

Adaptive management for resilient communities

Development in a volatile environment



Jodi Sugden, Practical Action, UK

Short-term projects and linear management approaches are often unsuitable for achieving resilient development in the face of volatile complexity. Adaptive management combined with longer-term project funding has the potential to deliver more appropriate development outcomes. This will require development practitioners to engage with complexity in a participatory and transparent way, through regular participatory context analysis, modifiable theories of change, and evidenced periods of review. Organizations must overcome their fear of failure and support project managers to 'fail forwards'. Non-government organizations should develop and pilot accountability frameworks that support learning and adaptation. They must prove to donors the value of monitoring for learning and adaptation to better achieve resilient development goals.



Summary

Short-term projects and linear management approaches are often unsuitable for achieving resilient development in the face of volatile complexity, and may result in undesirable outcomes. Global trends including rapid urbanization, environmental deterioration, and recurrent national and global financial crises have unpredictable and often sudden effects (DESA, 2013). In 2016 the global temperature exceeded the 1.5°C ‘safe limit’ agreed at the UN Framework Convention on Climate Change (UNFCCC) negotiations in December 2015 (Climate Central, 2016). More unpredictable weather patterns indicate that we are moving into an era of greater risks and instability (World Bank, 2014).

Log frames and theories of change may inadvertently promote mechanistic thinking by supporting the assumption that we can accurately predict the impacts of our work in such a complex and volatile environment (Valters, 2014). Rigid donor requirements may prevent managers from updating their theories of change as they implement and learn.

Adaptive management (AM) combined with longer-term project funding has the potential to deliver better development outcomes. It requires organizations to acknowledge that change is emergent and unpredictable, and to engage with this complexity in a participatory and transparent way. Non-government organizations should not only modify activities, but also regularly revisit the assumptions that underpin projects (‘double loop learning’) and the governance structures that enable or constrain change (‘triple loop learning’).

Regular, participatory context analysis is essential. Theories of change should be used as a ‘compass’ rather than a ‘map’ (Valters et al., 2016), to be tested and amended over time. Focusing monitoring on progress towards outcomes rather than on pre-agreed activities and outputs enables project managers to adapt as they learn. Regular reviews based on evidence can help decision-makers prevent maladaptation. Documentation is essential to ensure accountability and to maintain institutional memory.

Accepting that change is emergent and inevitable means accepting that certain activities will be modified or abandoned along the way. Overcoming the easy conceptualization of these decisions as ‘mistakes’ is challenging. Organizations must embrace learning and adaptation as the key to success. It is often assumed that there is a contradiction between AM and a results-driven, ‘value for money’ approach. AM in fact depends on a rigorous framework for monitoring and reacting to intermediate results.

Donor requirements are the main limitation to scaling out AM from individual projects to an organizational or sector-wide approach. NGOs must use what opportunities they have to manage projects adaptively to generate evidence to persuade donors that:

- Longer time frames enable a more appropriate and effective response.
- Value for money can be demonstrated on AM projects through regular context analysis, evidenced monitoring of learning and adaptation, and accountability frameworks that focus on progress towards outcomes.
- Sanctions should not be applied when activities do not contribute to goals, but when NGOs fail to rapidly comprehend this and adapt (Bakewell and Garbutt, 2005).

Attempting to build resilience in volatile contexts through short-term mechanistic projects may be undesirable

Introduction

Short-term projects and linear, mechanistic management approaches are often unsuitable for achieving resilient development in the face of volatile complexity. Such approaches do not allow the time or space to adequately analyse complex problems or the appropriateness of an intervention, nor to adjust the latter to fit the former (World Bank, 2015).

Global trends including rapid urbanization, environmental deterioration, and recurrent national and global financial crises have unpredictable and often sudden effects on development outcomes (DESA, 2013). In most countries, rising inequality has accompanied economic growth, adding fuel to existing political and social conflicts (Green, 2015). In February and March 2016 the global temperature met and exceeded the 1.5°C 'safe limit' agreed at the UNFCCC climate negotiations in December 2015 (Climate Central, 2016). More unpredictable weather patterns indicate that we are moving into an era of greater risks and instability (World Bank, 2014). Attempting to achieve resilient development in such volatile contexts through short-term mechanistic projects may result in inappropriate and undesirable outcomes.

Approaches to project and programme management

Log frames have proved useful as a project management tool because they force NGOs to think about what they want to achieve and how to get there. In an ideal situation, the log frame is developed in collaboration with key stakeholders to the project, leading to an agreed path from activities to goals. This sole theory of change can theoretically be modified as the project develops, but in practice managers may be reluctant to upset a hard-won consensus agreement, or to deviate from activities that have been signed off by a donor (Bakewell and Garbutt, 2005).

A 'theory of change' can be interpreted as either a management tool or as a broader approach to managing change. As a tool, it follows a similar logic to log frames: what do we need to do to achieve the change we want to see? In this usage, they can inadvertently promote linear mechanistic thinking, by supporting the assumption that we can accurately predict the impacts of our work in a complex and volatile environment (Valters, 2014). Rigid donor requirements that focus on pre-agreed activities and outputs may prevent managers from adapting and updating their theories of change as they implement and learn.

Adaptive management (AM) was originally conceived of as a way to manage the natural environment, in which 'social-ecological systems are complex ... characterized by a high degree of uncertainty ... and therefore present decision makers with challenging judgments ... often under enormous pressure (economic, environmental, social and political)' (Allen et al., 2011). There is great potential for this concept to be applied to resilience-building development work, particularly when it is combined with longer-term project funding. AM has attracted the interest of development actors (e.g. Bakewell and Garbutt, 2005; Mercy Corps, 2015). Debate continues, however, over what AM has to offer above and beyond traditional management techniques and, critically, whether it is compatible with the increasing sectoral drive towards results and 'value for money'.

This paper outlines the key principles that differentiate AM and how these can be integrated into project and programme management. It discusses some of the challenges associated with managing adaptively and argues that NGOs can and should overcome these to deliver resilient development and value for money in volatile environments.

The Zurich Flood Resilience Alliance

The Zurich Insurance Group and the Z Zurich Foundation (hereafter referred to as 'Zurich') have supported Practical Action since 2004 and in 2008 funded resilience-building projects in Bangladesh and Peru with £1.5m. In 2013, this relationship changed from a traditional donor–client relationship to a technical partnership, with the formation of the Zurich Flood Resilience Alliance.

Floods are the most common cause of weather-related disasters globally, and the incidence of severe flood events has increased significantly in the last three decades (CRED and UNISDR, 2015; PreventionWeb, 2016). Zurich launched the Zurich Flood Resilience Alliance in 2013 to advance knowledge, develop expertise, and design strategies to help communities build their flood resilience.



Severe flooding of the Vilcanuta River in Macchu Pichu, Peru. *Source:* Ross, 2016

To achieve these objectives, Zurich has partnered with the International Federation of Red Cross and Red Crescent Societies (IFRC), the International Institute for Applied Systems Analysis (IIASA), the Wharton Business School's Risk Management and Decision Processes Centre (Wharton), and Practical Action.

The alliance is supporting Practical Action to build community flood resilience in Bangladesh, Peru, and Nepal through our Zurich Flood Resilience Programme (ZFRP) over five years (2013–2018). Zurich are setting a new standard for adaptive development funding through their willingness to support Practical Action with flexible delivery, reporting, and governance structures. We believe this is making our programming more responsive and will over time enhance resilience outcomes

'The Zurich Insurance Group is committed to helping communities become more resilient to floods. We appreciate the complex and dynamic nature of building resilience, which is why we recognize the need for flexibility within the projects we fund. We believe the priority for donors should be the outcome of improved resilience rather than narrowly tracking activities and we would encourage others to invest in medium-to-long-term adaptive management arrangements'. David Nash, Zurich Insurance Group

for communities over and above what could be expected from a more traditional management approach.

Adaptation and learning in development

Several authors have tried to present visually how AM differs from traditional project cycle management (PCM), typically including more feedback loops and connections between the steps; Figure 1 is one such example. Other versions present a more or less similar picture (e.g. Allen et al., 2011; IIASA and Zurich Insurance Company, 2015).

In this figure, learning and adaptation both follow and precede goal setting, planning, and implementation. To manage adaptively is to acknowledge that it is impossible to know exactly how a development intervention will interact with a particular political, social, and environmental context. It requires us to recognize that change in such contexts is inevitable, 'emergent and contextual', rather than something that is imposed upon a stationary situation (Valters et al., 2016).

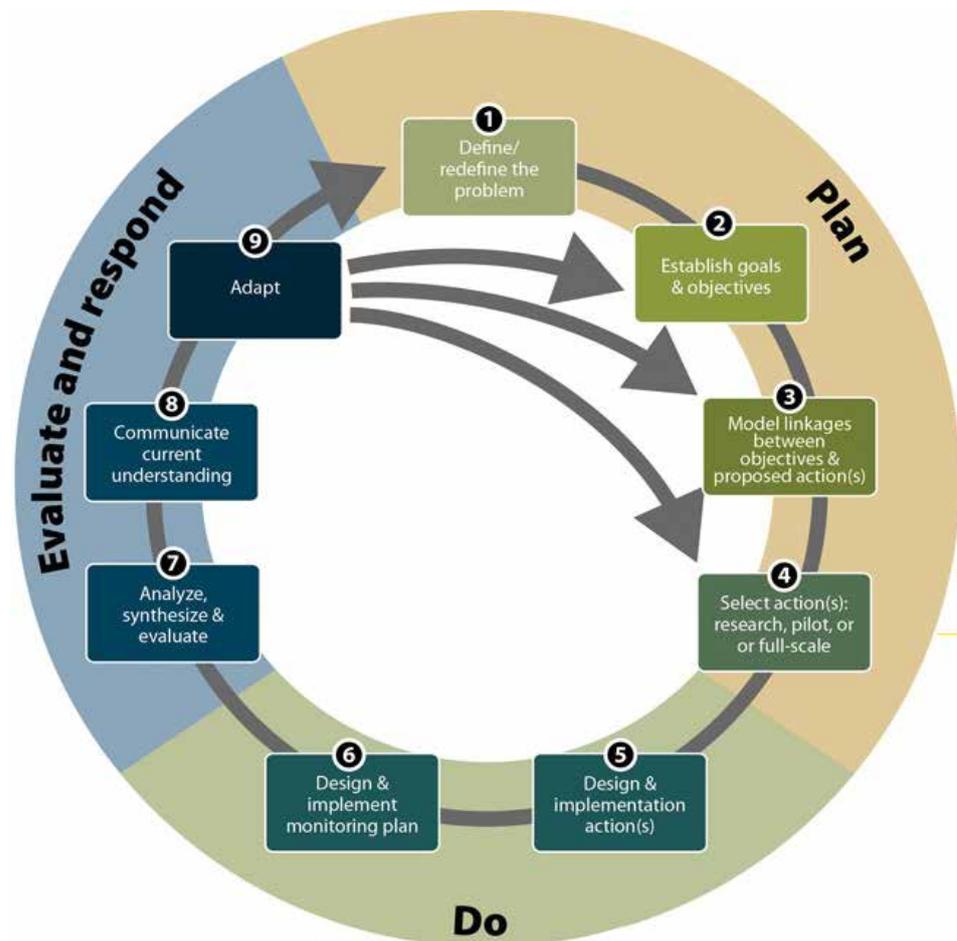


Figure 1 A visualization of adaptive management. Source: State of California, 2016

Effective adaptation requires continual learning about the context and the intervention

The traditional PCM model is a cycle, with learning present either as the recurring ‘evaluation’ stage or as a continuous function. In reality, however, learning is often limited by rigid donor requirements for the delivery of pre-agreed outputs. Effective adaptation to complex changing environments requires continual learning about the context, the intervention, and the interaction between the two *throughout* a project’s lifespan. Further, managers must be able to use this learning to adapt the project.

Learning and adaptation of a project can occur at three levels, referred to as single, double, and triple loop learning (see Figure 2). Single loop learning is the most common in development projects, and refers to the modification of activities. Double loop learning steps back to look at the assumptions that underpin a project, theories of change, and logic models. Triple loop learning steps back again to look at project governance and structural constraints. Managing adaptively implies that we not only modify our activities, but regularly revisit the assumptions that underpin our work and the governance structures that enable or constrain what we do.

Practical Action has undertaken both double and triple loop learning and adaptation in the delivery of the ZFRP. In late 2015 we brought together project management staff from Peru, Nepal, and Bangladesh with senior management from our UK head office to create one global engagement strategy for Practical Action’s ZFRP. We reassessed our core assumptions: were our activities on the ground generating the evidence we needed for our advocacy work at national, regional, and global levels? Where were the gaps and overlaps between project activities and advocacy work in each country office? What had worked well so far and what had not? Could we redirect programme funds to different work streams to be more effective? This was for us an intense period of *double loop learning and adaptation*. The workshop report documented the journey taken by the team during this time, the discussions held, and the decisions made.

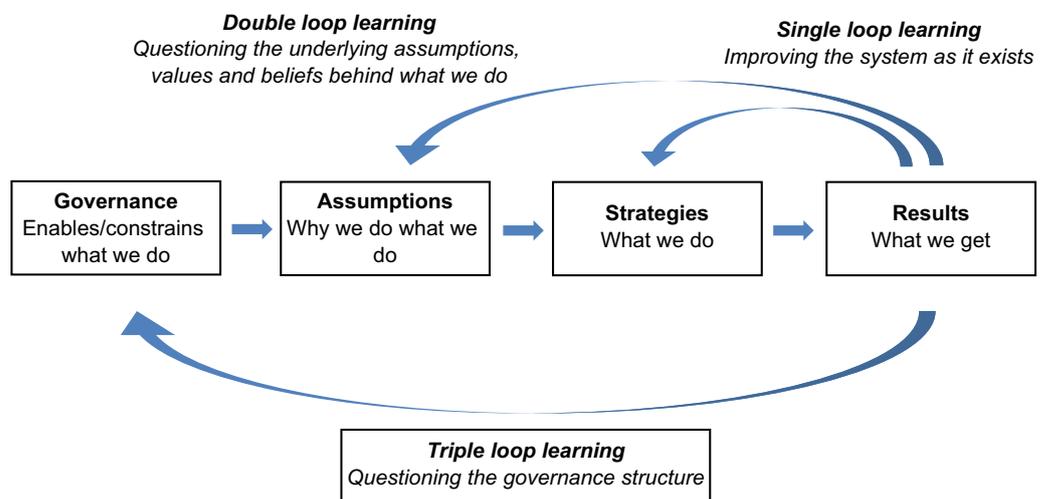


Figure 2 Single, double, and triple loop learning Source: adapted from Valters et al. (2016)

When the programme began in 2013 management responsibility was devolved to country teams, supported by senior technical leads in head office – the Zurich Management Team. It became clear, however, that this governance structure was not delivering as effectively as had been hoped, as the different departments and country offices involved in implementation struggled to communicate and learn from each other effectively. In late 2014 a decision was taken to hire a global programme manager. A learning review completed at

the end of 2015 found that this had improved communication between teams, enabling them to learn from each other more effectively and strengthening programme delivery. This is a good example of effective *triple loop learning and adaptation*, in which the governance structure was changed based on learning.

In both cases, evidencing what were essentially qualitative adaptation decisions and the reasoning behind them was an essential part of the process. Over the life of the programme, this documentation will form a key part of monitoring and evaluation, justifying the adaptation decisions that have been taken and showing how they have (or have not) contributed to realizing programme goals.

Putting AM into practice

Essentially, managing adaptively is about accepting, working with, and learning from change, and using this learning to be more effective. There are many tools available that managers can choose to assist them in this process (see for example World Bank, 2015). This section does not prescribe any particular tools, but instead lays out some fundamental ways that AM principles can be integrated into project and programme management.

Context analysis

Regular and frequent context analysis is an essential part of AM. The context should be viewed ‘not just as a constraint but also as a subject of change’ (Andrews, 2013).

Structured decision-making is a way of identifying and evaluating management options by ‘engaging stakeholders, experts and decision makers in the decision process and addressing the complexity and uncertainty ... in a proactive and transparent manner’ (Allen et al., 2011). This form of decision-making is key to AM. Problems must be defined in such a way that they can be continually reflected on and changed when necessary. Therefore, they must be contextualized by those stakeholders who face them and who affect them – their participation is essential. Furthermore, the assumptions of key stakeholders – including development actors – must be made explicit.

Practical Action is currently developing a participatory tool designed to bring together stakeholders across a river basin to overcome obstacles to flood resilience, which has the working title of Systems Analysis for Emergencies Resilience (SAFER). SAFER brings together flood vulnerable communities with key government, private sector, and academic stakeholders to analyse and contextualize flood resilience challenges and identify viable solutions. It enables vulnerable communities and development actors from all sectors to collectively analyse the problem, drawing out their assumptions so they can be reflected upon and, if necessary, challenged as the project progresses.

Realistically, NGOs may not have the resources to hold multiple participatory context analyses for each project. However, more informal context analysis can be built in, for example by scheduling regular briefings from locally experienced staff on social and political developments (Valters et al., 2016). In Practical Action’s ZFRP, this occurs through regular one-to-one conversations between the global programme manager and in-country project managers, which then informs the decisions of the Zurich Management Team.

The humanitarian sector provides some examples of rapid learning that may be useful to development practitioners. Real Time Evaluation (RTE), developed by UNHCR in the early 1990s, is a participatory tool that can be used to take a 'wide angle snapshot' of an active intervention and its context (Jamal and Crisp, 2002). RTEs are designed to look at the effectiveness of an intervention and its intermediate impacts, to rapidly inform what may be very short humanitarian interventions. They could therefore be adapted for use in longer-term development projects, to evaluate learning and support adaptation decisions.

Theories of change

Theories of change should be used as a 'compass' rather than a 'map'

AM requires that theories of change are used as a 'compass' rather than a 'map' (Valters et al., 2016), through which hypotheses of impact and change are tested and modified over time. Objectives should be broad enough to accommodate a variety of different activities, while still clearly identifying the goals of an intervention. Focusing monitoring on outcomes rather than on activities and outputs enables project managers to adapt projects as they learn about the context and how their work interacts with it. It should be understood that the proposed theory of change is a preliminary theory, and will likely be modified over time. Ideally, project managers should decide with beneficiaries and other key stakeholders at the beginning of the project what moves the project towards goals and what does not, while allowing that this in itself may have to be renegotiated at a later date as the context or learning determines.



Community-based organizations like this disaster management committee in Bangladesh help keep Practical Action updated on local political and social developments. *Source:* © Practical Action

Flexible work plans and budgets enable organizations to be more responsive to changing circumstances, and can help to reduce the negative impacts of the unexpected. For example, when catastrophic earthquakes struck Nepal in 2015, followed by civil unrest and severe fuel shortages, the majority of ZFRP activities in Nepal had to be suspended until early 2016. In a traditional funding relationship, this could cause problems as deliverables were not achieved on time and money was not spent as planned. The flexibility of our funding relationship with Zurich, however, enabled us to use the budget for national advocacy work that supported the realization of our goals until the political situation had calmed.

Evidence and review

Investing in internal knowledge management and institutional memory is essential. Regular evidenced reviews can help prevent 'hyper-reactivity' and maladaptation based

on insufficient evidence. Clear and rapid feedback loops are essential; all staff must know how, when, and with whom to share learning, and how, when, and by whom adaptation decisions will be made on the basis of that learning.

NGOs should think carefully about how they will monitor for and evidence AM. In-depth participatory context analysis can provide a baseline, but project managers should be clear on which sources they will consult and how they will know if that context has changed in such a way as to require project adaptation. Documentation is essential to maintain institutional memory, and to ensure that NGOs can provide good quality, detailed reports to donors on what adaptation decisions have been taken and why.

The challenges of managing adaptively

Different organizations may face different challenges when trying to manage adaptively, depending on their size, experience, and working culture, among other factors. The challenges experienced by Practical Action and outlined here will likely provide useful learning for other organizations.

Internal culture and ‘failing forwards’

Accepting that change is emergent and inevitable, and that learning and adaptation is a continual and necessary process, means accepting that certain activities will need to be modified or even abandoned along the way. Overcoming the easy conceptualization of these decisions as ‘mistakes’ is one of the greatest challenges of AM. The pressure to deliver what has been promised to donors, whether activities are achieving the desired outcomes or not, can be strong. Staff may also find it difficult to adjust to the flexibility of AM, and may initially be unwilling to make change decisions without reassurance from the donor, even if this decision-making power has been devolved to them.

Honest communication about what needs to change between staff on the ground, management, and donors requires a very high degree of trust that must often cross geographical and cultural boundaries. Staff must feel secure enough to admit that something they are doing is not achieving the desired results in order to change and ‘fail forwards’ (Green, 2015). The organization must overturn any culture of reprisals for ‘mistakes’ and embrace learning and adaptation as the key to success. At Practical Action we have used formal and informal processes to encourage this change. We modified the ZFRP reporting format to include a column in which project managers can comment on whether the activities are contributing towards outcomes as intended, or need modifying, and on lessons learned.

In a more informal way, senior management have encouraged project managers to give an honest assessment of activities and outputs and their relevance to achieving our goals, and to make suggestions for improvement. This has in some cases been quite challenging as some country staff are more willing than others to admit that something is not working. It also poses something of a risk. We encourage our staff to speak their minds and discuss challenges honestly on the ZFRP, but these staff also work on other, non-AM projects. If they take this new attitude and confidence to other projects, do they risk upsetting the status quo with senior managers and partners? Where AM is employed only on particular programmes, and not across an organization, senior staff must support project managers to respond appropriately to each situation.

The organization must overturn any culture of reprisals for ‘mistakes’ and embrace learning and adaptation as success

AM is completely dependent on a rigorous framework for monitoring and reacting to intermediate results

Accountability

There is justifiably increasing pressure on NGOs to be accountable for their work, and to deliver clear, pre-agreed results and ‘value for money’. It is often assumed that there is a clash between focusing on results and managing adaptively. There is in fact no contradiction; AM is completely dependent on a rigorous framework for monitoring and reacting to intermediate results. When the accountability focus shifts from activities and outputs to outcomes and goals, monitoring whether work contributes to realizing those goals is an essential part of effective adaptation. It is key to knowing what must be scaled up and what must be changed or stopped. A shift towards ‘outcomes for money’ has the added advantage of aligning project analysis more closely with the experiences of and benefits for beneficiaries (Hughston, 2016). The challenge then is to ensure the sectoral focus on results and value for money ‘supports, rather than inhibits ... experimentation and adaptation’ (Barder and Ramalingam, 2012).

AM projects must have a thorough baseline and context analysis to ground the project from the outset, and documented evidence of the adaptation decisions taken. Practical Action has assumed responsibility for providing a ‘learning report’ to Zurich and to an internal audience every six months which looks into what we have learned and adapted in each country and at a global programme level. Adaptive management arrangements may be more flexible and open as far as activities are concerned, but NGOs must account for the learning behind the adaptations they make.

Rapid monitoring–learning–adaptation feedback loops, such as RTEs, must connect project implementers to managers and donors. This may increase the amount of resources required for monitoring, evaluation, and learning. NGOs must therefore support donors to connect this extra budgetary need with better outcomes for project beneficiaries.

Scale-out of AM

This paper has highlighted Practical Action’s experiences of AM through the ZFRP. The willingness of Zurich to enter into a funding arrangement with flexible delivery, reporting, and governance arrangements has enabled Practical Action to be more responsive and more effective in our resilience programming. The question remains how organizations as a whole can move towards managing adaptively. The main limiting factor is donor requirements, which determine project funding. It is therefore up to NGOs to use what opportunities they have to manage individual projects adaptively to experiment and generate evidence that can be used to persuade donors that:

- Longer time frames enable a more appropriate and effective response.
- Value for money can be proved on AM projects through regular context analysis, evidenced monitoring of learning and adaptation, and accountability frameworks that focus on outcomes rather than pre-agreed activities and outputs.
- Sanctions should not be applied when activities do not contribute to goals, but when NGOs fail to rapidly comprehend this and adapt (Bakewell and Garbutt, 2005).

Conclusion

Short-term projects managed in a linear and mechanistic fashion are unsuitable for building resilient development in complex and volatile environments. In such contexts, AM has the potential to deliver more responsive projects and more positive long-term

outcomes. To integrate AM into management requires an honest appreciation of the unpredictability and volatility of the environment in which we work, and an understanding of change as something emergent, rather than something we impose. It requires us to engage with complexity in a participatory and transparent way, through regular participatory context analysis, modifiable theories of change, and evidenced, documented review. Organizations must overcome their fear of failure and support managers to fail forwards. It is up to NGOs to develop accountability frameworks that support AM and to prove to donors the value of monitoring for learning and adaptation to better achieve resilient development goals.

References

- Allen, C.R., Fontaine, J.J., Pope, K.L. and Garmestani, A.S. (2011) 'Adaptive management for a turbulent future', *Journal of Environmental Management* 92: 1379–84 [online] <<http://digitalcommons.unl.edu/ncfwrustaff/80>> [accessed 4 July 2016].
- Andrews, M. (2013) *The Limits of Institutional Reform in Development: Changing Rules for Realistic Solutions*, Cambridge: Cambridge University Press.
- Bakewell, O. and Garbutt, A. (2005) *The Use and Abuse of the Logical Framework Approach* [pdf], Stockholm: Swedish International Development Cooperation Agency <www.eldis.org/go/home&id=22810&type=Document#.V1ke84-cHcs> [accessed 7 July 2016].
- Barder, O. and Ramalingam, B. (2012) *Complexity, Adaptation, and Results* [online], Washington, DC: Center for Global Development <www.cgdev.org/blog/complexity-adaptation-and-results> [accessed 4 July 2016].
- Climate Central (2016) 'Earth flirts with a 1.5-degree Celsius global warming threshold', *Scientific American* [online] <www.scientificamerican.com/article/earth-flirts-with-a-1-5-degree-celsius-global-warming-threshold1/> [accessed 4 July 2016].
- CRED and UNISDR (2015) *The Human Cost of Weather Related Disasters 1995–2015* [online], Brussels: CRED; Geneva: UNISDR <www.preventionweb.net/files/46796_cop21weather-disastersreport2015.pdf> [accessed 4 July 2016].
- DESA (2013) *World Economic and Social Survey 2013: Sustainable Development Challenges* [online], New York: United Nations <www.un.org/en/development/desa/policy/wess/wess_current/wess2013/WESS2013.pdf> [accessed 4 July 2016].
- Green, D. (2015) *Fit for the Future? Development Trends and the Role of International NGOs*, Oxford: Oxfam.
- Hughston, L. (2016) *Outcomes for Money (OxM): An Unorthodox Analysis of Value for Money* [online], London: Plan UK <[www.plan-uk.org/assets/Documents/iati/Outcomes_for_Money_\(OxM\)_An_unorthodox_analysis_of_Valure_for_Money.pdf](http://www.plan-uk.org/assets/Documents/iati/Outcomes_for_Money_(OxM)_An_unorthodox_analysis_of_Valure_for_Money.pdf)> [accessed 4 July 2016].
- IIASA and Zurich Insurance Company (2015) *Turning Knowledge into Action: Processes and Tools for Increasing Flood Resilience*, Zurich: Zurich Insurance Group.
- Jamal, A. and Crisp, J. (2002) *Real-time Humanitarian Evaluations: Some Frequently Asked Questions* [online], Geneva: UNHCR <www.unhcr.org/3ce372204.pdf> [accessed 4 July 2016].
- Mercy Corps (2015) 'Managing complexity: adaptive management at Mercy Corps' [online], <<https://www.mercycorps.org/research-resources/managing-complexity-adaptive-management-mercy-corps>> [accessed 4 July 2016].
- PreventionWeb (2016) 'Flood – data and statistics' [online], <www.preventionweb.net/english/hazards/statistics/?hid=62> [accessed 5 July 2016].
- Ross, J. (2016) 'Peru House Project – June 7, 2013' [blog], MicroAid International Blog from the Field <<http://microaidinternational.org/WP/?cat=10&paged=2>> [accessed 4 July 2016].
- State of California (2016) 'Adaptive management' [online], California Department of Fish and Wildlife <www.dfg.ca.gov/ERP/adaptive_management.asp> [accessed 5 July 2016].
- Valters, C. (2014) *Theories of Change in International Development: Communication, Learning, or Accountability?* London: Justice and Security Research Programme, LSE.
- Valters, C., Cummings, C. and Nixon, H. (2016) *Putting Learning at the Centre: Adaptive Development Programming in Practice*. London: Overseas Development Institute.
- World Bank (2014) *Turn Down the Heat: Confronting the New Climate Normal*. Washington, DC: World Bank.
- World Bank (2015) *World Development Report 2015: Mind, Society and Behaviour*. Washington, DC: World Bank.

The Zurich Global Flood Resilience Programme

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

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

Jodi Sugden works with Practical Action on the Zurich Flood Resilience Programme. She supports the programme through research, analysis, knowledge capture, and communications.

Acknowledgements: This paper is the result of the hard work, discussion, and reflections on practice among the disaster risk reduction practitioners from Practical Action UK and internationally. We would like to thank everyone from Practical Action and beyond who contributed by sharing ideas and providing useful comments and feedback, particularly Dinanath Bhandari, Gehendra Gurung, Emilie Etienne, Abdur Rob, Colin McQuistan, Lizzy Whitehead, Chris Anderson, Jonathan Casey, and Chris Webbley.

Front page photo: A community disaster management committee discusses project progress and challenges in the context of their community action plan © Practical Action

Keywords: adaptive management, international development, floods, NGO, project management

Copyright © Practical Action, 2016

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

ISBN 9781853399527 Paperback

ISBN 9781780449524 Epub

ISBN 9781780447094 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.

Sugden, J., *Adaptive management for resilient communities: Development in a volatile environment*, Rugby, UK: Practical Action Publishing <<http://dx.doi.org/10.3362/9781780447094>>

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 978-1-85339-952-7

