

From Risk to Resilience

A systems approach to building long-term, adaptive wellbeing for the most vulnerable



Katherine Pasteur and Colin McQuistan

In 2011 Practical Action published *From Vulnerability to Resilience: A Framework for Analysis and Action to Build Community Resilience*. This was one of the first attempts by a development NGO to operationalize resilience and it provided project workers with a framework to apply the resilience concept to their projects. This policy brief updates our thinking on resilience. Using the experiences gained from the Zurich Global Flood Resilience Programme and our interactions with alliance partners, we have updated the Vulnerability to Resilience framework. For the potential of resilience thinking to benefit poor, hazard-prone people around the world, we need to find a simple way to combine the complexity of livelihoods, vulnerability, governance, hazards, and uncertainty into a simple practical approach. Resilience opens up a new way to think about and do development. Resilience requires a systems approach to explore development and disasters across sectors and at multiple scales. Resilience will certainly be central to the delivery of the Sendai Framework for Disaster Risk Reduction 2015–2030, the Sustainable Development Goals, and the Paris Climate Agreement. However, to be effective, these international agreements must put the most vulnerable at their heart.



Executive summary

From Vulnerability to Resilience, or V2R, is a framework for analysis and action to reduce vulnerability and strengthen the resilience of individuals, households, and communities. It provides a simple roadmap that sets out the key factors which contribute to people's vulnerability: exposure to shocks and stresses; future uncertainty; fragile livelihoods; and weak governance. For resilience-building projects to be successful, project workers need to understand the contribution of their activities to building resilience. V2R is a simple and practical approach to put this into practice to benefit the most vulnerable.

To be effective, resilience thinking must unravel inherent complexity. We need to understand the relationships between multiple factors: the interrelationships between community wellbeing and local drivers of risk; national and global trends which contribute to uncertainty; and the influence of the governance environment. Only by analysing and understanding the key issues and priorities will communities be able to make the right choices to strengthen their resilience. But rather than focusing on the static existence of assets and capacities, resilience thinking considers their dynamic deployment to reduce risk and enhance livelihoods in tandem.

For resilience to be mainstreamed in development practice we need to be able to measure it. Measurement is important for tracking performance and understanding impacts, but can we measure resilience in its entirety or should we focus on key characteristics such as asset security, preparedness, or adaptive capacity? There is a huge diversity of elements which could be measured and this raises a number of questions about process and outputs. Efforts to measure resilience are still in their infancy, but learning from experience will provide insights into how assets and capacities interact and are influenced by other elements, contributing to further refinement of the resilience approach.

The concept of resilience has opened a welcome space for more holistic thinking that integrates disaster management within broader development strategies. We are all aware that disasters impact the poorest the most. Resilience, therefore, must be built upon their experiences. V2R provides a framework for communities to engage in a resilience analysis and planning process, helping them to make appropriate 'no regrets' choices, particularly in the context of an unpredictable future. Evidence in favour of a systemic resilience approach indicates a move away from separate financing of disaster risk reduction towards integrating risk into all investments.

The V2R framework has been developed with the needs and interests of Practical Action programme staff in mind. However, the issues and principles in the document are also relevant to a much wider audience, including practitioners (NGOs and local government staff), researchers, and policymakers working in livelihoods, disaster management, and climate change adaptation.

Introduction

Practical Action sees resilience as a concept central to our development programmes that build poor people’s material and relational wellbeing. Disasters undermine development efforts from the national to the household level. Both the rich and poor are affected, but the poor tend to suffer disproportionately. Disasters erode the resources that people rely on to pursue their lives, potentially trapping them in a cycle: as poverty increases vulnerability, people are forced to take riskier choices, making them prone to further disaster. A single disaster can destroy years of progress in an instant.

A resilience approach is essential to the delivery of the Sendai Framework, the Sustainable Development Goals, and the Paris Climate Agreement

Building resilience aims to break this cycle by addressing the underlying causes of vulnerability, thus ensuring that people can pursue a pathway towards sustainable wellbeing (see Figure 1). Practical Action has been working to develop tools and strategies to aid programme staff in implementation. In 2011 we published *From Vulnerability to Resilience: A Framework for Analysis and Action to Build Community Resilience* (Pasteur, 2011). In 2013, Practical Action joined other development partners under the Zurich Flood Resilience Programme to further advance knowledge, develop expertise, and design strategies to strengthen resilience, specifically to flood hazard.

A resilience approach offers the chance to break down existing silos, proposing a systems approach to think about development and disasters across sectors and at multiple scales. It is vital that resilience is recognized as central to the delivery of the Sendai Framework for Disaster Risk Reduction 2015–2030 as well as the Sustainable Development Goals (SDGs) and the Paris Climate Agreement. To deliver resilience will require coherence across these international agendas and effective integration at all levels. This paper outlines the V2R framework, a practical approach to put this into practice to benefit the most vulnerable.

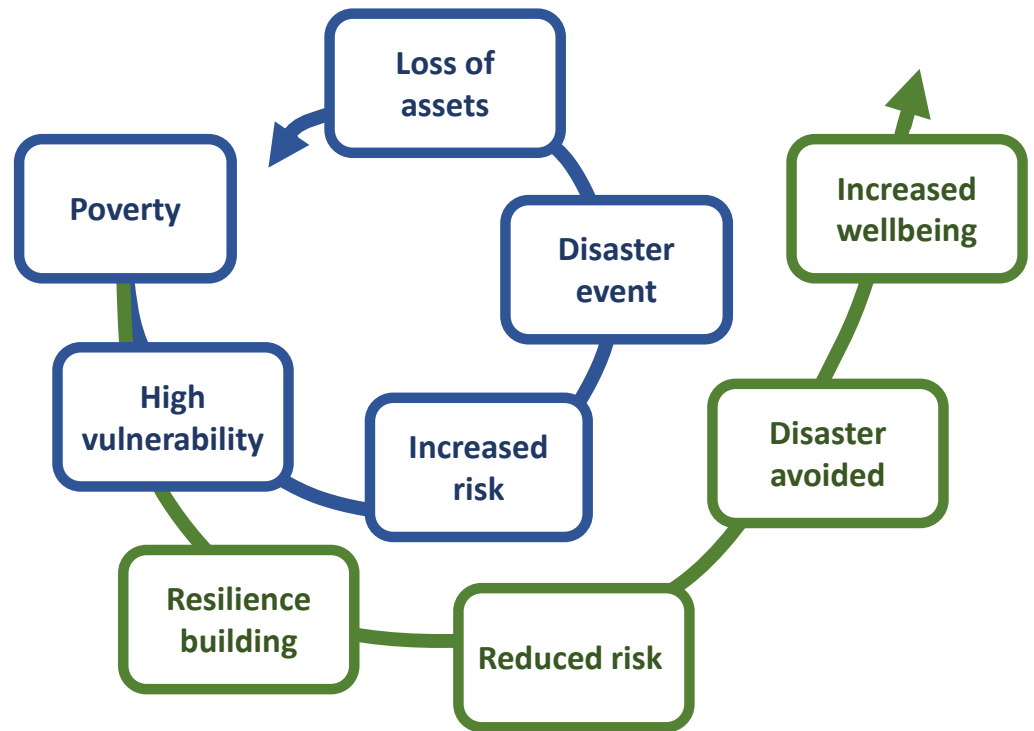


Figure 1 Resilience building as a pathway to wellbeing

Responding to past challenges

Historically, disaster management was the domain of humanitarian actors, focused principally on response and recovery rather than addressing the underlying causes of vulnerability. Although the cost-effectiveness of risk reduction and preparedness measures is proven to be greater than response and recovery, still more financial support goes to disaster recovery than to prevention. A resilience approach aims to correct this bias and shift the focus towards risk reduction.

Over the past 2 decades US\$106.7 bn in international aid was allocated to disasters. Of that just \$13.5 bn was for risk reduction measures. (Kellett and Caravani, 2013)

A holistic and people-centred approach to address the diverse factors that influence wellbeing underlies the resilience framework. This focuses on increasing household access and retention of assets, including greater income-earning opportunities; provision of essential services; effective social safety mechanisms; capacity building; and more robust coping strategies, all operating in an equitable governance environment. When assets are impacted by hazards, livelihoods are undermined, thus slowing, or even halting, progress towards development goals. Although shocks and stresses are acknowledged, their impact on wellbeing is not always fully explored and acted upon. Resilience thinking recognizes that for sustainable change, action must be taken to understand, assess, and address the risks associated with particular livelihoods and their contribution to individual and collective wellbeing.

We are living in an increasingly uncertain world. Rapidly changing climatic, socio-demographic, political, and economic conditions are making development trajectories more challenging to predict. Unpredictable patterns of weather and climate, a volatile global economy, technological advancements, and political upheaval mean that we can no longer rely only on past experience. These factors were previously under-acknowledged in analysis and decision-making approaches to disaster response and development. Resilience implies thriving in an unpredictable environment through working towards options that increase adaptive capacity within the system.

Even the best designed interventions will fail if they are implemented in a context where there is weak governance. Governance refers to the institutions, rules, and decision-making processes that mediate the relationships between the various elements influencing wellbeing described earlier. Flexible, equitable, integrated governance is needed to deal with the dynamics of uncertainty and change within systems, centred on robust learning. An integrated approach is essential if the twin goals of risk management and sustainable development are to mutually reinforce one another to strengthen long-term, adaptive wellbeing, creating sustainable pathways out of poverty. This leads us to the following definition.

Disaster resilience is 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. (Keating et al., 2014)

Pursuing resilience

This definition of resilience points to the need for different levels of analysis from individual to community to society. It identifies a range of inputs to, as well as expectations from, the development process, while recognizing that these factors are not static, but continually fluctuating over time. How can we accommodate these challenges for practical resilience programming?

Figure 2 illustrates the Practical Action V2R framework, unravelling the complexity of a systems approach to resilience in a simple diagram. It highlights the relationship between the various factors to be taken into account in strengthening resilience. It illustrates the interrelationships between community wellbeing and local drivers of risk; national and global trends which contribute to uncertainty; and the influence of the governance environment. Its purpose is to aid practical analysis in order to identify key issues and priorities to be addressed in order to strengthen resilience.

Key to the framework are the assets (e.g. income and food, essential services, agricultural assets, non-agricultural assets, technologies) and capacities (e.g. skills, sensitivity, adaptive capacity) – or capitals – that people draw on to build their livelihoods as well as to manage disaster risk (see Box 1). These are not static over time. They can be strengthened or further accumulated as a result of a positive development trajectory: for example, soil quality can be improved, increasing the productivity of natural capital, or children can go through school and gain qualifications, gaining human capacities. However, assets can also be eroded by disasters (e.g. homes destroyed by a landslide) or by longer-term stresses (e.g. soil erosion leading to gradual yield declines).

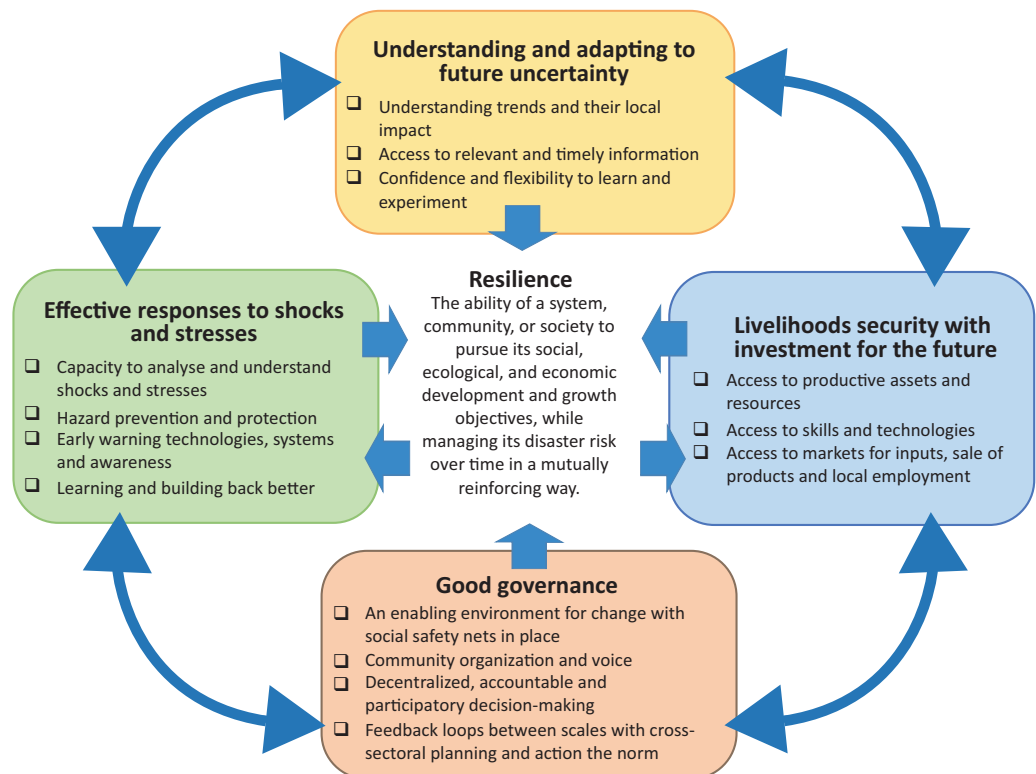


Figure 2 Vulnerability to Resilience framework

Box 1: The Five Capitals (or 5Cs: assets + capacities)

- human: education, skills, knowledge, and health status;
- social: relationships and networks that aid cooperative action, good governance;
- natural: the natural resources (e.g. land, water) from which livelihoods are derived;
- physical: items produced by economic activity (e.g. infrastructure, equipment);
- financial: income sources and access to other financial resources (e.g. credit, savings) with effective social safety nets.

Rather than focusing on the static existence of assets, resilience thinking considers their effective employment for reducing risk and pursuing livelihoods in tandem. This involves considering assets in relation to the other elements of the framework (stresses, uncertainty, and governance). Can homes and other physical assets be constructed or adapted to withstand flood or earthquake impact? Can capacities be strengthened so that people can regularly access and respond to information about changing weather patterns? Can institutions at different levels contribute to early warning systems so that communities are able to respond in the face of sudden threats, and protect lives and livelihoods as far as possible? A consideration of future uncertainty of sociodemographic and climate changes, the available options for disaster response and livelihoods, and greater integration between the two are necessary. In terms of governance, while analysis may start at the local level, the most effective strategies for resilience are likely to require engagement of government and non-government stakeholders, and influence on national and international policies. In respect to physical assets, the role of technology is critical, often seen as the ‘silver bullet’ solution to disaster response and wellbeing (see definition of Technology Justice). Technology, as well as providing options, can contribute to inherent injustices and fail to address the most pressing social and environmental challenges being faced.

Technology Justice

The goal of development should be to create sustainable wellbeing for all: wellbeing that is resilient and not eroded by shocks or stresses. All too often the response to risk is to rely on technological solutions that provide short-term benefit while postponing the disaster to a later date. The failure of the levees along the Mississippi that led to the catastrophic flooding of New Orleans following Hurricane Katrina in 2005 is a clear demonstration of the false security that hard infrastructural solutions can create, especially if they are not adequately maintained. Therefore it is vital that communities are empowered to engage in technology development and decision making so that they can make informed, owned decisions. Technologies have the potential to reduce the vulnerability of poor people around the world. However, the poor tend not to have the capacity or opportunity to engage in innovation, or to access or adapt existing technologies or to influence those whose technology use is adding to their vulnerability. Practical Action advocates for Technology Justice. This encourages the exploration of actions that ensure equality of access and promote inclusive processes of innovation of technologies, focused on strengthening the resilience of the poorest, the most vulnerable, those who are usually overlooked. Finally those who are using technology in a way that undermines the resilience of others are confronted with the impact and cost they inflict on others and are held accountable. (Meikle and Sugden, 2015)

The V2R framework helps unravel the complexity of a systems approach to resilience using a simple diagram

The V2R framework guides a participatory capacity and vulnerability analysis to identify opportunities and pathways for development that simultaneously manage or reduce risk and ensure a level of adaptability to possible changed circumstances over time. V2R stimulates the community to explore not only what they have today, but their aspirations for the future and the trade-offs inherent in these different choices. Community participation should always be at the heart of the analysis and the process should be the basis for reflection, learning, and decision-making by community members themselves. While communities may appear homogeneous, this is rarely the case. Disaggregation of analysis based on gender, social norms, and levels of asset ownership is essential, and the most vulnerable within the community must be included; they should be the focus and given voice in decisions if we are to be true to our aim of building resilience upwards from the weakest links.

Decision-making for resilience

The benefits of investing in risk reduction measures before disaster events occur heavily outweigh the costs. Strategies such as accessing information, preparedness, and early warning systems demonstrate some of the greatest economic benefits relative to investment. However, it can be difficult for communities to decide to invest in such measures given the complexity of options emerging from analysis based on the V2R framework. There may be difficult trade-offs to make between investing in risk reduction measures and strengthening livelihoods. There are likely to be multiple stakeholders involved and compromises to be made between decisions that reap collective benefits and those that result in differential gains and losses for individuals or particular groups, or between communities. There will also be short-term choices to weigh against long-term ambition.

For every one dollar spent on flood risk reduction, an average of five dollars is saved through avoided and reduced losses. (Keating et al., 2014)

Practical Action has explored the use of various decision-support tools to assist communities in selecting the most cost-effective proposals for the long term. Cost-benefit analysis (CBA) is a systematic approach to estimate the strengths and weaknesses of alternatives by assessing their relative costs and benefits both in the present and in the future. The process involves firstly assessing the cost of losses expected in the future under a situation of no action (i.e. without risk reduction). This cost is compared with the estimated value of reduced future losses expected from the implementation of risk reduction measures, taking into account the costs incurred in carrying out those measures. If the benefits exceed costs, then the measures are said to be economically efficient (see Box 2 for a case study from Nepal).

CBA uses economic efficiency as its metric for prioritizing risk reduction interventions, whereas in reality such decisions are likely to be made based on a number of different factors, such as equity, acceptability, or reliability of predicted benefits. Some variants of CBA aim to deal with these limitations. Cost-effectiveness analysis compares relative rather than actual costs and benefits, which is more appropriate in cases where assigning a monetary value (e.g. to something like human life) is neither achievable nor appropriate. Multi-criteria analysis allows criteria other than cost to be brought into the decision-making process. Robust decision-making approaches help in conditions of deep uncertainty; that is, where the parties do not necessarily agree on the probability distributions for the key inputs to the decision process. While these additional methodologies tend to lead to more robust decisions, CBA has the advantage of simplicity and of producing easily communicable results in the form of

Box 2: Cost–benefit analysis in Nepal

A retrospective study of the cost-effectiveness of Practical Action’s livelihoods-centred disaster risk reduction approach adopted for a flood-vulnerable community development project in Nepal applied cost–benefit analysis (CBA). This calculated a benefit–cost ratio ranging from between 1.13 and 1.45 under cautious assumptions, to 2.04 under more optimistic assumptions (i.e. for every £1 invested, the benefits were calculated to be between £1.13 and £2.04). The estimates did not take into account that the frequency of extreme weather events is expected to increase due to climate change, and therefore the benefits of investments in irrigation and flood protection infrastructure are likely to increase over time, further raising the potential benefit ratio. The study concluded that the CBA approach is potentially most powerful when it is used as a forward-looking planning and decision support tool to assist in channelling scarce resources into activities with the highest expected net benefits. (Willenbockel, 2011)



Disaster contingency planning must consider the needs of everyone in the community
© Practical Action

benefit–cost ratios. CBA would be significantly improved as a decision-support tool if it could be combined with the ability to measure the resilience of the system in question.

Can we measure resilience?

Measurement is important for tracking performance and understanding impacts, but can we measure resilience in its entirety or should we focus on key characteristics such as asset security, preparedness, or adaptive capacity? Tools to measure the effectiveness of resilience building and to monitor the rate of progress towards resilient outcomes are still in their very early stages and there is currently little consensus on best practice (Winderl, 2014).

The complexity of a systems approach leads to a huge diversity of elements which can be measured, and raises a number of questions about process and outputs. At what stage is measurement appropriate? Do we measure resilience during a state of normality (*ex ante*, ability to manage risk) or only when a disaster occurs (*ex post*, ability to cope and recover)? Can we give

an absolute value to a state of resilience or only one that is relative to a baseline or benchmark? Practical Action is working alongside the Zurich Global Flood Resilience Programme to pilot a tool that potentially measures resilience to flooding (Szoenyi et al., 2016).

By tracking the capitals pre- and post-event, it is possible to observe how development, disasters, and risk management activities erode or support wellbeing

The tool involves measuring the capital profile of a community, using the five capitals reflected in the V2R framework (see Figure 3). Theoretically, by tracking the capitals pre- and post-event, it is possible to observe how development, disasters, and risk management activities within the community erode or support wellbeing. Having baseline information means the five capitals could be measured after a hazard event to assess how they were impacted or utilized to cope and recover. A grounded set of metrics could help to guide the exploration of potential sources of resilience and test their effect on outcomes in order to contribute further evidence to our understanding of resilience.

In light of the inherent complexity involved, putting the five capitals approach into practice raises a number of challenges. Each capital embraces a wide range of elements, such that natural capital, as an example, could include land, water, and clean air, as well as watersheds and soil systems. Each of these may be difficult to quantify and, when measured, comparing capitals becomes difficult and the usefulness of the resulting analysis comes into question. We are looking for ways to allow for an exploration of the interdependencies between the capitals themselves, and between the capitals and other elements of the V2R framework. It will be important to not only measure the capitals but also understand the relationships between them: for example, how do social assets, or the wider governance context, frame access to particular resources which may appear plentiful in the wider community but are inaccessible for a large portion of the population due to social barriers? We are aware that the mere existence of an asset does not necessarily imply that it is being used effectively to manage risk or enhance wellbeing. Conversely, the lack of or weakness of an asset may be indicative of vulnerability; this raises further questions around the weighting of the measurements. By adopting a standardized approach we are hoping to learn more about resilience, understand how the capitals interact, and most importantly how they can be applied to enhance resilient wellbeing.

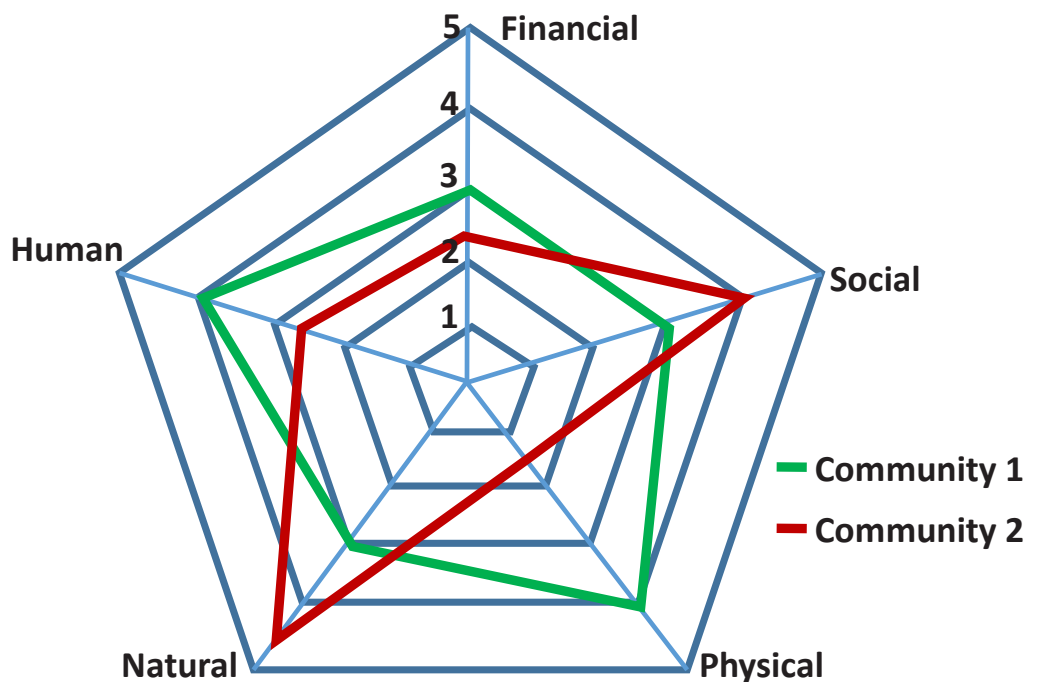


Figure 3 Example spider web diagram of two communities scored on the five capitals

Implications for policy, practice, and future learning

A review by the United Nations Development Programme notes the veritable explosion of initiatives aimed at better understanding and operationalizing resilience (Winderl, 2014). Although there is no consensus on a definitive meaning, the resilience discourse is proving successful in challenging past thinking and practice. It is leading to useful research into and practical innovation with new tools and approaches, and is, in turn, influencing donor policies and strategies. Funding for disaster risk reduction is gradually increasing, mainly due to availability of climate adaptation funds (Kellett and Caravani, 2013). However, donors still need concrete evidence of what works in practice. Further evidence of successful approaches and attribution of activities that build resilience are needed to help donors make appropriate aid investment choices.

If innovation is to be successful, communities must be empowered to identify and explore their own pathways towards resilience rather than having them imposed top down. A further challenge is to engage relevant stakeholders at all levels in understanding and working with community perspectives to facilitate an enabling policy and institutional environment locally, nationally, and internationally.

Resilience
is less
conceptually
amenable
to top-down
managed
approaches

A final key challenge is the development of mechanisms which bring different ideas and actors together for effective decision-making that works for individuals and communities. This needs to be congruent with government sectoral plans and strategies, requires strong learning and feedback loops, and necessitates accountability between the different layers of government and across sectors. While there are effective methodologies for public participation that facilitate community-level learning, engagement, and decision-making, resilience is less conceptually amenable to top-down managed approaches associated with government institutions. Efforts are still required to develop effective processes for bringing together different actors to achieve a mutual understanding of the issues at stake, and to arrive at shared plans for long-term adaptive action.



Sharing flood response preparedness messages in Nepal © Practical Action

Key messages

- The concept of resilience has opened a space for more holistic thinking that integrates disaster management within broader development strategies for increasing sustainable wellbeing.
- Disasters are most keenly felt by the poor, therefore resilience must be built upon their experiences and analysis.
- V2R provides a framework for communities to engage in a resilience analysis and planning process, helping them to make appropriate ‘no regrets’ choices, particularly in the context of an unpredictable future.
- Efforts to measure resilience are still in their infancy, but learning from experience will provide insights into how assets and capacities interact and are influenced by other elements of the framework, contributing to further refinement of the resilience approach.
- Evidence in favour of a systemic resilience approach indicates a move away from separate financing of disaster risk reduction towards integrating risk into all investments.

References

- Keating, A. Campbell, K. Mechler, R. Michel-Kerjan, E. Mochizuki, J. Kunreuther, H. Bayer, J. Hanger, S. McCallum, I. See, L. Williges, K. Atreya, A. Botzen, W. Collier, B. Czajkowski, J. Hochrainer, S. Egan, C. (2014) *Operationalizing Resilience against Natural Disaster Risk: Opportunities, Barriers, and a Way Forward*, Zurich: Zurich Global Flood Resilience Programme.
- Kellett, J. and Caravani, A. (2013) *Financing Disaster Risk Reduction: A 20 Year Story of International Aid [pdf]*, London: ODI <<https://www.odi.org/sites/odi.org.uk/files/odi-assets/publications-opinion-files/8574.pdf>> [accessed 9 June 2016].
- Meikle, A. and Sugden, J. (2015) *Introducing technology justice: a new paradigm for the sustainable development goals*, Rugby: Practical Action Publishing <<http://dx.doi.org/10.3362/9781780446240>>.
- Pasteur, K. (2011) *From Vulnerability to Resilience: A Framework for Analysis and Action to Build Community Resilience*, Rugby: Practical Action Publishing <<http://dx.doi.org/10.3362/9781780440583>>.
- Szoenyi, M. Nash, D. Bürer, M. Keating, A. McQuistan, C. Campbell, K. (2016) *Measuring Flood Resilience: Our Approach*, Zurich: Zurich Insurance Company.
- Willenbockel, D. (2011) *A cost-benefit analysis of Practical Action's livelihood-centred disaster risk reduction project in Nepal*, Brighton: IDS <<http://practicalaction.org/media/view/12930>> [accessed 9 June 2016].
- Winderl, T. (2014) *Disaster Resilience Measurements: Stocktaking of Ongoing Efforts in Developing Systems for Measuring Resilience [pdf]*, UNDP <www.preventionweb.net/files/37916_disasterresiliencemeasurementsundpt.pdf> [accessed 16 May 2016].

Katherine Pasteur is a freelance international development consultant. She has over 20 years' experience in the areas of sustainable livelihoods, natural resource management, and disaster risk reduction in Africa, Latin America, and Asia.

Colin McQuistan is the Senior Policy and Practice Adviser with Practical Action, UK. He leads the organization's influencing work on disaster risk reduction and climate change.

Acknowledgements: This paper is the result of engagement, discussion, and reflections on practice among the disaster risk reduction practitioners in Practical Action in the UK and internationally. We would like to thank everyone in Practical Action and beyond who contributed by sharing ideas and providing useful comments and feedback, particularly Chris Anderson, Jodi Sugden, Emilie Etienne, Amber Meikle, and Christine Comerford from Practical Action, and Chris Lyon from Dundee University.

Front page photo: Community meeting, to shift from risk to resilience information is vital for effective planning © Practical Action

Keywords: disaster risk reduction, adaptation, climate change, sustainable development, risk

Copyright © Practical Action, 2016

Practical Action Publishing Ltd, The Schumacher Centre, Bourton on Dunsmore, Rugby, Warwickshire CV23 9QZ, UK
www.practicalactionpublishing.org

ISBN 9781853399503 Paperback

ISBN 9781780449500 Epub

ISBN 9781780447070 Library PDF

All rights reserved. No part of this publication may be reprinted or reproduced or utilized in any form or by any electronic, mechanical, or other means, now known or hereafter invented, including photocopying and recording, or in any information storage or retrieval system, without the written permission of the publishers.

The authors have asserted their rights under the Copyright Designs and Patents Act 1988 to be identified as authors of their respective contributions.

Pasteur, K., and McQuistan, C. (2016) *From risk to resilience: a systems approach to building long-term, adaptive wellbeing for the most vulnerable* Rugby, UK: Practical Action Publishing <<http://dx.doi.org/10.3362/9781780447070>>

Since 1974, Practical Action Publishing has published and disseminated books and information in support of international development work throughout the world. Practical Action Publishing is a trading name of Practical Action Publishing Ltd (Company Reg. No. 1159018), the wholly owned publishing company of Practical Action. Practical Action Publishing trades only in support of its parent charity objectives and any profits are covenanted back to Practical Action (Charity Reg. No. 247257, Group VAT Registration No. 880 9924 76).

Design, editing, and production by Practical Action Publishing

Printed in the United Kingdom



ISBN 978-1-85339-950-3

