



Building resilience for a **BETTER WORLD**

**Capacity Statement:
Disaster Risk Reduction**

**Practical
ACTION
CONSULTING**



Climate change is leading to increasingly frequent and more severe hazards and disasters. People affected by poverty and inequality are the most vulnerable and hardest hit. We need to build resilience that connects cutting edge science to the needs, priorities and capacities of vulnerable people throughout the world.

Practical Action has been working with communities to reduce hazard risk, understand the impact of climate change, and improve people's resilience since the 1990s. We recognise that predicting and coping with disasters is not enough, so we aim to make resilience a way of life for those most at risk. By adopting new ways of working, living and managing our environments, we can reduce the likelihood of climate and weather-related disasters occurring.

We are committed to helping people tackle some of the world's toughest challenges – made worse by catastrophic climate change and persistent gender inequality. We have witnessed the results working in a range of different contexts affected by the cycles of poverty, inequality and disasters around the world.

Our varied experience uniquely places us to share innovative, viable and low-cost solutions which address the needs of communities affected by complex, recurring hazards. Our work supports risk-informed decision-making at local and national levels by applying innovative solutions in different contexts and at scale, to reach the last mile with effective disaster risk reduction that works for everyone.



We are Practical Action

An international development organisation putting ingenious ideas to work so people in poverty can change their world.

We're a global change-making organisation comprised of three specialist groups with unique expertise. The organisation consists of:

- **A development NGO** which works alongside communities to trial and perfect creative solutions to problems that keep people poor.
- **Practical Action Publishing** takes our learnings and those of other practitioners and disseminates them worldwide through books, journals and open knowledge platforms.
- **Practical Action Consulting (PAC)** provides specialist technical expertise to our own projects, to other development organisations, government bodies and the private sector.

Currently we work in more than 20 countries and operates from 11 regional offices across Asia, Africa, Latin America and the UK.

In recent years, we have focused on four inter-related sectors and, importantly, on the nexus between them. These include access to renewable energy, agriculture and food security, urban water, sanitation, hygiene and waste management, and disaster risk reduction.

We believe in the power of small to change the big picture. And that together we can take practical action to build futures free from poverty.

Our approach to disaster risk reduction

Through ingenious solutions, resilient communities can reduce its vulnerability and minimise the impact on their lives and livelihoods.

Practical Action develops ingenious solutions to the challenges identified by the stakeholders we work with related to living with disasters, making decisions in a context of complexity and uncertainty, and reaching the last mile.

To achieve this, we focus on developing early warning systems and climate information services, applying our expertise in research and innovation, last mile early warning and communication, knowledge management, and stakeholder engagement to deliver **effective and inclusive solutions to key resilience challenges for vulnerable communities.**

We work across the areas of risk knowledge, monitoring and warning, communication and dissemination, response capability, governance, multi-hazard early warning, and gender and social inclusion to build and strengthen **holistic and transformative systems** which work for people and communities at risk of disaster.

Collaborating to achieve change

Achieving effective and sustainable results requires meaningful collaboration and cooperation with a range of stakeholders who bring unique knowledge, experience, perspectives and requirements which shape our goals for disaster risk reduction and resilience. We work with a variety of practitioners and policy-makers at all levels to convene and connect people and information. This includes:

- **Leading researchers** from around the world, bringing together advances in physical and social sciences to improve the understanding of hazards, their impacts, and how to prepare and respond to them. We ensure their new research is informed by the concerns of affected communities, and collaborate with them to bring innovations to scale, maintaining a focus on appropriate technologies.
- **Meteorological agencies** in developing countries, so that they can sustainably build capacity and improve their monitoring and communication of hazard risk.
- **Decision makers** in local and national governments, collaborating to develop risk information that is useful, usable and used, and Standard Operating Procedures and Common Alerting Protocols better understand and take action in response to hazard risk information.
- **Resilience practitioners** including the Red Cross Red Crescent Climate Centre, UN agencies, and international, national and local NGOs to improve the delivery of disaster risk reduction.
- **Communities** so they're better prepared to cope with disasters, using strategies and low-cost technologies we have proven effective in different climate contexts that are vulnerable to floods, droughts and landslides. Working closely with marginalised groups in communities, we identify the ways in which different people experience disasters and risk reduction, so that DRR policy and practice can include and prioritise their needs and capacities in transformative ways.

Areas of expertise

Four paths to achieve change:



Research and Innovation: Putting Science into Practice

We partner with innovative researchers in the field of disaster risk reduction and early warning systems, working with them to ensure new technologies can successfully be brought to scale.



Last Mile Early Warning and Communication

Tailoring early warning systems to reach the last mile, including the most vulnerable and marginalised populations, means that current systems can be strengthened and work better to save their lives and livelihoods.



Global Knowledge Sharing

By supporting effective learning, we strengthen resilience to hazards around the world by facilitating and managing the synthesis, dissemination and uptake of knowledge generated by projects and research.



Stakeholder Consultation, Analysis and Advice

We undertake scoping, needs analysis and stakeholder consultation in areas relating to Disaster Risk Reduction, Early Warning and Climate Services.



RESEARCH AND INNOVATION: PUTTING SCIENCE INTO PRACTICE

Improving early warning lead time in Nepal

In collaboration with Lancaster University and the Nepal Department of Hydrology and Meteorology (DHM), we piloted **a new approach to flood forecasting that increased early warning lead time by 5 hours**, a significant improvement for communities where current systems give less than 2 hours of early warning.

For the past decade and in partnership with the Nepal Department of Hydrology and Meteorology (DHM), Practical Action has been working with communities in the Karnali floodplains, an area vulnerable to sudden onset floods, to develop a simple, low-tech, community-focused early warning system that saves lives and also allows to save moveable assets, livestock, and livelihood tools.

Working closely with a leading expert in modelling, statistical analysis and forecasting of natural hazards, an improved approach was developed using probabilistic forecasting. Initial successes in Karnali basin led the DHM to adopt the model and roll it out to all major river basins across Nepal in 2016. This includes large river basins such as the Narayani and Koshi, along with smaller basins, such as Kankai, Babai, and West Rapti. The results indicated an additional lead time of 3–5 hours for larger basins and around 1–3 hours for smaller basins.

We are exploring how to communicate these forecasts enhancing access to the improved early warning lead time. To achieve this, we are working with stakeholder groups to determine the audiences this information needs to reach, how uptake of and action on this information can be ensured, and how it can be most effectively communicated.

Multi-hazard Early Warning

Under the DFID and NERC-funded Science for Humanitarian Emergencies and Resilience (SHEAR) programme, we are working with researchers from Kings College London, Durham University, UK Met Office and British Geological Survey on multi-hazard early warning incorporating landslide risk.

We consider multi-hazard and cascading hazards including floods, earthquakes, landslides, as well as slower onset hazards including drought. The work aims to reduce the impacts of hydrologically related landslide multi-hazards (in terms of fatalities and destruction and damage to livelihoods and assets) and build resilience to landslides in vulnerable, often remote, and hazard-prone areas of South Asia.





LAST MILE EARLY WARNING COMMUNICATION

Gender Transformative Early Warning Systems

We have carried out **state-of-the-art research in Nepal and Peru** which explored how gender is considered at all stages of flood early warning systems. Lessons learned and best practices were identified for implementing systems which consider the **needs, capacities, constraints and priorities of different groups**, including those who are often marginalised or excluded, particularly women. The knowledge generated has been shared internally within Practical Action to enable cross-country learning, and shared widely to support practitioners to develop gender-sensitive approaches.

We have also worked with different stakeholder groups in Kenya and India (high level decision-makers, media personnel and the public) to identify the most **effective ways of communicating extreme weather events attributed to climate change**, such as droughts and heat waves.

For further information: [click here](#)

Missing Voices Methodology

We recently piloted a **new approach to researching the experiences of marginalised groups relating to risk and resilience**, that generated revealing data and highlighted issues which were invisible in the wider literature.

The approach prioritise some categories of marginalised groups to target based on existing and acquired contextual knowledge about the factors which drive marginalisation in a given context. Then, with the support of a trusted intermediary, typically a local NGO focused on providing support to a specific group,

and through snowball sampling, we make telephone contact with individuals who are part of the target groups, who are willing and able to speak with us. By doing so, the interviewees have control over when and where they undertook the interviews, enabling vulnerable groups to speak with greater openness and without scrutiny, in conversations touching upon sensitive topics.

This methodology significantly enhances the quality and openness of the interview data and since interviewers were not restricted by geography, it gave the opportunity to speak with individuals in locations that may have been too difficult, resource-intensive or time consuming to travel to in person.

For further information: [click here](#)

Gender and age inequality in Disaster Risk

We have worked with UN Women and UNICEF to carry out global research into the differentiated impacts of disasters on different gender and age groups, producing a report for the 2019 Global Platform for Disaster Risk Reduction. This research included a global, systematic literature review and three deep-dive country case studies, conducting key informant interviews and using our Missing Voices methodology to build an understanding of how gender and age inequality interact with disaster risk across a range of hazard types and country contexts. We developed a six-step approach to gender and age inequality-informed data to provide insight into the scale, impact and underlying drivers of differential impacts, which can be used to inform gender and age transformative action.

For further information: [click here](#)



GLOBAL KNOWLEDGE SHARING

People-centered knowledge for resilience

Alongside the Red Cross Crescent Climate Centre (RCCC) we are working to support **groundbreaking research being carried out across Asia and Africa** by the Science for Humanitarian Emergencies and Resilience programme, (SHEAR), focussing on landslide and multi-hazard early warning systems and forecast-based financing and early action.

SHEAR is supporting improved disaster resilience and humanitarian response by advancing monitoring, assessment and prediction of natural hazards and risks across sub-Saharan Africa and South Asia. It is working with stakeholders to co-produce demand-led, people-centred science and solutions to improve risk assessment, preparedness, early action and resilience to natural hazards.

We ensure that the knowledge generated by the programme's research projects supports effective learning across and beyond the programme, building a sustainable and high impact legacy of the projects' findings.

Our goal is to share knowledge with our colleagues in the humanitarian and scientific communities in ways that help to strengthen resilience to hazards around the world by facilitating and managing the synthesis, dissemination and uptake of knowledge generated by the projects.

Building an evidence base for Climate Information Services

We worked as **members of an international research consortia funded by USAID** as part of the Learning Agenda on Climate Information Services, identifying users of climate information services in sub Saharan Africa and their needs, developing a systems mapping methodology, and examining best practices for the design, implementation and evaluation of climate information services.

Our role as **knowledge broker** involved overall management and coordination of the consortium, support in the development of research and research outputs to ensure relevance and usability, synthesis of all the knowledge generated by the different research work streams, a comprehensive mapping of the regional climate information services landscape, and the development and implementation of dissemination strategies.

Since then, we have taken that learning forward and developed a **toolkit based on a synthesis and analysis of the available evidence to provide guidance on best practices for climate information services**.



STAKEHOLDER CONSULTATION, ANALYSIS AND ADVICE

Analysis of the Effectiveness of Climate Service

We undertook an **analysis of the effectiveness of climate services** across South Asia for DFID, advising them on **key priorities for a planned £125 million investment to enhance regional climate services for disaster risk reduction**. This encompassed a thorough review of the literature, targeted interviews and workshops.

Consultations included a wide range of senior stakeholders including National Meteorological Agencies, climate service users such as National Disaster Management Authorities, sectoral departments, intermediaries as well as significant regional donors such as the World Bank and USAID. This scoping covered South Asia including Afghanistan, Pakistan, Bangladesh, India, Nepal and Burma.

Scoping Civil Society Perspectives of Effective Early Warning

We led a study for DFID on **civil society perspectives on drought, flood and cyclone Early Warning Systems** across East, Central, Southern and West Africa, South Asia and the Caribbean.

The ten EWS case studies have informed DFID's research priorities in the current Science for Humanitarian Emergencies and Resilience (SHEAR) programme.

Case studies focused on Sudan, Kenya, Uganda, Burkina Faso, Niger, Zimbabwe, Malawi, Nepal, Bangladesh and the Dominican Republic.

Systems Mapping for climate information services

We have developed and piloted a participatory systems mapping approach to improve the functioning of a climate information services system so that it better meets the needs of smallholder farmer end users. The approach is designed to bring together the key people within a particular system to identify and address obstacles and leverage opportunities to improve how it functions for everyone.

The process involves five key steps, and is based on the participation of actors across the CIS value chain, including CIS producers, farmers, relays and other supporting services.

By bringing these actors together, the approach aims to develop comprehensive understanding of all the different components in the system: the actor (e.g. farmers, hydro-met agencies) the enabling environmental factors (e.g. legislation) and the supporting services (e.g. translators, media platforms) how they relate to each other and how information flows – or doesn't flow – between them. Participants use the maps to identify where the system is working well and where it is weak, and develop clear plans of action to address the gaps.

The approach has been piloted in Niger and Senegal.

Sharing the knowledge

Key publications in Disaster Risk Reduction

Brown, S. et al “Gender and Age Inequality of Disaster Risk” (2020), UN Women and UNICEF

Budimir, M. Smith, P. Brown, S. et al. “Communicating Complex Forecasts for Enhanced Early Warning in Nepal” (2020), Journal of Geoscience Communication

“A Practical Guide to Seasonal Forecasts” (2019) SHEAR

Brown, S. et al “Gender Transformative Early Warning Systems” (2019), Flood Resilience Alliance

Brown, S. Budimir, M. et al “Missing Voices: Experiences of Marginalised Gender Groups in Nepal and Peru” (2019), Flood Resilience Alliance

Climate Information Services Research Initiative, “Participatory Climate Information Services Systems Development Methodology” (2019)

Boyce, P. Brown, S. et al “Transgender-inclusive sanitation: insights from South Asia” (2018) Waterlines, 37:2, 102–117

Liu W, Dugar S, Brown S, et al. (2018). “Integrated participatory and collaborative risk mapping for enhancing disaster resilience”. ISPRS International Journal of Geo-Information 7 (2): p. 68.

Liu W, Dugar S, Thapa G, Brown S, (2018) “Participatory Digital Mapping, Building Community Resilience in Nepal, Mexico and Peru” Practical Action

Budimir, M., and Brown, S., 2017, “Communicating Extreme Weather Event Attribution: Research from Kenya and India”, Practical Action Consulting with Red Cross Climate Centre.

M. Budimir, S. Brown, S. Dugar “Communicating risk information and early warnings: bridging the gap between science and practice” (2017) in ‘Disaster Risk Reduction a Road of Opportunities’ UN major group for children and youth

Smith, P. J., Brown, S., and Dugar, S., “Community-based early warning systems for flood risk mitigation in Nepal” (2017) Journal of Natural Hazards and Earth System Sciences

Sinclair, H., Brown, S., et al, 2017, “Improving understanding of flooding and resilience in the Terai, Nepal”, Practical Action.

Wilkinson E., Budimir M., Ahmed A.K., and Ouma G., 2015, “Climate information and services in BRACED countries”, Resilience Intel.

Brown, S. and Dugar, S. “Increased lead times for flood early warning” (2017) Practical Action

Brown, S. (2013) “Early Warning System and Risk Assessment Case Studies”, Annex 3 of DFID SHEAR Scoping, Study. Evidence on Demand

Chinaporn Meechaiya, Emily Wilkinson, Emma Lovell, Sarah Brown and Mirianna Budimir, “The Governance of Nepal’s Early Warning System: Opportunities under Federalism”





**Together we can create a world
that works better for everyone.**

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