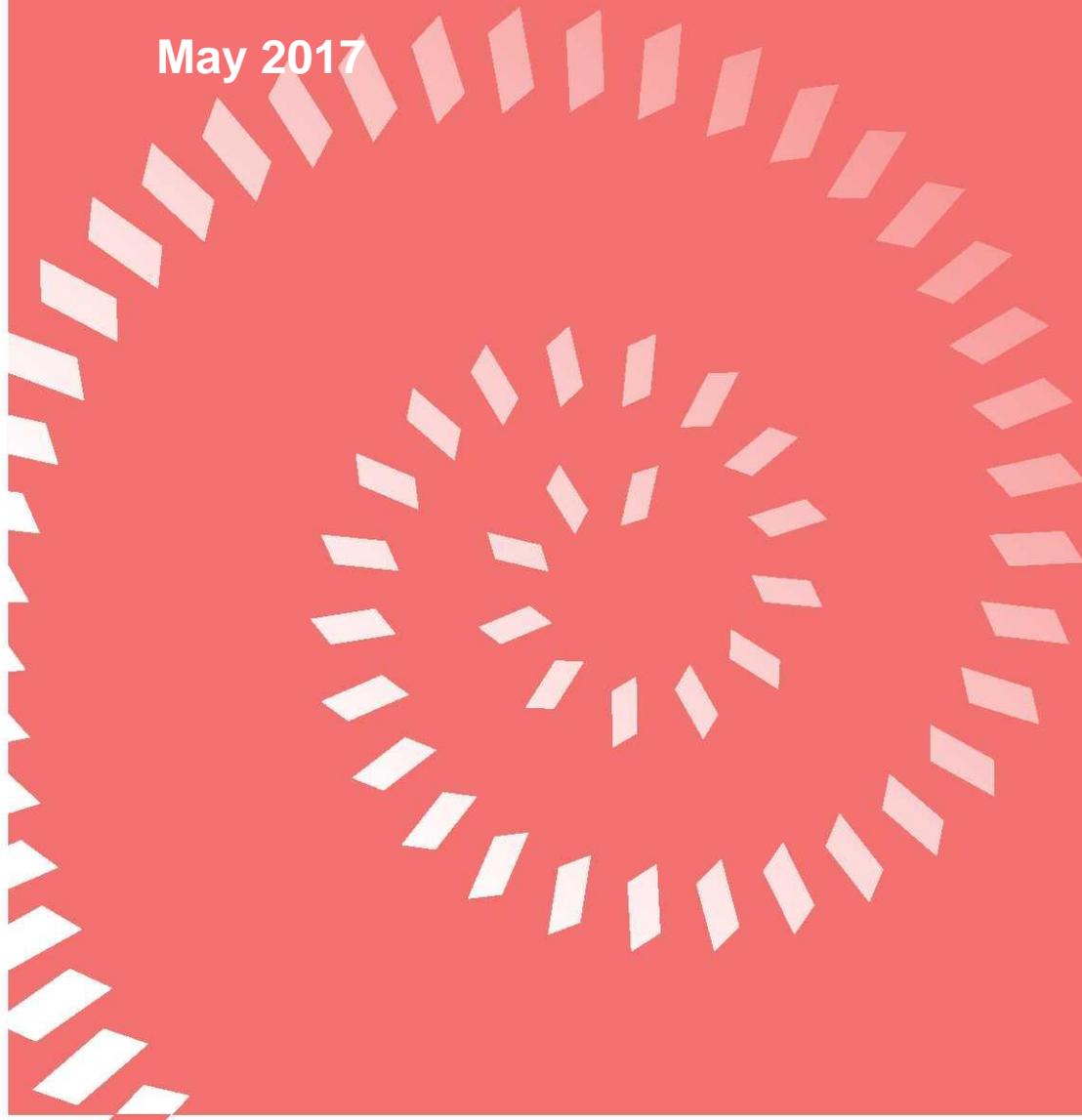




# Zurich Insurance: The case for effective insurance in flood prone areas

Making Business Mutual Case

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# Zurich Insurance:

## The case for effective insurance in flood prone areas

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### ***About the Making Business Mutual Case Studies***

This series of case studies explores how mutual approaches to business can help companies and their partners tackle some of the most pressing global challenges. The businesses featured in this series share a commitment to objectives beyond purely financial performance, as well as a serious intent to implement mutual practices through new forms of ownership, governance, leadership, measurement and management.

In particular, these cases address the measurement of multiple forms of capital, ecosystem shaping approaches, leadership development, business education, and policy formulation through laws and regulation that promote mutual conduct. The authors appreciate the collaboration of participating companies in creating these cases.

These cases were first developed for the annual *Responsible Business Forum*, the convening event of the Mutuality in Business Project, a joint research programme between Saïd Business School, University of Oxford, and the Catalyst think tank at Mars, Incorporated. The *Responsible Business Forum* brings together global companies, MBA candidates, scholars and activists to share their experience in confronting key challenges in their ecosystems to generate financial, social and environmental value.

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Author's Note: This is a descriptive case study, based on publicly available materials as well as on the information shared by the company described. This case study is not meant to provide critical analysis of the literature or information used to develop it. All errors and omissions are the authors' own.

<b>Case Name</b>	Zurich Insurance Company: The Case for Effective Insurance in Flood Prone Areas
	<p>Established in Zurich, Switzerland, in 1872, Zurich is one of the world's leading insurance groups, providing insurance and services to customers in over 170 countries. Zurich's mission is to help its customers "understand and protect themselves from risks."<sup>1</sup></p> <p>The Z Zurich Foundation provides a way for Zurich to carry out its commitment to community investment. The Foundation takes a long-term cooperative approach to tackling global challenges by combining Zurich's global experience and risk management capabilities with non-profit organisations' local knowledge and development expertise.<sup>2</sup></p>
<b>Ecosystem Pain Point</b>	<p>Globally, insurers have observed both an upward trend in weather-related insured losses due to the increase in frequency and intensity of extreme weather events and the growing economic cost associated with them.<sup>3</sup> Floods affect more people globally than any other type of natural disaster. The lack of both prevention and mitigation measures to reduce the physical impact of floods causes some of the largest economic, social and humanitarian losses. Zurich recognises that a proactive and holistic approach to the issue presents significant opportunities to grow revenues, reduce risk and improve brand value.<sup>4</sup></p>
<b>Business Strategy</b>	<p>In 2013, Zurich launched a flood resilience programme. The programme comprises a five-year commitment and includes an initial investment of USD 35.6 million by the Z Zurich Foundation.<sup>5</sup> The programme is a multi-stakeholder partnership that links academic insights, humanitarian sector capabilities and Zurich's own skills to enhance community resilience to flooding. It aims to demonstrate the benefits of pre-event resilience building over post-event disaster relief, and improve public dialogue around flood resilience.<sup>6</sup></p> <p>The knowledge gained through this work is used to influence policy-makers to prioritise pre-event resilience building and to educate communities on risks and prevention measures. The programme brings Zurich closer to the communities in which it operates and provides unique development opportunities to staff. The insights gained feed into Zurich's underwriting and claims practices to inform best practice externally.</p>
<b>Performance</b>	<p>To track performance, the company has developed a multi-capital framework, the Zurich Community Flood Resilience Measurement Framework, using a "5C-4R" model, as well as a Post Event Review Capability (PERC). These innovative tools help track impact and generate learning about the efficacy of various resilience-building approaches.</p>
<b>Prognosis</b>	<p>As the programme moves into its second phase, the main aims will focus increasingly on influencing policy-makers, funders and the industry in order to take a pre-event resilience building approach.</p>

<sup>1</sup> "Information about Zurich," *Zurich Insurance Group*, <https://www.zurich.com/>

<sup>2</sup> Ibid.

<sup>3</sup> "Home," *Insurance Institute of Northern Gauteng*, <http://www.iing.co.za/index.php>

<sup>4</sup> "Information about Zurich," *Zurich Insurance Group*, <https://www.zurich.com/>

<sup>5</sup> "Flood Resilience," *Zurich Insurance Group*, <https://www.zurich.com/en/knowledge/topics/flood-resilience>

<sup>6</sup> "Information about Zurich," *Zurich Insurance Group*, <https://www.zurich.com/>

## **Making Business Mutual Case Study: Zurich Insurance Group *Building the Case for Effective Insurance in Flood Prone Areas***

### **About the Company**

Established in Zurich, Switzerland, in 1872, Zurich is one of the world's leading insurance groups, providing insurance and services to customers in over 170 countries. Zurich's mission is to help its customers "understand and protect themselves from risks."<sup>7</sup>

The Z Zurich Foundation makes a valuable contribution to sustainable social and economic development by combining Zurich's global experience and risk management capabilities with non-profit organisations' local knowledge and development expertise.<sup>8</sup> The Foundation provides a way for Zurich to carry out its commitment to community investment from the group level. It takes a long-term cooperative approach to tackling selected global challenges.<sup>9</sup>

"Doing business responsibly" is at the core of Zurich's culture.<sup>10</sup> The Zurich flood resilience programme is one concrete example of how Zurich helps create new customer solutions, initiate public policy discussions and advance awareness.<sup>11</sup>

### **Ecosystem Pain Point**

Insurance companies have observed an upward trend in weather-related insured losses due to the increase in frequency and intensity of extreme weather events and the increasing economic cost associated with them.<sup>12</sup> Damage caused by natural catastrophes such as floods have quadrupled in the past 30 years for Zurich.<sup>13</sup> As David Nash, the Foundation Manager at the Z Zurich Foundation, explains:

Flood risk is likely to increase in the future due to a combination of socio-economic factors and anticipated increase in the frequency of extreme weather and climate events. It is a global challenge which impacts both developing and developed countries. Despite being a global issue, effective flood risk management is highly complex and there is no one-size-fits-all solution to implement universally.<sup>14</sup>

As Zurich is well aware, "[f]loods affect more people globally than any other types of natural hazard."<sup>15</sup> Extreme weather events of this kind cause some of the largest economic, social and humanitarian losses.<sup>16</sup>

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<sup>7</sup> "Information about Zurich," *Zurich Insurance Group*, <https://www.zurich.com/>

<sup>8</sup> "Z Zurich Foundation Annual Report 2014," *Zurich Insurance Group*, <https://www.zurich.com/ /media/dbe/corporate/docs/corporate-responsibility/z-zurich-foundation-annual-report-2014.pdf?la=en>.

<sup>9</sup> *Ibid.*

<sup>10</sup> "Creating Value for Zurich and Society," *Zurich Insurance Group*, <https://www.zurich.com/en/corporate-responsibility/creating-value-for-zurich-and-society>

<sup>11</sup> "Z Zurich Flood Resilience Programme," *Zurich Insurance Group*, <https://zurich.com/en/corporate-responsibility/creating-value-for-zurich-and-society/Z-Zurich-Flood-Resilience-Programme>

<sup>12</sup> "The ClimateWise," Thought Leaderships Series Issue Two, *Cambridge Institute for Sustainability Leadership*, 2012, <http://www.cisl.cam.ac.uk/publications/publication-pdfs/climatewise-thought-leadership-series-2012-issue-t.pdf>

<sup>13</sup> Delijoma Oramas-Dorta and Swenja Surminski, "Flood insurance schemes and climate adaptation in developing countries," *Journal of Disaster Risk Reduction*, 2013, <http://eprints.lse.ac.uk/66294/1/Binder1.pdf>

<sup>14</sup> David Nash, the Foundation Manager at the Z Zurich Foundation. Personal communication with SBS team.

<sup>15</sup> "Flood Resilience," *Zurich Insurance Group*,

Many developing countries are located in high-risk areas, with regular floods affecting large parts of the population. Currently, approximately 800 million people are living in flood prone areas, of which on average about 70 million people experience floods each year.<sup>17</sup>

Severe floods can put at risk past development gains by damaging natural capital and infrastructure, undermining economic development and setting back poverty reduction efforts. Although total economic losses from floods are higher in developed countries, the relative size of economic impacts and the number of fatalities are more significant in developing countries.<sup>18</sup>

Zurich recognised the impact floods have on people's lives and the extensive damage they can cause. This realisation led Zurich to the belief there is too little emphasis on increasing communities' resilience to floods.<sup>19</sup>

Globally, the rising costs associated with climate change effects pose serious challenges to governments in adopting efficient strategies to manage the increasing economic consequences.<sup>20</sup> Given the overall impact of catastrophes on public-sector finances, some governments, such as those in Latin America, are transitioning from an over-reliance on post-event disaster financing to a pre-event approach to disaster risk mitigation.<sup>21</sup>

Transferring risk to the private sector could provide efficient and cost-effective solutions that relieve already strained public-sector budgets.<sup>22</sup> As Nash describes:

Should a flood occur, taking action beforehand which reduces the potential losses is more cost effective than providing post-disaster relief. The more resilience that is built, the more insurance can be brought in to play its part in strengthening resilience by providing reliable and swift pre-determined financial compensation.<sup>23</sup>

Furthermore, uncertainties in assessing impacts of extreme weather events such as floods are high. These uncertainties affect property and casualty, business interruption, health, and liability insurance, among others. Insurers are more likely to avoid insuring a risk that has significant ambiguous components than a risk that is more well-defined.<sup>24</sup>

With core competencies in risk management and finance, Zurich is uniquely positioned to further society's understanding of risks associated with floods and advance creative solutions to minimise its impacts.<sup>25</sup>

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<https://www.zurich.com/en/knowledge/topics/flood-resilience>

<sup>16</sup> "Information about Zurich," *Zurich Insurance Group*, <https://www.zurich.com/>

<sup>17</sup> Sam Fankhauser and K.J. Thomas K.J., eds., *The Economics of Climate-Resilient Development* (Edward Elgar Publishing: 2016)

<sup>18</sup> Delioma Oramas-Dorta and Swenja Surminski, "Flood insurance schemes and climate adaptation in developing countries," *Journal of Disaster Risk Reduction*, 2013, <http://eprints.lse.ac.uk/66294/1/Binder1.pdf>

<sup>19</sup> "Zurich: Flood Resilience," *Zurich Insurance Group*, <https://www.zurich.com/en/corporate-responsibility/flood-resilience>

<sup>20</sup> Business Perspectives LLC., <https://businessperspectives.org>

<sup>21</sup> A. Pope, "Public-Private Partnerships bolster Latin American and Caribbean Resilience," *BrinkNews*, <http://www.brinknews.com/public-private-insurance-partnerships-bolster-latin-american-caribbean-resilience/>

<sup>22</sup> Carolyn Kousky and Len Shabman, "The Role of Insurance in Promoting Resilience," *BrinkNews*, 29 July 2016, <http://www.brinknews.com/the-role-of-insurance-in-promoting-resilience/>

<sup>23</sup> David Nash, the Foundation Manager at the Z Zurich Foundation. Personal communication with SBS team.

<sup>24</sup> Zurich Annual Report 2015, *Zurich Insurance Group*, <https://annualreports.zurich.com/2015/en/annual-report/risk-review/analysis-by-risk-type/insurance-risk.html>

<sup>25</sup> I. Kapphan, "The Financial Sector and its Potential for Putting the Economy on a Low-Carbon Path," *The Fletcher School*, [http://fletcher.tufts.edu/~media/Fletcher/Microsites/CIERP/Ideas/6\\_ideas/Kapphan.pdf](http://fletcher.tufts.edu/~media/Fletcher/Microsites/CIERP/Ideas/6_ideas/Kapphan.pdf):

With these considerations in mind, Zurich has found that it is well placed to, anticipate, and thereby, mitigate the risk uncertainties pose. These advance creative solutions help strengthen resilience to floods before an extreme weather event, rather than confronting challenges after they arise:

By understanding risks from natural hazards better, and by ensuring the need to reduce those risks and invest more in protection, Zurich is able to serve society with its own skills. On the other hand, this step is the prerequisite to make currently uninsured or uninsurable risks even insurable.<sup>26</sup>

These steps have helped educate communities about risk-prevention measures, and, in the process, aided in increasing insurability. As David Nash explains:

Through our flood resilience programme, we improve communities' understanding of and resilience to flood risks. As resilience builds, this will make flood risks better insurable and could ensure they stay insurable in the future.<sup>27</sup>

As Nash's comments indicate, it is in Zurich's business interest to support public policies that reduce and make risks more predictable. Moreover, Zurich's model shows the potential of private industry to help communities bolster their resilience to flood risk.

## **Business Strategy**

In 2013, Zurich launched a global flood resilience programme to enhance flood resilience. The programme consists of a five-year commitment and includes an initial investment of around USD 35.6 million by the Z Zurich Foundation.<sup>28</sup> Zurich believes that it is more effective to invest in pre-event resilience building than to wait until after the event and invest in relief and recovery. The programme also aims to improve public dialogue around flood resilience.

Resilience building in flood prone areas is a challenging and complex problem that needs a holistic, multi-stakeholder approach. To this end, the programme links "academic insights, humanitarian sector capabilities as well as Zurich's own skills and knowledge" to tackle floods in developing countries.<sup>29</sup> By building resilience, Zurich aims to create an environment in which insurance and other risk transfer mechanisms can be part of the solution to climate change induced disasters such as floods.<sup>30</sup>

## **Shared Two-way Learning**

The programme connects Zurich staff skills to the needs of its partners, which helps to shape interventions at the community level. This approach also provides a better understanding of the flood risks involved. The unique interdisciplinary approach broadens the scope of current flood resilience research and offers extraordinary opportunities to advance global understanding of flood impact. The knowledge and tools generated are intended for a wider audience and will be made available in an open source, through a portal and the development of an academy.

## **Partnership Approach**

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<sup>26</sup> Michael Szoenyi, "Thoughts fresh from WEF 2017: How to close the 100 Billion USD protection gap for natural hazards," *LinkedIn Pulse*, January 2017,

<https://www.linkedin.com/pulse/thoughts-fresh-from-wef-2017-how-close-100-billion-usd-szoenyi?trk=mp-reader-card>

<sup>27</sup> David Nash, the Foundation Manager at the Z Zurich Foundation. Personal communication with SBS team.

<sup>28</sup> "Flood Resilience," *Zurich Insurance Group*, <https://www.zurich.com/en/knowledge/topics/flood-resilience>

<sup>29</sup> Colin McQuistan, "The Zurich Flood Resilience Alliance Measurement Framework," *Practical Action*, 27 April 2017, <http://practicalaction.org/blog/author/Colinmcquistan/>

<sup>30</sup> "Information about Zurich," *Zurich Insurance Group*, <https://www.zurich.com/>

Flood risk is the result of many factors in a dynamic complex system. As a Zurich brief outlines, “[a] system-wide approach to resilience needs to capture a range of activities, actors and processes that are part of a resilience building system.”<sup>31</sup> Therefore, the Zurich Flood Resilience programme works in partnership with four core partners: International Federation of the Red Cross and Red Crescent Societies (IFRC), Practical Action, the International Institute for Applied Systems Analysis (IIASA), and the Wharton Business School’s Risk Management and Decision Processes Centre (Wharton).

Through these partnerships, Zurich has created an alliance, which has developed processes and tools that can be applied to increase flood resilience at the community level.<sup>32</sup> One such innovation to emerge from these collaborations is a flood resilience measurement framework.

In 2015, Zurich also included four additional organisations to test its measurement approach: the Academy of Sciences in the U.S., Concern Worldwide, Plan International, and MercyCorps. To seek other examples of innovative resilience building, Zurich joined with the Global Resilience Partnership (convened by The Rockefeller Foundation), the United States Agency for International Development (USAID) and the Swedish International Development Cooperation Agency (SIDA), to launch the Global Resilience Challenge Water Window.<sup>33</sup> The Water Window is a grant-based competition focused on building resilience to different water challenges, including floods. Zurich is the first private sector member of the Global Resilience Partnership, and provides a USD 10 million investment to fund solutions to build flood resilience.

### ***Enhancing Community Resilience***

The Zurich programme runs interventions with communities in flood prone areas in Mexico, Indonesia, Nepal, Peru and Bangladesh.<sup>34</sup> Each country programme uses slightly different interventions because of the context in which they operate. For example, in Nepal, access to efficient early warning systems, alternative livelihoods and strengthened collaboration with local decision makers are key to enhancing resilience.<sup>35</sup> In Mexico, there is also a livelihoods component, but the focus remains on developing local support mechanisms within communities.

The Zurich flood resilience programme helps communities manage flood risks better, without harming community development. This is what Zurich means by “communities’ resilience,” which is defined as the ability of a system, community or society to pursue its social, ecological and economic development and growth objectives, while managing its disaster risk over time in a mutually reinforcing way.<sup>36</sup>

### ***Influencing Policy-Makers***

Influencing policy-makers constitutes an important component of managing natural disaster risk. As David Nash says:

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<sup>31</sup> “The Zurich flood resilience alliance: A new approach to partnership for effective disaster risk reduction,” Risk Governance and Policies, *Interpraevent*, 2016,

[http://www.interpraevent.at/palmcms/upload\\_files/Publikationen/Tagungsbeitraege/2016\\_1\\_168.pdf](http://www.interpraevent.at/palmcms/upload_files/Publikationen/Tagungsbeitraege/2016_1_168.pdf)

<sup>32</sup> “Risk Nexus: Measuring flood resilience – our approach,” Zurich Insurance Group, February 2016,

[https://www.zurich.com/\\_media/dbe/corporate/docs/corporate-responsibility/zurich-flood-resilience-measurement-paper-feb-2016.pdf?la=en](https://www.zurich.com/_media/dbe/corporate/docs/corporate-responsibility/zurich-flood-resilience-measurement-paper-feb-2016.pdf?la=en).

<sup>33</sup> “Global Resilience Partnership,” *Devex Impact*,

<https://www.devex.com/impact/partnerships/the-global-resilience-partnership-455>

<sup>34</sup> Zurich North America – Insurance and Risk Management,” *Zurich North America*, <https://www.zurichna.com>

<sup>35</sup> “Information about Zurich,” *Zurich Insurance Group*, <https://www.zurich.com/>

<sup>36</sup> “Understanding risk to create resilient platforms for sustainable growth and human dignity,” *Insurance Development Forum*, <http://theidf.org/> *Insurance Development Forum*

The extent to which an insurer can contribute to society's effective and efficient prevention of, and recovery from, significant flood events is determined by the physical, economic and regulatory environment in which it operates. As such, it is critical that other societal stakeholders - including governments also take responsible steps to ensure and enhance the risk management framework associated with flood exposures.<sup>37</sup>

Currently, only 13% of disaster related funding targets resilience building, while 87% goes into activities after the losses have occurred.<sup>38</sup> Although there will continue to be a need for some relief funding, Zurich is striving to shift that needle with good evidence and setting best practices in resilience-building investments.

Zurich "research provides objective evidence that can influence policymakers' decisions"<sup>39</sup> in shaping responses to climate change related risks such as floods. Demonstrating the business case for its flood resilience programme to policy makers, Zurich studies show that for every dollar spent on selected flood risk reduction measures, an average of five dollars is saved through avoided and reduced losses.<sup>40</sup> Although climate change is one factor driving floods, policy makers' responses to climate change risks can help manage these impacts.

### **Impact on Zurich Core Business**

Through its flood resilience programme, Zurich tests solutions and ideas for replication and scale in collaboration with alliance members. The programmes gain expertise and knowledge from Zurich, which, in turn, aims to use these insights to refine and tailor insurance solutions. The learnings from the Zurich Flood Resilience Programme will feed into Zurich's underwriting and claims:

Zurich personnel involved in the programme are likely to gain increased understanding and insight which they can later use when advising customers and when providing survey reports to underwriters.<sup>41</sup>

Research and knowledge is generated and refined by academic institutions in the flood resilience alliance. The learnings gained allow Zurich to develop new technologies and innovations to prevent flood damage.

In practical terms, the first example of an enhanced approach has come in the United Kingdom. Risk Engineers are traditionally used by Zurich to assess risk from a range of hazards for their corporate customers. Their approach leads to the provision of a "risk improvement plan" to the customer. More importantly, however, the risk assessment informs underwriters of the nature of the risk for which insurance is being sought. When it comes to floods, the United Kingdom business has introduced a "Flood Fee Service," using the resilience thinking that the programme has developed. This extends Risk Engineering's offer from an internal underwriting function for customers to a more active report on measures that customers can take to manage the risk, which goes beyond physical protection and might not include insurance at this point.

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<sup>37</sup> David Nash, the Foundation Manager at the Z Zurich Foundation. Personal communication with SBS team.

<sup>38</sup> Michael Szoenyi, "Thoughts fresh from WEF 2017: How to close the 100 Billion USD protection gap for natural hazards," *LinkedIn Pulse*, January 2017, <https://www.linkedin.com/pulse/thoughts-fresh-from-wef-2017-how-close-100-billion-usd-szoenyi?trk=mp-reader-card>

<sup>39</sup> "Beyond Response and recovery: an introduction to the Zurich flood resilience program," *The Wharton School of the University of Pennsylvania*, [http://opim.wharton.upenn.edu/risk/library/zurichfloodresilience\\_intro.pdf](http://opim.wharton.upenn.edu/risk/library/zurichfloodresilience_intro.pdf).

<sup>40</sup> "The ClimateWise," Thought Leaderships Series Issue Two, *Cambridge Institute for Sustainability Leadership*, 2012,

<http://www.cisl.cam.ac.uk/publications/publication-pdfs/climatewise-thought-leadership-series-2012-issue-t.pdf>

<sup>41</sup> "The ClimateWise," Thought Leaderships Series Issue Two, *Cambridge Institute for Sustainability Leadership*, 2012,

<http://www.cisl.cam.ac.uk/publications/publication-pdfs/climatewise-thought-leadership-series-2012-issue-t.pdf>

Zurich boosted its reputation as a thought leader on enhancing resilience to floods, receiving a UNFCCC Momentum for Change Lighthouse Activity Award in 2014, and being invited to speak at key international forums on disaster risk reduction. Zurich's recognised focus and expertise on flood resilience has also led to an invitation to join the project board of a Defra-funded "Low Cost Resilience" Research Project. This project will investigate "resilient repair," repairing flood-prone buildings in ways that enable flood damage to be repaired more easily and at lower cost."<sup>42</sup>

### Case Example: Community Flood Resilience in Indonesia

The Bengawan Solo is the longest river on the Indonesian island of Java. It stretches over 600 kilometers from its source near Wonogiri in the island's southeast to the city of Surabaya on Java's northeast coast. It frequently floods during the rainy season. The Zurich flood resilience alliance in Indonesia has found ways to help communities in the river basin. The programme has proven so successful that local authorities are now using Zurich's approach to help more communities across Java.



Together with the Indonesian Red Cross, Zurich identified the communities that are most likely to benefit from its resilience approach. In the village of Tulungrejo, for example, the community has access to an emergency shelter the government has provided. However, the shelter is too far for some people to reach. As a first step, the Zurich programme has provided funds to build a raised evacuation site nearer to the village that can accommodate several hundred people. Safe routes were created across the village to the new shelter and local volunteers were trained as first-responders to form a "community-based action team," or "SIBAT."

Beyond these initial steps, the flood resilience alliance is developing a better early warning system in Tulungrejo and has built a command post, "POSCO," that can serve as a crisis centre for emergency response teams during floods. Once established, it will be equipped with technology to provide early warning bulletins, weather reports and other important public announcements.

To increase the impact of the measure, when not in use during floods, the community volunteers' action team (SIBAT) will conduct flood simulation exercises from the centre. As part of the programme, the Indonesian Red Cross has also introduced activities to raise community awareness, particularly in schools.

<sup>42</sup> Linda Freiner, "Zurich: Changing Lives Along Java's Bengawan Solo," Zurich Insurance Group, June 2016, <https://www.zurich.com/en/knowledge/articles/2016/06/changing-lives-along-javas-bengawan-solo>

The local government in the Bojonegoro district values the SIBAT (volunteer) approach, which has been formally endorsed by the district administration. Local administrators have already provided funds to similar projects in another village in Bojonegoro district to set up SIBATs, and are recommending that the model used in Tulungrejo be adopted and implemented in all at-risk communities in the province. Impressed with the results, district officials believe the programmes could even be adopted nationwide.

In this case, the intervention has enhanced physical capital through the new evacuation site and better early warning systems. These additions have reduced the time needed to react to floods, which adds rapidity. In addition, by increasing local knowledge, complementing SIBAT's efforts to increase knowledge and capabilities on a sustainable basis, the programme also enhances human capital."<sup>43</sup>

The programme, moreover, has had a positive impact on Zurich's business. Internally, 93% of staff are proud of Zurich's work in this area, and almost half have volunteered to be part of programme activities. In fact, Zurich has also been able to engage local brokers in the activities. Brand awareness has noticeably increased, with Zurich winning a local Insurance Industry award for its efforts. The work has helped engage corporate customers and their employees. Taken together, these initiatives strengthen relationships among a variety of key stakeholders.

## Performance

Programme performance is tracked through the "5C-4R" approach. Using their five different types of "capital" – the "5Cs" – and deploying and improving resilience traits that help them cope with floods – the "4Rs" – nearly every community can improve its resilience to floods. As David Nash describes:

There is value in of measuring the impact of interventions, as understanding the level of resilience can help to design ways to improve it. To demonstrate the impact of our approach, we needed a measurement tool. We found no practical tools that suited our needs.<sup>44</sup>

Zurich, along with its partners, has developed a measurement framework, which includes the "5Cs" and "4Rs" approach and a baseline tool to understand the communities it works with, particularly focusing on the characteristics of resilience."<sup>45</sup>

The resilience framework and tools are being deployed by Zurich's community partners in upwards of 75 communities on a trial basis and are being scientifically validated through the research partnership with Wharton and IIASA (International Institute of Applied Systems Analysis).<sup>46</sup> The aim is to understand what helps a community build resilience to flood disasters, and thereby identify possible resilience-building actions. This tool is used across all country programmes. This is cutting-edge applied research that will fill a gap, as there is no other measurement framework for disaster resilience available, according to UNDP.<sup>47</sup>

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<sup>43</sup> Linda Freiner, "Zurich: Changing Lives Along Java's Bengawan Solo," Zurich Insurance Group, June 2016, <https://www.zurich.com/en/knowledge/articles/2016/06/changing-lives-along-javas-bengawan-solo>

<sup>44</sup> David Nash, the Foundation Manager at the Z Zurich Foundation. Personal communication with SBS team.

<sup>45</sup> "Zurich's Response to ClimateWise." *Zurich Response*, June 2016,

[file:///C:/Users/agata/Downloads/Zurich\\_ClimateWise\\_submission\\_July\\_2016\\_final\\_version%20\(5\).pdf](file:///C:/Users/agata/Downloads/Zurich_ClimateWise_submission_July_2016_final_version%20(5).pdf)

<sup>46</sup> International Institute for Supplied Systems Analysis, <http://www.iiasa.ac.at/>

<sup>47</sup> Thomas Winderl, "Disaster Resilience Measurements: Taking Stock of Ongoing Efforts in Developing systems for Measuring Resilience," *United Nations Development Programme*, February 2014, [http://www.preventionweb.net/files/37916\\_disasterresiliencemeasurementsundpt.pdf](http://www.preventionweb.net/files/37916_disasterresiliencemeasurementsundpt.pdf)

## “5Cs” and “4Rs” Approach

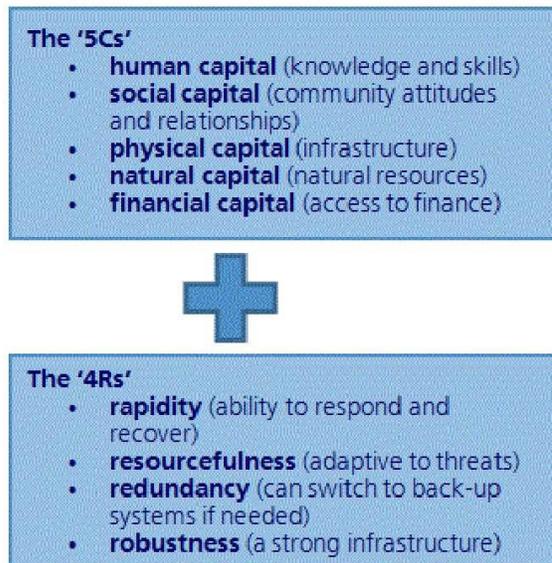
The community-based flood resilience measurement tool is based on the “five categories of sustainable livelihoods” (the “5Cs”) framework established by the United Kingdom’s Department for International Development (DFID), and the four properties of resilience (the “4Rs”) formulated by MCEER (Multidisciplinary Center for Earthquake Engineering Research, University of Buffalo, New York).<sup>48</sup>

Zurich Risk Engineers gather data on “risk factors” and, using their professional judgment, grade these to arrive at an overall view of risk. The resilience framework uses the same principle to assess the strengths of the “5Cs,” which is converted to a numerical scale for the purpose of tracking change over time for the specific community.

The “5Cs” are the five capitals that sustain and can help to improve community members’ wellbeing (physical, financial, human, social and natural capital).<sup>49</sup> For each capital, four separate properties characterise that capital’s resilience. The “4Rs” consist of robustness, redundancy, resourcefulness, and rapidity.<sup>50</sup>

### The 5Cs

First, the model builds on DFID’s Sustainable Livelihoods Framework. There is no one-size-fits-all solution to resilience building, and, as such, local context is critical. This model considers how a community builds, maintains and uses its assets as a necessary condition for development. These considerations fall into the five categories or capitals of physical, financial, human, social and natural.<sup>51</sup>



1. Physical – the things produced by economic activity from “other” capital, such as infrastructure, equipment and improvements in crops and livestock.
2. Financial – the level, variability and diversity of income sources and access to other financial resources that contribute to wealth.
3. Human – the education, skills and health of the people in the system.
4. Social – social relationships and networks, bonds that aid cooperative action, links to exchange and access ideas and resources.

<sup>48</sup> “MCEER’s Resilience Framework,” *University at Buffalo*, <https://www.buffalo.edu/mceer/research/resilience-framework.html>

<sup>49</sup> “Risk Nexus: Enhancing Community Flood Resilience: A Way Forward,” *Zurich Flood Resilience Alliance*, May 2014, [http://opim.wharton.upenn.edu/risk/library/zurichfloodresiliencealliance\\_ResilienceIssueBrief\\_2014.pdf](http://opim.wharton.upenn.edu/risk/library/zurichfloodresiliencealliance_ResilienceIssueBrief_2014.pdf)

<sup>50</sup> *Ibid.*

<sup>51</sup> “Risk Nexus: Enhancing Community Flood Resilience: A Way Forward,” *Zurich Flood Resilience Alliance*, May 2014, [http://opim.wharton.upenn.edu/risk/library/zurichfloodresiliencealliance\\_ResilienceIssueBrief\\_2014.pdf](http://opim.wharton.upenn.edu/risk/library/zurichfloodresiliencealliance_ResilienceIssueBrief_2014.pdf)

5. Natural – the natural resource base, including land productivity and actions to sustain it, as well as water and other resources that sustain livelihoods and wellbeing.

### **The 4Rs**

Secondly, the programme identifies the four resilience properties that a system can have. These were originally applied to physical assets and infrastructure, but Zurich believes that these properties also apply to non-tangible assets. The 4Rs are robustness, rapidity, redundancy and resourcefulness.<sup>52</sup>

1. Robustness – ability to withstand shock.
2. Rapidity – ability to contain losses and recover in a timely manner.
3. Redundancy – functional diversity.
4. Resourcefulness – ability to mobilise when threatened.

To combine the “5Cs” and “4Rs,” Zurich created a set of factors specific to flood resilience. These factors, referred to as sources, each fall into one of the five capitals and one or several of four resilient properties. For example, having a physical asset (a capital in the “5Cs” model) such as a community centre that doubles as a classroom during the floods adds “redundancy” (a property in the “4Rs” model) to the system, and so is considered a source of resilience.<sup>53</sup> Bringing together quantitative and qualitative data, each source of resilience is measured by “comparing data from the community with a definition of what that source can look like.”<sup>54</sup>

### **Numerical**

Using expertise from Zurich risk experts and their assessment approach provides a consistent benchmark for quantifying the strength of each “source.” Professional judgment of community practitioners allows them to assess the data collected by using the following four letter grades:

- A: Best practice for managing the risk.
- B: Good industry standard—no immediate need for improvement.
- C: Deficiencies—room for visible improvement.
- D: Significantly below good standard—potential for imminent loss.<sup>55</sup>

Scores are assigned to each source, and then can be aggregated to measure the capital, as a proxy for overall flood resilience.<sup>56</sup> The insight gleaned from evaluating the resilience level of each of the sources, and collective capitals, provides an entry point for prioritising interventions

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<sup>52</sup> Ibid.

<sup>53</sup> Ibid.

<sup>54</sup> “The PERC Manual,” *ISET International*,

[https://mafiadoc.com/the-perc-manual-iset-international\\_5980af081723ddeb563a0171.html](https://mafiadoc.com/the-perc-manual-iset-international_5980af081723ddeb563a0171.html)

<sup>55</sup> International Institute for Applied Systems Analysis, <http://www.iiasa.ac.at>

<sup>56</sup> Kanmani Venkateswaran et al., “The PERC manual Learning from disasters to build resilience: a simple guide to conducting a post event review,” *PreventionWeb*, 2015, <http://www.preventionweb.net/publications/view/47702>

that could be carried out as a part of community programmes.<sup>57</sup> To measure the impact of resilience building interventions, baseline assessment scores can be compared with the scores in an end line assessment.<sup>58</sup>

### **PERC Evaluations**

Zurich has also developed a systematic framework known as the Post-Event Review Capability (PERC) for the analysis of any rapid-onset disaster events, which focuses on how a specific hazard event became a disaster. To date, the PERC function has been applied only to floods, but it may, in the future, be used to assess other types of weather events. The PERC function, which is aimed at understanding flood events and causes of related catastrophes or losses, poses key questions of Zurich's independent forensic research<sup>59</sup>:

- What has worked well (best practices)?
- What has gone wrong and why (highlighting reasons for losses and assessing root causes)?<sup>60</sup>

The PERC function has developed a thorough understanding of best practices in flood mitigation and flood resilience. It also provides a platform for knowledge exchange and recommendations. The Zurich flood resilience alliance and wider partners have further refined the PERC concept and conducted additional studies on major flooding events.<sup>61</sup>

The insights and recommendations gained from the PERC are applied to customer risk insights on how they can better protect themselves from flood risk. This consists of brochures and knowledge transfer into customer facing functions. These insights help offer better service around flood risk and flood resilience. This approach will feed into Zurich's underwriting and claims practices, as well as inform best practice externally. Zurich Risk Engineering personnel involved in the PERC incidents are likely to gain increased understanding and insight, which they can potentially use when advising customers and providing survey reports to underwriters.

### **Prognosis**

The topic of floods remains important to Zurich. Looking to the future, Zurich is now planning ways to continue the work for an additional five-year period, starting in 2018. The core focus will be to strengthen the evidence base around the resilience measurement approach, through community programmes, and use it to push for more investment from other actors into pre-event work. The prognosis is good.

The main aims are focused on influencing policy-makers, funders and the industry, as Zurich moves into the second phase. As the programme enters its second phase, Zurich wants to focus its efforts on designing an approach that helps to promote pre-event resilience building in order to reduce overall losses from floods. This will enable Zurich to pursue its ambition to develop products that help incentivise risk reduction and resilience building behaviour. Another

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<sup>57</sup> Ibid.

<sup>58</sup> "Information about Zurich," *Zurich Insurance Group*, <https://www.zurich.com/>

<sup>59</sup> "Zurich's Response to ClimateWise," *Zurich Insurance Group*, June 2016, [https://www.zurich.co.uk/\\_/media/dbe/united-kingdom/docs/about-us/cr/zurich\\_climatewise\\_submission\\_july\\_2016\\_final\\_version.pdf?la=en](https://www.zurich.co.uk/_/media/dbe/united-kingdom/docs/about-us/cr/zurich_climatewise_submission_july_2016_final_version.pdf?la=en).

<sup>60</sup> Ibid.

<sup>61</sup> Kanmani Venkateswaran et al., "The PERC manual Learning from disasters to build resilience: a simple guide to conducting a post event review," *PreventionWeb*, 2015, <http://www.preventionweb.net/publications/view/47702>

goal is to develop products, which would help Zurich to expand to new markets. The flood resilience programme helps ensure that Zurich continues to strengthen its business and, at the same time, provides actionable insights to local communities in the face of natural disasters.

### Saïd Business School

Saïd Business School at the University of Oxford blends the best of new and old. We are a vibrant and innovative business school, yet deeply embedded in an 800-year-old university. We create programmes and ideas that have global impact. We educate people for successful business careers, and as a community seek to tackle world-scale problems. We deliver cutting-edge education programmes and ground-breaking research that transform individuals, organisations, business practice, and society. We seek to be a world-class business school community, embedded in a world-class university, tackling world-scale problems.

### Mars Incorporated

Mars' approach to business has long since been guided by five principles – quality, responsibility, efficiency, freedom and mutuality. Together they inform and guide the actions of all Mars associates every day as they do their jobs and interface with the outside world. The Mars' leadership has tasked its economic research unit, Catalyst, to start new work into unexplored territory for business; to identify critical drivers of mutuality and, using business pilots, to develop and test new metrics and management practices that can help boost mutuality in business situations. This work is called the Economics of Mutuality.

### The Oxford-Mars Mutuality in Business Partnership

On the back of these promising findings, a multiyear partnership with Oxford University's Saïd Business School was established in 2014 to focus on the development of a business management theory for the Economics of Mutuality with corresponding teaching curriculum, new management practices, and case study research. The research programme has combined the pursuit of normative questions – what is mutuality and how should it be enacted? – with grounded, ethnographic research on current thinking and practices. This has led to the development of field experiments and case studies examining how large corporate actors conceive of and pursue responsible business practices, and how these relate to their financial and social performance.

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