intervention domains	Interventions	Intervention definitions	Intervention examples
		exposure of vulnerable groups to risky situations.	
	Improvement of conflict resolution mechanisms	Local mechanisms for resolving conflict between two (or more) parties about the stewardship, ownership, and use of land and property	Simplified court processes, improved access to lawyers and legal information
Inclusive and accountable institutions	Civil society feedback monitoring mechanisms	Information about the performance of public institutions is disclosed to the public, who can then monitor how public and private institutions are applying pre- and post-disaster policies (e.g., provision of a platform for meetings between citizens and relevant government or company stakeholders to discuss citizens' rights, developing citizen action plans, and establishing grievance redress mechanisms to follow up with stakeholders)	Scorecards, social audits Disclosure of information related to government activities Face to face meetings Reinforcement of local dispute resolution mechanisms and simplification of court processes
	Capacity building of civil society	Providing support to citizens or civil society organizations by through training or consultants that have the skills and expertise needed by the organization to meet its goals. It might include support to manage the economic/	Support to build a campaign, to access funds for activities, training on specific skills needed to make the organization functional

Intervention domains	Interventions	Intervention definitions	Intervention examples
		bureaucratic tasks of an organization or help to set up a campaign.	
	Participatory approaches to decision-making	Bottom-up approaches that allow communities to take decisions on the development process and resources management in pre- or post-disaster settings, including Indigenous people, women, and other marginalized groups	Community-driven reconstruction Community-driven development projects Participatory budget initiatives Community-delivered services For example, the Citizen's Charter Afghanistan Project used community development councils
	Capacity building of public decision makers	Training, technical assistance, and support activities to strengthen institutional capacity to prepare or plan for, or respond to shocks and stressors This can include building specific skills, knowledge, behaviors, delivery of duty, and implementation of activities for public officials, such as newly elected or appointed public officials, local leaders, and legislators. This applies to all the category domains in the map.	Design the mandate and terms of reference for new and strengthened government agencies; provide support to write policies and response plans to shocks/stressors; create activities to make information accessible to bureaucrats or elected officials to ensure better-informed decisions Building capacity alongside ministries in government to improve overall service delivery and strengthen social protection schemes Building capacity of national public and private sector actors in understanding risk management and policies
	Public and public-private coordination mechanisms	Efforts to collaborate, coordinate, and share information, strategies, and policies to address shocks and build	Inter-ministerial or multisectoral coordination mechanisms, conferences, conventions National task forces, strategy committees Conferences, conventions to

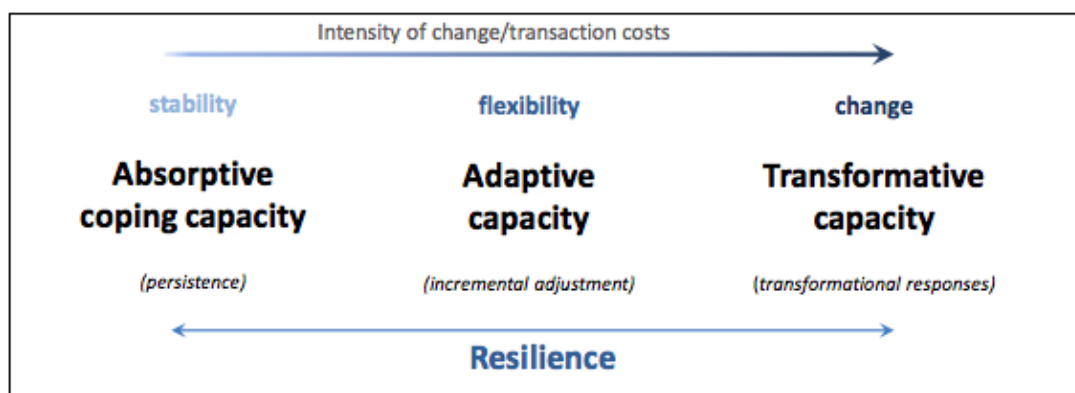
Intervention domains	Interventions	Intervention definitions	Intervention examples
		connections across the system or regionally	mobilize governments to prepare for environmental, climate-related, regional disaster early detection and coordination (e.g., Climate Risk and Early warning Systems initiative)

2.3 Outcomes of interest: ecological levels, groups, and definitions

Defining resilience outcomes. Béné and colleagues (2015) identify three overarching types of resilience capacities, which the USAID Resilience Capacity Measurement framework also describes (Figure 1):

- **Adaptive capacity** is “the ability to make informed choices about alternative livelihood strategies based on changing conditions” (Béné et al. 2012, p.11) and the ability to choose strategies to face environmental, social, political, economic, and climatic conditions.
- **Absorptive capacity** is the ability of people (e.g., individuals, families, communities) and institutions to quickly recover from a shock with minimum consequences (FSIN 2015, p. 15). This capacity ensures the functioning of systems and mainly comprises coping strategies (e.g. harvesting crops early to avoid floods or delaying debt repayments [OECD 2014]).
- **Transformative capacity** describes institutional and system-level changes for long-term resilience. This may include change at higher levels such as governance structures, in the enabling environment such as social factors or capital (cultural and gender norms), or relating to sustainability. At a systems level, transformative capacities help a country system to develop robustness against specific kinds of shocks (Béné et al. 2012; Carpenter et al. 2005; Folke et al. 2010).

Figure 1: Theory of change, adapted by USAID



Reproduced with permission from Béné et al. (2012). Resilience: new utopia or new tyranny? Reflection about the potentials and limits of the concept of resilience in relation to vulnerability reduction programmes. IDS Working Paper, (2012) (405, 21)

Together, these capacities reflect the multidimensional and multi-time horizon nature of resilience. To generate a list of specific outcomes associated with each capacity, we adapted USAID's Resilience Capacity Measurement framework and identified other outcomes that are also theoretically associated with the interventions through a preliminary scoping of the literature.

We classified outcomes into three types of resilience capacities: adaptive, absorptive, and transformative. These were theorized to enable the final highest-level resilience outcome, improved well-being (Vaughan 2018). In the absence of a single measurement definition for resilience, three capacities offer a conceptual entry to measure outcomes along the causal chain of resilience and at different levels, from the individual to the national level. In several instances, outcomes could not be separated neatly into a single type of capacity. This includes psychological, livelihoods, financial, and disaster risk management outcome groups, due to relevance at different ecological levels (i.e., individual, community, and societal).

Table 2: Outcomes included in the EGM¹

Outcome group	Definition	Outcome	Definition
Psychological (absorptive and adaptive)	Psychosocial capacities are factors that can indicate the degree to which people feel empowered or have the agency to deal with risk.	Risk aversion	Measure of changes in behaviors and decisions that demonstrate intentional aversion to economic or other risks, (e.g., reduced risk tolerance, increased motivation and confidence)
		Aspirations	Measure of changes in hopes, desires, ambitions, and wishes to attain or accomplish a particular goal
		Confidence to adapt	Measure of changes in the belief in one's ability to change or adapt to new situations
		Self-efficacy	Measure of changes in the belief in one's ability to succeed in a specific situation or complete a task
		Use of coping strategies	Measure of changes in how households engage in behaviors to meet their immediate needs in times of crisis
Financial (absorptive and adaptive)	Financial inputs and skills buildings to equip households with better financial skills and assets against shocks and stressors	Income, savings, and asset ownership	Measure of changes in participants' income (from wage labor, agriculture, investments, or other sources), and savings and asset ownership
		Credit access and use	Measure of changes in participants' ability to apply for, receive, and manage assets/credit (and have support for the above)

¹ Outcome groups, definitions, and in several cases, outcomes, were derived from Vaughan, E. (2018) *Resilience Measurement Practical Guidance Note Series 3: Resilience Capacity Measurement*.

Outcome group	Definition	Outcome	Definition
Livelihoods (adaptive)	Providing skills and information, as well as sensitization for groups to change or adapt their livelihoods and income in response to change	Input markets	Measure of changes in the existence of, or innovations surrounding, input market systems (e.g., the formation of groups of small businesses, associations, or co-ops selling agricultural inputs)
		Labor productivity	Measure of changes in productivity and participation in jobs and entrepreneurial projects, which result from the application of new skills
		Market information	Measure of changes in access to and use of information for understanding markets, including prices, changes in demand, and other economic trends
		Financial literacy	Measure of changes in participants' level of knowledge regarding financing and financial management options for themselves and/or their business, including suitable products and services and the legal and regulatory framework, including their rights and recourse
		Business skills	Measure of changes in participants' skills and access to begin, join, or support these businesses (and have a meaningful role) through skills, education, sensitization, etc.
		Diversified income sources	Measure of changes in whether participants earn income from new, additional sources including investments, agricultural yields, entrepreneurship, etc.
Livelihoods (transformative)	Creating infrastructure for sustainable markets that are more resilient to shocks	Structural market system resilience	Measure of changes in market connectivity, diversity, power dynamics, and rule of law. An example of structural transformation is a previously agriculture-reliant economy moving growth and labor towards manufacturing and services.
		Behavioral market system resilience	Measure of changes in market cooperation, competition, evidence-based decision-making, and business strategy. An example of behavioral domains is the number of joint partnerships or initiatives that may arise between producers and business owners.

Outcome group	Definition	Outcome	Definition
Disaster risk management (absorptive)	Disaster risk mitigation on a regional level, where local/regional governments communicate and create structures to observe, predict and respond to disasters	Emergency response structures	Changes in available structures that support disaster planning, mitigation, and local capacity-building activities to reduce the impact of recurrent disasters
		Early warning information	Measure of changes in access to information about anticipated shocks and stressors, including climate and weather information, market information, etc.
		Local conflict management structures	Measure of changes in the presence and capacity of local institutions for mediation and conflict resolution through formal or informal processes
Disaster risk management (transformative)	Disaster risk investment with institutions and governments buying into schemes and policies to result in better-prepared societies	Long-term green infrastructure	Measure of changes in the availability or prevalence of sustainable, long-term infrastructure that can enhance community resiliency to disasters and climate change because of increased water retention and groundwater recharge, flood mitigation, erosion control, shoreline stabilization, combatting of the urban heat island effect, improvement in water quality, and buildings' conservation of energy.
Social (absorptive)/ bonding social capital	Bonding social capital is seen in connections between community members. It involves principles and norms such as trust, reciprocity, and cooperation, and is often drawn on in the context of disaster.	Local group participation	Measure of changes in, participation in, and leadership of local associations, groups, clubs, co-ops, etc.
		Local borrowing	Measure of changes in, access to, and participation in local and community-level loans, saving groups, microinsurance, etc.
Social (adaptive)/ bonding social capital	Bridging social capital connects members of one community or group to other communities/groups. It often crosses ethnic/racial lines, geographic boundaries, and language groups, and can facilitate links to external resources and broader social and economic identities.	Producer organization participation	Measure of changes in participation in agricultural organizations, associations, or cooperatives (e.g., rural producer organizations)

Outcome group	Definition	Outcome	Definition
Social (transformative) / linking social capital	Linking social capital is seen in trusted social networks between individuals and groups interacting across explicit, institutionalized, and formal boundaries in society. Linked networks can provide resources and information that are otherwise unavailable.	Equitable household decisions	Measure of changes in participation in household decision-making by women, elderly people, and other marginalized individuals
		Gender equity and inclusion	Measure of changes in the level of equity for women, girls, and sexual and gender minorities, including participation in community organizations, decision-making processes, labor markets, etc.
		Social equity and inclusion	Measure of changes in the level of participation by marginalized groups in their communities in all aspects; this includes minority and youth participation as well as measures of steps that civil society are taking to be more inclusive (women and sexual and gender minorities are captured in the above).
Governance (transformative)	Governance is comprised of various norms and practices related to public affairs and the management of public resources. Access to functional formal and informal governance structures has been shown to play a vital role in resilience.	Local budget allocations	Measure of changes in how local (community and state-level) institutions plan and budget for anticipated shocks in advance
		Institutional accountability	Measure of changes in how public officials and institutions act in the representation or interests of their stakeholders
		Civil society organizationa l resilience and sustainability	Measure of changes in financial sustainability and organizational resilience; this includes measures of internal governance, administration, and management practice, human resources, financial/program management, and access to resources. It also includes measures of civil society organizations' ability to maintain physical and digital security and resist other types of attacks, often within restrictive political environments.
		Management of natural resources	Measure of changes in the sustainable use of major natural resources, including land, water, air, minerals, forests, fisheries, and wild flora and fauna. Managing natural resources for sustainable human use, including working forests and plantations, rangelands and agricultural lands, fisheries, marine and coastal resources, lakes, and rivers.

3. Methods

An EGM is a thematic collection of evidence on the effects of development policies and programs in a particular sector or thematic area (Snilstveit et al. 2017). EGMs are designed around a framework of interventions and associated outcomes, developed through a review of academic and policy literature, as well as consultation with experts and stakeholders. Systematic search strategies are then used to identify, review, and categorize relevant evidence from an expansive list of databases, websites, and gray literature. Included studies are mapped onto the intervention-outcome framework, creating a visualization that clearly presents existing evidence, clusters, and gaps.

The following evidence standards define the 3ie methodology:

- Transparent and explicit populations, interventions, comparator, outcomes, and study design inclusion criteria;
- Expert consultations with advisory groups within USAID RFS and with external sectoral experts;
- Systematic search, screening, and data extraction procedures; and
- Critical appraisal of SRs.

Using 3ie's EGM software, we created an online, interactive matrix that maps all included studies according to the interventions evaluated and the outcomes reported. This provides a visual display of the volume of evidence for intervention-outcome combination, the type of evidence (IEs, SRs, completed or ongoing), and a confidence rating for the quality of the SRs. The platform provides additional filters so that users can further explore the available evidence, for example, by global regions, income levels, or population. The EGM can be viewed at the following link:
<https://developmentevidence.3ieimpact.org/egm/building-resilient-societies-in-low-and-middle-income-countries-an-evidence-gap-map>.

The team searched 10 academic databases and 44 gray literature sources between February and June 2022. A complete list of evidence sources and search term is available in Appendix C.

After removing duplicates ($n = 66,100$), two of the team's independent reviewers double screened the titles and abstracts of 28,572 records (Appendix B). Double screening was switched to single screening when the agreement rate of the screening decisions reached 85%. The reviewers reconciled any disagreement on their screening decisions. The team then applied the bidirectional encoder representations from a transformers (BERT)-based machine learning model to the remaining 33,081 studies (Appendix B.5).

3.1 Analysis and reporting

To answer research question 1 regarding the extent and characteristics of the evidence base (Section 1.4), we present the distribution of IEs and SRs by date of publication, intervention(s) studied, outcomes reported, and population considered, including regions, countries, and specific population groups. To assess the quality of the SRs included in the EGM, we used a checklist adapted from Supporting the Use of Research Evidence Collaboration and graded the SRs as low, medium, or high confidence (Appendix G). For included medium- and high-confidence SRs, we further extracted

summaries of the key findings for policy implications. This enables readers to focus on narratives of currently available, higher-quality SRs.

To answer research question 2 regarding evidence gaps, we combined knowledge of the distribution of evidence with sectoral knowledge to determine meaningful primary evidence gaps, where no IEs exist, and synthesis gaps, where no up to date or medium- or high-confidence SRs exist, despite a cluster of IE evidence.

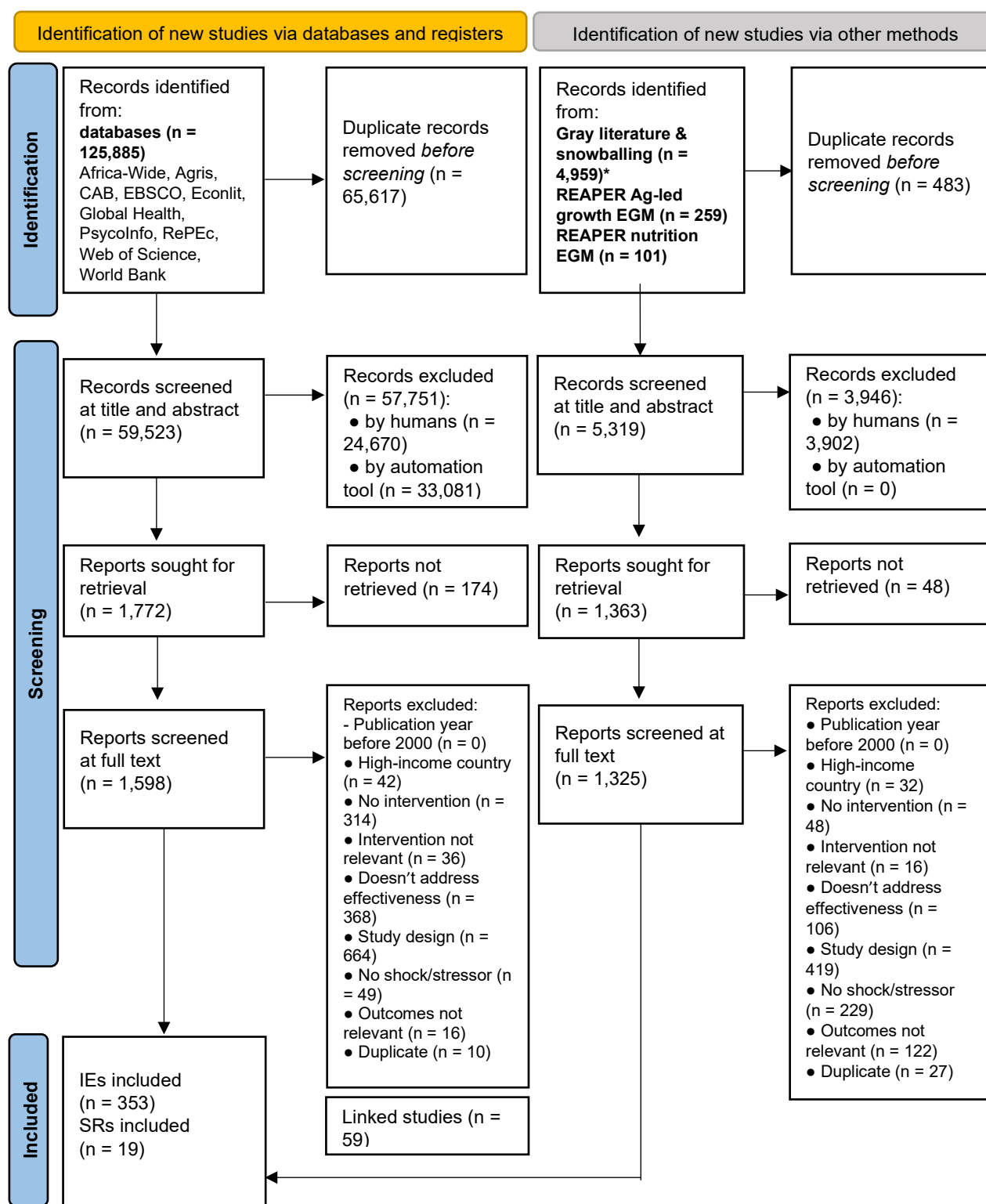
To answer research question 3 as to which evidence and synthesis gaps should be prioritized, we shared draft findings with stakeholders at USAID and the advisory group and solicited input regarding policymaker and practitioner priorities for future research.

4. Findings

4.1 Volume of evidence, and SR confidence level

The preferred reporting items for systematic reviews and meta-analyses (PRISMA) diagram in Figure 2 indicates that the evidence search identified 130,942 potentially relevant studies: 125,885 from academic databases, 4,959 from gray literature and snowballing searches, and 360 from two ongoing EGM projects on agriculture-led growth (Engelbert et al. 2022) and nutrition-sensitive programming (Tree et al. 2022) .

Figure 2: Preferred reporting items for systematic reviews and meta-analyses (PRISMA) diagram



Source: Adapted from Page et al. (2020). *Including studies obtained from auto-citation tracking via citation chaser (Haddaway et al. 2021).

Note: REAPER = The RFS Evidence Aggregation for Programmatic Approaches.

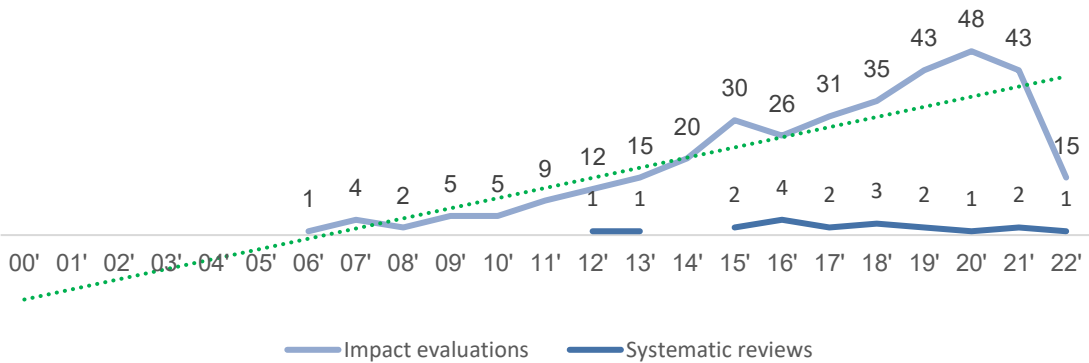
At the title and abstract screening stages, we were able to exclude more than half of the studies using our machine learning tool.² Of 3,126 studies included at title and abstract screening stages, the team retrieved the full texts of 2,967 studies. We were unable to retrieve the full text of 222 citations, mainly due to corresponding full articles not being found online.

We included 479 publications of academic and gray literature in total, covering 362 unique studies (343 IEs; 19 SRs) and 59 linked studies.³

Most IEs and SRs were completed and published (96%), with 15 studies ongoing. Most studies were accessible without any institutional login or paywall (n = 278, 77%). Among included studies, the most common publication type was journal articles (n = 196, 55%), followed by published reports (n = 99, 28%), and published working papers (n = 42, 12%).

There was an increasing number of publications in the last decade, with slight drops in 2016 and 2021 (Figure 3).⁴ We did not identify any visible trends in SRs due to a relatively small number included in the EGM (n = 19). The decrease of publications during 2022 should be interpreted with caution, as it only captures studies published through our final date of evidence search, June 2022.

Figure 3: Publication trend of included studies (2000–2022)



Note: The figure represents the number of publications of academic and gray literature by year. The numbers for 2022 only represent studies published through June 2022, the last date of the evidence search. The green dotted line represents a publication trend of the total IEs and SRs included in the EGM.

² See “Model accuracy and potential for missed studies” in Appendix B for additional detail on the potential for missed papers. It is worth noting that we deliberately adopted a very sensitive search strategy that was designed to capture as many relevant studies as possible, at the cost of also retrieving large numbers of irrelevant items. Compared with a more precise search strategy (i.e., one that retrieved fewer numbers of both relevant and irrelevant items), our approach to search and screening may have reduced the percentage of eligible studies we identified relative to our search results, while increasing the percentage of eligible studies identified relative to the entire literature.

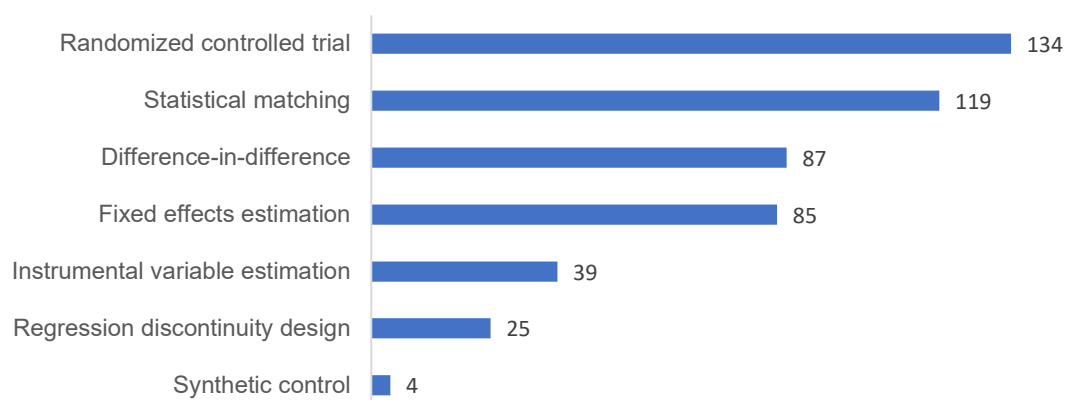
³ Studies were identified as “linked” if they had the same authors, study designs, and interventions and outcomes of interest (e.g., if a working paper was linked to a journal article by the same authors who assessed the same intervention, used the same study design and data sample, and measured the same outcomes of interest).

⁴ This trend is based on 359 unique studies. A total of 59 linked studies are omitted because they have the same authors, intervention, and outcome focus as the unique studies.

4.1.1 IE methods

Figure 4 shows the number and distribution of study designs utilized by included IEs. Among all studies ($n = 343$), 209 implemented quasi-experimental designs as the primary identification strategy (i.e., statistical matching, difference-in-difference, fixed effects estimation, instrumental variable estimation, regression discontinuity design, and synthetic control). The remaining 134 studies were randomized controlled trials. Ninety studies utilized mixed methods, combining quantitative and qualitative methods to improve interpretation of results.

Figure 4: IEs by study design



Note: The numbers in the figure represent counts of primary identification strategies utilized by IEs. If a study has more than one study design used, multi-coding was allowed. Up to three designs were coded per study if applicable.

4.1.2 SR confidence level

Out of the 19 included SRs, we assessed five of them as high-confidence, one as medium-confidence, and nine as low-confidence, and two were ongoing. The most frequent reason downgrading was insufficient information on quality appraisals/risk of bias of studies included in a review (e.g., no source of tools used for the quality appraisals/risk of bias) ($n = 7$), lack of clear reporting of the characteristics of the included studies ($n = 6$), and no indication of avoiding study selection bias (e.g., independent screening of studies by at least two reviewers) ($n = 6$).

4.1.3 Ethics approval

Only fourteen per cent of the IEs ($n = 48$) explicitly specified any ethics approval received for their research (Figure 5). Although an absence of reporting should not be interpreted as an absence of securing ethical approvals, it is recommended that studies collecting primary data from human participants undergo ethical review and clearance to minimize potential harm from participating in the intervention or study. These approvals should be explicitly reported to the extent possible.

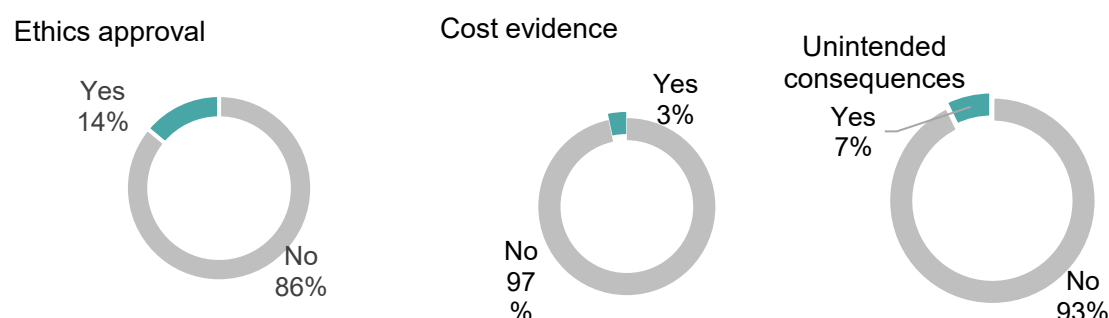
4.1.4 Cost evidence

As reported in Figure 5, only three per cent of included studies (IEs: $n = 12$; SRs: $n = 0$) reported any cost evidence such as cost-benefit analyses (Aker et al. 2011), back-of-the-envelope calculations (Takeshima et al. 2021), or a simple report of total intervention costs (Melesse and Bulte 2015).

4.1.5 Unintended consequences

A limited number of studies (IEs: $n = 25$; SRs: $n = 4$) provided information on the unintended consequences of interventions. Examples include unexpected crop price decreases during a lean season in control group areas, driven by lower demand in markets due to an intervention providing treatment participants with access to cereal banks (Cavatassi et al. 2018).

Figure 5: Ethics approval, cost evidence, and unintended consequences reported in the included studies



Note: Clockwise, the figure represents whether a study provided any ethics approval, cost evidence, and reported any unintended consequences of interventions.

4.2 Characteristics of evidence base

4.2.1 Geographical distribution and context

Our sample included studies from half of all countries categorized as L&MICs ($n = 68$, 50%. Figure 6).⁵ Countries categorized as low income were the most common ($n = 230$, 49%), followed by lower-middle ($n = 170$, 36%) and upper-middle income countries ($n = 70$, 15%).⁶ Sub-Saharan Africa was the most frequently studied region ($n = 232$), followed by South Asia ($n = 83$), Latin America and the Caribbean ($n = 64$), and East Asia and the Pacific ($n = 53$). There were fewer studies in the Middle East and North Africa ($n = 29$), and Europe and Central Asia ($n = 9$).

While the sample had wide geographical coverage, we only identified a few studies in most countries. One exception was that in 18 countries (representing the majority of the evidence base) 10 studies or more were found (Table 3).

⁵ World Bank 2020. <https://datatopics.worldbank.org/world-development-indicators/the-world-by-income-and-region.html>

⁶ If a study focused on 15 or fewer countries, they were counted here. If they focused on more than 15 countries, they were coded as “multicountry” rather than counted individually.

Table 3: A list of countries identified by 10 studies or more

No.	Country	Count
1	Ethiopia	35
2	Kenya	30
3	India	29
4	Bangladesh	22
5	Democratic Republic of Congo	14
6	Indonesia	14
7	Uganda	14
8	Sierra Leone	13
9	China	11
10	Niger	11
11	Philippines	10
12	Colombia	10
13	Tanzania	12
14	Malawi	12
15	Zambia	11
16	Nepal	11
17	Brazil	10
18	Afghanistan	9

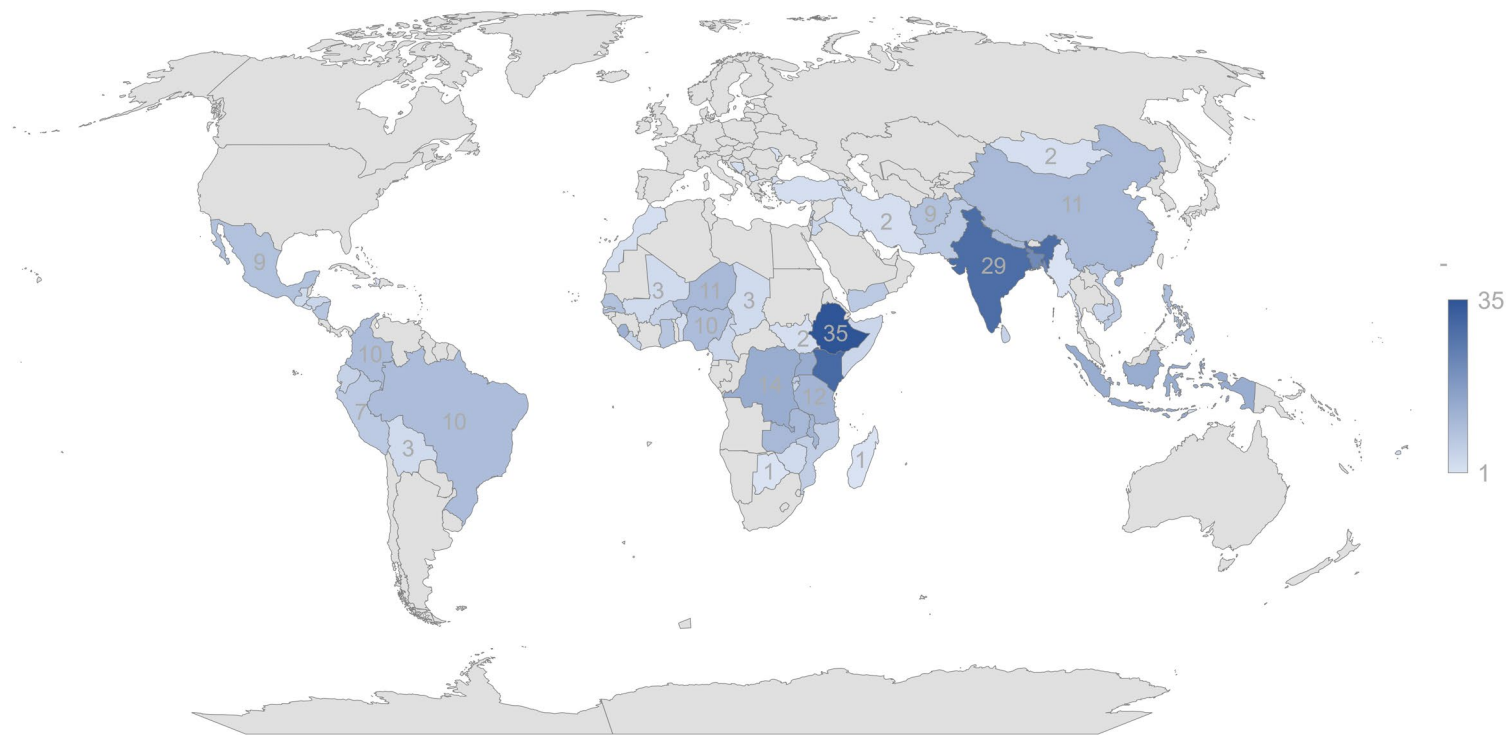
Note: This table presents a list of countries identified by 10 studies or more. The number of studies is indicated under the count column.

Approximately 95 per cent of studies were conducted in contexts classified as high risk for humanitarian crises and disasters, according to the INFORM Risk Index.⁷ However, we found no studies from the Central African Republic, which was marked as one of the most vulnerable countries to crises and disasters in 2022.⁸ No studies evaluated interventions in 16 other high-risk L&MICs, including Burkina Faso, Sudan, Libya, and Papua New Guinea.

We observed no visible trends in geographical coverage by publication year between 2000 and 2022, other than the emergence of studies implemented in Latin America, the Caribbean, Middle East, and North Africa from 2012 onwards.

⁷ Based on the INFORM Risk Index score, countries scored between 5.1 and 9 are at higher risk. (Disaster Risk Management Knowledge Centre 2022). <https://drmkc.jrc.ec.europa.eu/inform-index/INFORM-Risk/Risk-Facts-Figures>. This is one of the indices that can show a country's risk level against shocks and stressors. The index uses three dimensions: hazard and exposure, vulnerability, and lack of coping capacity.

Figure 6: Geographical range of IEs and SRs



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Note: The numbers in the figure represent the frequency of L&MICs identified in 349 of 362 studies. The figure does not assign a country label to nine studies (IEs: n = 3; SRs: n = 10) because nine of these were multicountry cases. A study was coded as “multicountry” if the paper included more than 15 countries.

4.2.2 Shocks/stressors and recurring crises, sex, age, and settings

Shocks/stressors

We classified studies according to the type and speed of the emergency and shock referenced in the observation period of the study, drawing on the INFORM methodology (DRMKC-INFORM 2022).⁹ Figure 7 below displays the frequency of shocks and stressors reported in the studies included.¹⁰

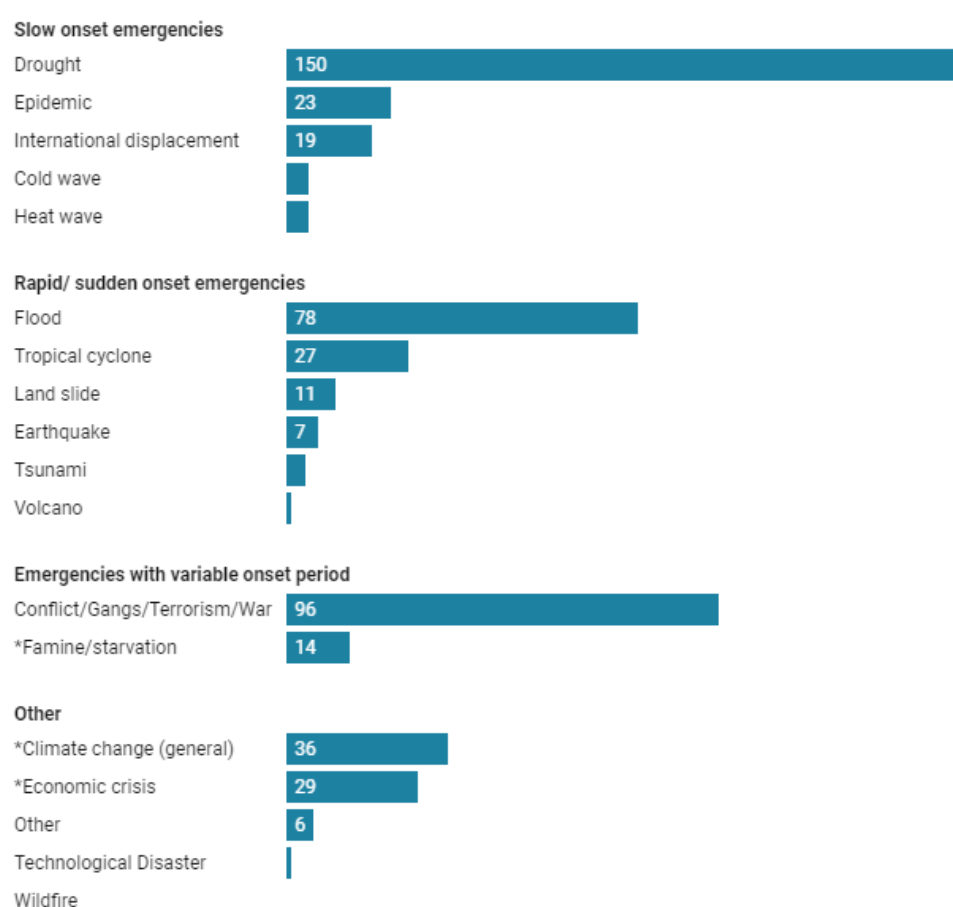
Slow onset emergencies were the most common among the included studies (n = 203, 39%), with droughts most frequently reported (n = 150). The next common was rapid and sudden onset emergencies (n = 128, 25%) such as floods (n = 78), and variable onset period emergencies (n = 110, 22%), such as civil or political conflicts, gangs, terrorism, and wars (n = 96). Few studies examined cold waves (n = 5, 1%), heat waves (n = 5, 1%), technological disasters (n = 1, < 1%) or volcanic eruptions (n = 1, < 1%). We found no studies of interventions addressing or relevant to wildfires. Six studies reported “other” types of shocks and stressors, such as massive pest infestations.

We examined how the types of shocks and stressors referenced in included studies changed over time. Epidemics increased in the last three years, mainly due to the COVID-19 pandemic. During 2020, they represented 6% of the included evidence base, and increased to 37% in 2022. On the other hand, studies mentioning conflict, gangs, terrorism, and war comprised approximately 30% of the evidence base in 2015, dropping to 20% from 2020 onwards.

⁹ Provides classifications based on types and speed at which an emergency occurs (i.e., rapid, sudden, slow, and variable). See Appendix D for more typology and definitions.

¹⁰ Multi-coding was allowed if more than one type of shock or stressor was mentioned in intervention contexts.

Figure 7: Types of shocks, stressors and recurring crises



Source: Adapted from the INFORM methodology (DRMKC-INFORM 2022). Asterisked types were created by 3ie during review of included studies.

Note: The figure represents the number of times each shock or stressor was mentioned. Multi-coding was allowed if more than one type of shock or stressor was mentioned as an intervention context in a study. “Climate change (general)” was coded if no specific shocks, stressors, or recurring crises were mentioned except overall climate change. “Tropical cyclone” includes hurricanes, cyclones, typhoons, and storms.

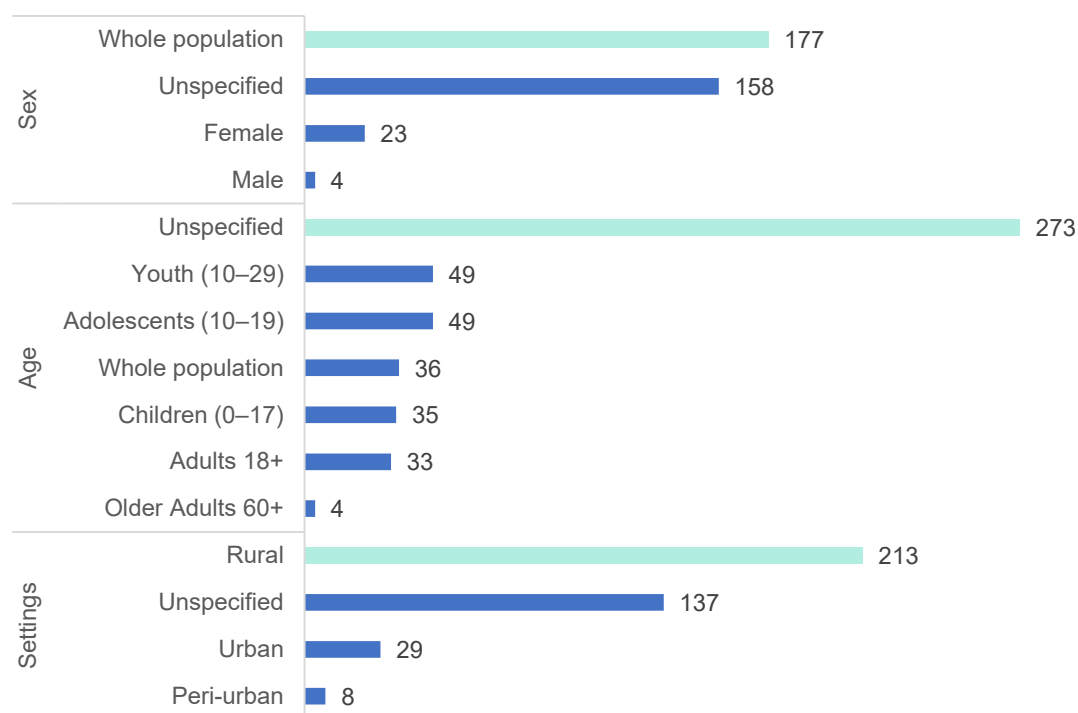
Sex, age, and settings

Figure 8 indicates which types of population sex, age, and residence area (i.e., settings) the interventions targeted. It was most common for interventions to target both women and men ($n = 173$, 48%) in rural areas ($n = 209$, 55%). In terms of age, youth ($n = 49$, 24%) and adolescents ($n = 49$, 24%) were targeted most often, however, in 269 studies the age was not specified. Males ($n = 4$, 1%), older adults ($n = 4$, 1%), and peri-urban areas ($n = 7$, 2%) were least reported as intervention targets. Most studies did not report specific information on population characteristics that were targeted; that is, they did not explicitly report which sex, age and setting types were of programmatic interest (unspecified sex: $n = 157$, 44%; unspecified age: $n = 269$, 75%; unspecified settings: $n = 137$, 38%).¹¹

¹¹ Characteristics of intervention targets were coded if there was an explicit reference to any of the pre-defined options of the data extraction tool. If not, the “unspecified” code was used.

Targeting criteria were sometimes associated with specific interventions. For example, around 80% of the interventions providing risk transfer and other financial instruments explicitly targeted rural areas only (n = 18); 20% were “unspecified” (n = 5). Interventions falling under social cohesion and conflict resolution domains mainly targeted younger demographic groups such as children, adolescents, and youth, while those under social protection mostly did not deploy targeting strategies. Social protection programming was the only domain in this EGM framework where targeting adults aged 60 or older appeared.

Figure 8: Sex, age, and settings targeted by interventions



Note: This figure represents the number of studies reporting any population characteristics of sex, age, and settings that interventions targeted. Age ranges partly overlap between children, adolescents, youth, and adult groups. Multiple coding of age was allowed.

4.2.3 Distribution of studies across interventions

Figure 9 shows the distribution of studies across intervention categories within each domain and by type of study (IE or SR). Studies examined 429 different intervention activities (IEs: n = 407; SRs: n = 26), and because some studies evaluated multiple interventions separately (in multi-arm studies, each arm is counted as one separate study), the total count of interventions is higher than the number studies.

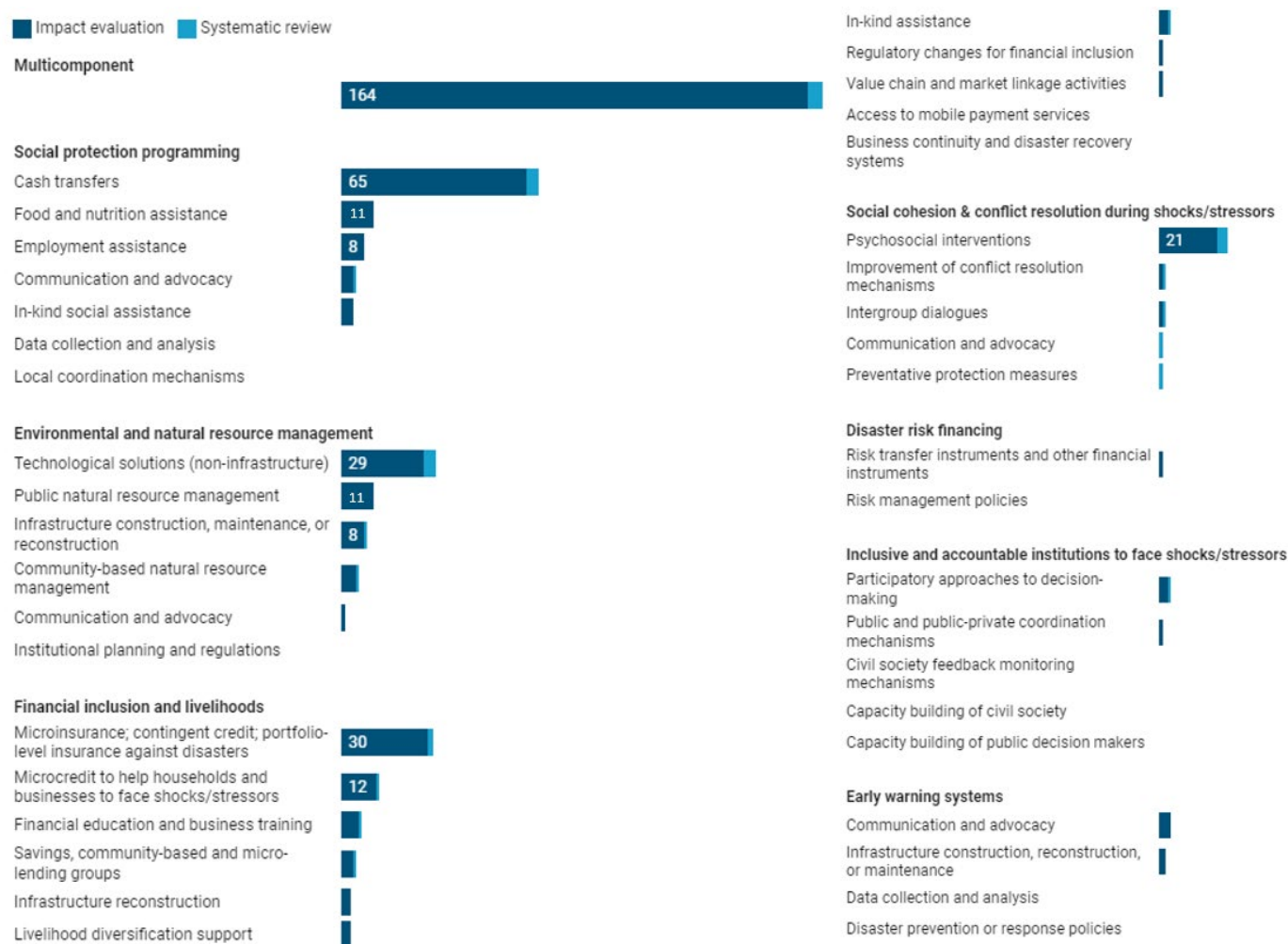
A key trend in this literature is the high prevalence of studies evaluating multicomponent interventions, that is, the combination of multiple intervention strategies (e.g., cash transfers plus microinsurance). Of 362 studies, 148 (IEs: n = 144; SRs: n = 4) reported 169 multicomponent interventions. The high prevalence of multicomponent interventions reflect the sector’s increasing adoption of multisectoral approaches (as also discussed in the background). In Section 4.2.5, we describe the characteristics of these multicomponent interventions in more detail.

Within the remaining studies that assess “single” interventions (e.g., cash transfer only), the most prevalent were those belonging to the social protection programming domain (IEs: n = 96; SRs: n = 4), with cash transfers representing the largest intervention category for both IEs and SRs (n = 65; n = 4). The financial inclusion domain was the second largest category (IEs: n = 63; SRs: n = 6), with microinsurance predominant (IEs: n = 30; SRs = 2), followed by microcredit (IEs: n = 12; SRs = 1), financial education (IEs: n = 6; SRs: n = 1) and social cohesion and conflict resolution, where the psychosocial intervention category was the largest with 21 IEs and four SRs. Environmental and natural resource management was the third largest domain (IEs: n = 54; SRs: n = 7), with technological solutions (non-infrastructure) the largest subgroup for both IEs and SRs (n = 29; n = 2).

While we found clusters of evidence across intervention domains, we did not find many studies evaluating most of the 40 intervention types included. Of these, 22 had fewer than ten studies and 11 had no studies. These include studies related to institutional policies and regulations from the early warning system domain, and risk management policies under the disaster risk financing domain.

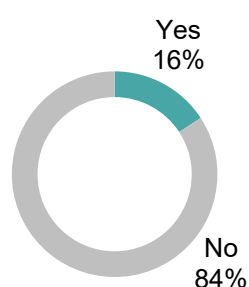
Among the included studies in the EGM, 57 (16%) pertained to interventions using digital devices or platforms such as mobile phones, computers, television, video, the Internet, radio, and social media (Figure 10). Examples include cash transfers via mobile phones (Aker et al. 2011), crop insurance interventions using a tamper-proof smartphone app (Kramer et al. 2018), and social cohesion-oriented messaging via radio and social media (Finkel et al. 2018).

Figure 9: Study arms by intervention domain and category, divided by study type



Note: The numbers in the figure represent intervention distributions by domain, category, and study type. If a study has more than one intervention arm, multi-coding was conducted.

Figure 10: Digitalization



Note: the figure represents whether interventions used any digital devices or spaces (e.g., radio, social media).

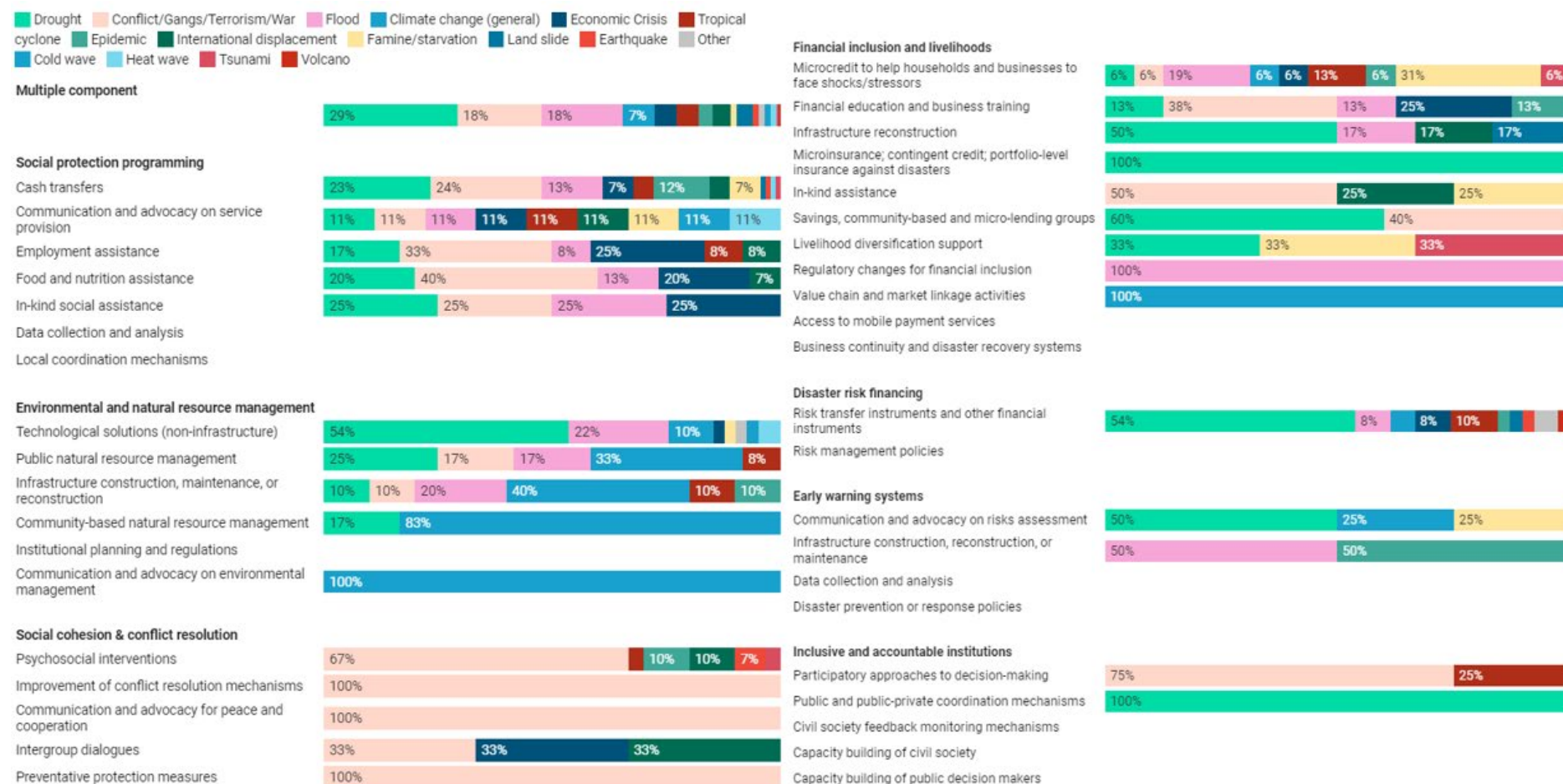
4.2.4 Interventions by shocks, stressors or recurring crises

Figure 11 shows the distribution of evidence examining different types of shocks and stressors by intervention domain and disaggregates this information by category. If more than one shock or stressor was mentioned in the study, it was coded under each applicable type. The shocks and stressors mentioned most frequently in studies examining multicomponent interventions are droughts ($n = 70$), conflicts, gangs, terrorism, and war ($n = 42$), and floods ($n = 41$) (Section 4.2.5).

Cash transfer interventions were implemented to address the widest variety of shocks/stressors, such as conflict, gangs, terrorism, and war ($n = 23$), drought ($n = 21$), floods ($n = 12$), and economic crisis ($n = 6$). Six studies mentioned “other” shocks, stressors or recurring crises that were not defined in our typology, such as massive pest infestations. These were found in multicomponent categories ($n = 3$), disaster risk financing ($n = 2$), and the environmental and natural resource management intervention domain ($n = 1$).

As would be expected, approximately 70 per cent of “single” interventions on conflict resolution were reported within conflict, gangs, terrorism, and war contexts ($n = 25$). The remaining 30 per cent mentioned other types of shocks and stressors such as international displacement ($n = 4$), epidemics ($n = 3$), earthquakes ($n = 2$), economic crisis ($n = 1$), and tropical cyclones ($n = 1$). Studies reporting on epidemic shocks were related to psychosocial interventions during the COVID-19 pandemic (Carney et al. 2021; Gadari et al. 2022) and Ebola outbreaks (Bandiera et al. 2020).

Figure 11: Distribution of shocks by intervention type



Note: The numbers in the figure represent shock and stressor distributions by intervention category. If a study has more than one shock or stressor type, or intervention category, multi-coding was allowed. The shock and stressor type “other” (n = 6) refers to those not categorized by any of the listed shocks and stressors, which were mostly about massive pest infestations in the targeted areas.

4.2.5 Multicomponent interventions

As indicated above, a significant share of the literature assessed multicomponent interventions (41%, $n = 148$ studies). Because some studies examined different combinations of interventions, the studies cover a larger number of interventions (169 different multicomponent interventions; IEs: $n = 164$; SRs: $n = 5$). Figure 12 indicates the number of multicomponent interventions falling within each intervention domain.

Within multicomponent interventions, there is significant diversity in the ways in which programs combine different strategies. Originally our approach was to identify “common packages.” However, the large number of unique combinations of strategies makes an analysis at the intervention category level challenging.

To give a sense of the types of approaches that are typically combined, we present a summary of how programs combine strategies that fall into multiple intervention domains. If a multicomponent combination was found in seven or more studies, we presented that intervention domain combination as a new intervention category on the map. This threshold was chosen because combinations with fewer than seven studies did not have discernable similarities or patterns. For the remaining studies, we grouped them into a “multicomponent mix” category.

The “multicomponent mix” category comprised the largest proportion of the multicomponent interventions ($n = 64$). Next, the social protection domain was the most studied among multicomponent approaches. Twenty-five multicomponent interventions combined some forms of social protection with financial inclusions and livelihoods domains, followed by 21 with different intervention categories within social protection.

Ten multicomponent interventions used diversified approaches from environmental resource management, early warning systems, financial inclusion, and inclusive and accountable institutions domains. Ten multicomponent interventions combined environmental resource management approaches with financial inclusion. Finally, nine multicomponent interventions combined different intervention categories within the financial inclusion domain.

The intervention categories most often combined with other strategies were cash transfers ($n = 125$), technological solutions (non-infrastructure) ($n = 73$), communication and advocacy ($n = 57$), financial education and business training ($n = 46$), and participatory approaches to decision-making ($n = 36$). A full list is available in Appendix E.

Multicomponent interventions may try to tackle vulnerability through different programming approaches. For instance, an intervention might deliver cash transfers, early warning systems communication, and microinsurance. We explore the relationship between shocks and stressors mentioned among multicomponent intervention studies in Figure 13. There are visible patterns for some categories; for example, financial inclusion and livelihoods + environmental and natural resource management + inclusive and accountable institutions were only implemented in the context of natural disasters such as drought (40%), flood (40%), and climate change effects in general (20%).

However, most multicomponent interventions were implemented to tackle numerous shocks. For example, social protection + inclusive and accountable institutions were

generally implemented in conflict, gangs, terrorism, and war contexts (88%), but also during economic crises, which are likely linked to these contexts.

Environmental and natural resource management + financial inclusion and livelihoods + early warning systems + inclusive and accountable institutions were mainly implemented in drought (35%) or flood (28%) settings, but also in nine other types of shocks and stressors. The combination of categories falling under social protection programming was mainly implemented in the context of displaced populations (26%), drought (26%), conflict, gangs, terrorism, and war-affected settings (17%), and six other shocks and stressors settings.

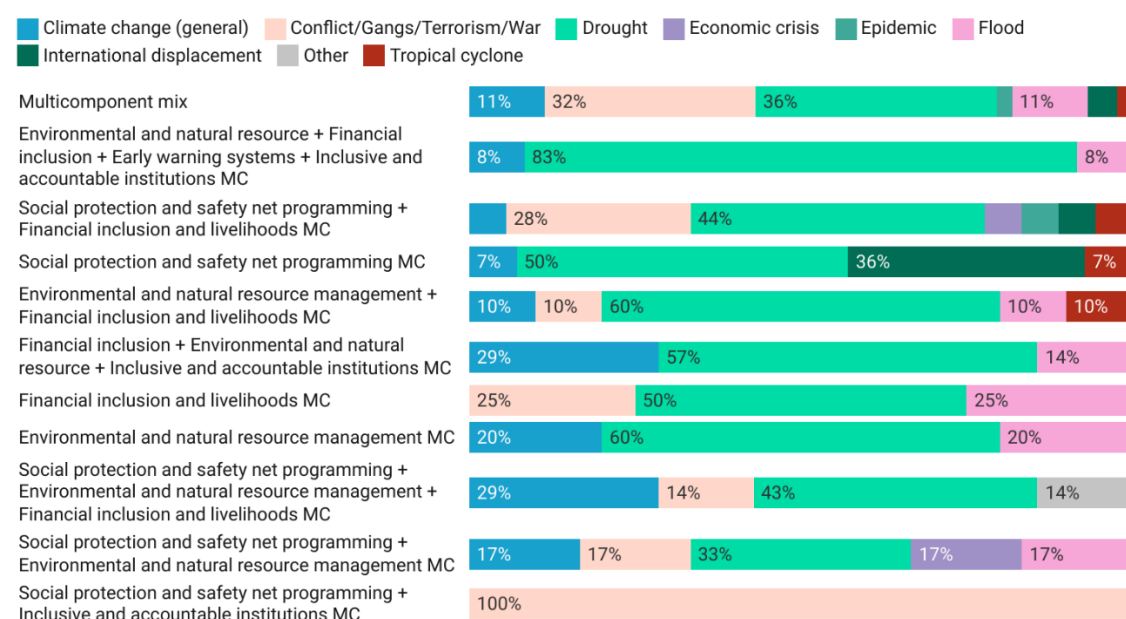
Figure 12: Multicomponent interventions by intervention domain



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Note: MC = multicomponent. This figure presents the most common MC intervention combinations at the intervention domain level. The “multicomponent mix” category comprises intervention category combinations where fewer than seven studies were found.

Figure 13: Multicomponent domains by types of shocks and stressors



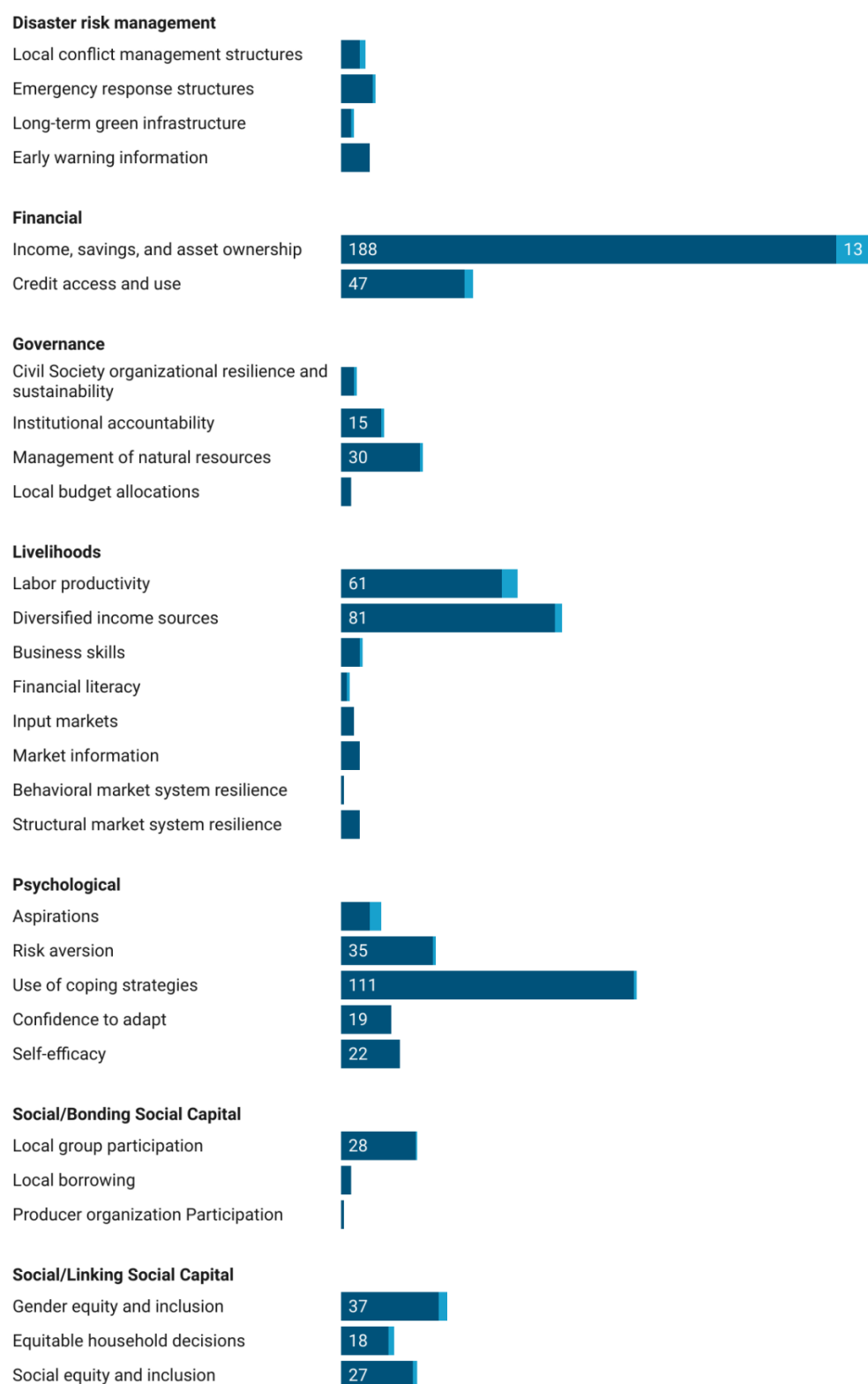
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Note: MC = multicomponent. This figure presents the distribution of shocks and stressors mentioned per MC study group. If a study had more than one multicomponent group, that study was counted twice or more, depending on how many multicomponent groups it had.

4.2.6 Distribution of studies across outcomes

Most of the studies examined more than one outcome (outcome n = 848 among n = 362 studies). Figure 14 indicates the distribution of outcomes examined in each intervention category, separated by study type. The full description of these outcomes is presented in the framework in Section 2.3.

Figure 14: Outcome distributions by outcome domain, type of capacities, and study type



Created with Datawrapper

Note: Numbers indicate outcomes assessed by the included studies. Multi-coding was allowed if a study had more than one outcome type. Defined ways of using resilience capacities adapted from Vaughan (2018).

All 29 outcome categories listed in our framework were represented in the included studies. For IEs in particular, the most common outcome category was income, savings, and asset ownership (n = 199) in the financial (absorptive/adaptive) domain, followed by coping strategies (n = 111) in the psychological (adaptive/absorptive) domain. Other financial outcomes, including credit access and use (n = 50) and livelihood-related outcomes, such as diversified income sources (n = 84) or labor productivity (n = 61), were more commonly examined. This is likely due to the number of studies evaluating social protection programming interventions, such as cash transfers.

Outcomes at the transformative level, and those measuring system-wide or institutional-level change were less frequently examined. This may be due to challenges such as conducting IE study designs appropriate for assessing systems-wide interventions and the longer time horizons needed to measure such outcome changes.

Among SRs, the three most common outcome domains were financial (absorptive/adaptive) (n = 14), livelihoods (adaptive) (n = 10), and social/linking social capital (transformative). Like IEs, the most common outcome category examined in SRs was income, savings, and asset ownership (n = 8). No SRs assessed diversified income sources, although we found this outcome measured in 81 IEs. We also found no SRs examining nearly half of our outcome categories (13 of 29), including those on market system resilience and long-term green infrastructure. The lack of SRs examining outcomes at the transformative level may be due to the same reasons described above.

4.2.7 Implementation and funding agencies

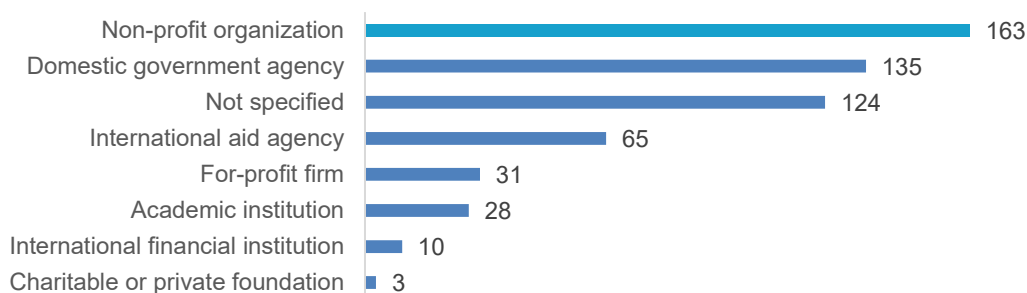
We extracted data on who implemented programs in the included studies, who funded the program, and who funded the study. We categorized agency types as follows: (1) implementation agencies refer to any agency who implemented interventions within the EGM scope; (2) program funding agencies are funders who financially supported the interventions; and (3) research funders are those who funded the research (IEs or SRs). The latter two funders are not necessarily the same. Examples include a study by Syll et al.(2020) that assessed impacts of weather index-based insurance and loans; the intervention was funded by the government of Senegal, while the research was funded by 3ie and the UK Foreign, Commonwealth & Development Office.

Thirty-eight per cent of the studies did not include data on implementation, program funding, or research funding agencies (Figure 15). Non-profit organizations were the most frequently mentioned intervention implementation agency (n = 163, 37%). Examples include the International Rescue Committee, Mercy Corps, and Oxfam. International aid agencies, which refer to public and private agencies providing bilateral or multilateral development aid, were the key funding source for both programs (n = 106, 38%) and research (n = 123, 24%). Examples include the UK Foreign, Commonwealth & Development Office, Irish Aid, UNICEF, and USAID (for definitions of agency types, see Table 4 of Appendix B.7).

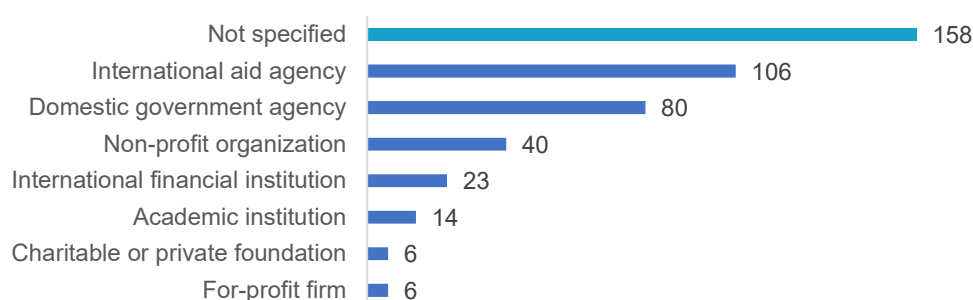
Charitable or private foundations were the least common organization to implement (n = 3, < 1%) or fund programs (n = 6, 2%). For-profit firms were the least common program funders (n = 6, 2%), and research funders (n = 2, < 1%) overall.

Figure 15: Implementing and funding agencies

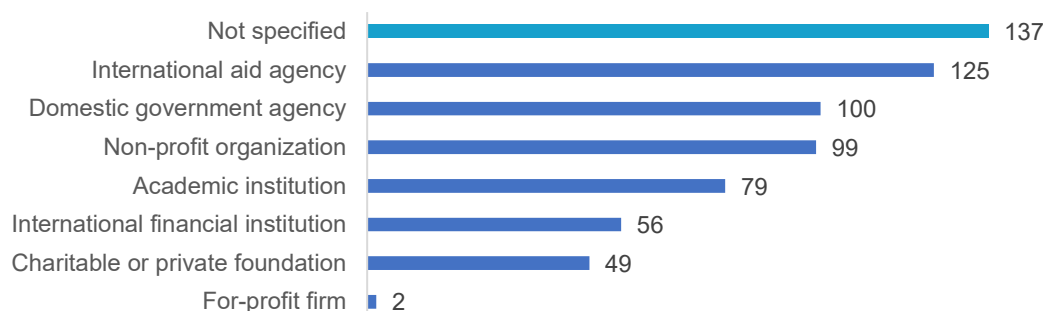
Implementing agency



Program funding agency



Research funding agency



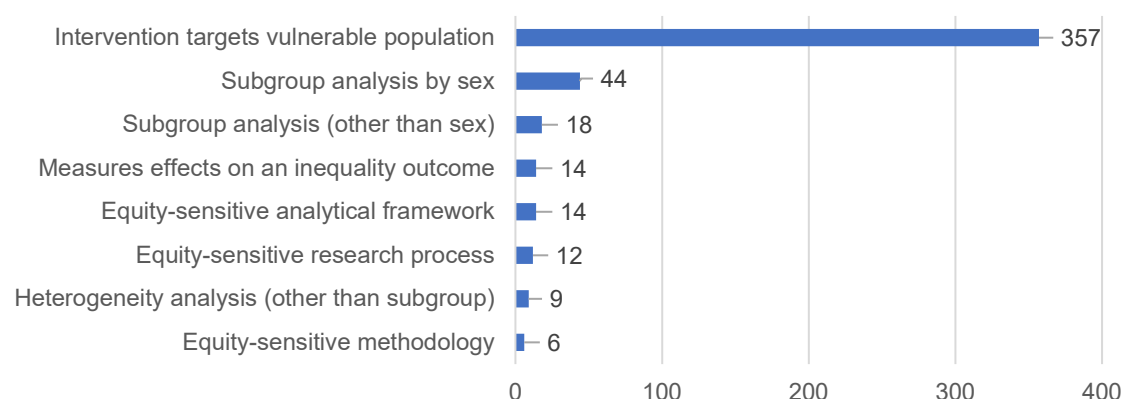
Note: Numbers in the figure represent frequencies of any reported intervention implementers, and program and research funders. Multiple agencies were coded from a study, if applicable. The team extracted data only when a study explicitly mentioned any agency of the following: those who implemented interventions in the studies' interest (implementing agencies), those who funded interventions (program funding agencies), and those who funded research (research funding agencies). Studies do not necessarily have the same agencies in the above three aspects. See Appendix B for more details.

4.2.8 To what extent do studies address equity?

We extracted data on how, and the extent to which, studies address equity (see full definitions in Table 5 of Appendix B.7). As shown in Figure 16, we classified studies according to nine different equity dimensions. All included studies targeted vulnerable populations. This is likely due to our EGM inclusion criteria of settings affected (or potentially affected) by covariate shocks and stressors. The second most-common equity focus was conducting subgroup analyses to assess differential impacts by equity-related attributes ($n = 62$), such as sex, and the socioeconomic status of participants.

None of the studies explicitly mentioned incorporating equity-sensitive ethical research practices, such as ethical considerations for working with vulnerable populations during data collection and analysis. Only a few studies used equity-sensitive methodologies (n = 6), such as in-depth interviews, focus groups or life histories to observe contextual factors that may account for differential impacts.

Figure 16: Equity focus



Note: Numbers in the figure represent the frequency of equity focus reported in the study designs. If applicable, multiple focus types were coded from a study. Equity-sensitive analytical framework refers to studies theoretically discussing the role of drivers of equity considerations in studies' analytical framework contexts or theories of change (e.g., an IE using a gender analysis framework). This is different from "measures effects on inequality outcomes" code, which refers to inequality outcome indicators being measured in a study (e.g., income inequality). Subgroup analyses refer to splitting participant data into subsets (i.e., subgroups) to analyze differences in effect sizes. See full definitions in Table 5 of Appendix B.7.

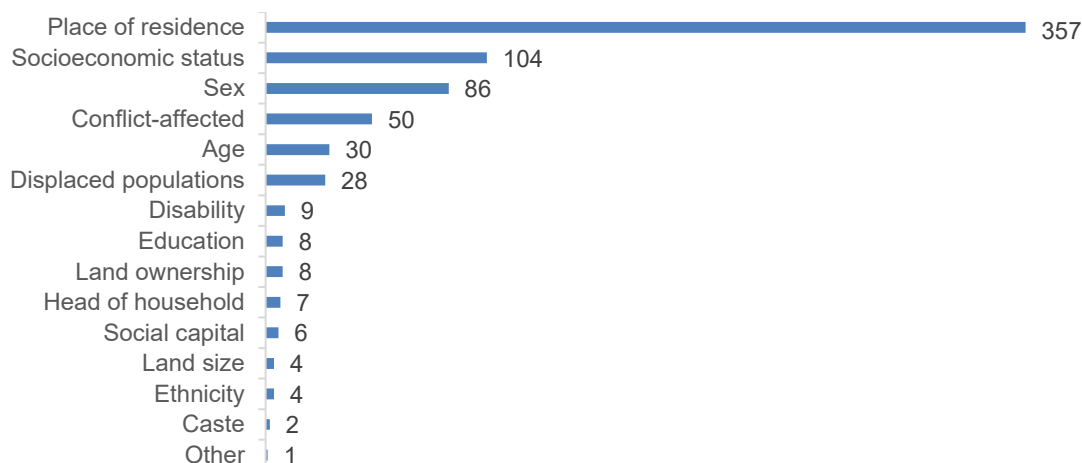
Figure 17 presents the dimensions of equity in the included studies. A study could address more than one equity dimension; for example, if an intervention explicitly targeted women or children living in a drought-prone area, the equity focus was coded as "intervention targets vulnerable population" and the dimension as "age, sex, and place of residence."

Other than populations living in shock- or stressor-prone areas (place of residence), interventions also often targeted vulnerable populations based on their socioeconomic status (n = 89), conflict-affected status (n = 48), or sex (n = 29). In nine studies mentioning the dimension "disability," the focus was related to "intervention targets vulnerable population," although only three studies explicitly reported that organizations working with persons with disabilities (e.g., the Ethiopian Center for Disability and Development) were involved in implementing these interventions.

The most-discussed dimension within the studies was "place of residence," which is consistent with our findings on interventions targeting those living in shock- and stressor-affected areas. This was followed by socioeconomic status (n = 104), sex (n = 86), and conflict-affected (n = 50). Socioeconomic data from intervention participants were used to assess differential impacts via methods such as subgroup or heterogeneity analyses (n = 9).

The dimension “sex” was mainly connected to the subgroup analysis by sex (n = 44), but also using an equity-sensitive analytical framework (n = 8), and effects on inequality outcomes (n = 7). The dimension “conflict-affected” was largely related to the focus type “intervention targets vulnerable population” (n = 48), with very few subgroup analyses (n = 2). One study reported “other,” which pertained to sexual violence survivors targeted by the intervention (Bass et al. 2016).

Figure 17: Equity dimensions



Note: Numbers in the figure represent frequencies of equity dimensions reported in the included studies. If applicable, multiple dimension types were coded from a study.

4.2.9 Key findings from high-confidence SRs

This section presents key findings and policy implications from the seven high-confidence SRs represented in the EGM. Appendix H includes summaries of each of the individual SRs.

Conditional and unconditional cash transfers seem to increase household savings and assets

Overall, cash transfers seem to increase household savings and assets. Evidence from across three SRs suggests that cash transfers (both unconditional and conditional) can increase household savings and assets, as well as household food security – an outcome which was not included in our framework as stated in the limitation section below but is relevant to resilience and therefore reported here. Below are the main findings and recommendations from the three SRs on cash-based interventions (Doocy and Tappis 2017, 113 studies; Lwamba et al. 2022, 104 studies; Pega et al. 2015, 3 studies).

Findings vary on the relationship between cash transfer programs and MHPSS outcomes. Cash transfer programs had lower administrative costs, which resulted in reaching more beneficiaries than traditional aid. Some studies in the SRs indicated no effect of unconditional cash on selected health and mental health outcomes. This indicates that both positive and negative effects are reported across reviews. Contextual and implementation factors, such as the geographical spread of a disaster, likely impact effectiveness, including how cash transfers can be disbursed to affected populations.

Variables related to implementation quality (e.g., targeting, security, implementation capacity and training) are important for the effectiveness of cash programs in emergency contexts.

Evidence on the relative effectiveness of unconditional, conditional, in-kind, and voucher modalities are mixed, and insignificant results are frequently reported. Contextual factors such as being in conflict-affected or post-drought settings are essential in understanding relative effectiveness in emergency contexts.

MHPSS interventions have some limited effects on increasing hope and social support

Below are the main findings and recommendations of the two SRs that included MHPSS interventions (Bangpan et al. 2017, 59 studies; Purgato et al. 2018, 11 studies). We used the umbrella term MHPSS, as psychosocial support interventions were often complemented with interlinked mental health components.

Contextual and implementation factors were major determinants of effectiveness in MHPSS-related interventions. Community engagement (including family engagement) was a common facilitator across the two reviews, as well as provider trainings, in one review (Bangpan et al. 2017).

Evidence from one review (Purgato et al. 2018) suggested that MHPSS interventions for children can be effective in improving coping strategies, hope for the future, and the ability to build social support. By contrast, Bangpan and colleagues (2017) found limited evidence on increasing hope (0.45 Hedge's g; 0.19; 0.71; 5 studies) and building social support (-0.41; -0.88; 0.07; 2 studies). They found insufficient evidence for coping, grief, suicide, guilt, stigmatization, and resilience. In adults, authors found moderate evidence for building social support (0.08 Hedge's g; -0.49; 0.64; 2 studies). Due to the limited number of studies included in the meta-analyses, results should be interpreted with caution.

Improved agricultural technologies practices to face climate change seem to have positive effects on farmers' vulnerability and income

Agricultural technologies such as improved seeds seem to have positive effects on economic outcomes as reported by the two high confidence SRs (Stewart et al. 2016, 19 studies; Garbero et al. 2018, 12 studies).

Both reviews reported positive effects on income. In one case (Stewart et al. 2016) this was a consequence of introducing orange-fleshed sweet potato and training, while in the other case (Garbero et al. 2018) it was the result of using improved seeds that were resistant to some effects of climate change, such as drought. In the first review, they also found positive effects on food security, while in the second they found positive effects on productivity (welfare); overall, however, the evidence remains limited and of low quality.

Findings from the medium-quality SR on index-based insurance suggests that there might some positive effect on managing risks; it is limited, but this SR is eleven years old therefore out of date (Cole et al. 2012, 12 studies). Authors found positive effects of insurance take-up on the use of fertilizers or hybrid seeds to manage risks, but the evidence is extremely limited (two studies); no effects were found on the adoption of irrigation practices (seven studies). Four studies looked at the effects of insurance on income and found positive effects, though not always significant, and three other studies reported positive effects. Finally, five studies showed mixed results on the effects of the insurance on assets. These results are derived from single-study effect sizes, as no meta-analysis was performed, so we warn to use them with caution.

5. Discussion: what are the key evidence gaps?

The map provides a graphic display of the included studies, with each study mapped according to the intervention/outcome intersection(s) they cover. The size of the bubble indicates the relative size of the evidence base for each intersection. The 19 gray bubbles show IEs, while the colored bubbles show SRs – the colors indicating our confidence level in the findings of the reviews. The EGM highlights two types of gaps: absolute evidence gaps, where few or no studies have been conducted, and synthesis gaps, where there is a lack of up to date, high-quality SRs. We describe these evidence gaps in more detail below.

5.1 “Absolute” evidence gaps

Overall, the evidence is concentrated around a few intervention categories, such as cash transfers, leaving most of the others understudied, considering the broad scope of this map.

For many intervention categories, we identified no or few studies. This includes data collection and analysis for early warning systems, business continuity and disaster recovery systems, capacity building of civil society, civil society feedback monitoring mechanisms, access to mobile payment services, disaster risk financing risk management policies, institutional planning and regulations related to resources management, preventative protection measures within social cohesion and conflict resolution, data collection and analysis for social protection programming, and local coordination mechanisms for social protection programming.

The lack of studies for these categories may be due to the difficulty of evaluating some of these interventions, especially in contexts where shocks and stressors are relevant. However, the fact that some studies evaluated these types of interventions demonstrates that it is feasible.

IE observation periods are often aligned with program support cycles; this is often a limitation if change is expected beyond the life of the program. For instance, capacity building of civil society, institutional feedback mechanisms, and institutional planning and regulations related to resources management entail institutional processes which require longer time horizons for implementation and expected change.

In other cases, for some types of interventions, resilience is in the early stages of consideration. For instance, preventative protection measures within social cohesion and conflict resolution more commonly report on conflict related outcomes – resilience dimensions are yet to be explored. Finally, our criteria requiring explicit relevance to shock and stressor contexts may have excluded relevant evidence on the general effectiveness of these approaches in non-crises contexts.

A few intervention categories do not appear as single interventions, but they are present in multicomponent interventions. These categories include capacity building for civil society (n = 10), capacity building of public decision makers (n = 9), disaster prevention and response policies (n = 7), local coordination mechanisms (n = 5), business continuity and disaster recovery systems (n = 3), access to mobile payment services (n = 3), data collection and analysis for early warning systems (n = 2), risk management policies (n = 2), data collection and analysis for social protection systems (n = 1), risk financial instruments (n = 1), and civil society feedback monitoring mechanisms (n = 1). Since most of these interventions were implemented in a bundle with others, rather than standing alone, we may know little of their stand-alone effect if studies are not designed to isolate the impact measurement of components within a portfolio.

Three outcomes were evaluated less commonly in the evidence base. These are producer organization participation, behavioral market system resilience, and financial literacy, which were examined in fewer than five studies. The remaining outcomes were present in at least five or more studies. While these outcomes are not relevant for all the intervention categories, three are particularly relevant for interventions falling under the financial inclusion and livelihood domain, where interventions aim to help farmers and/or entrepreneurs to develop business skills, increase access to improved markets or producer groups, and better recover from shocks and stressors. In other interventions such as cash transfers or in-kind assistance, these outcomes are less relevant, and studies exploring these relationships would serve no theoretically justified purpose.

Studies are concentrated in a few countries and regions, which are unsurprisingly those more likely to be affected by disasters and crises (INFORM 2022). The Middle East and North Africa (n = 28) and Europe and Central Asia (n = 9) were less frequently evaluated regions. While Europe is less often affected by crises, North Africa and, in particular, Asia including the Middle East, are frequently severely affected by natural and humanitarian disasters (CRED 2021; INFORM 2022). This highlights a need to know what works for crisis management and resilience strengthening in these contexts. Additionally, 27 of 68 countries covered in this EGM had three or fewer studies, leaving some important geographical gaps.

Given the broad range of shock and stressor typologies the EGM is covering, evidence is limited across most of them. In particular, we found a few or no studies for wildfires (n = 0), volcanic eruptions (n = 1), technological disasters (n = 1), tsunamis (n = 4), cold waves (n = 5), heat waves (n = 5), earthquakes (n = 7), and landslides (n = 11). Other shocks and stressors were examined in at least 14 studies. Gaps on shocks and stressors may be related to the size or severity of devastation. According to a report by ReliefWeb (CRED 2021), the most common disasters between 2001–2020 were floods and storms, followed by earthquakes, extreme temperatures, landslides, droughts, and wildfires. In 2021, wildfire frequencies exceeded drought events globally.

5.2 Synthesis gaps

We identified two clusters of quantitative IEs assessing the effects of single interventions, for which we found no medium- or high-confidence SRs. One cluster comprises technological solutions (non-infrastructure) interventions and their impact on the use of coping strategies outcomes (n = 8). We found no SRs for a cluster of studies examining cash transfer interventions and their impact on the use of coping strategies as an outcome (n = 27).

Contemporary, updated synthesis is needed. Two reviews examining technological solutions (non-infrastructure) interventions on income and savings (Garbero et al. 2018; Stewart et al. 2016), are dated eight and five years old, respectively. The two SRs looking at cash transfers (Doocy and Tappis 2016; Pega et al. 2015) should also be updated as they examine IEs dated eight years, and ample new evidence has since been published. Similarly, the two SRs on psychosocial interventions will need to be updated soon, as both are five years old (Bangpan et al. 2017; Purgato et al. 2018). Finally, the medium-confidence SR on indexed insurance (Cole et al. 2012) was published in 2012, and further evidence has since been published.

There was one cluster of IEs evaluating multicomponent interventions for which we found no medium- or high-confidence SRs. Sixteen primary studies looked at the combination of social protection programming + financial inclusion and livelihoods intervention domains on income and savings. We found one high-confidence SR, but it focused on women only.

There was also a cluster of 30 IEs under the multicomponent mix domain on income, savings, and asset ownership outcomes. However, given the high variability of interventions and their components implemented among those studies, synthesizing them might be more difficult than in a standard SR. On the other hand, a synthesis of this evidence would potentially allow for a better understanding of the contexts and components in which they were implemented.

5.3 Methodological gaps

There is a lack of reporting on the use of equity and gender-sensitive approaches during research. Six studies adopted an equity-sensitive methodology, nine conducted heterogeneity analyses (other than subgroup), 12 adopted an equity-sensitive research process, and 14 reported measures effects on an inequality outcome.¹²

There is a lack of evidence reporting whether unintended consequences occurred as a result of the intervention (n = 25). Reporting unintended consequences can be useful in identifying, for instance, any cases of maladaptation or simply discovering any additional outcomes which were not planned to be measured because they were not inserted in the theory of change.

¹² Heterogeneity analysis (other than subgroups) indicates that rather than just comparing the two subsets of samples, the average treatment effects can be calculated by interacting the treatment with different characteristics, or through a quantile regression, which examines the effects across the range of the outcome variable, as opposed to changes in the mean impact as is the case for ordinary least squares regression, or by estimating marginal effects of the treatment.

We do not know much about the cost of the interventions included in this map. A limited number of studies (n = 12) reported cost evidence data. Understanding not only whether an intervention is effective, but also its costs, can be crucial for a policymaker when deciding which intervention should be implemented.

Mixed methods approaches are not adopted very often. Less than a third of the studies (n = 90) utilized qualitative techniques, which serve an important purpose in unpacking the reasons why interventions work or fail to work, and for facilitating interpretation of quantitative results.

5.4 Limitations of this EGM

EGMs are valuable tools for collating information and describing the evidence base. They do not, however, provide any indication as to whether certain approaches are effective. Evidence gaps do not mean that interventions do not work. Rather, they indicate a lack of knowledge as to whether interventions work. An absence of evidence should not be interpreted as evidence of ineffectiveness. Conversely, a large evidence base could show conclusively that an intervention does not work.

Mapping all the available evidence related to strengthening resilience in L&MICs is an ambitious undertaking. Our need to establish a reasonable scope presented us with decisions that needed to be made within the framework, which could be regarded as limitations. For instance, we did not examine interventions that are theoretically connected to resilience, such as public health or educational sectors, as well as those relevant to building resilience against idiosyncratic shocks, stressors or recurring crisis. There were also more outcomes related to resilience that could be explored, such as food security, child malnutrition, or expenditures and consumption (as is commonly examined in the anti-poverty literature for economic well-being). These are limitations that future research should examine.

6. Conclusions and implications

In considering the evidence base on interventions to strengthen resilience against covariate shocks, stressors or recurring crises, we adopted a broad scope, covering seven intervention domains: (1) disaster preparedness; (2) early warning systems; (3) social protection programming; (4) environmental and natural resource management; (5) financial inclusion and livelihoods; (6) social cohesion and conflict resolution; and (7) inclusive and accountable institutions. Overall, we find a modest, but growing evidence base of 362 studies, 19 of which are SRs, published between 2000–2022.

Considering the broad scope of our map, both substantially and geographically, the evidence base is limited and cash transfers, microinsurance, contingent credit, portfolio-level insurance against disasters, and technological solutions are the only intervention in which the evidence base might be approaching saturation. For all the other areas the evidence base is limited, and 10 interventions have no, or very few, studies identified.

We also see a significant concentration of studies of multicomponent interventions; that is, studies in which the intervention evaluated consisted of several discrete intervention strategies. However, these studies addressed a wide range of combinations of intervention strategies. Aside from nine combinations of interventions domains, it was not

possible to identify common intervention packages. The prevalence of multicomponent approaches likely reflects the reality of programming in this area. Resilience is a multidimensional concept, and it is broadly recognized that people rely on multiple sources of resilience.

The diversity of multicomponent approaches is likely driven by several factors. It may be that intervention combinations are typically tailored to specific contexts to address context-specific barriers to resilience. Alternatively, it may reflect a poorly understood theory of change for how to strengthen resilience, leading program designers to “shoot in all directions” and include many different types of components in the hope that one (or a combination of them) will work. Programming that explicitly targets resilience is a recent development, which may explain why “standard packages” have yet to emerge in the way we see in other sectors.

Identifying effective approaches for strengthening resilience is essential to addressing the risks posed by the increasing rate of natural and human-made shocks and stressors. The evidence identified here provides a good starting point, but also highlights the need for more research. This need is urgent, and we urge funders, implementers, and researchers to adopt a coordinated and targeted approach to addressing the most critical evidence gaps. In the following section, we outline implications for decision makers, researchers, and commissioners.

6.1 What intervention/outcome areas could be prioritized for primary research and/or evidence synthesis?

Not all evidence gaps require further research, particularly if there is no theoretical basis for the intervention and expected outcome (e.g., an early warning systems intervention might not be linked to local borrowing). However, for more frequently implemented interventions, research should be commissioned to fill identified primary evidence gaps. In the evidence gap analysis, we list eight interventions categories which are not studied as single or multicomponent interventions. We also identify other outcomes and geographic and contextual gaps which should be filled.

For example, we did not find any studies measuring important indicators relating to financial inclusion or facilitating environments. Resilience interventions in the Middle East are also understudied, despite the region’s frequent experiences with crises and disasters. Finally, interventions relevant to common shocks like wildfire and extreme temperatures are also understudied. A total of six synthesis gaps – clusters of studies with no medium- or high-confidence SRs – should be considered for systematic review.

6.2 Implications for decision makers

By identifying and making available existing evidence, the EGM aims to provide a resource for decision makers and technical advisors. While the EGM does not provide any indication as to whether certain approaches are effective, it presents a way in which to navigate the existing evidence.

- When funding and designing programs, decision makers may consult the EGM to determine whether rigorous evidence exists for a specific area of interest, starting by looking at any high-confidence SRs. These reviews suggest that:

- Cash-based and technological solutions interventions may tackle multiple outcomes related to resilience, such as household income and assets and food security.
- Psychosocial interventions might help children and adolescents to improve their hope for the future, their coping strategies, and the ability to build social support – although evidence is limited and mixed across the two reviews which reported these findings, and more studies are needed. Community and family support can be a facilitator to reaching these outcomes.
- If a high-confidence SR is not available for the policies and/or interventions of interest, findings from individual IEs should be considered, but treated with caution, as results may not be representative across contexts.
- If there is a cluster of IEs of policies and/or interventions of interest, commissioning a mixed methods SR should be considered to fill these synthesis gaps.
- Studies reporting unintended consequences, which can be filtered in the online map, should be consulted when designing new policies and/or interventions to avoid causing any harm to beneficiaries.
- When funding or designing programs in an area with a limited evidence base, one should consider commissioning an IE to be integrated with program implementation.

6.3 Implications for researchers and commissioners

Resilience is a complex concept, and by its nature, programming often happens in very challenging contexts. This means the costs of research may be higher, with methodological challenges and potential risks to beneficiaries and researchers. However, the emerging evidence base identified in this EGM highlights that conducting IEs is indeed feasible in this field.

- A key implication from this EGM is that there is a need for new IEs to be conducted and commissioned in a more coordinated and strategic fashion to maximize the value of future research investments. The fragmented nature of the current evidence base, including research on multicomponent interventions, limits our ability to synthesize evidence across contexts and draw generalizable conclusions.
- For some contexts and interventions in this field, “traditional” IE designs may not be feasible or appropriate. In such cases, there is a need to consider a broader range of methods, including “small n” study designs (White and Phillips 2012).
- There are few intervention areas in which the evidence base is reaching saturation. This includes cash transfers, microinsurance, contingent credits, portfolio-level insurance against disasters, and technological solutions (non-infrastructure). Therefore, when prioritizing interventions for future studies, commissioners and researchers may focus on areas of promise, or of significant investment in programming.
- Some understudied areas such as the Middle East and Central Asia should be prioritized for future research as they are high-risk regarding climate and social crises.
- There is a lack of SRs looking at the effect of cash transfers and technological solutions (non-infrastructure) interventions on coping strategies. We have also identified a cluster, but no high-confidence SRs, on the combination of social protection programming with financial inclusion and livelihoods intervention domains on income and savings outcomes.

- When commissioning and designing new studies, we suggest that commissioners and researchers consider the following:
 - Adopt study designs that allow a comparison of the relative effectiveness of different types of interventions and ensure a low risk of bias in the study.
 - Adopt theory-based, mixed-methods study designs (Dixon and Bamberger 2022; White and Phillips 2012). Studies incorporating both quantitative and qualitative analyses can help to improve understanding of causal mechanisms, pathways, implementation considerations, context, or intangible outcomes, such as social processes or self-efficacy building.
 - Identify potential for unintended consequences (either positive or negative) *a priori* and assess these, and report any other unintended consequence identified after implementation.
 - Collect data using validated outcome measures, both to improve measurement validity and the consistency of outcome measures across studies.
 - Incorporate equity-sensitive methodologies or research processes, including, but not limited to, assessing effects on different populations, and taking into consideration equity and gender issues while designing the intervention, collecting the data, and analyzing the outcomes. This is crucial to providing a full overview of the effects of the intervention and accounting for differences among vulnerable groups.
 - Measure effects at different time points, including longer follow-up periods, as some outcomes, especially those related to transformative capacities and institutional outcomes, might require years to occur.
 - Integrate cost analysis, such as cost-effectiveness, to help decision makers better understand the actual cost of an intervention and choose the most cost-effective options.

Online appendices

Appendix A: Advisory group list

<https://3ieimpact.org/sites/default/files/2023-05/EGM23-Online-appendix-A.pdf>

Appendix B: Additional methods detail

<https://3ieimpact.org/sites/default/files/2023-05/EGM23-Online-appendix-B.pdf>

Appendix C: Example search string

<https://3ieimpact.org/sites/default/files/2023-05/EGM23-Online-appendix-C.pdf>

Appendix D: Typology and definitions of included emergencies

<https://3ieimpact.org/sites/default/files/2023-05/EGM23-Online-appendix-D.pdf>

Appendix E: Full multicomponent table

<https://3ieimpact.org/sites/default/files/2023-05/EGM23-Online-appendix-E.pdf>

Appendix F: Data extraction codebook

<https://3ieimpact.org/sites/default/files/2023-05/EGM23-Online-appendix-F.pdf>

Appendix G: Systematic review critical appraisal tool

<https://3ieimpact.org/sites/default/files/2023-05/EGM23-Online-appendix-G.pdf>

Appendix H: SRs confidence ratings and summary of individual SRs

<https://3ieimpact.org/sites/default/files/2023-05/EGM23-Online-appendix-H.pdf>

Appendix I: Additional analysis

<https://3ieimpact.org/sites/default/files/2023-05/EGM23-Online-appendix-I.pdf>

Appendix J: USAID RFS Center for Resilience Strategic and Programmatic Approaches

<https://3ieimpact.org/sites/default/files/2023-05/EGM23-Online-appendix-J.pdf>

Appendix K: Summary of the evidence categorization and research implications

<https://3ieimpact.org/sites/default/files/2023-05/EGM23-Online-appendix-K.pdf>

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