World Vision
ASIA PACIFIC

Tulane University

A REVIEW OF

DISASTER RISK REDUCTION PROGRAMMING AND BEST PRACTICES

Understanding the Effectiveness, Impact, Sustainability, and Scalability of World Vision's Disaster Risk Reduction Activities in the Asia-Pacific Region

MARCH 2023

Acknowledgements

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World Vision is a Christian relief, development and advocacy organisation dedicated to working with children, families and communities worldwide to reach their full potential by tackling the causes of poverty and injustice. World Vision is dedicated to working with the world's most vulnerable people. World Vision serves all people regardless of religion, race, ethnicity or gender.

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Child and Adult Safeguarding Considerations

We ensured the safe and ethical participation of children when they shared their stories. Surveys were conducted remotely to adhere to COVID-19 preventive measures, in line with World Vision's safeguarding protocols. Some names have been anonymised and changed to ensure confidentiality. All photos were taken and used with informed consent.

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Background & Introduction

Disaster Risk Reduction

The United Nations Office for Disaster Risk Reduction defines disaster risk reduction as activities "aimed at preventing new and reducing existing disaster risk and managing residual risk, all of which contribute to strengthening resilience and therefore to the achievement of sustainable development".[1]

In the past 20 years, disasters have increased globally due to multicausal hazards and environmental pressures, particularly affecting vulnerable and low-income countries lacking consistent resources like food security, clean water, healthcare, disaster resilience education, and shock-resistant infrastructures.[2,3,4]

As an influencing factor, global climate change is propelling climate extremes and hazards to occur at an unprecedented rate and scale.[4,5] "The difference between 1.5 and 2 degrees of warming is substantial: every fraction of a degree translates into increased risks, particularly in the most vulnerable contexts of Asia and the Pacific," and "analysis shows that under all climate-change scenarios, and in comparison to global averages, Asia and the Pacific will be most impacted and new hotspots of exposure and vulnerability to climate-induced, cascading multi-hazards will be created."[5]

According to the Global Assessment Report on Disaster Risk Reduction[4], disaster risk is increasing faster than risk reduction efforts due to interconnected global systems, anthropogenic climate change, political instability, and neglect of risk reduction activities.[4,6] If these trends persist, "the number of disasters per year globally may increase from around 400 in 2015 to 560 per year by 2030—a projected increase of 40% during the lifetime of the Sendai Framework."[4]

Asia-Pacific Region

The Asia-Pacific region has the highest frequency of environmental disasters like floods, cyclones, and earthquakes compared to other regions.[2] In 2020 alone, the Asian Disaster Risk Center estimated 163 disasters in the region, which is higher than the annual average of 146 over the past three decades.[7]

> ***Over the last 5 decades, disasters in the Asia-Pacific region have affected more than 6.9 billion people and resulted in over 2 million deaths. On average, a person in the region is "5 times more likely to be affected by disasters than a person living outside the region."[5]***

Disasters in the Asia-Pacific region are also the costliest globally, with the World Bank[8] estimating annualised economic losses exceeding $300 billion per year when accounting for slow-onset disasters.

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International Initiatives to Reduce Disaster Risk

Sendai Framework

The Sendai Framework on Disaster Risk Reduction 2015-2030 (Sendai Framework) succeeded the Hyogo Framework for Action in 2015 as the multilateral framework on DRR, which expanded the scope of disaster risk reduction (DRR).[9,10]

Following the 2015 Third UN World Conference on Disaster Risk Reduction, the UN General Assembly endorsed the Sendai Framework as the first major agreement. The framework aimed to comprehensively address all dimensions of disaster risk such as hazard, exposure, vulnerability, and coping capacity. Its main priority was to prevent the creation of new disaster risks, reduce existing risks in vulnerable contexts, and increase resilience to disaster shocks in an increasingly globalised world.[4,9,10]

At the highest level, the Sendai Framework outlined 4 priority areas and 7 key targets for DRR initiatives[9] (Fig 1):

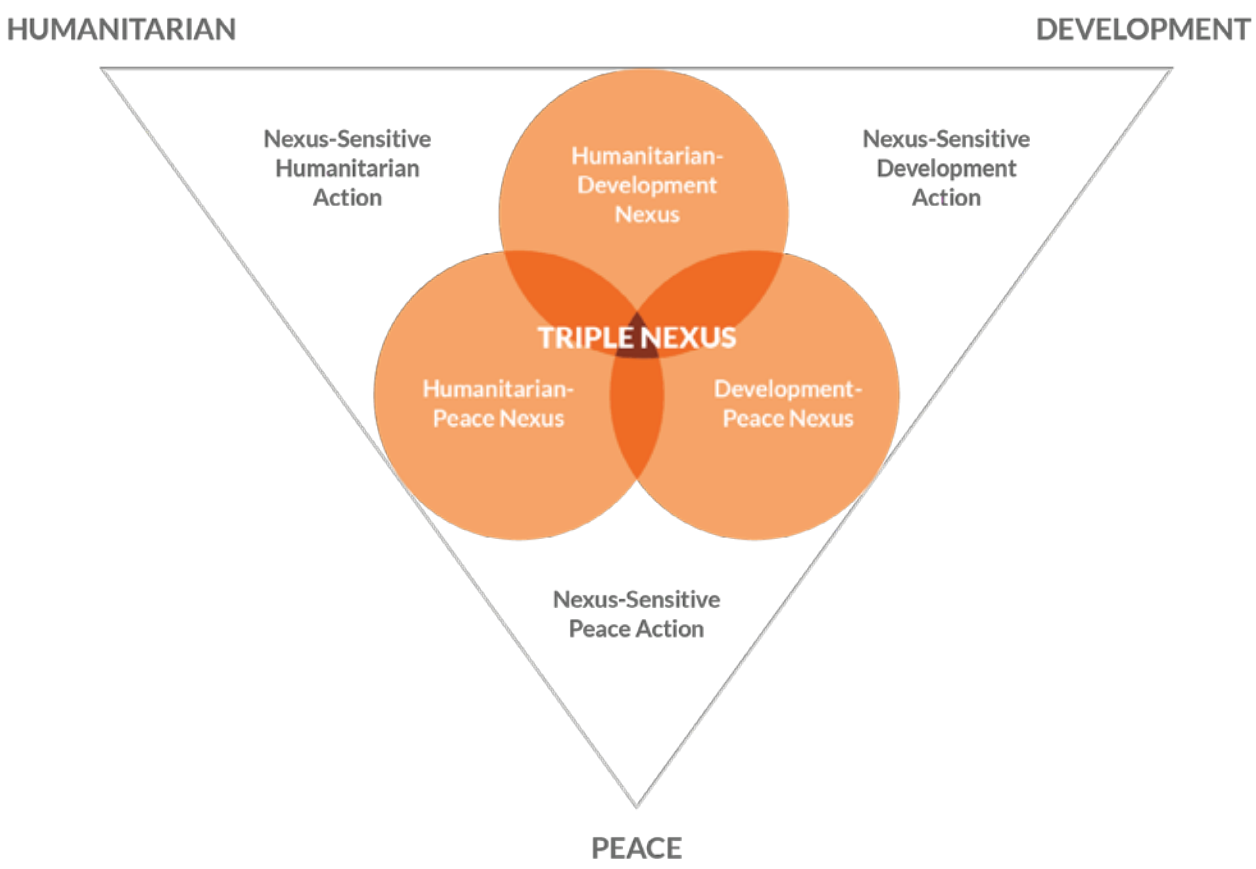
FIGURE 1: Sendai Framework priorities and targets (adapted from Global Assessment Report, 2022)

The Triple Nexus

The international community now supports a more integrated approach to disaster risk reduction for sustainable development. This approach is called the Humanitarian-Development-Peace (HDP) programming strategy, which emphasises the need for better coordination between donor funding streams and integrated portfolio management to reduce disaster risk (Fig 2).

The HDP approach recognises that activities can prioritise humanitarian, development, or peace objectives depending on the context, but all these objectives are interconnected, and good evidence is necessary to make programming decisions. DRR is a critical goal under the HDP approach.[11]

FIGURE 2: The Humanitarian-Development-Peacebuilding Triple Nexus (Howe, 2019)



BHA ER4

The Bureau for Humanitarian Assistance (BHA) of USAID is a major donor partner of World Vision's partnership. In 2022, BHA released its Strategic Framework for Early Recovery, Risk Reduction, and Resilience (ER4), which emphasises the interconnectedness of early recovery, risk reduction, and resilience efforts. However, it recognizes that funding for these activities is often separate, with different requirements and orientations. While risk reduction initiatives receive humanitarian funding with modest amounts and shorter project cycles, resilience activities receive development funding (Bureau for Resilience and Food Security, or BRFS, and Title II non-emergency funds).[12] BHA stresses the importance of integrating these funding sources more effectively to achieve resilience and disaster risk reduction.

World Vision

World Vision prioritises disaster risk reduction and climate change adaptation (CCA) as core elements of their programming to build disaster-resilient communities. They work collaboratively with donor organizations, partner organizations, and local communities in the countries where they operate to improve capacity and organization.[13,14]

World Vision developed an urban DRR framework in 2014, piloted in Bangladesh, Indonesia, and China. World Vision has a global DRR portfolio, however most of its DRR activities are focused in the Asia-Pacific region, which has been disproportionately affected by disasters. Due to the high volume of DRR programming in the region, the regional office recognised the need for a more comprehensive framework to improve the impact of DRR efforts due to limitations, a growing risk landscape, and changing donor strategies.

Purpose of Study

The purpose of this study is to support strengthened World Vision DRR programmes in the region.

Objectives of Study

Objective 1:
Understand the current strengths and gaps in World Vision DRR programming in the region (Desk Review)
Objective 2:
Understand evidence-supported promising/best practices for DRR programming (Literature Review)

Study Methodology

This study used a two-pronged approach: a desk review of World Vision DRR projects in the region and a review of the published and grey literature of DRR efforts in the region. The methodology was iterative and involved extensive consultation between the research team and World Vision stakeholders.

Description of desk review methodology

World Vision's DRR projects in the region were reviewed for effectiveness, impact, sustainability, and scalability. The review included 84 active and closed projects from 2018-2021. A collaboratively developed matrix (Appendix 1) captured project information such as timeline, funding, intervention, and results by DRR activity category, along with key project results, effectiveness, impact, sustainability, scalability, and lessons learned.

The study requested project documents from World Vision Field Offices to assess the DRR-specific activities of 84 projects that were active and/or closed from 2018-2021. World Vision-US and the research team assessed the documents provided by the Field Offices for project descriptions, progress/results reports, and impact/performance evaluations. The analysis was based on complete and identifiable information as of 07 Sep 2022. Project documents were uploaded to a private Google Drive accessible only to the research team, which included a doctoral student team lead and two master's students. Dr. Nancy Mock provided oversight and quality control.

Description of literature review methodology

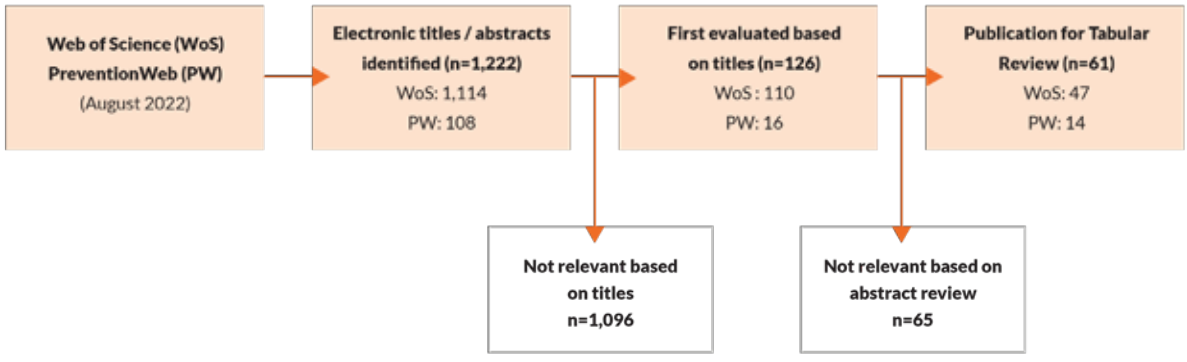
A literature review was conducted to find evidence-based promising practices in DRR in the region. The review was limited to the region of interest and articles published in English and followed best practices and approaches similar to a scoping or systematic review. Online peer-reviewed databases (e.g., Web of Science, PreventionWeb, GoogleScholar) were used to identify peer-reviewed literature using key terms and Boolean operators ("AND", "OR", "NOT") to narrow the review to evidence-based analyses of DRR-related interventions.

World Vision identified 14 broad DRR activity categories with sub-terms for a literature review. Searches were conducted using 106 key terms, 20 population-related terms, 16 outcomes terms, and 11 study types. Top-level category terms included: Agriculture and Food Security, Economic Recovery and Market Systems, Humanitarian Coordination and Information Management (HCIM), Logistics Support and Relief Commodities, Monitoring and Evaluation, Natural and Technological Risks, Social Protection, Public Health and Nutrition, Risk Management Policy and Practice, Safety and Security, Shelter and Settlements, WASH, CBDRR, and Other. The search was limited to English language publications from the past five years. To avoid any bias, a variety of sources were considered such as research articles, working papers, institutional reports, etc.

The team followed a process of title screening, abstract screening, and full-text screening to assess the articles for relevance and duplication. (Fig. 3) The Zotero reference management system was used to organize articles and facilitate data extraction. Articles that met the inclusion criteria and passed the initial screening were reviewed in full. The team organized the full-text articles into a spreadsheet that documented key information such as the year of publication, author details, type of document, and key findings.

Appendix 2 provides the terms and strategies used. The inclusion of articles that used systematic review methods and impact evaluations was prioritised for analysis.

FIGURE 3: Systematic screening of literature



The review mainly used peer-reviewed literature but also searched for evaluation studies in the grey literature. Online resources such as USAID DEC, GoogleScholar, Google Search, and handsearching, as well as manual methods like backward citation searching were used to find evaluation reports for specific projects. The reports were reviewed and information such as author, year published, document title, document type, method, and key findings was extracted into a tabular format.

Challenges and Limitations of the Study

A document repository had to be created at the start of the study because World Vision does not have a centralized repository for its DRR projects. The study team decided which projects should be included and relied on World Vision regional and US staff to obtain the necessary documents. However, this process was time-consuming and did not always result in obtaining the required documents within the study timeframe.

Therefore, the study faced challenges in data quality. 14 projects (17%) had substantial information missing, and 26 projects had unclear or inconsistent funding information. Additionally, some project reports did not show cumulative progress toward project-level targets, making it harder to assess project outcomes.

The study found that there was a lack of common understanding among field, regional, and HQ staff on what constitutes a DRR activity, how budgets for such activities are determined, and the relationship between DRR and resilience activities. To address this, based on the experience of the study team (World Vision and Tulane members), the study recommends developing a clear terminology for identifying DRR, resilience, and Climate Change Adaptation activities, and establishing consistent coding schemes for financial data tracking.

Gaps in Data Quality & Documentation

Inconsistent documentation was a major limitation during data extraction. Different types of reports (project proposals, donor agreements, baseline reports, mid-term reports, final reports, and evaluation reports) were examined, but not all reports were available for each project. Most projects only had a mid-term or final report and a donor agreement or project proposal, which made consistency of information across all projects limited. Activity and result descriptions in mid-term and final documents were not always clear. In some cases, descriptions of activities were incomplete or inconsistent. For instance, the Bangladesh GPOP project had incomplete activity descriptions, such as:

"The Graduation Approach will be complemented with DRR interventions. Ultra-poor households will be supported to better prepare for and respond to disasters to minimise the risk of asset depletion during and after disasters. The project will support communities to conduct Community Risk Assessments, develop Risk Reduction Action Plans and awareness raising on the importance of DRR. Finally, the project will incorporate child protection interventions to support ultra-poor households."

It was determined that this activity description was too vague to identify appropriate outputs and outcomes, making it difficult to evaluate effectiveness, sustainability, and impact.

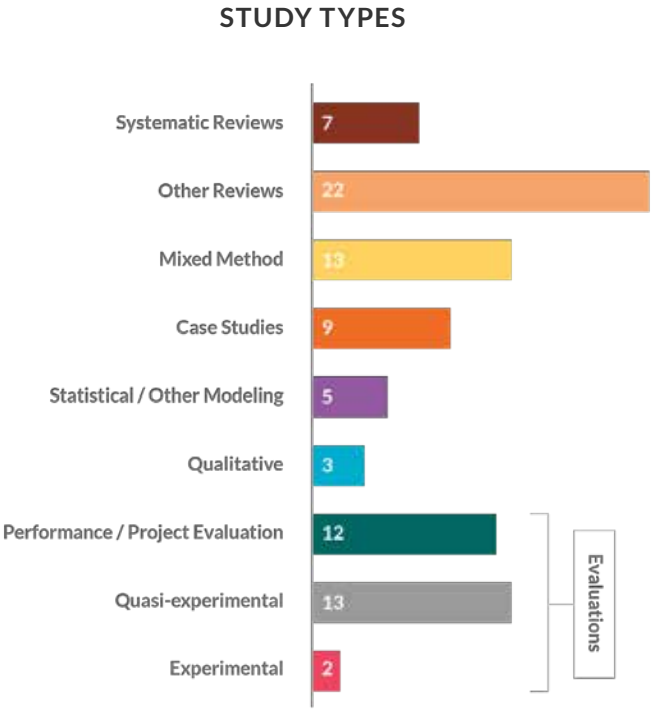
Results

Key Findings from the Literature Review:

The Sendai Framework emphasises the need for more evidence to support DRR policy.[9] However, existing impact evaluation studies of DRR programming have been limited[10,16,17] despite being a standard approach for international organizations like the World Bank.[10] UNESCAP recognises the importance of impact-based and risk-informed initiatives for robust DRR programming.

The literature review included 86 studies (Fig 4), but only 17% of them were impact evaluations (IE) with comparison groups. There were only two IEs with experimental designs and performance evaluations were often qualitative or measured changes in output indicators over time. These evaluations were found to cover a variety of DRR activity categories (Fig 14), and selected examples are discussed in Table 4. As is consistent across DRR programmes, projects tend to have included activities that crossed multiple DRR category types; however, the most salient activity types were used to categorize identified projects. Monitoring and Evaluation was a primary component of 5 projects[18–22] with 4 of the project documentation covering performance evaluations of the development of Incident Command Systems;[19–22] HCIM was a primary component of 3 projects;[18,23,24] Disaster Health Management was covered in 2 evaluations of a single project, the ARCH project;[25,26] Risk Management and Practice was identified to be a primary component of 3 projects, USAID's SERB project,[27] the Red Ready Programme,[28] and the Joint Programme on DRM in Nepal;[29] EWS/Anticipatory Action was found to be the primary component of 2 projects, USAID's DisasterAWARE [24] and FAO's regional evaluation of ASEAN countries.[30]

FIGURE 4: Broad categorization of study types identified for inclusion



Demonstrating the longer-term impact of DRR activities is challenged by inconsistent occurrence of events that stress-test the systems put in place.[10,17] The COVID-19 pandemic, climate shocks, and the Ukraine invasion highlight the importance of a systemic risk approach in addressing interconnected risks and feedback among drivers, effects, hazards, and vulnerabilities.[31–33]

Impact evaluation studies were found to be more common amongst interventions focused on economic recovery (n=12). These interventions encompassed insurance schemes,[34] microfinancing,[35] microcredit programmes,[36,37] forecast-based financing,[38,39] cash transfers,[40,41] and other social/community-oriented economic strategies (see Table 1).[23,42–44] As a component of DRR, economic recovery interventions were related to aspects of household/community recovery and response to shocks post-disaster.

TABLE 1: Evaluation Studies and selected examples

Study Type	Number of Studies	Study Designs	Selected examples of Successes	Selected examples for improvement
Performance/ Project Evaluations	**12**	**Surveys, Mixed Methods, Case Studies**	**ARCH** [25,26] - standardization of EMT training was determined to be transferable/scalable **USAID SERB** [27] - field level collaboration was suggested to be effective for training/ simulation events for mass casualty management **USAID PROSPECT** [23] - clear ToCs are suggested to be effective in guiding activity implementation	**USAID API** [23] - external factors, COVID-19 and communication/ coordination, have delayed progress in policy implementation **Incident Command Systems** [22] - mixed success in usage and scalability was due to lack of stakeholder buy-ins **Early Warning** [18,24,30] - generally needs improvement in interagency collaboration, clear action triggers and thresholds, greater disaster awareness education, and increased information sharing
Experimental/ Quasi-Experimental	**15**	**Panel surveys, DiD, regression discontinuity, PSM, CRCT**	**Index-based Livestock Insurance** [34] - households that purchased insurance recovered faster from shock-induced asset losses than non-insured **Self-help groups** [36,37] - SHGs, credit rationing, and microcredit schemes mitigated adverse economic impacts across monsoon cycles, and for cyclone hit households **Forecast-based financing** [38,39] - FbF was effective in helping households evacuate in response to flooding; FbF was correlated with reduced livestock mortality in anticipation of extreme winter events	**Joint Programme on DRM** [29] - resilience indicators were primarily output driven and had no clear positive effects on household engagement in non-farm income generating activities **Microfinance** [35] - results of microfinance schemes were found to be inconclusive in making households resilient to multiple shocks
Systematic Reviews	**7**	**Systematic review of literature**	**Nature-based solutions** [45] - promising activities are reported in Bangladesh: forest/wetland restoration, agroforestry , and participatory wetland management. These activities reduce vulnerability to floods, storm surges, landslides, etc.	**Hospital DRM** [46] - generally problems in DRM are due to a lack of coordination rather than a lack of resources; management should focus on coordination strategies and operating procedures to prepare for disasters **Flood GIS** [2] - in developing contexts, there is a lack of good data on population vulnerability, hydrodynamic systems, and hydro-physiographic modelling

These studies found that these intervention types led to improved food security/recovery outcomes with some caveats. For example, studies focused on recovery from a single shock, but most poor and marginalised groups face multiple shocks. At least one study showed that the risk reduction approach only protected against a single shock and not when a second shock followed.

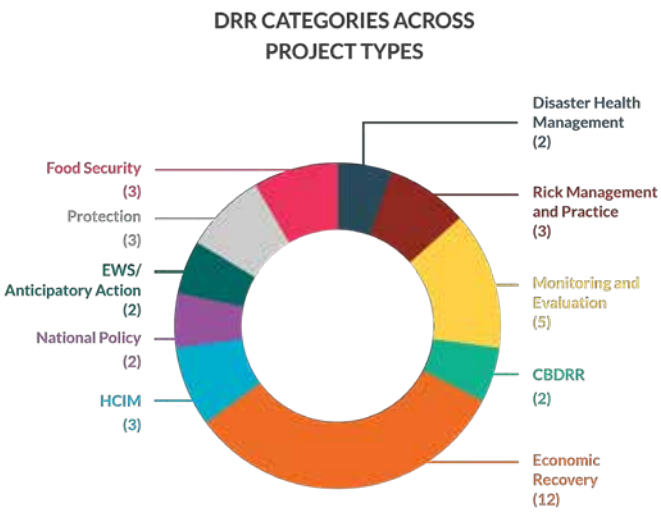
Early Warning/Early Action and vulnerability assessments in the Asia-Pacific region were also noted as both essential to DRR but deficient in concept and application. Studies suggest promoting greater interagency collaboration, clarity around action triggers and thresholds, increased disaster awareness education, and improved information sharing across the sector to address gaps.[30] These efforts focus on country-level implementation, such as the development of Information Communications Technology (ICT) tools, technical advice, and guidelines to support the effective use of these systems.[18,24,30]

Additionally, to improve early warning systems in the Asia Pacific region, it is important to have a shared understanding of key terms related to anticipatory action and shock-responsive social protection to avoid confusion. This can strengthen the ability of early warning systems to support anticipatory action and behaviour change, and ultimately reduce the risk of losses from disasters in the region.[24]

Most DRR programme evaluations have used correlational or descriptive methods,[10,17] and few studies[10,16,17] have provided sufficient evidence of effects based on impact evaluation studies using a sufficient counterfactual. An unpublished study showed an improvement in the evidence base for DRR programming over the past five years, but this trend was less significant in the Asia-Pacific region.

The literature characterized DRR activities as highly diverse as indicated in Figure 5 below:

FIGURE 5: Broad DRR categories included in evaluation studies



The themes identified as important for improved DRR can be categorised as: understanding vulnerability/risk, tackling global disparities, partnerships and multilateral engagement, project management and effectiveness, and tools and practices.

Understanding Vulnerability/Risk

Achieving adaptive resiliency refers to the practices that "enables social units to reassess their circumstances, learn from their disaster experiences, and adjust their strategies in light of the 'new normal' ushered in by disaster."[47] Learning from disasters[2,48] can help social units develop effective coping mechanisms[2,49] and build capacity for adaptive resiliency. However, it's crucial for DRR projects to consider the various factors that influence communities, populations, and geographic contexts' vulnerabilities.

Gan et al.[50] found that vulnerability assessments are often inadequate in identifying vulnerable populations. There is a conflation of terminology where 'high-risk' or 'at-risk' is used interchangeably with 'vulnerable,'[50,51] leading to systematic misrepresentation of study purposes in DRR programming. In the context of global climate change hazards, vulnerability refers to the propensity to be adversely affected, which is distinct from other definitions of 'risk.'[50]

Vulnerability Assessments are an important tool to identify sub-populations, climate conditions, and which geographical locations are most vulnerable to a hazard, and disaster risks.[50,51] As such, Vulnerability Assessments should measure "the interaction between a population's exposure, sensitivity and their adaptive capacity to hazards, including the consideration of relevant socio-economic and demographic indicators."[50]

Without robust vulnerability assessments, disaster risk management practices may not meet the needs of vulnerable populations.[46] However, vulnerability is socially determined and varies depending on context. For example, studies in China have identified children and the elderly as vulnerable, but less is known about vulnerability factors in Indonesia and Vietnam.[50] Despite contextual variability, having reliable metrics for vulnerability assessments can improve data quality.

Community Understanding of Disaster Risk

A significant portion of the literature revealed that communities have a large gap in understanding certain disaster risks. In Indonesia, for instance, a study showed that respondents had "poor" (54.33%) or "fair" (45%)[52] knowledge of coastal hazards and lacked knowledge of slow-onset disasters such as coastal erosion and sea-level rise. While respondents had knowledge of rapid-onset disasters like earthquakes and tsunamis, slow-onset disasters were identified as crucial points for disaster education intervention.[52]

Several articles suggest that DRR education for children[3,52-55] can be integrated into curriculum-based or training-based programmes as modules, short courses, drills, and printed and visual media. A study in India found that actively engaging children in DRR education increased confidence and knowledge diffusion,[53] resulting in children taking on more activities within the community and feeling proud of their role in their family's disaster preparedness. These findings support the important role of children in DRR.[53]

Tackling Global Disparities

Developed and underdeveloped countries have different capacities to reduce disaster risks, and this gap is emphasised in the literature. In the context of anthropogenic climate change, the concept of environmental justice is important, and there is a need for equitable action. To avoid climate-trade dilemmas in the Asia-Pacific region, Sekiyama[56] suggests that more economically developed countries should provide greater access to resources for less-developed Asian countries and subregions to help reduce greenhouse gas emissions.

> ***More specifically, measuring and understanding risk at subnational levels is challenging. Municipal governments often lack the capacity to conduct participatory risk assessment and rely on quantitative data from outside agencies, which may not reflect the ground-level reality.[57]***

Having access to accurate and comprehensive information on risk, hazards, vulnerability, and capacity is crucial for effective DRR programming. However, even basic demographic data can be outdated, making it difficult to identify and quantify target populations.[58] Nair et al.[58] found that a lack of standardization for the collection and sharing of health information is a barrier to effective programming, which was confirmed by Docherty et al.[59] who noted that multi-hazard environments in developed countries have been studied more extensively than those in underdeveloped countries,[59] emphasizing the need to balance the spatial distribution of multi-hazard research.

Advanced technologies can help collect and process data in underdeveloped areas[18] through low-cost sensors, public domain datasets, and new Information and Communication Technologies and techniques.[59] To reduce disaster risk effectively, low-income countries should shift from a single-hazard approach to a multi-hazard approach.[48,60]

Partnerships and Multilateral Engagement

Collaboration and partnerships are important for DRR, resilience, and climate change adaptation. Donors and implementing partners emphasise the need for coherence and integration across these areas. Policy coherence around integration is increasing, and research collaborations between national organizations (federal, military, municipal, and local) and international collaborators (researchers, NGOs, etc.)[61,62] need to be strengthened. Multi-disciplinary and collaborative analysis can deepen the understanding of risk and support research capacity[63] and strengthen the science communication and science policy advocacy.[61,64,65] The literature shows a growing call for greater interdisciplinary collaborations to better understand complex, multi-hazard, social, and environmental problems.

Rahman et al.[67] found that a lack of partnership and connection between stakeholders adversely affects the performance of humanitarian supply chains. This can be attributed to a lack of coordination, insufficient information exchange between stakeholders, and a scarcity of transparency.[67] In their analysis, they discovered that one incapability in bonding between stakeholders can lead to other issues such as duplicated efforts from NGOs and CSOs and an inability to find the best professionals for the endeavor.[67]

Enhancing information sharing in humanitarian contexts is essential for successful Disaster Risk Reduction (DRR) planning.[58,66,68] It is necessary for stakeholders and organizations to mutually adopt frameworks for data sharing and standardize data collection/reporting processes.[58]

A crucial feature of Partnerships and Multilateral Engagement is 'policy coherence'; the comprehension that national and local government policies ought to be supportive of each other in targeting goals and involving CSOs and NGOs.[69] Nevertheless, understanding the role of community organizations in local-level planning and implementation can be ambiguous.[69,70] Darjee et al.[69] looked at this issue through the lens of climate change adaptation policy in Nepal, where coordination and accountability between local governments, ministries, and implementing offices were lacking.[69] Additionally, research indicates that women and gender minorities are not included enough in Disaster Risk Reduction/Disaster Risk Management activities' planning, which diminishes these activities' effectiveness.[70,71] Consequently, it is suggested to implement gender-sensitive practices throughout organizational development related to DRR policy.[70-72]

Partnerships and Community Engagement

Partnerships were found to be an important emergent theme as it concerned community-based disaster risk reduction (CBDRR) programming as well. However, many government or NGO-led projects on CBDRR programmes intended to assist governments and other support agencies (i.e., NGOs) and not sufficiently focused on assessing the needs of vulnerable people in relation to disaster risks and hazards[73]. As a result, vulnerable community members may not have adequate disaster preparedness and response skills. Sufri et al.[73] suggest that these community members are thus continuously exposed to the same hazard threats.

CBDRR programmes in the literature are typically project-based and are not continued long-term nor do they cover all potentially vulnerable districts. The lack of long-term projects reportedly leads to a low sense of community ownership in CBDRR programmes due to the low community awareness on the importance of the programme activities[74]. However, community gatekeepers can help optimise coordination and networking between key stakeholders and organizations[1]. In the instance of a disaster, NGOs who have identified community gatekeepers could contact the community gatekeeper to gain a first assessment of the situation immediately and then be able to take a targeted, informed set of actions[1].

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When considering the limitation of resources in a community for disaster resiliency projects, community project managers and community resource managers should seek to allocate resources to high-level "management and resource" endeavours and away from "design" or "function" based endeavours in order to achieve resource optimization and improve community resilience[75].

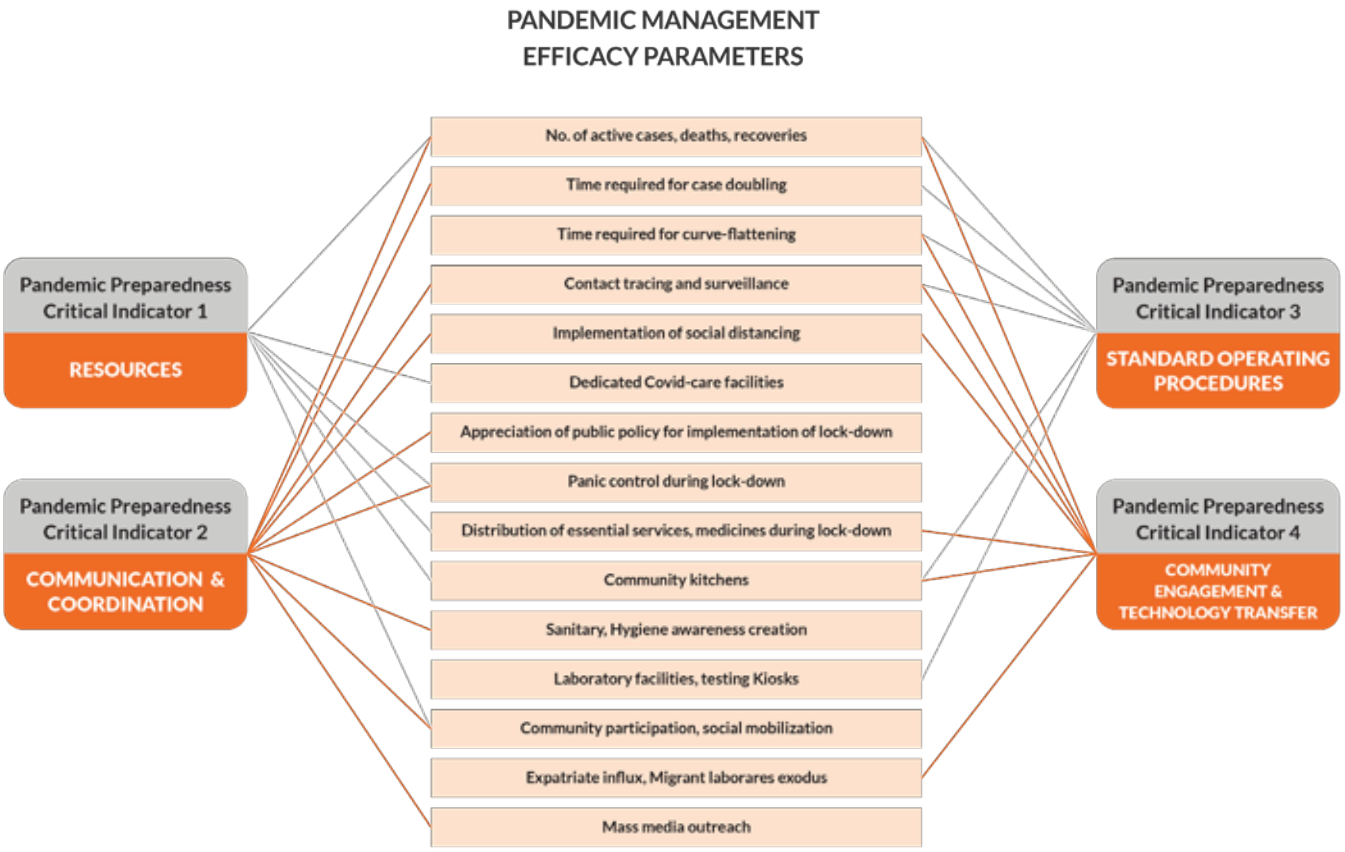
One apparently effective project that leveraged community engagement was a citizen science project called Revitalising Informal Settlements and their Environments (RISE) in Indonesia and Fiji[65]. This project was successful at creating a collaborative space for knowledge sharing between the project/research team and collaborating communities. The RISE project was an initiative between the Monash Sustainable Development Institute, Wellcome Trust, New Zealand Ministry of Foreign Affairs and Trade, and the Australian Department of Foreign Affairs and Trade. The project employed a citizen science approach to community-based flood mapping. Community-members were directly involved in the process – they were given a flood gauge, took pictures of it periodically, and were able to share the pictures in a way that they could interact with both fellow community members and the research team. Community members that were directly involved in the project declared having a positive experience. Some participants had a high level of interest in the results of the project and felt it empowered them to become more active in providing evidence of flood related issues to local council members. "Citizen science approaches can contribute to improve local scientific literacy, strengthen local networks, facilitate the participation of local community members in decision-making and enhance the quality of management practices due to the larger scale monitoring capacity"[65]. Evidence from interviews also suggest that the community collaborators shared the results of the monitoring process with others, expanding the reach of the project.

Project Management and Effectiveness

Theories and studies of project management have been well incorporated into business and organisational development fields; however, a review of the literature[45,76–78] found little formal study of effectiveness as it concerns project management and disaster management programmes. Prasad et al. [76] however went on to assess the external factors of disaster recovery that influences the internal characteristics of disaster project management. In their modelling, they found that internal characteristics of disaster project management influence disaster resilience.

As part of the iterative model development, the authors found that community groups influenced diffuse learning both directly and indirectly through internal characteristics of project management[76]; concluding that highly effective groups were able to add directly to community level resilience for a range of disaster types through alternate-domain (AD) learning (AD learning occurs when an experience with a disaster leads to the individuals, families, and communities developing capacities in unrelated areas)[76]. In other words, community group processes are likely to influence disaster resilience. Specifically, group strength, continuity, and capacity are likely to be positively correlated with alternate-domain (AD) learning[76]. George & Anilkumar[79] also suggests that understanding the intersection of project management and disaster management can yield more effective programming. Specifically in that a toolkit of measurable indicators can be used to sensitise decision makers on the capacity of emergency management systems to handle a disaster. It was found that the state of Kerala, India could leverage the social capital of NGOs locally to better support the populace during COVID-19 lockdowns and with vital resource delivery in the community[79]. Thus, reinforcing the role of NGOs as appropriate agencies in supporting government and public efforts in addressing disaster related needs[66,69,79]. In the context of pandemic disaster preparedness, a critical indicators (Fig 6) toolkit was found to be useful in identifying performance and areas of improvements for disaster response organizations[79].

FIGURE 6: **Critical indicators for assessment of disaster preparedness capacity development (source: George & Anilkumar, 2021)**



Using specialised and trained personnel in the field of crisis management and the appointment of qualified and competent managers are often necessary actions to take for effective and consistent project success[46]. For example, many problems of hospital disaster risk management are due to lack of clear coordination efforts rather than lack of resources. Coordination and clear communication strategies between stakeholders and organizations is known to lead to more effective disaster management capability. The absence of a proper risk reduction culture, as well as the lack of an administrative culture for crisis management, were among the identifiable barriers to implementation of disaster risk management in healthcare settings[46].

Tools and Practices

Tools and practices emerged as a theme based on perceived gaps across numerous studies[51,64,78,80–83]. For example, practices around disaster risk mapping were detailed in a desk review of global best practices for the South Asia region[51,84]. The high-level recommendation being that effective disaster risk mapping "as a tool to assess the nature and magnitude of disasters and vulnerability requires a coherent methodology and spatial focus"[51]. More specifically, components of comprehensive risk mapping should include aspects of individual hazard maps, multi-hazard maps, exposure maps, vulnerability maps, disaster risk maps focused on population and GDP, and social development risk maps (which currently lack coherent methods and indicators)[51]. The importance of comprehensive disaster risk mapping was emphasised across multiple studies [2,51,57] and especially including measures of gender, ethnic, and age inequalities[46,51].

Increased emphasis on the development and use of community-based toolkits such as participatory community risk assessments and participatory learning and action – participatory mapping, historical timelines, social Venn diagrams, seasonal calendars, and problem trees – have the potential to link people's lived experiences of risk with local-level plans[57]. However, effective use and integration of these methods requires adequate capacity support to local communities[57–59]. On the other hand, specific disaster mapping such as "flood mapping, flood-vulnerable area boundary, and improved weather occurrence prediction are more straightforward with optical data. In calculating flood depth, topographic models and flood vulnerability maps are necessary to help identify flood-prone areas"[2].

An extensive multi-country performance evaluation found that the ASEAN Regional Capacity on Disaster Health Management (ARCH) Project is considered a DRM success[25]. Standard Operating Procedures (SOPs) and standard curricula for the disaster health management training courses were tools initiated by the ARCH Project and used by partners across multiple countries[25,26]. Since 2016, Thailand Emergency Medical Teams (EMT) have been accredited by the WHO EMT initiative, while Indonesia and the Philippines are in the process of developing and accrediting. A regional network was established through the ARCH Project and was found to be beginning to function– with Laos building from the Thailand model for programme designs[25,26,85]. The standard curriculum of the disaster health management training course is one of the notable outputs initiated by the ARCH Project. Development of SOPs and action plans that were consistent across countries/areas allowed for standard data collection, standard training, and facilitated support for multilateral cooperation[86].

By and large, early warning systems (EWS) are considered an essential element of DRR programming, especially impact-based forecasting[1,3,57,73,74,87–90]. To further improve upon these types of systems, there are some calls to leverage advanced technology and machine learning to improve the accuracy of multi-hazard risk detection[51,90,] though these methods require use of big data technology[90]. Increasingly, EWS are integrating scientific and traditional information streams[57]. EWS increasingly emphasizes the importance of linking EW information and Anticipatory Action[30].

Nonetheless, donors and the World Meteorological Organization have plans to transform early warning system value chains to deliver on a five-year goal with focus on developing regional multi-hazard warning systems in Asia[91]. Currently, this initiative is working to enhance the forecasting, communication, risk assessment, and preparedness capacities of 48 countries[91].

World Vision DRR Activities

Descriptive Analysis

Overall, the Desk Review of World Vision Asia-Pacific Region DRR programming includes 84 projects across 17 countries (Fig 7 and Fig 8). Figure 7 shows that World Vision DRR activities are clustered geographically. Some countries including Bangladesh, Mongolia, Indonesia, Philippines, and Papua New Guinea have several DRR activities. The gross indicator of number of DRR activities, however, hides very important variations of the intensity and funding levels of activities. For example, while the Philippines, Sri Lanka, and Indonesia benefit from the largest number of projects, donor-sponsored funding levels were highest in the Solomon Islands, Timor-Leste, and Bangladesh. Other countries enjoying larger funding include Vietnam, Mongolia, and Philippines.

Sponsorship programmes predominated in Vanuatu, Nepal, China, and Laos. However, one issue is that project funding devoted to DRR activities is modest. 35% of projects were funded at a level of less than 250k USD and 80% were funded at less than a million USD. Only 20% were funded for 1 million or more USD.

Sixty percent (60%) of the projects were less than two years in duration (see Table 2). However, the length of projects varies both within and between countries (Fig 9). Bangladesh, Vanuatu, Indonesia, Vietnam, and Papua New Guinea had one or more projects that had cycles of five years or more.

On funding and country source (Fig 8) and project length by country (Fig 9) there was a lack of data from Cambodia, Myanmar and Thailand.

FIGURE 7: Map of World Vision projects in the Asia-Pacific Region

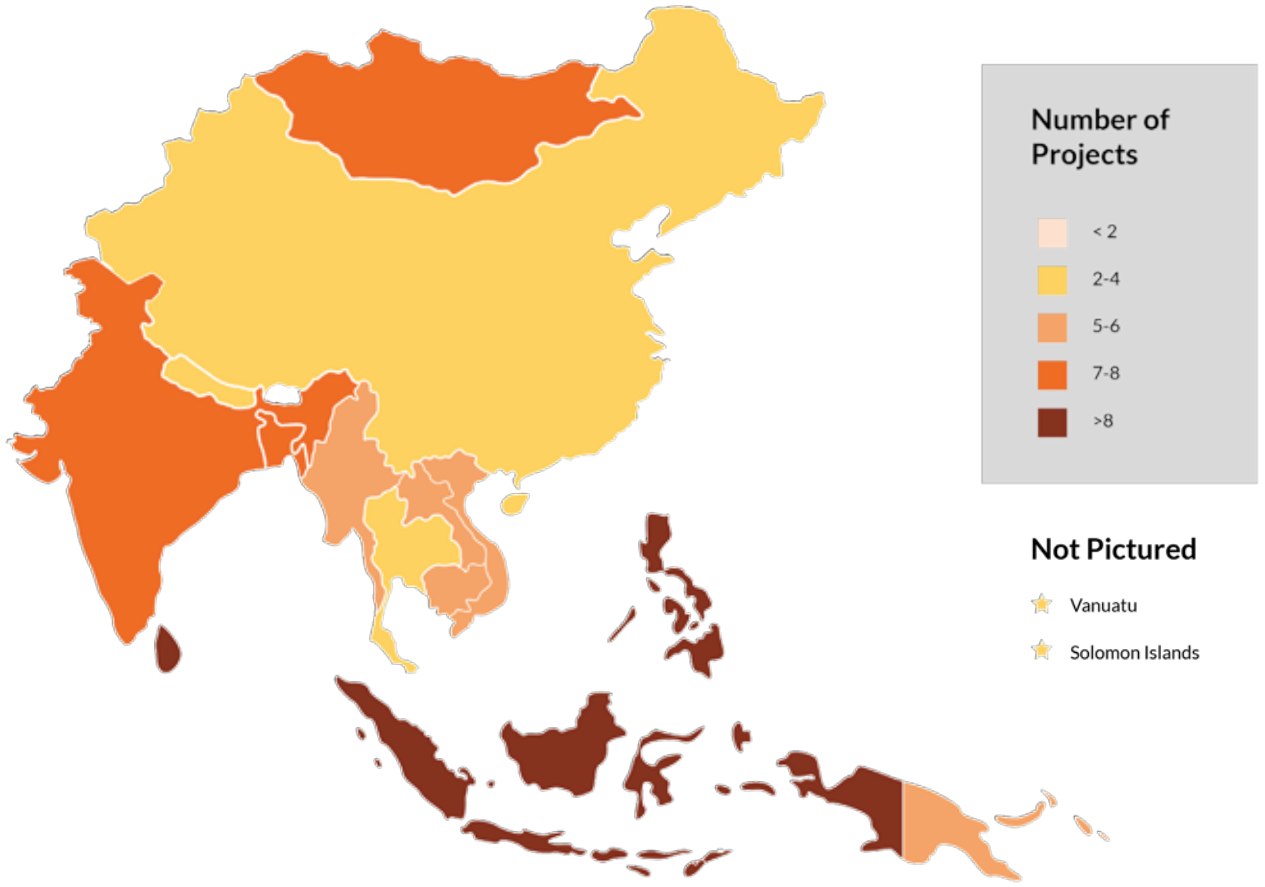


FIGURE 8: Amount of funding by Country and Source

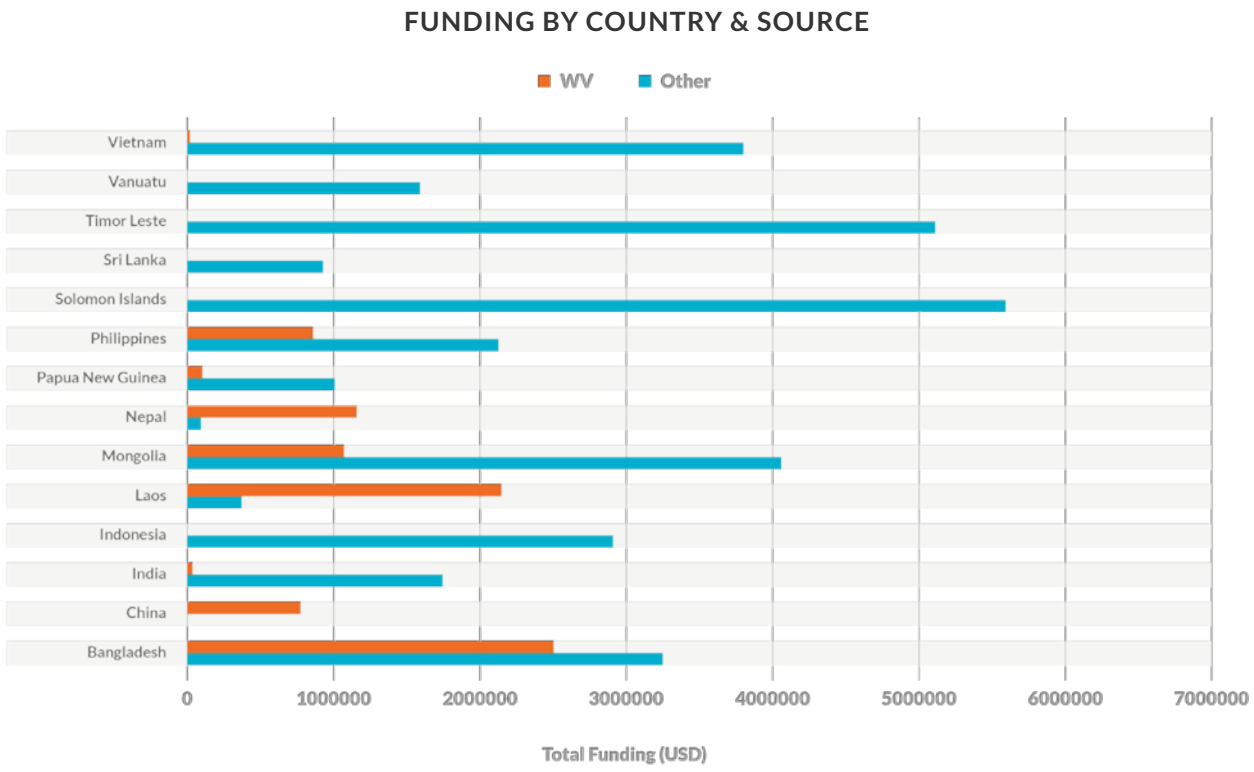
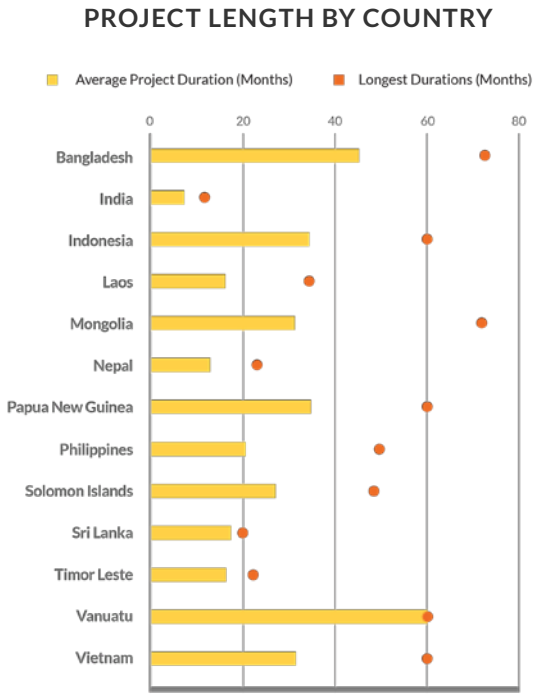


TABLE 2: Average Project Length

Project Duration (years)	Number	Percentage
<1	23	33.3%
1 to <2	18	26.1%
2 to <3	9	13.0%
3 to <4	5	7.2%
4 to <5	11	15.9%
5+	3	4.3%

FIGURE 9: Distribution of project length by country



Types of DRR Interventions

DRR projects in the region involved a great variety of intervention activities (Fig 10) across 16 different intervention types. The most common intervention type was Community-based Disaster Risk Reduction (CBDRR), which was present in nearly 45% of all projects. More than 60% of projects included three or more interventions (Table 3), with protection, Humanitarian Coordination and Information Management, economic recovery/market systems, and agriculture and food security interventions being present in 30% or more of projects. CBDRR projects often also included national policy, early warning, protection, information management, and agricultural interventions, as shown in Figure 11.

FIGURE 10: Distribution of DRR intervention types

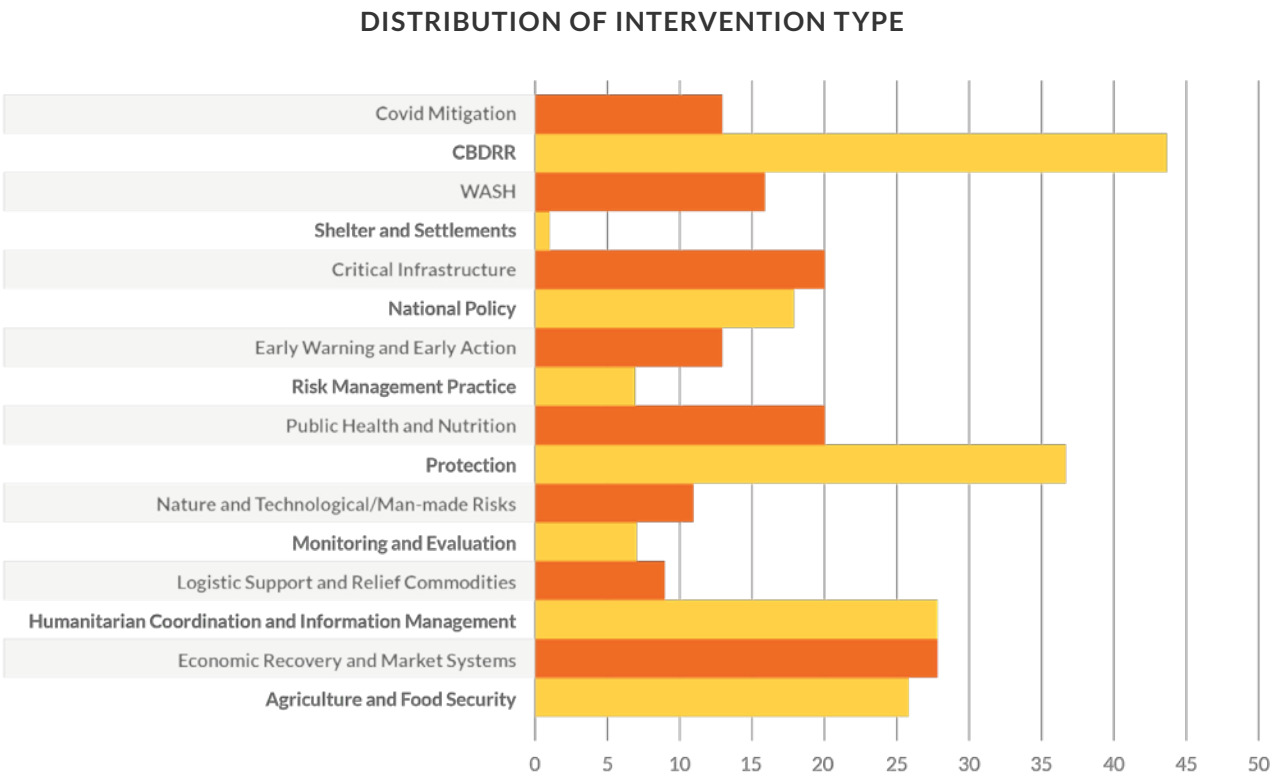
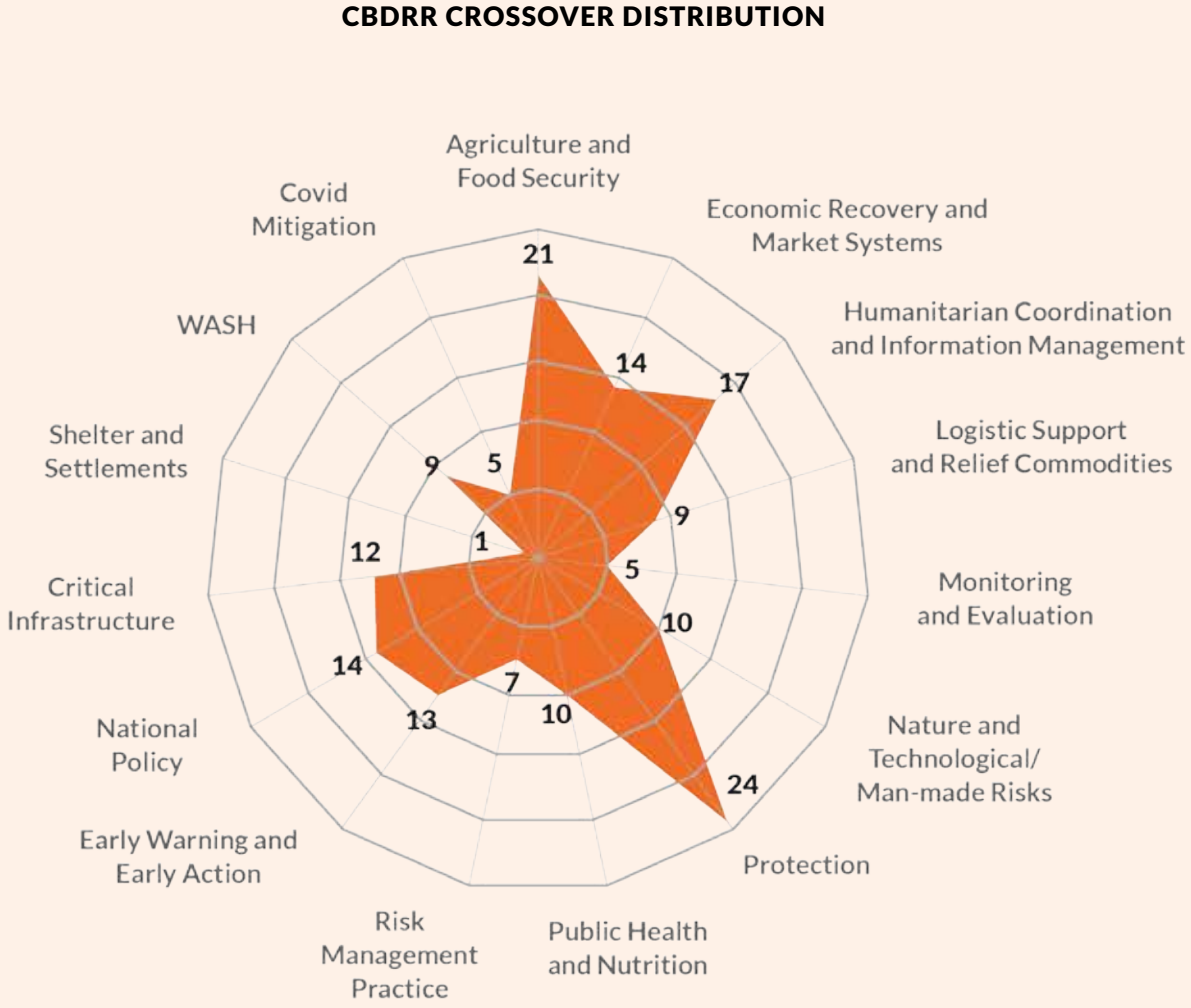


TABLE 3: Frequency of projects that include multiple interventions

FREQUENCY OF PROJECTS

Number of interventions	1	2	3	4	5	6	7
Frequency	11	15	12	12	5	10	11

FIGURE 11: Crossover distribution of CBDRR project types



DRR activities are typically underfunded, short-term, and have fragmented resources across several sectors. Both the literature review and desk study revealed a diverse range of sectors represented in DRR efforts, but the literature placed greater emphasis on DRR economic recovery and less on CBDRR. Community ownership was identified as a significant constraint to the impact and sustainability of DRR efforts in the literature.

Analysis of DRR Interventions

Areas of Strength

World Vision's project management in DRR programming was generally effective, when measured against output targets set by DRR activities. However, the challenge is that outcomes are rarely measured in World Vision and the literature as a whole. By shifting to a longer-term, outcome-driven framework, World Vision can improve project management and effectiveness. While project cycles may be short, World Vision should consider a broader Theory of Change (ToC) that situates short-term interventions as catalysts for individual, community, and institutional changes in risk management.

Despite a lack of outcome results, World Vision has substantial field experience in CBDRR, with emerging best practices that emphasise the link between community and national policies. CBDRR often leads to institutional improvements in national preparedness plans, making it a 'systems level' approach. While nearly half of projects had sustainability statements, only Vietnam's CESP activity included indicators of ownership and partnership, reflecting a high success rate – 86% for ownerships and 89% for partnership.

Whereas 8 projects included identifiable scalability practices, these mostly involved monitoring policy document production and governmental trainings. For example, the Increasing Community Resilience to Disaster in Bangladesh Project (ICRDB) developed and implemented 364 hazard risk reduction plans and policies, across multiple levels of government. While the quantity of these outputs is impressive, country offices should focus on monitoring outcome measures, such as the adoption of CBDRR models by law and the implementation of the law.

On the other hand, Vietnam's CESP successfully influenced the amendment of law on Natural Disaster Prevention and Control leading to the adoption of World Vision's model as a national one, resulting in sustainability and scalability. This project is also the only project with a clear set of sustainability measures.

World Vision's CBDRR programming sets itself apart from other programmes, which include educational support and school safety components. Six projects developed school-based CBDRR plans, and four included educational support. Education is a key component of DRR programming, as it raises awareness of hazards and risk reduction measures, as well as promotes skills-based behaviour change. However, the data suggests that World Vision could improve its monitoring of long-term outcomes and impacts of its educational DRR activities. This could involve tracking the diffusion of information into communities and measuring any resulting skills-based behavioural change. By conducting robust evaluations, World Vision could gain a deeper understanding of the impact of these activities on reducing risk and improve community resilience. Overall, the lack of monitoring these substantive results by the majority of CBDRR and policy/practice changes restricts the comprehensive evaluation of the effectiveness of these efforts.

Many CBDRR activities (27%) included Early Warning Systems (EWS), which achieved their output targets. The literature stresses the importance of early warning (EW)/early action and vulnerability assessments.

World Vision could benefit from studying case examples of successful EW efforts to enhance the integration of these activities into community-based programmes. These activities can also involve engaging youth; for example, local-level knowledge workers can incorporate EW concepts and into educational curricula.

While collective learning emphasises the importance of portfolio approaches, Humanitarian-Development-Peace (HDP) coherence and the nimble use of sequencing layering and integrating (SLI) interventions, this review found some exceptions. For instance, CESP in Mongolia was layered with multiple DRR activities, including livelihood, resilience, child protection, life skills/children's participation, and WASH. World Vision's long-running and well-funded Nobo Jatra project in Bangladesh served as a strong foundation for layering BHA DRR interventions to facilitate shock-responsive programming, resulting in exceeding DRR indicator targets and positive changes in food security. Longer-term development interventions and CESP programmes can serve as the basis for sustaining shorter-term DRR investments. World Vision could gain valuable insights by conducting in-depth evaluations of country programmes that effectively employ SLI approaches

World Vision's engagement in agricultural production, water access, and natural resources management is essential to climate change adaptation, as these activities intersect DRR, CCA, and resilience work. They are also priority components of CBDRR programming and can be considered approaches to peacebuilding.

Areas that can be Strengthened

Monitoring and Evaluation

The initial intent of the review was to capture evidence-based insights from project evaluations. However, this review did not find any impact evaluations among the DRR activities, whether experimental or quasi-experimental evaluation designs. Furthermore, the desk study revealed that most monitoring among projects focused only on output monitoring (see Table 4), with effectiveness measures varying greatly from outcome measures in the agricultural and livelihoods sectors to simple counts of beneficiaries reached. For example, in Disaster Ready Vanuatu and The Launglon Area Programme in Myanmar, the effectiveness was measured only by the number of beneficiaries reached, which offers little basis for assessing results.

Less than half of all projects were found to have collected any type of outcome indicators (see Table 5), with the most common being intermediate outcome indicators such as knowledge retention related to training, which is not clearly linked to behavioural change.

The lack of robust results in monitoring and evaluation can be attributed to donor guidance for reporting and accountability within the humanitarian sector. Donors also prioritise output over outcome measures and rarely require or pursue impact evaluation in the humanitarian sector. This contrasts to 'resilience' activities that primarily stem from the development stream of donors, which tend to place a heavy emphasis on monitoring and evaluation, including impact evaluations. However, only agricultural and public health interventions commonly included meaningful outcome measures. These findings are entirely consistent with the literature review, which reveals the weak evidence for program results and the infrequent use of impact evaluations.

Similarly, World Vision design documents often lacked a strong logic model or Theory of Change (ToC), and these were rarely used to frame or measure impact in final or reporting period reports.

TABLE 4: **Common outputs and outcomes by high-level indicator category**

Indicator	Output	Outcome
DRR Training	• Training on search and rescue, disaster preparedness, first aid, etc. • IEC materials distributed to various groups • Number of disaster/hazard plans created and implemented in community	• Knowledge retention after two months of training • Certifications received from trainees • Percentage increase in knowledge of disasters and confidence in tackling them
Livelihood	• Training, creation of saving groups or market sharing groups • Provision of livelihood materials or infrastructure • Workshops completed/people trained on savings strategies	• Utilization of practices from training • New sources of Income • Increases in income • Improved product production • Ability for parents to provide for their children, • Ability to save money, • Ability to afford DRR strategies • Number of jobs supported or created • Graduation from Ultra Poor status
Nutrition	• Training of mothers/caregivers on child nutrition • Provision of food or money for food • Agricultural training for growth of household food • Growth monitoring	• Child health status • Use of home-grown food following activity • Meal frequency or rating • Level of malnutrition among children
WASH	• Sanitation kits • WASH trainings • Creation of WASH facilities	• Sanitation of hygiene behavioural changes • Observed uptake of hygiene/sanitation facilities
Risk Management/ Infrastructure	• Creating of drainage systems, risk monitoring plans are created, land-use plans are put into place, and protection plans are made, waste collection systems established	• Outcomes are not widely recorded
Early Warning Systems	• Early Warning Systems put into place	• Proportion of Population that understands EWS for most common types of disasters.
Protection	• Child sponsorship, peer-to-peer mentorship, child or gender protection training, and protection workshops in relation to abuse or child marriages	• Decrease in the number or percent of children who experience recent abuse • Percent of adolescents who feel safe in their community • Percent of women or adolescents who feel they have decision-making power in the household • Percent of parents who feel physical punishment is necessary. • Female and PWD participation or representation in local committees, workshops, or trainings
Policy	• Policy analysis, plan writing, government workshops, Committees or governmental groups put into place with plans or SOPs	• Laws, bylaws, or official plans that are put into place or passed by established committees
Agriculture	• Agricultural inputs provided to families (seeds, livestock, etc.), families able to start small businesses selling produce. Trainings provided to farmers on new farming techniques, resilient crops, etc.	• People reporting using climate-smart agricultural techniques after trainings • Innovative agricultural techniques employed • Improvements in food security
COVID-19 Mitigation	• COVID Prevention messaging provided to community members • Provision of hygiene kits and PPE and the installation of hand-washing facilities	• Limited COVID-19 spread in the community or transmission mitigation

TABLE 5: High-level outcome measures by DRR activity category type

Category	Number of Projects with the Indicator	Percent of Total Projects with this Indicator	Number (Percent) of Projects with Output Measures	Number (Percent) of Projects with Outcome Measures	Number (Percent) of Projects with Outcome Targets
Agriculture and Food Security	27	32.14%	27 (100%)	15 (55.56%)	7 (25.93%)
Economic Recovery and Market Systems	31	36.90%	31 (100%)	13 (41.94%)	6 (19.35%)
Humanitarian Coordination and Information Management	28	33.33%	28 (100%)	6 (21.43%)	5 (17.86%)
Logistic Support and Relief Commodities	10	11.90%	10 (100%)	0 (0%)	0 (0%)
Monitoring and Evaluation	7	8.33%	7 (100%)	0 (0%)	0 (0%)
Nature based solutions and natural resources management	13	15.48%	13 (100%)	1 (7.69%)	1 (7.69%)
Protection	37	44.05%	37 (100%)	15 (40.54%)	3 (8.11%)
Public Health and Nutrition	20	23.81%	20 (100%)	11 (55.00%)	3 (15.00%)
Risk Management	9	10.71%	9 (100%)	0 (0%)	0 (0%)
Early Warning/ Early Action	14	16.67%	14 (100%)	1 (7.14%)	0 (0%)
Natural Policy	18	21.435	18 (100%)	3 (16.67%)	2 (11.11%)
Critical Infrastructure	20	23.81%	20 (100%)	3 (15.00%)	3 (15.00%)
Safety and Security	0	n/a	n/a	0 (n/a)	0 (n/a)
Shelter and Settlements	1	1.19%	1 (100%)	1 (100%)	1 (100%)
WASH	19	22.62%	19 (100%)	8 (42.11%)	2 (10.53%)
CBDRR	44	52.38%	44 (100%)	19 (43.18%)	11 (25.00%)
COVID Mitigation	16	19.05%	16 (100%)	1 (6.25%)	0 (0%)
Conflict Mitigation	0	n/a	n/a	0 (n/a)	0 (n/a)

1. Projects can contain multiple indicators
2. Percent of projects that contain this indicator, not percent of total indicator makeup
3. Percent of projects that contain that specific indicator, not total projects

Out of the analysed projects, only 10 had an identifiable ToC clearly noted in their project proposal/design document. However, of the projects with clear ToCs, only one project interpreted the impact of the project against the ToC. For example, the Timor-Leste Cyclone Seroja Recovery Project had a basic ToC that allowed the measurement of the satisfaction level of farmers and trainees as outcome measures. World Vision's large Nobo Jatra project, a resilience/development project, had a detailed ToC, which is consistent with development projects.

Information collected on the participation of ethnic minorities and other marginalised populations in project activities was limited. Documentation generally reported on targeted beneficiaries along gender lines, urban-rural divides, youth/children involvement, and specific professions (farmers, fishers, etc.). However, beyond these broad categorizations of project participants, little information was collected.

The CBDRR intervention package is highly diversified, possibly to an extent where it lacks sufficient focus to achieve impact. The literature and World Vision experiences suggest that a smaller number of well sequenced interventions may achieve better results. Standardised approaches and indicators, as well as a program design kit for CBDRR may be worth considering by World Vision. Evaluating CBDRR community engagement models systematically is crucial since community ownership tends to be a component of many CBDRR activities.

COVID-19 Pandemic Effects

The COVID-19 pandemic created substantial barriers for World Vision programming. For Vietnam's CESP, social distancing regulations resulted in lower child participation as several large-scall activities were prohibited. COVID-19 restrictions also required changes in visits to Area Programmes. In addition, the closure of schools due to COVID-19 posed a challenge for educational or school-level activities.

Many projects were affected by COVID-19, resulting in virtual formats for workshops, trainings, and meetings, which were reported as less accessible and more inconvenient for participants due to factors such as the need for a quiet place in to participate, internet access, and limited technological resources. COVID-19 response measures also affected project outcomes, with pandemic restrictions cited as explanatory factors for not meeting recent livelihood and nutritional targets

However, COVID-19 mitigation efforts frequently included education and distribution of mitigation materials (such as PPE). In the Strengthening Community Adaptive Capacities during the Pandemic and Conflict Emergency Context project in the Philippines, COVID-19 kits were purchased for 450 total children, consisting of one box of disposable masks, three cloth masks, two face shields, and a 250 ml bottle of isopropyl alcohol. Additionally, 15 hand-washing units were also installed.

In general, community-engaged projects were directly impacted by COVID-19 lockdown measures. It was found that COVID-19 mitigation efforts were primarily focused on output, as evidenced by the presence of identifiable indicators in 16 projects. One country project in Laos reported containingCOVID-19 transmission until August 2021 through their Food Security and Quarantine initiative.

Certain projects were able to identify the adverse effects of COVID on their performance. In Mongolia's Community Engagement and Sponsorship Plan, measurements showed a decline from the target, indicating challenges in the community as due to COVID-19. These findings could offer lessons insights for future projects. For instance, when some livelihood and nutritional targets were not met, COVID-19 restrictions were often cited as barriers to comprehending or enhancing the effectiveness of donor projects that were layered with CESP/AP programs.

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Recommendations

- **Develop** a regional or central document archive for DRR and related projects across the region to support knowledge management, learning, and adaptation. Easy access to project documents is crucial for effective management.

- **Outline** a process and standard operating procedures for developing and updating tracking spreadsheets, including a method for reconciling information in trackers and project documents. Trackers should capture project results.

- **Develop** lexicons for resilience, DRR, and Climate Change Adaptation activities. Improve budget coding of DRR activities to enable effective financial analysis of projects and portfolios.

- **Leverage** long-term presence and area-based programming to incorporate targeted DRR interventions based upon a TOC that relates DRR investments and intended long-term outcomes.

- **Strategically** identify and orient funding opportunities based on a ToC for DRR in each country, emphasizing locally-led approaches, sustainability, and scalability.

- **Strengthen** HDP coherence by improving sequencing, layering, and integration within World Vision's portfolio and with partners. Coordinate more effectively with other World Vision teams, including those focusing on food security, resilience and climate change adaptation. Conduct surveys of key donors to better understand their evolving DRR strategies and coordinate donor resources around World Vision's DRR agenda.

- **Conduct** in-depth analyses and case studies of countries that have successfully implemented CBDRR and SLI interventions. Identify good practices in key intervention areas such as early warning and early action, vulnerability assessment, inclusion, financial inclusion, community engagement and governance, and monitoring, evaluation, and learning. Examine successful examples of CBDRR sustainability and scaling-up efforts and explore the role of youth in CBDRR and early warning systems.

- **Revise** the indicator compendium and monitoring/evaluation strategy to include outcomes for disaster risk reduction interventions. Develop longer-term outcomes that can be monitored by country programs, even with short project cycles. Strengthen monitoring of inclusiveness. Consider using a capacity framework based on the Kirkpatrick Model or other approaches that link capacity investments to changes in the behaviours of individuals, communities, and organizations.

- **Conduct** selective impact evaluations to refine its CBDRR model based on learnings from the deep dive analyses.

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Appendix 1: Project Data Extraction Matrix

DRR World Vision Spreadsheet			
Key:	Basic Info	Interven-tion	Outcomes

Document Reviewer	Country	Project Name	Project/ Report Documents	Start Date	End Date	Donor, Amount	Target Area/ Pop.	Partner Organiza-tions	Targeted Benficiaries: M/F, Urban/ Rural	Agriculture and Food Security (Agriculture/Na-ture-BasedSolutions, Farmer Natural Re-source Management/ Agriculture Conservation Management)		Economic Recovery and Market Systems (Public-Private Partnership Response Capacity/Cross Sector Collaboration, Disaster Risk Insurance, Market Based programming/ Market Sensitive Crisis Response)	
										Descrip-tion	Results (% target achieved)	Descrip-tion	Results (% target achieved)

Humanitarian Coordi-nation and Information Management (Hu-manitarian Disaster Response Coordina-tion, First Responder Capacity Building/Di-saster Response Team Training, Emergency Simulations, Technical Assistance and Capac-ity Building, Disaster Monitoring Response Systems (DMRS))		Logistic Support and Relief Commodi-ties (Efficiency and Availability of prepared-ness and prevention commodities, Supply Chain/ Access to markets, Critical Relief Items Management, Community Resource Assistance and Management, Logistics Capacity Assessments/ Supply Chain Disrup-tion Management)		Monitoring and Evaluation (Risk Iden-tification Monitoring, Incident Management Systems/Incident Command Systems, Real Time Information Systems, Impact-Based Risk Forecasting/ Risk Transfer/Risk Governance and Social Resilience)		Nature and Techno-logical/Man-made Risks (Climate Change/ Crises Solutions, Geo-hazard Assessments and Forecasts/Geo-hazard Risk Modeling, Hydrometeroroligcal Hazard Monitoring, Man-made Risks)		Protection (Advocacy, Coordination, and Policy/Emergency -Related Gender Policies, Vulnerable Populations Support/ Community-Based Protection Assistance, Child Protection and Information manage-ment/Child Protection Assistance, Gen-der-Based Violence Mitigation, Mental Health and Psychoso-cial Support Guidance/ Psychosocial Support relief, Cultural DRR)		Public Health and Nutrition (Anticipatory Actions on Public Health and Nutrition/ MCH, Health-Relat-ed DRR /Nutrition Response, neonatal and Young Child Feeding Monitoring, Reproductive Health-care Services Capacity Building)		Risk Management Practice (Emergency Response, Disaster Assitance Program/ Disaster Assessment and Coordination, Information Sharing and Management)	
Descrip-tion	Results (% target achieved)	Descrip-tion	Results (% target achieved)	Descrip-tion	Results (% target achieved)	Descrip-tion	Results (% target achieved)	Descrip-tion	Results (% target achieved)	Descrip-tion	Results (% target achieved)	Descrip-tion	Results (% target achieved)

Early Warning and Early Action (Hazard Monitoring Analysis/ Anticipatory Action, Disaster Guidance Systems, Emergency Operations Guideines Standardization, Disaster Awareness and Preparedness)		National Policy (Policy Planning Support, ICS Systems, Policy Assessment & Impli-mentation)		Critical Infastructure (CSO & Communi-ty Coordination, Critical Infrastructure Preparedness, Waste Management Systems)		Safety and Security (Humanitarian/First Responder Safety Management, Violence Against Responders Monitoring, Population Needs During Crises Assessments)		Shelter and Settle-ments (Informal Land Management Identi-fication, Assistance Delivery/Distribution Procedures, Urban DRR, "Build Back Better" Initiatives)		WASH (WASH Material Distribution Strategy, Sanitation Provision Strength-ening, WASH Surge Ca-pacity Enhancement)		CBDRR (Community Based DRR (CBDRR)/ Community Based Risk Assessment (CBRM), Community Adaptive Capacity/Community Action Planning, School-Based DRR/Ed-ucation School Safety/ Education Knowledge Development, WASH Materials as prepared-ness materials)	
Descrip-tion	Results (% target achieved)	Descrip-tion	Results (% target achieved)	Descrip-tion	Results (% target achieved)	Descrip-tion	Results (% target achieved)	Descrip-tion	Results (% target achieved)	Descrip-tion	Results (% target achieved)	Descrip-tion	Results (% target achieved)

Covid Mitigation		Conflict Mitigation		Key Results (How have results been conceptualized and measured? What is the strength of evidence relative to indicators, study designs, and methodologies used?)	Baseline Measured? (Y/N)	Effectiveness (To what extent did the project meet its target(s)?)	Impact (To what extent have projects measured outcome and impact indicators against theories of change?)		Sustainability (To what extent have projects incopoorated aspects of "Local Ownership, Partnering, Transformed Relationship, Local and National Advocacy, & Household Resilience"? Has the project assessed availability of capacity, resources, and mechanisms, as well as continued activities resulting from the initiative?)		Scalability (To what extent have projects assessed the capacity to scale or continue developing the best practices of the project?)	
Description	Results (% target achieved)	Description	Results (% target achieved)				Theory of Change? (Y/N)	Impact Measured	Sustainability Report? (Y/N)	Sustainability Practices	Scalability Report? (Y/N)	Scalability Practices

Lessons Learned/Strengths and Weaknesses (If project components succeeded, what about the practices yielded success as it relates to DRR? If components were unsuccessful, why did it not work well? Were there any barriers?)		Evaluation Report (Based on if an evaluation report is available for a project)		Project Adaptations (Did the project need to change strategies or goals during project implementation?)	Recommendations (If given) - What could have been better?	Extra notes
LL Report? (Y/N)	Lessons Learned Recorded	Evaluation Report? (Y/N)	Evaluation Findings			

Appendix 2: Literature Review Methods

Run	Search Term	Hits (#)
1	TS=(agriculture security OR food security OR agriculture based solution* OR nature based solution* OR farmer natural resource management OR agriculture conservation management) and English (Languages)	46955
2	TS=(Economic Recovery OR Market System OR Public Private Partnership Response Capacity OR Cross Sector Collaboration OR Disaster Risk Insurance OR Market Based Program* OR Market Sensitive Crisis Response) and English (Languages)	74262
3	TS=(Humanitarian Coordination OR Humanitarian Information Management OR First Responder Capacity Building OR Humanitarian Disaster Response Coordination OR Disaster Response Team Training OR Emergency Simulation* OR Technical Assistance OR Capacity Building OR Disaster Monitoring Response System*) and English (Languages)	44198
4	TS=(Logistics Support OR Relief Commodities OR Critical Relief Items Management OR Community Resource Assistance OR Community Resource Management OR Logistics Capacity Assessment* OR Supply chain disruption management) and English (Languages)	42846
5	TS=(Monitoring and Evaluation OR Risk Identification Monitoring OR Incident Management System* OR Incident Command System* OR Real Time Information System* OR Impact Based Risk Forecast* OR Risk Transfer OR Risk Governance OR Social Resilience) and English (Languages)	122268
6	TS=(Natural Risks OR Technological Risks OR Climate Change Solution* OR Climate Crisis Solution* OR Geohazard Assessment* OR Geohazard Forecast* OR Geohazard Risk Model* OR Hydrometeorologic* Hazard Monitor* OR Man made risk*) and English (Languages)	67995
7	TS=(Social Protection OR Social Advocacy OR Social Coordination OR Social Policy OR Emergency related gender polic* OR Vulnerable Population* Support OR Community Based Protect* OR Child Protection Information Manage* OR Child Protection Assist* OR Gender based Violence OR Mental Health Support OR Mental Health Guid* OR Mental Health Support Guid* OR Psychosocial Guid* OR Psychosocial Support OR Psychosocial Support Guid* OR Psychosocial Support Relief OR Psychosocial Relief OR Cultural Disaster Risk Reduction) and English (Languages)	177835
8	TS=(Public Health and Nutrition OR Public health nutrition OR Health Related Disaster Risk Reduction OR Nutrition Response OR Neonatal Food Monitor* OR Young Child Food Monitor* OR Child food monitor* OR Reproductive healthcare service* OR Reproductive healthcare capacity build*) and English (Languages)	19771
9	TS=(Risk Management Policy OR Risk Management Practice OR Early Warning OR Early Warning Early Action OR Hazard Monitor* OR Hazard Analy* OR Anticipatory Action OR Emergency Response OR Emergency Operation* OR Emergency Guideline* OR Emergency Operation Guideline* OR Disaster Assist* OR Disaster Assist* Program* OR Disaster Assess* OR Disaster Coord* OR Disaster Guid* OR Disaster System* OR Disaster Guid* System* OR Information Shar* OR Information Manage* OR Disaster Aware* OR Disaster Prepar* OR Policy Plan* OR Policy Support OR Policy Plan* Support OR Civil Society Organ* OR Civil Society Coord* OR Civil Society Organ* Coord* OR Critical Infrastructur* OR "Build Back Better" OR Waste manag*) and English (Languages)	526651
10	TS=(Safety and Security OR Safety OR Security OR Humanitarian Safety OR First respon* safety OR Violence against responder* OR Crisis assess*) and English (Languages)	553036

Run	Search Term	Hits (#)
11	TS=(Shelter and Settlements OR Shelter OR Settlements OR Informal land manag* OR land manag* OR Assist* Deliv* OR Deliv* Assist* OR Assist* Distrib* OR Distrib* Assist* OR Urban Disaster Risk Reduction) and English (Languages)	125199
12	TS=(WASH OR WASH Material Distrib* OR WASH Distrib* OR WASH Material OR Sani* Provi* OR WASH Surge Capacity OR WASH Capacity) and English (Languages)	30560
13	TS=(Community Based Disaster Risk Reduction OR Community Disaster Risk Reduction OR Community based risk manag* OR community risk manag* OR community based disaster risk manag* OR community disaster risk manag* OR Community Adaptive capacity OR Community Action Plan* OR School based disaster risk reduction OR school disaster risk reduction OR school based disaster risk manag* OR school disaster risk manag* OR Education School Safety OR School safety OR education Safety OR Education Knowledge Develop* OR education develop* OR knowledge develop*) and English (Languages)	335219
14	TS=(Conflict Mitig* OR Global facilit* for disaster risk reduction OR facilit* for disaster risk reduction OR COVID* Mitig* OR Disaster Risk Reduction OR First Aid OR Rescue and Search plan* OR Search and Rescue plan* OR Rescue plan* OR Urbanization OR Fragility OR Fragile Context* OR Disaster Drill*) and English (Languages)	95492
15	#14 OR #13 OR #12 OR #11 OR #10 OR #9 OR #8 OR #7 OR #6 OR #5 OR #4 OR #3 OR #2 OR #1	1798718
16	TS=(Asia* OR East Asia* OR Asia-Pacific OR Asia Pacific OR Bangladesh OR Cambodia OR China OR India OR Indonesia OR Laos OR Mongolia OR Myanmar OR Nepal OR Philippines OR Papua New Guinea OR Solomon Island OR Sri Lanka OR Thailand OR Timor Leste OR East Timor OR Vanuatu OR Vietnam) and English (Languages)	658874
17	TS=(Mitigation OR Recovery OR Preparedness OR Response OR Resilienc* OR Governance OR Invest* OR Rehabilitat* OR Reconstruction OR Capacity Building OR Social Cohesion OR Sustainable Natural Resource Manag* OR Sustainable Resource Manag* OR Natural Resource Manag* OR Community Manag* Infrastructure OR Community Preparedness OR Gender equality OR social inclusion OR Gender equality and social inclusion OR Climate change resilienc*) and English (Languages)	4038545
18	ALL=(Impact Evaluation OR Impact Assessment OR Meta Analysis OR Systematic Review OR Literature Review) and English (Languages)	729902
19	TS=(emergenc* OR disaster OR disaster risk* OR humanitar*) and English (Languages)	279567
20	#15 AND #16 AND #17 AND #18 AND #19	1152
21	TS=(engineer* OR ecolog* OR occupational health OR meteoro*) and English (Languages)	589537
22	#20 NOT (TS=(engineer*))	1114

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