USING CLIMATE AND DISASTER RISK INFORMATION TO BUILD RESILIENCE

EVIDENCE FROM OXFAM'S RESILIENT DEVELOPMENT PORTFOLIO

OXFAM

Climate and disaster risk information are important tools for resilient development. Combining such information with participatory analysis and planning can create effective early warning systems, and inform forward-looking decision making at household and community levels. Through its programs, Oxfam has built links with government agencies and local non-governmental organisations (NGOs) to ensure that information related to rapid-onset hazards is locally relevant, and accessible to women and people with disabilities. However, for this information to support preparedness for slow-onset hazards, Oxfam and others (including government) needs to increase equitable access to climate information.

KEY LESSONS FOR RESILIENT DEVELOPMENT

1. Access to climate and disaster risk information allows households and communities to take action to protect lives, assets and livelihoods.

2. Climate and disaster risk information is more effective when participatory approaches are taken to improve household and community knowledge, and support is given to climate and disaster risk information generators to improve its relevance and accessibility.

3. Gender inequality and other sources of marginalisation affect access to climate and disaster risk information; Oxfam and other actors need to prioritise work to address this.

4. Stronger organisational responses are required for implementing effective early action for slow-onset hazards such as El Niño, as climate and disaster risk information has traditionally been used more readily for early action for fast-onset hazards.

Solomon Islands: Spiderweb diagrams are used to capture community priorities in relation to climate change and disasters. *Photo: Charlotte Sterrett/Oxfam*

INTRODUCTION

Oxfam has been implementing resilience-building programs across the Asia-Pacific region for more than a decade. Evidence from research and evaluations demonstrates how these initiatives support women and men, as well as governments and communities, to build resilience at scale.

Oxfam defines resilience as the ability of women and men to realise their rights and improve their wellbeing despite shocks, stresses and uncertainty.[1]

This Evidence Brief synthesises evidence of how Oxfam is working to integrate climate and disaster risk information into its programs. It also considers the contribution of Oxfam's work with stakeholders at different levels to promote the use of information for forward-looking decision-making.

It is one of a series commissioned by Oxfam Australia that identifies where, how and why **Oxfam's approach to resilient development** has created impact. The findings and lessons are intended to influence discussions among Oxfam staff, Oxfam partners, and the broader development community (in particular, development partners) about how to achieve resilient development outcomes.

Climate and disaster risk information

The provision and use of climate and disaster risk information[2] is an important tool for building resilience as it equips people to prepare for the multiple risks that they are likely to face now and in the future.[3] Climate and disaster risk information is being generated at short, medium and long timeframes and by various institutions.

NGOs like Oxfam are playing a "knowledge broker" role, supporting women and men and local authorities to access and interpret this information.[4] They are supporting the agencies that generate climate and disaster risk information by sharing their information with end-users, and working with them to ensure the information is relevant and accessible. Oxfam has widely applied its Participatory Vulnerability and Capacity Analysis (PVCA) methodology in community-centred resilience programs. The PVCA combines local and scientific sources of disaster and climate information, to provide a basis for effective local responses to build resilience.
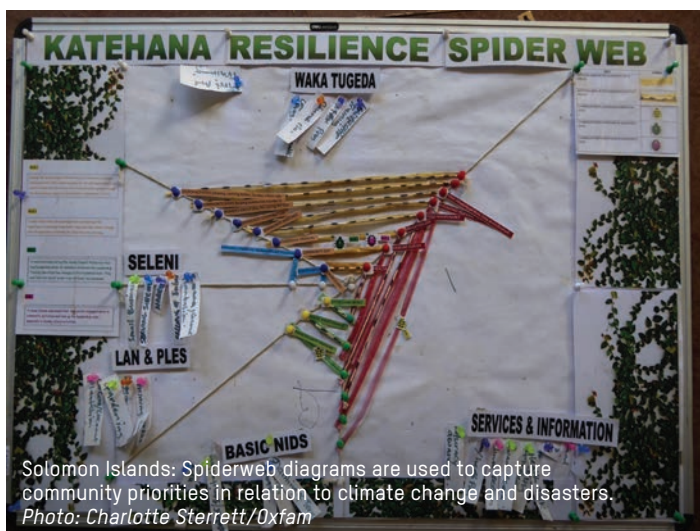
FINDINGS

Key Finding 1: Access to climate and disaster risk information allows households and communities to take action to protect lives, assets and livelihoods.

Across the Asia-Pacific region, Oxfam is supporting communities and local authorities to use both early warning and long-term climate and disaster information to inform decisions that will reduce risk and build resilience.

Finding 1a: People are using early-warning systems to make decisions that have protected lives and assets in rapid-onset emergencies.

A people-centred early warning system comprises of four key elements: knowledge of the risks; monitoring, analysis and forecasting of the hazards; communication or dissemination of alerts and warnings; and local capabilities to respond to the warnings received.

The establishment of people-centred early warning systems in Bangladesh, Indonesia, Nepal, Pakistan, Sri Lanka and Vanuatu have allowed communities to take action that has protected lives, property and productive assets during disasters.

- In Pakistan, Oxfam and partners assisted communities and local authorities to establish early-warning systems. Communities supported by the project received early-warning information two days before the 2010 floods - a full day before comparison communities. This allowed people to take early action to evacuate community members, and secure and protect household and livelihood assets[5].

- In Vanuatu, communities on Futuna Island acted on early-warning information ahead of Cyclone Pam. People secured boats and houses, evacuated to safer locations and cut back the leaves of their root crops so that they could be salvaged after the storm.

- In the Philippines, Oxfam supported local governments and communities to access climate information and set up low-cost early-warning systems. This included establishing six automated water stations at local government units, in partnership with the national weather bureau PAGASA. During

Cyclone Agaton, this meant that the local government had a good estimate of how intense the rainfall would be, for how long and how fast the flood would rise. They were to communicate this with communities.

In all these examples, early-warning systems were combined with socially inclusive disaster management plans and committees, who led the response to the warnings. This meant that project-supported communities were better prepared than comparison communities.[6] In Vanuatu, the positive impacts have been sustained, with early warning for cyclones in 2017 resulting in immediate action.[7]

Finding 1b: People are changing livelihood practices and protecting assets as a result of their improved understanding of climate change and disaster risk.

Securing and enhancing livelihoods, and forward-looking decision-making are key elements of Oxfam's approach to resilient development. In Asia and the Pacific, strategies that support this goal include livelihood diversification, and access to savings and credit.

There were instances where knowledge of climate change had contributed to changing livelihood practices and protecting assets. Because the systems were able to adapt with the environment, people are able to make forward-looking decisions that take into account the impacts of climate change.

- In Bangladesh, participation in the program's Participatory Vulnerability and Capacity Analysis led to a number of people raising their houses to protect against floodwater damage.[8]

- In the Solomon Islands, people have moved food production sites away from rivers, and started multiple garden plots to minimise damage from flooding and pests.[9]

- In Timor-Leste, increased understanding of climate change motivated farmers to change their production practices to be more climate-change resilient. These changes have also increased volume of production and household income.[10]

Philippines: A local Women's Farmer Group in Sitio Matinao. Women in the group make use of a small piece of land which they use to grow new vegetables and crops before trying them at home in their own gardens. *Photo: Tessa Bunney/ Oxfam*

Disaster risk reduction and preparedness activities help communities respond better to disasters. *Photo: Atul Loke/Oxfam*

COMMUNITY-BASED EARLY WARNING AND PLANNING SAVES LIVES AND PROPERTY IN PAKISTAN

The 2010 floods were the worst in Pakistan's history, affecting 20 million people. In the lead-up to these floods, Oxfam and its local partners — Doaba Foundation and HELP Foundation — implemented the *Community-based Disaster Risk Management and Livelihoods Program*, which involved more than 21,000 people in 60 villages along the Indus and Chenab rivers. The program:

- Mobilised and trained training community-based organisations to develop disaster-management plans. The process emphasised relationship-building at a community level, alongside partnership and participatory planning. Local ownership of the plans was emphasised.

- Developed an automated monitoring system with sensors at certain points in the river. Trained community members would automatically receive SMS warnings of increasing river levels, which would help them take early action.

- Established an Emergency Resource Control Centre to inform and disseminate early-warning information to government departments, and built relationships between community organisations and river barrage management upstream, so people knew who to call to get river-level information.

- Combined the above with emergency preparedness activities, including first-aid and search-and-rescue training, as well as construction of raised emergency shelters, culverts, water harvesting ponds, and "flood friendly" pit latrines.

The floods hit 18 months into the program, and put these measures to the test. An impact evaluation was carried out following the floods. It found that participating villages received two days advance warning of the floods compared to one day in other villages. The early-warning information, combined with community preparedness activities increased the communities' abilities to take deliberate protective action. This included evacuating and protecting their assets before the flood hit. People in participating villages consequently lost less grain, and fewer livestock, equipment and tools than comparison villages. They also recovered more quickly.

Bangladesh: Oxfam's Executive Director Helen Szoke learns about the importance of women's producer groups in building community resilience.
Photo: Abir Abdullah/Oxfam

Key finding 2: Climate and disaster risk information is more effective when participatory approaches are taken to improve household and community knowledge, and support is given to climate and disaster risk information generators to improve its relevance and accessibility.

Across Oxfam's projects, it's not enough to simply provide climate and disaster risk information to communities or implement early-warning systems. Involving the community in the development of government systems has been a critical step to effectiveness and understanding.

Finding 2a: Participatory approaches, including PCVA, built communities' and local government knowledge of climate and disaster risks and strengthened community institutions.

Multiple projects used PCVA as a foundation for building a shared understanding of climate and disaster risks. This analysis was used as the basis for local and subnational action plans for addressing disaster risks and long-term change.

- In Vanuatu, Timor-Leste and Vietnam, Oxfam and its partners have produced a range of educational materials to improve understanding of disaster risks, including theatre production, television, radio shows, discussion groups and posters.[11]

- In Timor-Leste, evidence from the 2015–2016 El Niño response suggests community recall of key messages was stronger where multiple methods were used.[12]

- In Pakistan, Oxfam partners mobilised communities to demand better early warning of floods from government stakeholders, as well as developing an innovative flood-monitoring system that monitors upstream river flows.[13]

- In Vanuatu, by linking scientific assessment of risks with traditional knowledge, a more complex local understanding of climate risk was developed.[14]

Strengthening the ability of communities to respond to climate and disaster risks has been critical to success.

- In Vanuatu, Oxfam supported the development of community disaster and climate committees. These committees led disaster preparedness ahead of cyclones Pam and Cook, and mobilised community members to protect assets.[15] A

review found that communities that had gender and disability inclusive committees were more likely to respond to early-warning messages, and support the evacuation of the most vulnerable community members.

- In Pakistan, the establishment of trained disaster committees, with links to government, were critical to the effectiveness of response to the floods just 18 months after the project's inception.[16]

Finding 2b: Working with information generators improved the provision, accessibility and relevance of climate and disaster risk information.

Oxfam and its partners have strengthened communication of early-warning information from forecasting agencies to communities, and between community members.

- In Pakistan, Oxfam helped to establish an Emergency Resource Control Centre to inform of appropriate responses to early warnings and disseminate early-warning information to government departments. SMS alerts were automatically generated for early flood warnings, which strengthened relationships between communities and officials and enabled downstream communities to verify the automatically generated warnings.[17]

- In the Philippines, Oxfam partnered with the national weather service PAGASA to install six automatic weather stations in six local government areas, and trained nine local government staff as weather observers. This has enabled increased accuracy in local-weather forecasting, including measures of rainfall intensity during typhoons.[18]

- In Indonesia and Solomon Islands, Oxfam has worked to establish a Journalists Forum that provides training on effective communication of disaster risks, early warnings and climate information.[19]

Indonesia: Communities need climate and disaster risk information in order to plan what crops to plant and harvest. *Photo: Rodrigo Ordonez/Oxfam*

Key Finding 3: Gender inequality and other sources of marginalisation affect access to climate and disaster risk information; Oxfam and other actors need to prioritise work to address this.

In order to be effective across society, efforts to improve access to climate and disaster risk information must consider gender and power dynamics. Although a number of Oxfam's resilience projects had a specific focus on working with women and shifting gender norms, disability, ethnicity and other factors also shaped access to relevant information. (Note. See the associated evidence brief on gender equality and inclusive approaches for more information).

- In Vanuatu, women identified challenges to accessing climate information. These included not having a radio to listen to weather forecasts; not being able to read the community noticeboards due to low-literacy; not being included in council meetings where information is shared; and not being able to attend awareness and training events due to other commitments.[20]

- In the Philippines, investment in local weather stations and distribution systems resulted in a reliable five-day weather forecasting system that reached communities, overcoming the barriers for communicating with women. Village's weather bulletins would include climate data, which women used to plan their weekly farming and livelihood activities, including household chores such as washing clothes.[21]

- In Vietnam, the percentage of female respondents with awareness of climate change significantly increased from 38 per cent at baseline and 89 per cent at end-line. Male awareness increased from 68 per cent at baseline to 94 per cent at end-line. So the gap narrowed between women and men during the project, the gap still exists.[22]

- In Vietnam, ethnicity and inter-sectionality created challenges for sharing information. Women from ethnic minorities with limited formal education, low levels of literacy, and some with limited fluency in the national language made it more difficult for communication and absorption of new knowledge and skills more difficult.[23]

- In Vanuatu, research found that adults with disabilities had poorer access to disaster risk reduction efforts compared to adults without disabilities. Three out of every 10 adults with a disability had never attended school, and 43 per cent said they were unable to read a message on a mobile phone – a simple test of literacy particularly common for early-warning systems.[24]

In some cases, these differences are occurring despite an explicit focus on gender and inclusion within climate change adaptation projects. This points to the impact of historical inequality that must be addressed for resilience programming to be fully inclusive and effective.

Timor-Leste: Participatory Capacity and Vulnerability Analysis is used to help communities better understand climate change and disaster risk and to make decisions on how to prepare and adapt now and into the future, including how to adapt their agricultural and farming techniques. *Photo: Tessa Bunney/Oxfam*

Indonesia: Wina, Coordinator of the Village Preparedness and Response Team of Tegal Maja Village, provides simulation training to a number of elementary school students on the beach. *Photo: Yusuf Ahmad/Oxfam*

Key Finding 4: There was more evidence of success in using short-term disaster risk information than in using medium- to long-term climate information, particularly in the face of slow-onset hazards such as El Niño and associated drought.

The evidence of households and communities using climate and disaster risk information is most strongly demonstrated in response to rapid-onset hazards, where people took action to protect livelihood assets and minimise loss (as presented in key finding 1). There are more limited examples of the use of climate and disaster risk information for slow onset hazards, including drought associated with El Niño suggesting this is an area in need of increased attention.

Funding 4a: Local relevance is an important factor for the effective uptake of information. Oxfam's staff and its partners' capacity for linking climate information to local implications was critical for effective communication.

This research identifies gaps and challenges that need to be overcome for effective uptake of climate information in livelihood decisions.

- In Thailand, an impact study found little difference between the use of climate information in participating households and those in the control group. It suggested that available forecasts did not provide information or advice that they needed to make informed decisions.[25]

- In Timor-Leste, a peer review of the 2015–16 El Niño response highlighted the need to supplement generic, national-level messages about El Niño impacts with locally relevant actions such as what variety of trees to plant to protect water sources.[26]

Furthermore, Oxfam and its partners need to develop and broker the technical capacity to apply weather and climate information to its local context:

- In Timor-Leste, summary climate sheets that include information on weather patterns and planting seasons have been produced in some areas, but partners found it difficult to explain the scientific information to farmers.[27]

Finding 4b: Stronger organisational responses are required for implementing effective early action for slow-onset hazards.

A common challenge for governments and NGOs is developing appropriate responses to early warnings of slow-onset hazards. Even within Oxfam, a review of early action found that organisational recognition of the likely and actual impact of El Niño was late. This challenge is by no means limited to Oxfam – with the UN Special Envoys on El Niño and Climate stating *"there is no question that a much greater sense of focus and urgency is required to ensure that future El Niño Southern Oscillation do not result in the scale of emergency caused by the 2015–2016 El Niño".*[28]

CONCLUSION

Evidence from Oxfam's projects indicates that the use of climate and disaster risk information is contributing to resilient development outcomes. This was particularly evident where climate and disaster risk information were linked to community planning and response capacity, especially with respect to rapid-onset disasters. There was also evidence that the dissemination of climate information is informing actions to protect lives, assets and livelihoods. Early-warning systems and participatory disaster risk and climate change planning are important elements for building resilience, and their benefits are strengthened when they are linked with the development of strong and inclusive local institutions.

Additional efforts must be made to ensure that weather and climate information is accessible to all people including women, those with disabilities, and from ethnic minorities. The low uptake of early warnings for slow-onset hazards such as El Niño, and limited examples of climate information in long-term planning, highlight areas where Oxfam could increase its attention in the future.

RESEARCH QUESTIONS AND METHODOLOGY

The following questions were based on Oxfam's conceptual frameworks, relevant academic literature, and discussions with Oxfam staff.

1. How has the use of climate and disaster risk information in Oxfam projects contributed to resilient development outcomes?

2. How has Oxfam worked with others to support access to climate and disaster risk information for women and people with a disability?

3. How has Oxfam supported household, community and government decision-making processes to be more flexible and forward-looking, and able to respond to existing hazards and future change?

35 evaluations and research reports from Oxfam projects from the Asia-Pacific region were used to inform this brief. Findings were qualitatively coded against each research question and emergent sub-themes, and assessed for quality of evidence.

A detailed methodology, including limitations, is available from Oxfam.

Vanuatu: School gardening projects help children learn new and more resilient gardening techniques. *Photo: Simon Bradshaw/Oxfam*

REFERENCED PROJECTS

PAKISTAN
Community-based Disaster Risk Management and Livelihoods Program*

BANGLADESH
Resilience through Economic Empowerment Climate Adaptation Leadership and Learning*

NEPAL
Joint Programme on Disaster Risk Management and Humanitarian Preparedness*

VIETNAM
Partnership for Equitable Resilience to the Impacts of Climate Change of the Coastal Communities in Deltas of Vietnam*

PHILIPPINES
Building Resilient and Adaptive Communities and Institutions in Mindanao, Philippines (BINDS)*

SRI LANKA
Humanitarian Partnership Agreement - Disaster Risk Reduction Project*

THAILAND
Climate Change Community-Based Adaptation Model for Food Security*

INDONESIA
Building and Deepening Resilience in Eastern Indonesia*

Deepening Resilience in Agam District, West Sumatra*

TIMOR-LESTE
Improving Land and Water Management to Reduce the Impacts of Climate Change*

Action for Resilient Communities in Timor-Leste - Humanitarian Partnership Agreement Response*

VANUATU
Yumi Stap Redi long Klaemet Jenis: Vanuatu NGO Climate Change Adaptation Program*

Central America-Melanesia (CAMEL) Resilience Building Program*

SOLOMON ISLANDS
Central America-Melanesia (CAMEL) Resilience Building Program*

*These projects were supported by the Australian Government and implemented by Oxfam and partners.

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TIMEFRAME	CLIMATE AND DISASTER RISK INFORMATION	SOURCES[5]	RELEVANT ACTIONS
Short term *(hours, days, weeks)*	Weather forecasts (for example, temperature, rainfall and wind); and specific warnings (for example, cyclone, heavy rain events, or strong winds, flooding, tsunami).	National meteorological and hydrological agencies, the Australian Bureau of Meteorology, the Joint Typhoon Warning Centre, Pacific Tsunami Warning Center, as well as local observations.	Communicate warnings to community members; activate emergency response plans.
Medium term *(months, seasons)*	Above or below average rainfall for the coming season; and likelihood of Tropical Cyclone or Typhoon formation.	National meteorological and hydrological agencies, the Australian Bureau of Meteorology, and the International Research Institute for Climate and Society.	Revisit disaster plans; replenish emergency stocks; alert community members; take action to minimise risks to livelihoods.
Long term *(years, decades)*	Increasing risk of extreme high or low rainfall; increasing extreme temperatures; increasing average temperatures; associated effect on ecosystems, livelihood assets and infrastructure.	National meteorological and hydrological agencies, Intergovernmental Panel on Climate Change, the Pacific-Australia Climate Change Science and Adaptation Planning program.	Develop and review risk reduction and adaptation plans with forward-looking information; support community members participate in decision-making.

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NOTES

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