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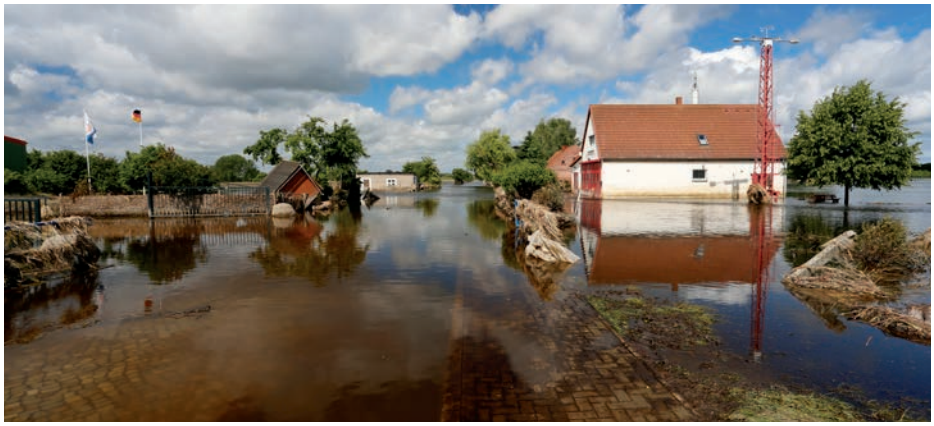
Beyond response and recovery: an introduction to the Zurich flood resilience program

This issue brief provides an overview of the global challenges caused by flooding and how we are tackling them through the work of the Zurich flood resilience alliance.



Why we focus on floods

Floods affect more people globally than any other type of natural hazard. They cause some of the largest economic, social and humanitarian losses, involving on average some 250 million people each year.[1]

While floods are natural, there is nothing 'natural' about their disastrous consequences. Often the poorest and least-prepared communities suffer most. Evidence shows that repeated disasters like floods undermine societies' and economies' potential to develop and it may trap them in a poverty cycle. We tend to think of these events as happening in other places, to other people but floods also cause devastation in developed countries. The reasons for this are surprisingly similar in both developing and developed countries.

To address the need for a proactive approach to flood risks, Zurich Insurance Group (Zurich) launched a dedicated flood resilience program in 2013. It includes two humanitarian organizations – the International Federation of Red Cross and Red Crescent Societies (IFRC), and Practical Action – and two leading research institutions: the Wharton School of the University of Pennsylvania (Wharton), and the International Institute of Applied Systems Analysis (IIASA) in Austria.

The program is based on a new approach to cross-sector collaboration. It brings together flood risk research, community-based programs and risk expertise. It looks for, and shares ways that community flood resilience can be measured and improved. The program directly helps about 125,000 people through projects in flood-prone communities in Bangladesh, Indonesia, Mexico, Nepal, Peru and the U.S.

Growing risks

Risks of floods are increasing. By some estimates, river flooding alone could annually affect 54 million people worldwide by 2030, more than double the number currently affected. There are several reasons why floods are having a greater impact:

Growing populations, more people living in cities: The world's urban population increased fivefold from 700 million in 1950 to 3.9 billion in 2014.[3]

"A system-wide approach to resilience needs to capture a range of activities, actors and processes that are part of a resilience building system,"

Urban growth is particularly strong in developing countries, where cities' disaster plans and emergency facilities may be unequal to the task of coping with major floods. Constructing buildings on flood plains, paving over land that provided drainage and lack of waste infrastructure all add to the risks.

More people living near water: Where land is at a premium, developers may ignore warnings and build in places exposed to river floods and storm surges. Cities in coastal regions on or near rivers including those in developing countries such as Jakarta, Lima, Shanghai, Dhaka, and Manila are highly vulnerable. But floods can also shut down a sophisticated metropolis like New York City, as Superstorm Sandy showed in 2012.

Greater prosperity – more to lose: The kind of development that depends on agriculture is more vulnerable to drought, while countries reliant on industrial development for growth suffer more from floods.[4] A higher standard of living that brings with it more manufacturing and production increases the value of property at risk. Such risk might be countered by protection measures (for example, raising buildings). Even so, a catastrophic flood can threaten not only the economy of a region, but entire global supply chains: severe flooding in manufacturing sites in Thailand in 2011 led to global shortages of components needed by major car makers and severely hit production of computer hard disks.[5]

Climate change: Research indicates that the risk of floods could continue to increase significantly in many parts of the world due to expected changes in climate patterns. Warmer temperatures affect weather patterns and sea levels. Tropical cyclones common in the northwest Pacific included Typhoon Haiyan in 2013, perhaps the strongest tropical cyclone in recorded history to make landfall, which killed over 7,000 people.

Our approach to flood resilience

Understanding flood 'resilience'

It is hard to change habits or convince people to move out of harm's way. Raising resilience is doubly important if it helps people to anticipate and cope with floods. It not only allows them to reduce the flood exposure to lives and property. Resilience also helps them recover more quickly.

We see resilience as the ability to continue to thrive in the face of disasters. It keeps people's lives intact before, during and after floods. It helps communities become more prosperous and stable. Resilience is frequently described as a 'system' or even as a 'system of systems,'[6] one that is holistic in nature. "A system-wide approach to resilience needs to capture a range of activities, actors and processes that are part of a resilience building system," according to a UN study.[7]

Ways resilience can be increased

There are several different ways we can enhance flood resilience, including:

- Through better assessments of flood hazards and communicating the risk to residents.
- Taking measures to lessen the severity of floods and mitigate their impact, including first-aid and health training, community planning, and setting up emergency shelters.
- Gaining a better understanding of how decisions are made in the face of risks and uncertainty to make the most effective solutions easier to find.
- Improving warning systems and helping communities adopt emergency protocols.
- Supporting efforts to rebuild 'better' – to safer standards – after floods.
- Ensuring people have opportunities to secure an income during floods – for example, by providing training in new skills so farmers have alternative revenues when cropland is under water.

"One common misconception is the 'it will never happen to us' syndrome: decision-makers underestimate flood risk, preferring to see floods as an unlikely event."

- Developing ways to safeguard assets exposed to flood risk at an individual or community level.
- Working with local officials and other policymakers and the private sector to help make communities more flood resilient.

Increasing resilience makes economic sense

We believe pre-emptive action – reducing flood risk before an event – brings benefits far in excess of those recovery can provide. On average, for every dollar spent on targeted flood-risk reduction measures, five dollars can be saved by avoiding and reducing losses.[8]

Despite the advantages of acting before floods happen to improve resilience, over the past two decades, only 13 percent of aid spending went to reducing and managing risks. The remaining 87 percent went to emergency response, reconstruction and rehabilitation post-disaster.[9] This emphasis on relief as opposed to resilience is neither logical nor efficient.

Understanding behavioral bias is key

Psychology plays a major role in flood resilience. By better understanding how people think, we can address the reasons why, despite its high cost-effectiveness, some communities and even international donors do not invest enough in pre-flood mitigation.

One common misconception is the 'it will never happen to us' syndrome: decision-makers underestimate flood risk, preferring to see floods as an unlikely event. There is also the 'there is nothing we can do, anyway' syndrome – people become fatalistic when they feel powerless to control the outcome of events. People also procrastinate: even when they know that investing in flood protection is necessary, they avoid making decisions. They might fall into the trap of refusing to invest in flood protection because they assume the government or donors will step in.

There's also a 'gambler' mentality at work: people believe that because a flood recently occurred, there won't be another one any time soon, forgetting that disasters occur independent of one another. And, too, there are very real budget constraints that must be overcome to convince people that it is in their own best interest to take action.

Creating a flood resilience alliance

Flood risks are increasingly interconnected and interdependent. A holistic approach is needed to address them. Through our pioneering collaboration we can tackle the challenges communities face. This effort works as an alliance that brings together organizations with complementary skills and expertise.

We are seeing the advantages of a combined approach in community programs where the IFRC and Practical Action use their extensive experience working with communities to identify and implement solutions. Programming is an iterative process typically starting by assessing and analyzing the situation; innovative solutions are devised, and then work begins with communities to assess, select and implement the best solutions. The impact of the actions implemented is then evaluated.

Research by Wharton and IIASA confirms the advantages of investing in pre-event mitigation as opposed to post-event relief. The research also provides objective evidence that can influence policymakers' decisions. Further, it can create an environment in which insurance and other risk transfer mechanisms can be part of the solution.

As an insurer, Zurich acts as a catalyst in providing human, technical and financial resources. The Z Zurich Foundation has made an initial five-year commitment of USD 35.6 million to the alliance. This is in addition to contributions of time, expertise and resources of Zurich employees around the world.

Our flood resilience alliance members

Alliance member	Background and expertise	Location	Link
Zurich Insurance Group	Established in Zurich, Switzerland, in 1872, Zurich provides insurance and services to customers in over 170 countries. As one of the world's leading insurance groups with about 55,000 employees, Zurich's mission is to help its customers understand and protect themselves from risks.	Headquartered in Switzerland	www.zurich.com
International Federation of Red Cross and Red Crescent Societies (IFRC)	Founded in 1919, the IFRC is the world's largest volunteer-based humanitarian network, reaching 150 million people each year through its 189 member National Societies. The IFRC and its members act before, during and after disasters and health emergencies to meet the needs and improve the lives of vulnerable people. They do so with impartiality as to nationality, race, gender, religious beliefs, class and political opinions.	Headquartered in Switzerland	http://www.ifrc.org/
Practical Action	Begun in 1966, this international non-governmental organization (NGO) uses technology to challenge poverty in developing countries. It seeks to advance education and relieve poverty by improving knowledge of technical, economic and social science.	UK	http://practicalaction.org/
International Institute for Applied Systems Analysis (IIASA)	Established in 1972, with a scientific staff of over 300, IIASA provides insight and guidance to policymakers worldwide by finding solutions to global and universal problems through applied systems analysis.	Austria	http://www.iiasa.ac.at/
Wharton Business School's Risk Management and Decision Processes Center	Wharton was founded in 1881 as the first business school in the U.S., as part of the University of Pennsylvania. Begun in 1984, the Wharton Risk Management and Decision Processes Center is recognized as a leading research institution that develops and promotes effective corporate and public policies for dealing with catastrophic events.	U.S.	http://riskcenter.wharton.upenn.edu/

How we intend to improve flood resilience

Buildings can be rebuilt after a flood. It is harder to rebuild lives, especially when dealing with repeated floods. With each flood, social bonds are tested, people lose income, family ties strained. Increasing a community's resilience to floods is the best way to counter these destructive forces. We can improve resilience, even when the task is sometimes difficult. This section introduces some examples of the specific challenges that we face and how we are addressing them.

The challenge: we need to invest more in resilience

Images of flood disasters in the media resonate with the public. People respond, and at least for a time, give generously. But such aid, while invaluable for the recovery phase, may fail to provide long-term solutions. Therefore, we need to direct investments toward increasing communities' flood resilience for the long term, not just when disaster strikes.

Better facilities and alternative livelihoods in Mexico: Work led by the IFRC and the Mexican Red Cross began in 2014 in 11 communities around Jonuta, a municipality in the state of Tabasco. Tabasco includes one of the world's largest wetlands through which the Usumacinta River flows. The river can rise as much as three meters during the rainy season. The people in these communities must live with floods several months out of the year and therefore need innovative solutions to earn a living, even during periods of high water.

Work is underway to build multi-purpose community buildings that can double as school rooms or medical facilities if necessary. Work is also being done to train communities on how to catch and prepare the invasive 'devil fish,' benefiting not only the environment, but possibly also providing them with a sustainable food source and a new source of income.

Community-based early warning systems in Nepal: Nepal is still recovering from the devastating earthquake in April 2015. But even as recovery begins, some communities in Nepal face a new threat: the onset of the monsoon season. Monsoon rains often trigger flash floods and mudslides, posing significant risks. Timely warnings about imminent floods can save lives and help people protect their possessions.

Under the lead of Practical Action, we are working in the Karnali River basin which begins in the southern slopes of the Himalayas and flows through Nepal to India. A major focus is on improving early warning systems implemented in 2010. In particular, this includes improving weather forecasting, keeping live-saving technology working even under extreme conditions, and training communities to act on the information received from measuring stations along the Karnali River.

Connecting upstream and downstream communities in Indonesia: Bukit Duri in the southern part of Jakarta city is bordered on one side by the Ciliwung River. When it floods, garbage and sewage block the river and end up flowing into the community. Much of this waste comes from upstream communities such as Tugu Utara. The IFRC and the Red Cross society in Indonesia, PMI, are leading our work with both Bukit Duri and Tugu Utara to improve waste management practices. By helping remove the waste from the river, the impact of periodic flooding is reduced. Not only that, but the waste management process also provides a valuable chance for these communities to add paying jobs, as the waste can be converted to compost and sold locally.

"There is no 'one-size-fits-all' solution or tool to measure resilience."

The challenge: measuring resilience

Data allow us to use resources – external and those within a community – to the best advantage. Good data and statistics tell us if an approach works, and also let us know if one approach works better than another. The information derived from measurements lets us identify successful actions. It tells us why measures succeed. It allows us to better predict whether a particular action will work not just in one community, but in others as well.

There is no 'one-size-fits-all' solution or tool to measure resilience. Any system used to measure resilience should find answers to specific questions related to an individual community. Useful, empirical measures of flood resilience offer clear, unbiased insights, and eliminate the need to make decisions based solely on subjective impressions or anecdotal evidence.

We are developing a community-based flood resilience measurement tool based on the 'five categories of sustainable livelihoods '(the 'Five Cs') framework established by the UK's Department for International Development (DFID),[10] and the four properties of resilience (the 'Four Rs') formulated by MCEER.[11] We will produce community resilience ratings based on these factors using Zurich Risk Engineering's Risk Grading to determine the level of resilience.

How a community can be rated based on 'livelihood stability' as a source of resilience

This is one example of how a community could assess its residents' vulnerability to income loss during floods. It establishes whether floods affect income, then determines how many residents have alternative income sources. If results show a need, a program might be tailored to provide other ways to earn money during floods.

Risk factor: Livelihood stability	A (Strength)	D (Growth area)	Baseline question
	Households have ability to maintain income stream via one or more livelihood strategies.	Households have no livelihood continuity strategy in the case of flood.	If your main economic activity is affected by floods, what other form of income do you have?

Grading	A	B	C	D
Percent of community with alternative income strategy.	>75%	>50%	>25%	≤25%

The challenge: enabling communities to control their own future

For communities that must regularly deal with floods, change seems particularly daunting. Very often these communities struggle to think beyond the immediate present. To keep people engaged in finding long-term solutions, community members must be part of the dialogue and the solution. Communities need structures that support dialogue: every member of a community must be part of discussions when looking for solutions.

Improving awareness about the impact of floods: Following Superstorm Sandy in 2012, a survey of over 1,000 New York City residents showed that people often tend to misjudge the risks floods pose to their own lives and property. A survey by Wharton with VU University Amsterdam found that homeowners may generally be aware of flood risks, but they often fail to recognize the risks they face as individuals. People tend to underestimate potential losses. This might explain why 80 percent of residents in the area inundated by Sandy's storm surge had no flood insurance, and 90 percent of small business had no flood protection, either – despite the fact that flood insurance is highly subsidized by the U.S. federal government. If people had a clearer understanding of what they stood to lose, they would be more likely to take protective measures. Based on these findings, the alliance has recommended that the U.S. Federal Emergency Management Agency (FEMA) provide flood maps showing not just where floods might occur, but also the damage floods could cause.[12]

"To build community flood resilience, you need different groups and individuals with specific types of knowledge and skills."

The challenge: policymakers need information and insights

Bringing policymakers into the picture: Limiting development in areas with flood hazards is difficult. People want to – or must – live and work near water.[13] But they can still be alerted to the risks of building on a flood plain. Policymakers and local officials should encourage better planning. Wherever possible, this should be done without compromising development that could benefit a community's long-term well-being and prosperity.

Engaging with the government in Peru: The El Niño phenomenon occasionally leads to heavy rains that cause floods in some parts of the world. Many years may pass between floods, but when they do come, the floods can be devastating. In communities in the Piura region in northern Peru and in the Rimac River Basin northeast of Lima, our program is working to make it easier for people to be better prepared for these types of floods. One factor elevating the risk is that, because floods tend to be rare in these areas, people forget the danger, as the buildings built in risky areas since the last flood attest. A big part of the program involves working closely with local authorities. It is also important to increase confidence in the government's ability to provide assistance.

Looking to the future

Our flood resilience program offers a platform to advocate learning, share knowledge, and apply what we learn in individual communities to help others, while serving as a catalyst for innovation and policy dialogue. A number of activities will support this approach in the future:

We are developing an 'open-source' solutions catalogue: This would make it easier to share knowledge to build flood resilience. The catalogue, drawing on the flood resilience alliance's community programs, will provide vulnerable communities with access to information on flood mitigation measures and solutions. It could also include research, processes and tools developed by the alliance.

We are testing a tool to understand the flood resilience system: The flood resilience alliance is developing a tool to increase the understanding of the factors and the interactions driving flood risk and wellbeing. It will be tested in 2015 in pilot communities in Nepal and Peru. The tool will make it easier to identify risk factors, map risk systems and sources, and spot potential problems.

We are exploring different ways the alliance could build further resources: This might include establishing a 'Flood Resilience Academy.' The Academy would be one way to share our knowledge and support practitioners in achieving more sustainable, replicable solutions. It could also be supporting efforts to identify and develop innovations to address flood risk.

Continuing the dialogue: We will continue to update you on our progress. We acknowledge that there are many different approaches to resilience. Ours includes testing our risk approaches in different settings, in both low-income and developed economies, in rural and urban settings, to make sure our approach is replicable and scalable to help enhancing flood resilience way beyond our own activities.

Read more:
www.zurich.com/en/corporate-responsibility/flood-resilience

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