

The Zurich flood resilience program – Phase 1 from 2013-2018

Executive summary



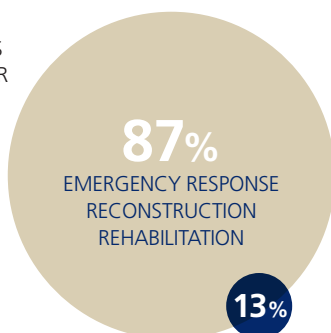
Motivation of the Zurich flood resilience alliance, its setup and objectives

Motivation

By using our risk expertise as a global insurer, Zurich helps customers and communities to reduce the devastating impacts of floods, even before a flood hits – we call this flood resilience. Floods affect more people globally than any other type of natural hazard and cause some of the largest economic, social and humanitarian losses. Loss of life and economic and insured losses are increasing in many regions, and flood risks are more interconnected and interdependent than ever.



REDUCING &
MANAGING RISKS
PRIOR TO DISASTER



Fraction of money spent on post-event versus pre-event

Pre-event risk reduction is the focus of our efforts across the Zurich flood resilience program. We know that prevention is cost-effective, but nearly 87 percent of disaster-related spending on aid goes into emergency response, reconstruction and rehabilitation, and only 13 percent toward reducing and managing the risks before they became disasters.¹

But flood resilience cannot be enhanced by one stakeholder alone, that is why we have created a multi-organizational partnership to enhance societal flood resilience in 2013. We call this the Zurich flood resilience alliance ('the Alliance').

¹ Kellett, J. & Caravani, A. 2013, "Financing disaster risk reduction: A 20-year story of international aid."



Setup

The Alliance has included the following partners since its inception. Zurich acted as the catalyst; providing human, technical and financial resources:

- The International Federation of Red Cross and Red Crescent Societies (IFRC), with programs in Mexico, Indonesia and Nepal;
- The International Institute of Applied Systems Analysis (IIASA) as a research partner;
- Practical Action, with programs in Bangladesh, Nepal and Peru;
- The Risk Management and Decision Processes Center of the Wharton Business School at the University of Pennsylvania (Wharton) as a research partner.

In 2015, we decided to invite a set of further, so-called **boundary partners**, to drive impact and scale. These were:

- Concern Worldwide (working in Afghanistan and Haiti);
- Mercy Corps (Indonesia, Nepal and Timor-Leste);
- Plan International (Nepal);
- United States' National Academy of Sciences (NAS, working in Cedar Rapids and Charleston).



Objectives

The Alliance has four primary objectives:

- Measurably enhance flood resilience in vulnerable communities across the world;
- Enhance the effectiveness of disaster risk reduction (DRR) solutions;
- Develop and promote knowledge and expertise on flood risk and resilience;
- Improve awareness and public dialogue around flood resilience and flood risk reduction solutions at national, regional and global level.

The flood resilience measurement framework and tool for communities (FRMC)

A survey conducted in 2014 for the United Nations Development Program (UNDP) concluded that:

“no general measurement framework for disaster resilience has been empirically verified yet.”

We have tried to address this gap and have built a community flood resilience measurement framework, together with the tools to practically apply it. The resulting FRMC is a decision- support tool. It combines the five capitals (5C) model from the Sustainable Livelihoods Approach (SLA) adopted by the UK’s Department for International Development, and the four properties of a resilient system (4R) developed by MCEER, a multidisciplinary research center, at the University of Buffalo.

The current FRMC version has been used in over 110 communities in 13 programs within nine countries. During its use so far, over 1.1 million data points have been created to measure flood resilience.

Community program results – inputs, outputs and impact



Input



The Z Zurich Foundation (‘Foundation’) made contributions to all partners over the course of the program, totaling CHF 36.83 million. Meanwhile, Zurich Insurance Company Ltd. (‘Zurich’) took on the cost and expense budget for approximately 2,420 work days of staff fully employed for the program, in addition to significant senior management input, as well as resources at local country level in Indonesia and Mexico where Zurich has an office presence and where programs were run.

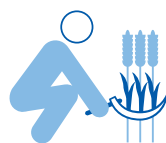


Output

The following Alliance partners were active, alongside Zurich, in the community program: **IFRC, Practical Action, Concern Worldwide, Mercy Corps, NAS, Plan International.** Below is a summary of their main outputs:



- **IFRC** created tools and undertook community surveys which enabled dialogue with communities; helping them to prepare for, reduce the risk and respond to floods. Actions arising from these discussions included three major reforestation campaigns, the creation of waste management centers and evacuation centers, training in community first aid, community-based emergency plans, 70 community brigades and education for school-children on flood awareness;



- **Practical Action** focused on creating end-to-end early warning systems (EWS), including 11 million alert messages to communities they covered during recent flood events. They also focused on building community capacity – including initiatives around livelihood activities like farming, built physical flood protection, engaged in advocacy with global and national governments on flood risk prevention and disseminated knowledge via information sharing platforms;
- **Concern Worldwide** trained community members on flood resilience and addressed capital needs including building: physical capital such as gabion and retaining walls and check dams, human and social capital such as flood resilience committees, natural capital such as tree plantation and financial capital such as community employment in infrastructure works. Concern also undertook national advocacy initiatives, including consultations with government agencies in Afghanistan and Haiti;
- **Mercy Corps** established and strengthened disaster preparedness groups in Indonesia. They strengthened community-based waste management and flood information distribution in the country. In Nepal and Timor-Leste, Mercy Corps ran financial literacy classes and formalized savings and lending associations. They also improved EWS, physical and green infrastructure;
- **NAS** implemented disaster preparedness training to 19 nonprofit organizations. It facilitated a meeting of a diverse stakeholder set to focus on planning and financing local mitigation efforts in Linn County, Iowa. NAS also organized a Cedar Rapids Flood Resilience Symposium to address some of the community's main resilience and flood challenges identified by the results of the FRMC. Finally, NAS has advocated for the use and effectiveness of the FRMC, including in a forthcoming article to be published in the European Review Journal;
- **Plan International** worked in Nepal, with their unique child-centered approach in two communities in the Koshi river basin. Activities included training on key aspects of Disaster Risk Management (DRM), training focused on teachers and children. Plan also implemented infrastructure improvements like shelters, river embankment stabilization and elevation of critical infrastructure, as well as bringing Community Disaster Management Committees together with local government.

Impact

Through the use of the FRMC, we find that overall there is a very positive direction in resilience between the start and the end of the programs. Many communities are increasing their flood resilience, with very few exceptions, resilience measurement results have gone up in all program communities over the duration of the program. One important – but unquantifiable – impact has been the level

of collaboration, exchange and sharing of knowledge across country programs.

Even though it is difficult to quantify specific figures, we know that the Alliance's DRR activities have made a difference and benefited a great number of people. A selection of our partners have nevertheless shared the following number of **beneficiaries** in the program communities we have worked with:

<p>Concern</p> <p>Haiti: 7,279 households (36,395 individuals)</p> <hr/> <p>Afghanistan: 2,030 households (12,830 individuals)</p>	<p>Mercy Corps</p> <p>Indonesia: 3,534 households (14,136 individuals)</p> <hr/> <p>Timor-Leste: 681 households (4,290 individuals)</p> <hr/> <p>Nepal: 254 households (1,959 individuals) directly, as well as 13,821 households (77,710 individuals) indirectly through upgrades to EWS</p>
<p>IFRC</p> <p>Indonesia: 21 communities served with 128,528 direct beneficiaries</p> <hr/> <p>Mexico: 21 communities served with 10,000 direct beneficiaries</p> <hr/> <p>Nepal: 25 communities served with 42,700 direct beneficiaries</p>	<p>Plan</p> <p>Nepal: 1,034 households (5,600 individuals)</p>

The total number of direct beneficiaries of the Alliance is approximately 225,000.

In addition, our partners report the following highlights in terms of impacts:

- **IFRC:** In Indonesia, impacts include the full implementation of the early warning and early action system (FEWEAS) for Citarum and Bangawan Solo river basins. The system covers over 26 districts/ municipalities, and could reach over 40 million people;
- **Practical Action:** In Nepal, warning lead times of the EWS have increased from two-three hours, to five-seven hours lead time, and loss of lives is lower compared to river basins without EWS. In Bangladesh, long-term lead times have increased from two to five days. In 2017, there was no loss of life in the program areas in Peru during the devastating coastal El Niño flooding;
- **Concern:** The most vulnerable and marginalized in society are being reached. This is demonstrated by a better representation of those groups at committee level and in the participation of flood resilience planning and decision-making processes;
- **Plan International:** In Plan's project sites, as a result of its continuous interventions, the local government has started to budget more for flood risk reduction. Since 2015, a total of approximately NRP 4 million has been set aside for soil conservation, flood protection infrastructure and disaster prevention, a local disaster emergency fund and for livelihood diversification.

Research program

Input

The Foundation's financial input was CHF 3.4 million into the research program, split between IIASA and Wharton. Zurich's input included staff commitment equivalent to a part-time position. From IIASA, there was commitment from one professor, one Ph.D. student and several contributions from four other staff. At Wharton, there was input from three researchers, as well as executive support from the head of the school.

Output

Researchers developed and produced around 40 articles and other publications. These have been cited 897 times.

The research focused on several key questions:

1. *What is community flood resilience and how can it be measured?*
2. *Is pre-event resilience building more cost effective than post-event relief and recovery?*
3. *What incentivizes people to invest in flood resilience measures?*
4. *What is the role of financial risk transfer in building flood resilience, especially in developed countries and through the UNFCCC's loss and damage mechanism?*
5. *How can we use innovative crowd-sourcing approaches for generating relevant flood risk data?*
6. *The role of novel decision-support techniques, including serious gaming, for motivating investment into pre-event flood resilience.*
7. *How can forensic risk analysis inform DRR investments?*
8. *What are the learnings from the Alliance partnership approach?*

Impact

An early in-depth meta-study examining a variety of programs and projects working in the flood resilience space found that, on average, one dollar invested in prevention saves five in future losses, a compelling cost-benefit ratio.² In addition, the research program: supported shifts in climate negotiations on dealing with climate-related impacts and risks; shifted the narrative on DRR toward building back better and an enhanced role for resilience; helped the Alliance to achieve a gradual increase in contributions to the Natural Hazards Section of European Geosciences Union (EGU) – from contributor to co-convenor.

² Zurich Risk Nexus: "Turning knowledge into action – processes and tools for increasing flood resilience," 2015; Zurich Flood Resilience Alliance White Paper: "Making communities more flood resilient: The Role of cost-benefit analysis and other decision support tools in Disaster Risk."

Post Event Review Capability (PERC)



PERC³ analyses the root causes of why events become disasters. It tries to answer, at an event level, what worked well and where there are opportunities for further improvements. We have covered over a dozen big flood events based on our assumption that they provide a lot of opportunity for learning.

Input

Zurich's financial input into PERC has been roughly USD 350,000; as part of the overall expense and contracting budget to our PERC partner ISET-International. Additionally, invaluable volunteer time was committed by companies from the insurance, engineering and NGO sectors – simply because they were attracted by the PERC concept to provide learning.

³ More on PERC at:

<https://www.zurich.com/en/sustainability/flood-resilience/learning-from-post-flood-events>

Output

There have been 13 PERC reports produced so far.

Impact

PERC has been recognized in the scientific field of disaster forensics. This has ultimately led to the influence we have had at EGU and other scientific events. We have had several requests from other organizations both from the scientific field as well as from the private sector, to see how the PERC methodology can be applied in their contexts. There have also been requests around how PERC could be expanded from flood to other perils, for example wildfires. At local level, PERC has been solicited to be presented at national scientific or flood practitioner conferences, such as the Natural Hazards Workshop Colorado and the Flood and Coast conference in the UK. We identified a number of common lessons despite extremely varied contexts. PERC findings have been applied to easy-to-understand recommendations and risk reduction advice for the general public, for government-based decision makers as well as for risk managers and commercial customers in the insurance context.

Leveraging the work of the Alliance



Knowledge generation and sharing

In total, we have produced 341 knowledge outputs from the Alliance. These include academic journal papers, practitioner-focused toolkits and solutions, policy briefs, infographics, videos, blogs and many more. This knowledge is brokered externally through our Flood Resilience Portal available in English, Spanish and Nepalese.

Influencing and advocacy

At global level, this includes presence at flagship conferences such as the UN Climate Change Conferences and World Economic Forum initiatives. We have also co-organized our own events, such as in 2016, when Zurich co-organized (together with Wharton) the Forum on the Financial Management of Flood Risks with the OECD. At country level, the focus has been on sharing best practice learned through programing with national level forums and government departments. Our efforts have been recognized through awards such as the UNFCCC's 'Momentum for Change Lighthouse Award' in 2014 and a Convergences' 'Special Climate Prize' in 2015.

Conclusions – past success, future ambition

The flood resilience program that has run as a first phase from 2013-2018 has been highly successful. Most of our partners decided to continue with us on our journey into the second phase – a testimony in itself.

Partners were positive on their experience. They enjoyed working with – and through – others. They have said that the depth of the programs, including the flood resilience measurement framework, has made a significant contribution to the overall resilience space. And they said that, while the decision-making processes on how to prioritize flood resilience solutions is a time-consuming process, it truly works.

In particular, the long-term approach of the Alliance program has been a key factor in success. It helps to design different and more meaningful and often more innovative resilience-building interventions. Ultimately, that leads to an improved understanding of resilience across all partners and the communities with whom we work.

We know that floods remain a major, global challenge, beyond 2018 with flood risk expected to increase given socio-economic as well as climatic drivers. Now, we need to go beyond simply describing the problem (by stating how large and costly flood losses are and how much suffering they cause). We need to focus more on finding solutions to the problem. It is easy to react post-event and make funds available to recover. It is hard to find commitment to make the money available when the risk has not yet materialized – acting pre-event is difficult. This is the challenging field we are committed to tackle further.

While we have been successful and on the right track, the problem of encouraging more investment into resilience as well as the trend of increasing losses and suffering from flooding

across the globe has not been solved yet and more still needs to be done. Alliance 2.0 will run during the five-year period 2018-2023, with our core and boundary partners of Alliance 1.0 working in a fully collaborative and 'joined-up' setup. It has secured funding of approximately CHF 20 million from the Foundation.

We are grateful for the past five years setting up and implementing the successful Alliance 1.0 and the learning this has created, and we eagerly look forward to executing on our ambitious targets for Alliance 2.0. There, we will keep what has been positive and learn and improve from the experiences that our journey so far has highlighted.



About the Zurich flood resilience alliance

An increase in severe flooding around the world has focused greater attention on finding practical ways to address flood risk management. In response, Zurich Insurance Group launched a global flood resilience programme in 2013. The programme aims to advance knowledge, develop robust expertise and design strategies that can be implemented to help communities in developed and developing countries strengthen their resilience to flood risk.

To achieve these objectives, Zurich has entered into a multi-year alliance with the International Federation of Red Cross and Red Crescent Societies, the International Institute for Applied Systems Analysis (IIASA), the Wharton Business School's Risk Management and Decision Processes Center (Wharton) and the international development non-governmental organization Practical Action. The alliance builds on the complementary strengths of these institutions. It brings an interdisciplinary approach to flood research, community-based programmes and risk expertise with the aim of creating a comprehensive framework that will help to promote community flood resilience. It seeks to improve the public dialogue around flood resilience, while measuring the success of our efforts and demonstrating the benefits of pre-event risk reduction, as opposed to post-event disaster relief.

Photos by Michael Szönyi, Zurich – p.3 top (Practical Action Nepal); center (Mexican Red Cross), bottom (Practical Action Nepal); p.4 top (Nepal floods) bottom (Charleston floods), p.7 (Practical Action Nepal) with exception of front cover (Nepal) and p.6 (Indonesia) provided by Mark Heaseman, Z Zurich Foundation and p.2 (Nepal floods) provided by Andreas Guntli.



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