



Planning and implementing climate change responses in the context of uncertainty

Exploring the importance of social learning and the processes of decision-making

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Significant uncertainties around future climate change challenge the implementation of policies and programmes. Mobilising action that can respond to climate change and be flexible enough to learn from new experiences as well as adapt to unknowns is difficult, given traditional short-term timeframes, sector silos and the predominantly top-down nature of planning cycles. Process-driven approaches, such as social learning, offer a more flexible approach to tackling climate uncertainties. These approaches place the emphasis on building the capacity, knowledge, evidence and stakeholder relationships necessary to support first short-term and then longer-term decision making and action.

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Executive summary

Climate change presents several challenges to planning and implementation of policies and programmes. There are significant uncertainties regarding future climate change. Precipitation projections from climate models do not converge well for many parts of the world. Sudden tipping points may occur, with implications for both long-term infrastructure decisions and large investments, as well as shorter-term interventions. Assumptions made in climate models introduce uncertainties to predicted trends. Climate change in the future may undermine current decisions; people and businesses may invest in livelihoods and enterprises that will need to be altered. They may need to adjust current decisions to take account of a range of future possibilities; and will need to take adaptation decisions pre-emptively to avoid large costs, losses and damage.

This paper contributes to addressing these challenges by bringing together literatures on planning and implementation, drawing on social learning and the challenges climate uncertainty poses. It asks whether and how elements of the processes that draw on social learning could help deliver better outcomes in the context of climate uncertainty. One critical element of this is to explore the potential for social learning in incorporating the needs and priorities of diverse actors, particularly women and other marginalised groups. We analyse the role the planning and implementation process can play in resolving some of these challenges, from a theoretical perspective but also in practice. The paper outlines the literatures on climate uncertainty and planning processes, drawing on social learning, before going on to present a framework for analysis.

The main challenges from climate uncertainty are: the uncertain nature of evidence, the multi-sectoral nature of climate effects, long cause and effect timeframes, and differential impacts on marginalised groups. There is a concerted focus on improving climate science and the delivery of climate information services to address some of these issues. However, so far evidence is limited of uptake of climate information in policymaking

and its sustained use through to adaptive management of implementation.

A number of approaches have sought to improve decision-making and use of relevant evidence for complex problems in different contexts. Social learning is one such approach, supporting knowledge sharing, joint learning and co-creation of evidence among stakeholders around a common issue. Through iterative learning, reflection and action cycles, it can catalyse behaviour change and social mobilisation beyond the level of the individual to create systemic change. The four key dimensions of social learning are engagement and participation, capacity building and understanding, iterative reflection, and challenging institutions. Although there is some evidence on how social learning could support ways to address climate uncertainties, no systematic attempt has been made to learn from all the different process-driven approaches to assess which works best. The increasing number of examples of practice present a good opportunity to carry out such an assessment.

We undertook three empirical case studies and analyse what we can learn from them about how process-based approaches address climate uncertainties. The case studies are:

1. **Shared learning dialogues in two Indian cities: Gangtok and Gorakhpur.** As part of the Asian Cities Climate Change Resilience Network (ACCCRN), more than 50 cities in south and southeast Asia have deliberately used shared learning dialogues (SLDs) as part of the process of building urban resilience. The SLD is a specific approach to social learning, which the Institute for Social and Environmental Transitions (ISET) largely developed (ISET 2010). The SLD has been at the centre of ACCCRN's approach to building climate resilience and shares key features with a social learning approach.

2. **District climate planning in Bundibugyo district, Uganda.** The African Climate Change Resilience Alliance (ACCRA) has been working with Bundibugyo district to build capacity to mainstream climate change in development planning for over five years. ACCRA is a consortium of five partners established in 2009 that engages in research, capacity building, and advocacy, working in Mozambique, Uganda and Ethiopia. Across its work ACCRA has taken an approach that is implicitly one of social learning.
3. **Devolved climate planning in Isiolo county, Kenya.** A coalition of international nongovernmental organisations (NGOs) and national government agencies, the Adaptation Consortium, began work in Isiolo in 2010 to support the county to be climate finance-ready and mainstream climate change in planning and implementation. The consortium uses an integrated approach that consists of four key elements: setting up a county-level climate change fund (CCAF); putting in place county- and ward-level adaptation planning committees; integrating participatory research and climate information into planning; and strengthening monitoring and evaluation to track progress with resilience building. This has elements of social learning in the approach.

The case studies provide evidence that the processes of participation and engagement, and capacity development, have led to changes that will help address some of the challenges of climate uncertainties. This support takes the form of increasing stakeholders' understanding of different perspectives, supporting and amplifying the perspectives of marginalised groups, and increasing stakeholders' capacity to consider climate change as a multi-sectoral issue. However, significant challenges remain around integrating iterative reflection into practice, given lack of incentives for critical reflection and action over time. Efforts to challenge institutions have succeeded in several instances, primarily where they have taken the form of challenging practice within agreed parameters, or re-instigating institutional practices that have fallen out of use.

Despite these successes in addressing the need for multi-sectoral planning and consideration of impacts on marginalised groups, real challenges have remained in developing effective processes and catalysing institutional changes needed to adequately address other issues of climate uncertainty, including uncertainties in evidence and the long timeframe of climate change. None of the case studies in this paper could address these two issues substantively for a variety of reasons concerning stakeholder buy-in, project timeframes and objectives, capacity and motivation.

Given these initial results and remaining gaps in knowledge and practice, a concerted effort is needed to learn more about the value of different processes in addressing future climate uncertainties. This includes how the four dimensions drawn from social learning might be included, with extra attention to addressing the conditions needed to carry out the more challenging aspects of climate planning and implementation, such as iterative reflection and challenging institutions and systems. We suggest that taking a process-based approach to managing climate uncertainties makes it possible to explicitly address these uncertainty-based challenges.

We argue that further action-orientated research is needed that focuses on building evidence and understanding on how process-oriented approaches to planning for adaptation can improve outcomes. This should integrate considerations of power, politics and decision-making into how processes are designed and tracked, aiming to maximise the likelihood that these can be negotiated to ensure resilient outcomes for marginalised groups. We consider active experimentation essential to push forward understanding in this area. This would involve working with policymakers, practitioners, and businesses to develop and test process-oriented interventions that improve planning with respect to climate uncertainties, while at the same time fostering stakeholders' buy-in – across levels and sectors – to better understand how to encourage the move from planning to mobilisation and action.

1

Introduction

Climate change presents challenges to planning and decision-making because of the changing nature of the risk and significant uncertainties about risks in the future (Ranger and Garbett-Shiels 2012). Dealing with uncertainty is not a new challenge for international development. However, what is unique in the case of climate change is that “in the absence of perfect foresight or reliable information about probabilities of different outcomes due to climate change, established statistical and optimization techniques are not helpful for informing decisions” (Bhave *et al.* 2016 1). There may be several changes or tipping points that cause unanticipated consequences or sudden change for which populations will not be prepared or even have considered. This impacts on long-term infrastructure decisions and large investments, but also has implications for shorter-term interventions. For example, changes in the future may make current decisions maladaptive or inefficient if communities invest in livelihoods and pathways that need to change in the future, and current decisions may need to be adjusted to take account of a range of future possibilities to be most effective. It is possible that effective adaptation will require making large-scale changes now, to avoid decisions based on short-term planning cycles that may lock in exposure to climate hazards. While in many places there has been a concerted focus on improving climate science and climate information services, evidence of uptake of this information and its sustained use in decision-making has been limited (Lemos *et al.* 2012).

A number of approaches have sought to improve decision-making, use of relevant evidence and inclusive outcomes in relation to complex problems, often requiring collective action in different contexts. One of these is social learning, an approach that:

“[facilitates] knowledge sharing, joint learning and co-creation experiences between particular stakeholders around a shared purpose, taking learning and

behaviour change beyond the individual to networks and systems. Through a facilitated iterative process of working together, in interactive dialogue, exchange, learning, action and reflection and on-going partnership new shared ways of knowing emerge that lead to changes in practice” CCSL 2013

An emerging literature has built on individual case studies about social learning and other aspects of adaptive capacity that might support addressing climate uncertainties. However, there has not been a systematic attempt to learn from all the differences in any process-driven or partially process-driven approaches to assess which dimensions might support addressing climate uncertainties and in what ways.

This paper contributes to addressing this gap by bringing together literatures on planning and implementation, drawing on social learning and the challenges climate uncertainty poses. It asks whether and how elements of the processes that draw on social learning could help deliver better outcomes in the context of climate uncertainty. A crucial element of this is to explore the potential for social learning in incorporating the needs and priorities of diverse actors, particularly women and other marginalised groups. We analyse how social learning processes in planning and implementation help resolve some of these challenges, both from a theoretical perspective but also in practice. We start by outlining the literatures on climate uncertainty and processes of planning that draw on social learning, then present a framework for analysis. We analyse three case studies and discuss what we can learn from them about how process-based approaches can address climate uncertainty, before going on to draw out preliminary conclusions and ways forward.

2

Planning and decision-making in the context of climate uncertainties

A range of uncertainties are involved in planning for climate change (Wilby and Dessai 2010; Brooks *et al.* 2013; Ranger and Garbett-Shiels, 2012). These mean it is impossible to provide reliable probabilistic projections of what the future climate will look like (Stainforth *et al.* 2007) and this rules out many traditional approaches to risk management (Groves *et al.* 2008, Lempert and Collins 2007; Wilby and Dessai 2010). This situation has been referred to as “deep uncertainty” (Lempert *et al.* 2003). Hall (2007) highlights that an overreliance on deeply uncertain climate projections can lead to costly mistakes. On the other hand, waiting for complete information before planning for adaptation is likely to lead to higher economic costs and high vulnerability. Wilby and Dessai (2010) describe the cascade of uncertainty around climate change that includes the many assumptions, predictions and unknown elements of how the global climate system and society will respond to such changes. They emphasise the uncertainty of how physical systems will interact with socio-economic and ecological systems. The cascade also highlights uncertainty about how climate impacts will affect different groups and individuals within a particular context through local impacts and adaptation responses.

Different groups are more or less susceptible to harm as a result of climate change. A large and growing body of research points to the ways in which women and other marginalised groups often experience a higher level of risk and vulnerability because of pre-existing precarious situations, which include lack of assets (Moser and Satterthwaite 2008; Holmes and Jones 2010), access to services (Khan *et al.* 2014), and their differing absorptive capacity to bounce back from shocks and stresses (Bradshaw and Linnekar 2014; Schalatek *et al.* 2012; UNFCCC 2010). Different groups of men and women need different support to build their resilience and experience adaptation and mitigation interventions in different ways (IFAD 2014; Otzelberger 2011; Dankelmann 2010). The notion of who is impacted and how adaptation responses address these differentiated impacts is a key dimension to addressing climate uncertainties in an inclusive way.

Uncertainty is not unusual in decision-making, but what is unique with climate change is the reliance on scenarios or models that come with a range of unquantifiable uncertainties – both implicit and explicit. Ranger (2013, 21) argues that it is “highly unlikely that further research will significantly reduce uncertainties in future climate risk for the timescales in which many

adaptation decisions need to be made". Policy and planning therefore need to continue in the face of these uncertainties and find ways to make decisions now, where necessary, to avoid the costs both human and economic of delay.

There are specific decisions where climate uncertainties present particular challenges, such as long-term decisions that 'lock in' investment. The lack of quantifiable, readily useable evidence on impacts and vulnerability means that planning for adaptation requires a system that can adapt, learn and respond to changing information on what is working, and how that relates to the changing climate, as evidence emerges (Ranger and Garbett-Shiels 2012). Such approaches to planning are not new; they are routine in forestry and conservation where there is deep uncertainty over how ecosystems will respond to measures (Williams and Brown 2012; Dinshaw *et al.* 2014). This, however, differs from the traditional approach to risk management, where decisions are one-off and 'optimised' against a particular probability distribution of risk.

Climate uncertainties do not directly affect some decisions (Ranger 2013). These are generally short term, win-win (ie have benefits even without climate change), are not in climate-sensitive sectors, and/ or can be changed over time. They include many examples of current climate responses that are locally driven and respond to current priorities often linked to climate variability. However, even in cases where uncertainties do not directly interact with the planning

decision in question, climate change is still an issue that needs to be considered. Win-wins may shift over time, and short-term options may also lead to path dependency and investment in certain livelihoods that are difficult to shift from in the medium term. How such approaches incorporate more marginalised groups and their vulnerabilities also sets the context for any medium- to long-term solution to addressing adaptation in the community, city or district. Another dimension that all climate responses need to consider – whether explicitly in the longer term or not – is that because change is not linear, or thresholds may be passed in some environments, non-incremental and irreversible responses will be necessary, defined by some as transformative responses (O'Brien 2012). The processes by which climate planning is done therefore need to facilitate and allow these 'transformative' responses to emerge, as and when appropriate. Transformative responses are those that go beyond restoring the status quo, to a more fundamental shift in social, political, or ecological relations and systems, thereby creating new, sustainable situations that are better able to cope with a range of shocks or stresses (Pelling 2011).

These challenges of uncertain (and limited) evidence, longer time frames, the multi-sectoral nature of climate change and differential impacts on marginalised groups present wider challenges to institutions working on climate change responses. These are discussed in the next section.

3

Conceptual framework

Climate uncertainties can challenge certain decision-making tools, as discussed above, but also challenge planning paradigms and institutions. Planning is often short term and political priorities are defined by electoral cycles (Fisher 2013; 2016). Policymakers often want or feel they need evidence with a high level of certainty to make decisions on future investments, and planning often occurs in silos without much cross-sectoral engagement (Rai *et al.* 2015; Fisher *et al.* 2016). The uncertainties inherent in climate change and the need to plan for an uncertain future challenge these overarching paradigms. The timeframes are long and go beyond political cycles, evidence will not be certain in the next decades and uncertainties extend across sectors. These are aspects that need to be further understood.

Managing uncertainties also requires certain institutional capacities and a growing literature explores different aspects of adaptive capacity that institutions need to plan effectively for climate change (Pahl-Wostl *et al.* 2010; Tompkins 2005; Jones *et al.* 2010; and Brooks *et al.* 2013). Many of these challenges are not unique to climate change and reflect governance challenges in many development contexts. But there has not been a systematic analysis of how these dimensions of adaptive capacity relate to the specific challenges of climate uncertainties and adaptation planning in this context. At landscape level, an increasing body of evidence exists on the merits of using adaptive process-based approaches such as social learning for improved natural systems management. Participatory, flexible, and iterative approaches to problem solving have been identified as a suitable alternative to models used in the past (Armitage 2005; Berkes 2009).

3.1 Process-based approaches to addressing complex problems

We can best understand social learning in relation to other process-based approaches to addressing complex problems. Stakeholder participation takes various forms, ranging from manipulation to consultation to full citizen control (following Arnstein 1969). A range of framings and approaches strive to engage more deeply with individuals and groups who are affected by and can address challenges, including some that focus explicitly on processes and quality of interactions.

The roots of social learning come from a variety of disciplines and schools of thought. Harvey *et al.* (2013) refer to origins in the psychology of (individual) learning (Bandura 1977) and the sociology of (shared) learning (Argyris and Schön 1978; Wenger 1999). Some scholars understand learning as a more radical process, that can lead to transformation (Mezirow 1991; Capra 2007) or emancipation (Freire 1970). While many of the social learning practice examples are in natural resource management and food security, other examples range from energy planning to climate change adaptation (Harvey 2013; Garmendia and Stagl 2010; Collins and Ison 2009). Efforts have been made to bring together and categorise the literature on social learning, which is largely case study-based (eg Rodela 2011; Harvey *et al.* 2013). Stemming from the range of case study examples, debate and attention have increased in relation to the merits of social learning as an approach

to tackling the complex problem of climate change (Ensor and Harvey 2015; Harvey *et al.* 2012; Collins and Ison 2009; Pahl-Wostl *et al.* 2001).

As Collins and Ison (2009) point out, “the term social learning has arisen in response to a growing recognition that learning occurs through situated and collective engagement with others”. Social learning should not be conflated with a process of linear communication of information in an attempt to share knowledge. Rather, social learning actively seeks to engage stakeholders to learn together to co-create knowledge, inducing behaviour change through a shared process of learning by doing (Harvey *et al.* 2012). Social learning often works more effectively where there is a sense of shared purpose in reaction to a common, often urgent, problem. It should not therefore be used synonymously with stakeholder participation. Reed *et al.* (2010) argue that while considerable evidence suggests that participatory processes can help social learning, even if participation takes place it does not guarantee that social learning has happened.

A key theoretical framing in social learning is ‘loops of learning’, a framing that raises questions about activities, values, norms, power and institutional structures. Flood and Romm (1996) describe three loops of learning that represent very different types of learning questions. Single-loop learning asks, ‘Are we doing things right?’ and can improve the efficiency of existing routines and actions. Double-loop learning asks, ‘Are we doing the right things?’ and can reframe the problem and change our goals. Triple-loop learning asks, ‘How do we decide what is right?’ and can alter values and beliefs or governance systems. This triple-loop view of social or organisational learning explicitly integrates notions of power and sets learning in a social or political context (*ibid.*; McCarthy *et al.* 2011). The third loop more directly addresses issues of uncertainty, allowing for a deeper, more reflective process that challenges mainstream deterministic approaches and norms by asking ‘what is right’.

In this paper we take the broad definition of the Climate Change and Social Learning (CCSL) initiative (CCSL 2013) that focuses on a social learning approach as a catalyst for systemic change as defined in the introduction. Van Epp and Garside (2014) suggest that ‘effective’ social learning processes should lead to different outcomes that can be tracked and assessed over time. They define key indicators in the CCSL Monitoring and Evaluation (M&E) Framework for Social Learning that can be used to track and measure

progress across domains. Learning change outcomes can be normative (related to norms), relational (involving relationships), or cognitive (focused on knowledge) (*ibid.*). Together, these three kinds of learning outcomes can in turn generate changes in values and practice that occur across individuals, networks, institutions, and systems. The normative and relational aspects of learning are particularly important in building broader buy-in and institutional understanding over time. The anticipated overall result is evidence of these changes having a positive impact on sustainable development, linked over the longer term to addressing climate uncertainty, with increased impacts where systemic change at institutional/system level also occurs.

Work on social learning has brought together many potential approaches to addressing complex problems and, in this case, climatic uncertainty in a particular approach. This approach has been most successful at the very local level, between small communities that know each other well. It is less clear how this translates into formal government planning systems, for example, or multi-scalar governance issues (Butler *et al.* 2015). At institutional level, there can be challenges with using and integrating social learning approaches. The fit between existing institutional architectures, and practices and incentives, and those recommended for organisations that aim to integrate social learning into core practices, is often limited (Ensor and Harvey 2015). Other literatures, such as debates on politics and participation (Huberman 1995; Chambers 2004), post-normal science and deliberation (Funtowicz and Ravetz 1991), and monitoring and evaluation of adaptation (Brooks and Fisher 2014; Dinshaw *et al.* 2014) have highlighted similar dimensions that help address some of the challenges of climate uncertainty with an analysis that can add something to the challenges of power and politics, scale and unevenly differentiated impacts on marginalised groups, as well as specific tools and approaches. Participatory forms of evaluation, for example, can have many similarities to a social learning approach as they are about reflecting and learning on practice to improve it for the future. The literature on evaluation brings a set of tested tools and methods to the broader ideals of social learning.

In the following sections we explore four key dimensions identified through social learning as potentially important aspects of processes that aim to address climate uncertainties. We also explore how these ideas have been developed in other key literatures, before bringing the concepts together into the framework for analysis.

3.2 Engagement and participation

Characterising the dimension: since the earliest debates on participation and engagement, it has been widely agreed that engagement of a range of stakeholders in development programming and planning has been advantageous (Chambers 1994). Within social learning literature, engagement has been widened to be understood as outreach to and involvement of individuals and groups in problem definition and learning processes. Engagement as part of a social learning-oriented approach involves identifying all key stakeholder groups that climate change affects, including women, young people and other marginalised groups. Recent work developing and testing the CCSL M&E framework has shown that thorough stakeholder research – wide consultation, stakeholder mapping, and power analyses, for instance – is an important part of the identification process (Van Epp and Garside 2016). Trusted facilitation has also been recognised as an important part of fostering outreach to and connecting different stakeholder groups (*ibid.*). Initiatives piloting the CCSL M&E framework found that just opening the door to these groups was not enough; targeted efforts, including capacity building, were needed to ensure their equal participation (*ibid.*), and the timing and duration of their engagement mattered.

Addressing climate uncertainty: engagement and participation have theoretical links to addressing climate uncertainties as they allow diverse stakeholders to build better relationships and a more nuanced, shared understanding of a given issue. In the context of uncertain evidence, it means new co-generated evidence could be more robust, because it takes into account a wider range of knowledge and perspectives. Solutions that multiple stakeholder groups have co-developed could also be more holistic, by including representatives from a wider range of sectors, as well as marginalised groups that are most vulnerable to climate change impacts. More holistic solutions would address the interconnected nature of climate uncertainty impacts on different sectors, and also incorporate the different timescales and needs of different stakeholder groups. Without it, decision-making may perpetuate poverty and power imbalances that translate into vulnerability.

A complex set of pre-existing and dynamic power relationships influence participation and any process is likely to sit within these (Foucault 1971; Fraser 1997). For instance, in the context of formal government processes, any participation is also occurring within

pre-existing relationships between the citizen and the state, which bring a particular history and set of power relationships to any process (Corbridge *et al.* 2005). Foucault for example argues that relationships of power are present in all processes that have to do with knowledge creation, knowledge communication and knowledge use: “the criteria of what constitutes knowledge, what is to be extracted and who is designated as qualified to know involves acts of power” (Foucault 1971, 25). Just participation is unlikely to be enough to address climatic uncertainties, but it may be a pre-requisite to do so in a way that takes account of multiple uncertainties and how they affect different groups in different ways.

Relevant approaches and tools: participatory evaluation is one approach in the evaluative literature that could be understood as a form of social learning, as it is a process of reflection on past activities with a wide group of stakeholders to learn how to do things better. According to Brunner and Guzman (1989) “participatory evaluation is an educational process through which social groups produce action-oriented knowledge about their reality, clarify and articulate their norms and values, and reach a consensus about further action. It is a tool that social groups use to learn about themselves and their environment, to orient their collective activities, and to construct a common vision of a desirable future.” In terms of addressing elements of process, participatory evaluation is about participation, but also co-generating evidence and some dimension of reflection and iteration.

3.3 Capacity development and building shared understanding

Characterising the dimension: this dimension emphasises development of stakeholders’ knowledge and skills that enable the group to build a shared understanding of climate change issues and co-generate evidence. In a social learning-oriented approach, capacity needs for effective knowledge co-creation are determined both in a top-down, and collectively in a bottom-up, manner. Case studies testing the CCSL M&E framework have shown that both types of processes for designing capacity development activities are useful: while bottom-up determination improves the likelihood that capacity development resources will be used efficiently on topics that are of greatest relevance to stakeholders,

top-down determination is more likely to include soft skills that will support stakeholders to deliberate and co-create knowledge on an equal footing, which may be overlooked by stakeholders who cannot yet see how important they are (Van Epp and Garside 2016). Initiatives piloting the CCSL framework also showed the utility of non-traditional styles of capacity development: learning-by-doing and learning through facilitation focused on helping different stakeholder groups to appreciate the perspectives of others (*ibid.*). Finally, capacity development for specific actors – such as government agencies and policymakers – can challenge organisations to reduce barriers to social learning, and increase uptake and sustainability of project or programme outcomes (*ibid.*).

Addressing climate uncertainty: capacity development theoretically links to addressing climate uncertainty as it could enable decision-making that is informed by multiple sources of information (based on varying assumptions) and types of knowledge. This would help to address issues of uncertainty around assumptions underpinning particular data sources through triangulation. Capacity development helps stakeholders to better understand the complexity of climate uncertainty, and the cross-sectoral cooperation needed to manage it. Better understanding helps increase motivation to address longer-term effects, and differential impacts on marginalised groups. Without it, engagement may not lead to the building of a shared understanding of the issues. Part of the purpose of capacity development in the context of climate uncertainty is to make sure evidence (co-) generated is useful for decisions and to ensure people have the capacity, motivation and incentives to use that information.

Relevant approaches and tools: approaches such as post-normal science (Funtowicz and Ravetz 1991) were developed for contexts such as these, where “facts are uncertain, values in dispute, stakes high and decisions urgent” (Ravetz 1986, 422). The approach relies on involving an extended peer community in scientific discussions and decisions to enhance scientific outputs and rigour: “they bring extended facts into the knowledge base used in decision making and... they act as a broadened peer review committee for that knowledge base: an extended ‘quality control’ function” (Turnpenny *et al.* 2011, 7). Some of these functions are relevant for how climate science and other forms of knowledge need to be considered within climate planning processes, and highlight the relevance of such an approach for co-generating evidence around an issue such as climate change.

Specific tools and approaches are also being developed to look at co-generating evidence within participatory evaluation. One such example is participatory sensemaking (Van Hemelrijck and Guijt 2016; Van Hemelrijck *et al.* 2015). Participatory sensemaking is a process that enables all stakeholders (including intended beneficiaries) to collectively analyse evidence produced by an evaluation, and assess the causal linkages in a systemic theory of change.

Finally, a key question remains over what evidence is (co-)generated through such processes and how this feeds into iterative reflection and improvement over time. Evidence from evaluation suggests that decisions on which knowledge gaps should be addressed within planning or evaluative processes are rarely guided by an assessment of the value of that information; the choice of measures and data usually falls on information that is readily available or easy to generate, which may be irrelevant to the uncertainties that most affect outcomes (Clapp *et al.* 2013; Hubbard 2014). This is highly relevant in the context of climate change, where data may be more difficult to measure and historical data sets missing, but inputs into decision-making processes are still needed.

3.4 Iterative reflection and action

Characterising the dimension: social learning-oriented approaches foster multi-directional knowledge transfer involving multiple parties who gain new knowledge and understanding (eg farmers to researchers, farmers to farmers, researcher to farmer, etc). Through these processes evidence may be co-generated, building on a variety of different knowledge sources and types. Correspondingly, social learning literature has characterised iterative learning as collective or group learning that occurs continuously or cyclically to co-create or reflect on knowledge (Van Epp and Garside 2014). Capacity building and participation also feed into this co-generation. An analysis of five initiatives using this type of approach has shown that the number and frequency of reflect-act cycles is an important factor in the effectiveness of iterative learning (Van Epp and Garside 2016). When iterative cycles are too far apart, opportunities for using new evidence to make adjustments to a project or programme's strategy may be missed. Case studies have also shown that incorporating planned, structured reflection moments is more effective than relying on unintegrated, unstructured ones (*ibid.*). Reflection ideally – but not always –

includes regular re-evaluation of impact pathways (double-loop learning) and questioning of assumptions and norms (triple-loop learning). These processes – supported by documentation of the collective learning taking place – drive decision-making on further action (*ibid.*). Crucially, being about to act on an evolving understanding of the issue at hand requires an institutional environment that supports experimentation and adaptive management; for instance, through flexible project structures and funding (*ibid.*).

Addressing climate uncertainty: the theoretical link to uncertainty is that through iterative cycles of reflection and action stakeholders will be able to continually incorporate the results of activities and emerging climate and other data into their work. This will enable them to improve outcomes over time as more evidence is available on what works and what the future climate will look like. Results and data considered could include unintended consequences in different sectors, or unanticipated effects on marginalised groups that emerge over time. Multiple cycles can encourage decision-making for long timeframes, in addition to short ones. They also help stakeholders to build trust, and improve incentives for each subsequent cycle of decision-making.

Relevant approaches and tools: the idea of cyclical reflection on progress and decisions has also been picked up and developed in work on monitoring and evaluation of climate change adaptation (Brooks and Fisher 2014; Anderson 2012) and work on flexible and robust decision-making (Lempert *et al.* 2003; Reeder and Ranger 2011). Reeder and Ranger (2011) discuss how in the context of longer-term decisions, such as deciding the height of the Thames Barrier in London, a context-first approach rather than a science-first approach is useful. They discuss how certain decisions can be considered at key points along the pathway, and regular monitoring of data and conditions is needed to decide when to activate certain key decision-making points. This also reflects a broader trend within development practice to “do development differently”, which the Overseas Development Institute defines as using an approach that is “problem-driven; iterative with lots of learning; and engaging teams and coalitions, often producing hybrid solutions that are ‘fit to context’ and politically smart” (ODI n.d.).

Work around adaptation M&E has emphasised the importance of using evaluative data to learn from interventions to ensure that adaptation improves over time and is better tailored to the context. Brooks and Fisher (2014, 63) argue that:

“the complexity and urgency of adaptation demands greater transparency to those who are intended to benefit from adaptation interventions as well as a greater emphasis on effectiveness and learning from results. Carefully designed monitoring and evaluation processes can support continuous learning through reflection and evaluation and are therefore particularly relevant for evaluating adaptation outcomes that are complex, long term and uncertain. Given the complex nature of many adaptation initiatives, complementary monitoring and evaluation efforts require an iterative approach to learning and an effort to institutionalise learning into monitoring and evaluation processes”

A variety of evaluative tools within the wider development sector have sought to develop a process with inbuilt iteration and reflection. One such tool is Problem Driven Iterative Adaptation (PDIA). PDIA proposes useful tools to analyse the political economy behind decision-making, identify problems that could catalyse the attention of decision makers, and trigger flows of resources to fix those problems.

3.5 Challenging institutions, norms and practices

Characterising the dimension: ‘institutions’ here refers not only to formal organisations (eg government bodies or research institutes), but also to the informal ‘rules of the game’ that structure interactions and learning processes (North 1990). In a social learning-oriented approach, institutions are challenged to reduce barriers to – and increase opportunities for – collective, iterative learning that involves multiple stakeholder groups to drive decision-making on managing climate uncertainties. This includes mapping existing norms and processes to develop a change strategy. Work on social learning has shown that the integration of challenging institutions into a project or programme from the beginning – through engagement, capacity development and iterative learning involving institutional actors – is more likely to lead to a reduction of barriers to – and an increase in support for – social learning (Van Epp and Garside 2016). Such an approach also involves identifying key individuals or groups who will champion the necessary changes. Challenging through a champion can be easier and more effective than challenging from the outside (*ibid.*).

Addressing climate uncertainty: the theoretical link to addressing uncertainty here is that processes could break down structural and cultural barriers to new decision-making processes. These processes could be more attentive to uncertainties, and acknowledge the need for action and reflection despite uncertain evidence. They could also involve a greater range of stakeholders, challenging institutional silos and encouraging stakeholders to take account of differential impacts on marginalised groups. Lastly, they could enable new approaches to risk management that prevent path dependencies that could be detrimental in the future by challenging the short-term nature of institutions and promoting more flexible, innovative solutions.

Challenging institutions is also important when more transformative climate responses are necessary. As Pelling (2011) argues, “transformation often challenges the status quo, threatening those who benefit from current systems and structures” and therefore to enable transformative responses to climate change a process is needed that allows those options to come to the fore, and to be supported despite structural barriers and a potential lack of incentives around the transformative option. O'Brien (2012) argues that “power, politics and interests can present formidable barriers (or pathways) to transformation, yet they are often ‘invisible’ within systems analyses”. A learning-based approach that seeks to enable transformation or challenges the status quo therefore needs to be attentive to these dimensions and make them explicit.

Relevant approaches and tools: examples of new approaches that challenge institutional norms and practices include proposed specific new technical approaches to risk management that seek to move the paradigm from one of a single optimal choice in policymaking to a robust one that works well across a range of scenarios (Lempert *et al.* 2003; Groves *et al.* 2008). A robust approach to adaptation entails designing policies that will deliver their objectives in the widest range of possible scenarios, rather than those that are optimal for a particular future climate. This could challenge current institutional norms around risk management.

3.6 Framework for analysis and methodology

Building on the above discussion we developed an analytical framework to explore the question of how elements of learning-based processes of planning and implementation help deliver better, more equitable outcomes in the context of climate uncertainty. The framework has helped us to assess how the four dimensions of learning processes above help to address four challenges of climate uncertainties that we have identified: long time frames, uncertain evidence, impacts on marginalised groups, and multi-sectoral planning. The framework, in Table 1 below, outlines the theoretical linkages between each dimension of learning and the particular challenges of climate uncertainty.

We selected three case studies to explore these dimensions and the framework in practice. Data collection took place between June and September 2016. The case studies were selected for having had an active planning process around climate change that seemed to include at least some of the previously-identified elements of a process-driven approach: engagement, capacity building, iteration and challenging norms and systems.

The three cases were:

1. Shared learning dialogues in two Indian cities: Gangtok and Gorakhpur,
2. District climate planning in Bundibugyo district, Uganda, and
3. Devolved climate planning in Isiolo county, Kenya.

In each case we worked with a local partner that had been involved in planning, to understand the approach taken and the core dimensions of the process. We undertook semi-structured interviews with key stakeholders in each context, using an interview schedule based on the above analytical framework and coded responses according to this framework. Where possible we also undertook focus groups with local people who live in areas most vulnerable to climate change, and collected plans and documents related to the planning process and climate risks. In most cases we were able to carry out focus groups with women and men separately.

Below we outline the case studies and the processes they underwent to develop an approach to addressing climate change. We go on to discuss more widely findings across the case studies for each dimension.

Table 1: How elements of process can help address the challenges of climate uncertainty

	UNCERTAIN EVIDENCE	MULTI-SECTORAL / INTERCONNECTED	LONG TIMEFRAMES	LIKELIHOOD OF DIFFERENTIATED IMPACTS ESPECIALLY ON MARGINALISED GROUPS
Engagement/ participation of diverse stakeholders	New evidence co-generated is more robust to uncertainty as takes into account range of types of evidence (triangulation) with different uncertainties, assumptions and knowledge bases. As climate projections converge – models improved, hindcasting tests prove validity of models etc. – decisions can be taken to use outputs from ensembles. These can be based on the trust and relationships developed that support dealing with this type of evidence and decision.	Stakeholders perspectives go beyond traditional sectors and new connections are made or strengthened.	Different timeframes used by stakeholders can help broaden priorities and assess longer term implications. Better understanding of the linkages between short term and longer term decisions.	Including insights from marginalised groups in a meaningful and robust way makes decisions more attentive to power relations and institutional barriers, as well as differentiated impacts.
Capacity building and shared understanding		Better understanding of multi-sectorality and co-generation processes build understanding of complex issues.	Increased understanding can increase motivation to look at longer term effects. Co-generating evidence can build a more complex picture across time.	Other stakeholders understand these differentiated impacts and are motivated to address them.
Iterative reflection and action (non-linearity)	Decisions can be made on basis of evidence when available/ sufficient so allows build up of information, reflection on uncertainties and identifying necessary information for decisions (such as using the ensembles outlined above).	As unintended consequences across sectors are noted or deemed to be important they can be added in.	Enable decision to be taken when most appropriate for evidence available and planning.	As differentiated outcomes and unintended effects become apparent for different groups they can be incorporated into planning.
Challenging institutions	May help challenge norms on the need for specific forms of data or help validate evidence from wider range of sources with differing assumptions of validity, certainty etc.	Challenging institutional silos and norms within sectors.	Challenging institutional silos and norms within sectors, such as short-term planning timeframes, could help address aspects of uncertainty.	Challenging institutional practices could encourage stakeholders to listen to and take into account of the differentiated impacts on marginalised groups and livelihoods, including recognising the particular needs and priorities of women.

4

Case studies

4.1 Shared learning dialogues in Indian cities

As part of the Asian Cities Climate Change Resilience Network (ACCCRN), more than 50 cities in south and southeast Asia have deliberately used shared learning dialogues (SLDs) as part of the process for building urban resilience. The SLD is a specific approach to social learning, which the Institute for Social and Environmental Transitions (ISET) largely developed (ISET 2010). The SLD has been at the centre of ACCCRN's approach to building climate resilience and shares key features with a social learning approach. Initially implemented in ten cities – in India, Indonesia, Thailand and Vietnam – an independent evaluation recognised these as “successful processes for engaging a range of city stakeholders and developing inter-sectoral working practices” (ACCCRN 2011). This initial phase, which began in 2008 and was funded by the Rockefeller Foundation, involved investing high levels of time and effort in the ‘core’ cities. Recognising the extent of the need for urban climate resilience, a second phase that involved a much ‘lighter touch’ approach was subsequently developed, expanding the programme’s coverage to two more countries – Bangladesh and the Philippines – and around 40 more cities.

These two phases provided examples of different ways of implementing a process-based approach to addressing climate uncertainty. To explore the qualitative differences in the process and outcomes we focused on two cities in India: Gorakhpur in the state of Uttar Pradesh and Gangtok in Sikkim. Gorakhpur is a large city in Uttar Pradesh, with an official population of almost 700,000. There is high uncertainty about future rainfall, with issues of flooding and water logging also being experienced because of the rate and

direction of urban expansion. Gangtok is the capital and largest town in Sikkim. It is located in the eastern Himalayan range at an elevation of 1,650m, and has a population of around 100,000. The city’s topography is characterised by its mountainous location, with many rivers, streams, and *jhoras* (drainage channels). The anticipated effects of climate change include changing monsoon patterns, rising temperatures, and changing availability of glacial meltwater. Gorakhpur was one of the ten initial cities involved in ACCCRN, and became part of the programme in 2009. The local implementing organisation was the Gorakhpur Environmental Action Group (GEAG), a locally based environmental NGO. In contrast, Gangtok joined the programme in 2014, with ICLEI South Asia (ICLEI SA) – the regional office of an international network of local authorities, based in Delhi – delivering the process.

Gorakhpur’s engagement in ACCCRN began in 2009–10, with ACCCRN partners working in collaboration with GEAG to develop a specific set of tools for an SLD; and GEAG engaging the Municipal Corporation and other key stakeholders in an engagement phase that included compiling climate information and undertaking SLDs with key city-level stakeholders and deliberating on initial city vulnerabilities. A city-level steering committee was formed in 2009, with the municipal commissioner as chair, to lead the ACCCRN process. From this steering committee, thematic groups were also formed to have shared learning processes on specific issues. Data collection was done at community and household levels for vulnerability assessments through a shared learning process. ACCCRN moved into an implementation phase during 2011–14 and GEAG received further funding for this. GEAG and city stakeholders decided to focus on peri-urban agriculture and micro-resilience planning in a particular ward, Mahewa. Neighbourhood and thematic committees

were set up in Mahewa; the neighbourhood committees addressed local issues, while the thematic committees looked at common concerns such as water and sanitation, agriculture, drainage and health. A ward-level committee was also set up as part of institutionalising process, with a link to the ward councillor and representation from the thematic committees. In Mahewa, monitoring mechanisms were established at the community level and resilience indicators were developed. The city-level steering committee, thematic committees and other stakeholders were involved in guiding projects. During 2013–14 district disaster management plans were also developed bringing in climate change with the support of another programme.

In 2014, ICLEI SA approached Gangtok Municipal Corporation to be part of the ICLEI ACCCRN Process (IAP) to develop a city resilience strategy using an SLD approach. Staff from ICLEI SA went for an initial scoping mission and held meetings with different stakeholders to plan for SLDs. They formed a Climate Core Team team to drive the process, with municipal officials led by commissioner. In August 2015 a loose stakeholder committee was formed and the core team convened an SLD process, with support from ICLEI SA, to consider climate research. A mixed group of stakeholders attended, with state-level representation and staff from universities, NGOs and donor projects. In April 2016 the stakeholder committee reconvened to consider urban vulnerabilities, and in June 2016 an SLD was held on the resilience strategy with the stakeholder group. A pilot project was also set up with the support of ICLEI SA on waste disposal in the city marketplace.

These differences in length of time in the programme, level of resources available, and type of organisation facilitating the programme provided useful points of comparison for assessing how process-based climate planning processes operate in practice in urban settings. What they have in common is an exposure to current and potential future climate-related shocks and stresses (although the nature of these differs), high levels of social vulnerability, and complex institutional arrangements which make precise lines of responsibility for different aspects of urban governance hard to discern. The main findings in Gangtok and Gorakhpur are discussed in more detail below.

Framing of climate change and uncertainty: in Gorakhpur, GEAG introduced climate change with a pragmatic focus in terms of local impacts on systems, which meant there was less of a focus on future impacts and uncertainty, certainly with community groups. An external organisation made predictions with some consideration of uncertainty. In Gangtok, ICLEI SA carried out background scoping on the climate risks the city faced. The State Action Plan provided most of the climate information for this. Uncertainty was deliberately

underplayed to gain political support and simplify messaging as the issue was introduced.

Engagement/participation: Gorakhpur had three-levels of engagement, at community and ward level, municipal and state government, and with non-state actors. So the focus was both horizontal (between stakeholders at the same scale) and vertical (across scales; e.g. from community to municipal government). Participation within formal government institutions was more limited than local activities within communities, partly at least because of transfer of more senior staff and the challenges of building relationships and buy-in. In terms of engagement across scales, some members of the city steering committee had a fairly narrow view of engagement based on teaching communities how to adapt and giving them the information they needed, whereas others recognised this as more of a two-way process. The Gangtok IAP process focused on municipal officers and developing cross-governmental links. Stakeholders commented on the importance and novelty of how the IAP brought together a wider range of stakeholders from across sectors in the SLDs in a more informal environment than usual within the municipal corporation allowing them to really engage with each other and the new perspectives brought both from ICLEI SA and other internal stakeholders. Actors in both cities focused on pragmatism in selecting entry points for engagement in terms of where they felt they had the stronger relationship or best chance of success. In Gangtok, a champion from the municipal corporation supported the process, whereas in Gorakhpur the citizens environmental forum acted more as a champion for activities at the city scale.

Participation of more marginalised groups was varied across the two cases. In Gorakhpur, more marginalised groups at the urban periphery were brought into formal planning spaces through engagement in a range of local technical groups and committees. This included specific groups for women where they were able to bring up issues of importance to them. There was also a special research report into the resilience of women. Both these steps meant there was a good understanding of the differentiated needs of men and women in this context. The local groups did not always formally engage with the other spheres of engagement but the in-depth understanding gained was transferred to other actors through reports and GEAG and key individuals acting as knowledge brokers. In Gangtok, although there was formal representation of ward councillors at the shared learning dialogue this engagement did not seem to enable much more in-depth consideration of differentiated climate impacts in the city – at least as part of the research and meetings observed for this paper.

Capacity building and co-generation: a range of capacity-related activities ran along a continuum from an approach broadly based on an information deficit model to one that focused much more on capacity for knowledge co-creation. In Gangtok, the design of the SLDs included assessing the adaptive capacity of different actors to implement the city resilience strategy. The focus was on transferring 'expert' knowledge to local actors who had not yet been exposed to information on climate change, to equip them to do their jobs more effectively. A range of ideas were shared in the IAP format and interviewees talked about knowledge transfer and making new social connections. The relatively short timeframe and limited depth of engagement in Gangtok precluded meaningful co-generation of knowledge by officials and citizens in the city, but they were exposed to a wider range of perspectives through the SLD process and interviewees commented on how this helped build their understanding of different sectors and planning timeframes. In Gorakhpur, the focus for capacity building was much more on poorer individuals and communities in peri-urban and more central areas of the city, often in informal settlements. Focus group evidence suggested this gave women confidence and improved their capacity to organise themselves around key issues of concern, suggesting they would be more able to articulate their needs in different fora. Farmers learnt along with GEAG new approaches and techniques, and communities also gained technical knowledge. A significant change in capacity in Gorakhpur was in the types of relationships that individuals had within communities and with external institutions, and their understandings of these different points of view. Building the capacity of municipal officers was a long-term objective in both cities, but challenges existed around staff engagement and transfers.

Iterative reflection on progress: the dimension of iterative reflection and action has been a key one in the models underpinning the original ACCCRN process and the process ICLEI used. In Gangtok, the element of iteration was built into the theory of developing the resilience strategy in two ways: repeated SLDs allowed participants to revisit decisions and evidence discussed; and the whole process was designed to be reflected upon after implementation through monitoring and review. Although this was the case in theory, because of the mixed participation at the SLDs and lack of many repeat participants very little iteration was possible within the SLD process. In Gorakhpur, repeated SLDs were used at the level of the city steering committee and in Mahewa to allow reflection on evidence collected and implementation so far. Interviewees said that changes

were made by the steering committee in plans and implementation and fed back into community and other activities. The steering committee commissioned new evidence generation to feed into the reflections. At the local level repeated interaction about thematic areas and plans allowed a body of knowledge and capacity to be built up, but there was no clear evidence of iterative reflection leading to changes in values or practice. Neither process seemed to put much emphasis on revisiting underlying values or opening up the possibility of failure. This needs to be seen within the context of a donor-funded project and incentives linked to delivery and results.

Challenging institutions, norms and practice: the SLD process in Gangtok and Gorakhpur appears to have taken a somewhat pragmatic approach to challenging institutions. GEAG and ICLEI SA have had to take a strategic decision about whether to change the norms and practices of the municipal corporations and other bodies by pushing them from outside, or by working more tactically from within developing and supporting champions. They have tended to choose the latter option. In this regard, rather than directly challenging institutions they are trying to get them to work better in an incremental fashion. Where possible they have used agreed norms and legal frameworks as a basis for change. Efforts have been made through the ACCCRN process to create new institutional structures within the municipal corporation in Gorakhpur, notably with the establishment of a climate change cell. These challenge the norms of institutional practice, even if this is within quite tightly defined parameters. New ways of working have also been instigated that challenge social norms, such as through more informal, participatory styles of meetings and the inclusion of more marginalised groups (or information about those groups) within formal municipal processes.

In summary, the process-based approach to building urban climate change resilience through SLDs clearly showed the potential for engaging with the four key dimensions of social learning. In both Gorakhpur and Gangtok, the innovative and interesting nature of the process helped to generate broad stakeholder interest and engagement among a range of groups. Despite a complex institutional environment, the process also generated political support, although this could be reversed by personnel changes. As well as the (perhaps inevitable) constraints of time and funding, it also appeared that the level of embeddedness of the organisation driving the process – whether a local or national NGO – affected the extent to which the process became deeply embedded in setting priorities and taking decisions.

4.2 District climate planning in Bundibugyo district, Uganda

Bundibugyo is a mountainous district in western Uganda, on the border with the Democratic Republic of Congo, with a population of around 230,000 people (Jockus 2013). Rain-fed agriculture is the main source of income (ACCRA and GoU n.d.). The district's geography makes it particularly prone to soil erosion and landslides. The poverty level is around 60%; in 2010 0.2% of households had access to electricity, and 98% of the population is dependent on firewood and charcoal (Isabirye 2016). This dependence has led to deforestation, increasing the potential for erosion and landslides. Infrastructure is also already poor (*ibid.*). Climate change has brought increased flooding and unpredictable rain patterns, which exacerbate pre-existing issues. For the many villagers farming and living on the steep mountain slopes throughout the district, the combination can mean famine and even fatalities when crops fail and homes are washed away. An increase in temperatures has also been observed; coupled with flooding, this has led to an increase in pests and diseases (Jockus 2013).

The African Climate Change Resilience Alliance (ACCRA) has been working with communities and authorities in Bundibugyo district for over five years to build capacity to mainstream climate change in development planning. ACCRA was established in 2009, a consortium of five partners that engages in research, capacity building, and advocacy, and works in Mozambique, Uganda and Ethiopia. Across its work ACCRA has taken an approach that is implicitly one of social learning. It has made an effort across the four dimensions identified in the conceptual framework on process: to engage all relevant stakeholders; to develop their capacity to understand climate change and learn from each other; to encourage cyclical learning between them; and to challenge the institutions responsible for making decisions about climate change that affect the most vulnerable.

Many of ACCRA's interventions in Uganda have sought to improve decision-makers' ability to address climate uncertainty. These efforts have taken several different forms over the past five years, including:

- **Climate change mainstreaming with local government:** ACCRA carried out capacity gap analyses at district level in relation to mainstreaming climate change and disaster risk management. These analyses informed the nature of ACCRA's technical and financial support to the process of mainstreaming local climate-related issues in

Bundibugyo's 2011–2015 District Development Plan (Isabirye 2016). It challenged government institutions by bringing representatives of key ministries together with community members in Bundibugyo to discuss climate change risks and challenges (ACCRA 2011). It also funded a training workshop that key ministries facilitated, at which district representatives from all sectors agreed on the main issues for each sector and identified actions to reduce vulnerability (*ibid.*).

- **National Adaptation Plan of Action activities:** ACCRA supported the piloting of National Adaptation Plan of Action (NAPA) activities in Bundibugyo through capacity development. With ACCRA's support, the district developed a proposal for NAPA funding based on improving its existing development plan. The activities in the proposal were selected based on issues that the sub-counties had identified and were mainstreamed during ACCRA's previous engagement with Bundibugyo. The project used exchange visits with other districts and iterative learning processes in farmer field schools to build community members' capacity to carry out resilience-building activities such as tree planting, soil and water conservation, and construction of energy-saving stoves. The project was successful, but relatively short-lived.
- **Development of national climate change adaptation indicators:** using lessons from the NAPA pilot, ACCRA pursued the development of climate change mainstreaming indicators for the monitoring tool the national government used to assess local governments' performance. In 2014, the Ugandan government invited IIED to launch a tracking adaptation, monitoring development (TAMD) project in Uganda (Kajumba *et al.* 2016). Five districts were chosen for the TAMD project, four of which ACCRA funded. In these districts, ACCRA carried out theory of change exercises with community members to collect indicators, and an institutional capacity scorecard exercise with district officials to inform capacity development activities. District and ministry officials jointly validated indicators gathered from the five districts. Once formally adopted, they will also inform the Performance Measurement Framework for the national Climate Change Policy and the Program-based Budget Tool, used to allocate funds between sectors.

The focus of the case study is the impact of social learning-oriented processes on planning for climate uncertainty at district level. Within Bundibugyo, two sub-counties were used for comparison: Harugale and Bakonzo. ACCRA was directly engaged with Harugale through a pilot of NAPA activities, but was only indirectly engaged with Bakonzo through its engagement at the district level.

The main findings of the Bundibugyo case study are discussed in more detail below.

Framing of climate change and uncertainty:

throughout ACCRA's work in Bundibugyo, it has addressed climate change in terms of its impacts on local livelihoods and lives. It has not, however, introduced the concept of climate uncertainty directly. Although ACCRA has carried out capacity development exercises on climate uncertainty – in the form of games that teach flexible and forward-looking decision-making – it did not do this in Bundibugyo. ACCRA's interventions have addressed various dimensions of climate uncertainty, including its multi-sectoral nature and differential impacts on marginalised groups (primarily women). Other dimensions, such as long timeframes and uncertain evidence, are not yet a focus.

Engagement/participation: through various ACCRA initiatives a wide range of stakeholders have been engaged in addressing climate change and climate uncertainty, including communities and women as a specific group within those communities. Representatives of different ministries and sectors were brought together, as were members of different levels of government, and from communities. Although these kinds of interactions were already occurring to some extent through standard government procedures, ACCRA's interventions augmented them, especially through its work at district and national levels to build an understanding of climate change as crosscutting, and not solely an environmental issue. In Harugale, engagement of male and female community members in the NAPA pilot has resulted in an enduring community group that is ready to spearhead climate resilience activities and give input on adaptation decision-making, should more funding and/or opportunities appear. Although the Red Cross carried out similar activities in Bakonzo, it appears that the sub-county lacks a group of champions. Women are also meaningfully included in other projects such as the TAMD indicator development, and community groups. In the NAPA committee women were active and vocal; the Training of Trainers (ToT) and farmer field schools for NAPA activities also included women.

Capacity building and co-generation: tailored capacity-development activities on climate change, uncertainty and mainstreaming were conducted with all major stakeholder groups and at multiple levels. The common language and understanding that this capacity development has contributed to has enhanced stakeholders' ability to learn from each other regarding climate change adaptation. Climate change is now understood as a crosscutting issue, and district decision makers plan together. Institutional silos and

barriers remain, especially in terms of funding, which is allocated according to sector and currently inadequate for key departments. ACCRA has used institutional capacity self-assessments to determine capacity needs in a bottom-up manner at the district level. In Harugale, men and women alike in the NAPA committee could name examples of differentiated impacts of climate change for both genders, showing increased understanding of differential impacts.

Iterative reflection on progress: encouraging cyclical learning and reflection among government departments was not a major element of ACCRA's interventions. Activities bringing multiple stakeholder groups together were learning opportunities, but the interventions did not focus on putting in place new systems that would ensure that learning continued after/without ACCRA's support. Standard government planning procedures involve opportunities for iterative learning to some extent, but government hierarchy and rigidity continue to present obstacles to the flexibility and third-loop learning needed to address climate uncertainty. At local level, the NAPA activities encouraged cyclical learning and reflection, but it appears to have ceased at the end of the project. That said, the pilot set a precedent for a collective learning process through farmer field schools, which could be revived if an opportunity arose. In Bakonzo no such precedent exists.

Challenging institutions, norms and practice: ACCRA worked to challenge government at the national and district levels through engagement and capacity development. It identified champions, especially at the national level, and developed an evolving change strategy based on existing norms and processes. At the national level, some long-term changes are visible, in part because of the government's own desire to implement these changes. At the district level, fewer changes are visible and attribution to ACCRA's social learning approach is more difficult. This is in part because of districts' positioning in the top-down government hierarchy, as well as the transient nature of government staff in a given district: many officials who were engaged by ACCRA's initial interventions in Bundibugyo had left or could not remember the activities. That said, the conceptualisation of climate change as a crosscutting issue requiring the coordination of multiple sectors – a major focus of ACCRA's work – appears to have become the new norm among district officials in Bundibugyo.

In summary, through work on mainstreaming climate change into planning ACCRA successfully engaged a range of stakeholders across several levels in planning for climate change; built their capacities to learn from

each other; and challenged district government to value climate change as a crosscutting issue requiring horizontal cooperation. Iterative learning was not a strong feature of ACCRA's interventions. Addressing the issue of uncertain evidence has not been a focus of ACCRA's work in Bundibugyo, so there is limited evidence of social learning's impact on this topic at the district level. That said, engagement in iterative learning (action and reflection cycles) of Harugale community members in the NAPA pilot created trust and built relationships that have the potential to help them cope with uncertain evidence. Through inclusive engagement and capacity development on climate change mainstreaming throughout its interventions, ACCRA has challenged institutions – specifically, district-level government – to shift towards treating climate change as a crosscutting issue. Engagement and capacity development of vulnerable communities have ensured their participation in developing planning tools at the district and national levels that take their needs into consideration. Furthermore, the engagement of women through gender analysis tools – in particular, in community consultations and activities such as the NAPA pilot – may help sub-county and district stakeholders to address the differential impacts of climate uncertainty on different groups.

4.3 Devolved climate planning in Isiolo county, Kenya

Isiolo is in northern Kenya and is an arid and semi-arid land (ASAL) county. People of five main ethnic communities live there: Boran, Turkana, Samburu, Somali and Meru. As in other counties in the ASAL areas, Isiolo is vulnerable to hazards such as drought and floods, and also has significant competition and conflict between groups over variable and unpredictable resources such as water, pasture and arable land.

A coalition of international NGOs and national government institutions¹, the Adaptation Consortium, began work in Isiolo in 2010 to support the county to be climate finance ready and to mainstream climate change in planning and budgeting. The work is under the leadership of the National Drought Management Authority and involves local partners such as the Resource Advocacy Programme, Woman Kind Kenya, ALDEF and EDS-Eastern. The consortium uses an integrated approach that consists of four key elements: setting up a county-level climate change fund; putting in place county- and ward-level adaptation planning committees; integrating participatory planning tools and

climate information into planning; and strengthening monitoring and evaluation to track progress with resilience building.

The county climate change fund (CCCF) is a public fund under the discretion of county government. Ward Adaptation Planning Committees prioritise investments in public goods related to climate adaptation for 70% of the fund which are then implemented by service providers. There is a county adaptation planning committee (CAPC) with a range of stakeholders from the county and ward-level and a series of ward adaptation planning committees (WAPCs), community organisations that decide on and prioritise investments in public goods. The WAPCs conduct participatory resilience assessments to establish those factors that either strengthen or weaken the local economy and local livelihood systems and ultimately their resilience. The WAPCs then use the resilience assessments to prioritise investments in public goods whose costs fall within the CCCF allocation. Investments have to meet seven criteria that promote climate-resilient growth and adaptive livelihoods. The WAPCs prioritise investments in public goods, which they send to the CAPC for approval. The CAPC cannot veto local plans if they meet the seven criteria, but only work to strengthen ward-level proposals. WAPC members also sit as representatives on the CAPC. CAPC members undertake monitoring visits to see how investments have been implemented, and WAPC members with the communities develop theories of change to assess how well the investments are contributing to building resilience.

County-wide processes on climate change have also taken place, such as resource mapping, whereby stakeholders from the county government and community leaders and elders came together with GIS mappers to map natural resources and their condition in wet and dry periods. The resulting atlas is a resource for county planners, bringing together local and technical knowledge on natural resources and has been used to plan new infrastructure investments. WAPC and CAPC members have undergone extensive training about what constitutes resilience in their context, how to operate within the system, and on new tools and knowledge such as climate information and geomapping.

The Isiolo CCCF has completed two cycles of investment in public goods. The two rounds were implemented over a span of three years, between 2013 and 2016. The public goods investments aimed at building resilience to climate change have so far broadly targeted the livestock sector, which is main source of livelihoods for about 90 per cent of the county population.

¹ International Institute for Environment and Development, Christian Aid, Met office, National Drought Management Authority and Kenya Metrological services.

We undertook the case study with the CAPC and one ward, Kinna. We discuss the main findings of the Isiolo case study in more detail below.

Framing of climate change and uncertainty:

seasonal and yearly forecasts were most important in investment decisions and government systems provided this information. So far the CAPC has not been able to give significant consideration of longer-term impacts of uncertainty about trajectories whilst appraising investments, and climate understanding is based on historical experience. The CAPC and WAPCs work on an annual timeframe for public goods investments, and within government planning cycles of 5–10 years, so it is challenging to consider longer time frames. The national government has responsibility for longer-term climate forecasts.

Engagement/participation: engagement was mainly through formal county or ward planning committees. WAPC members are selected through public meetings and must include women and youth representatives. Other engagement was sought through longer-term planning processes such as work on resource mapping, the county integrated development plan and sectoral plans. Involvement in the WAPCs made community members feel engaged and able to articulate their needs. For reasons of buy-in and community structure, there is an overlap between the WAPCs and customary institutions (*dedha*). More work needs to be done, however, to understand how inclusive such processes are within the communities in question and how far different groups of women and age groups are able to make their needs heard. Some initial evidence however, showed this to be positive for some groups of women. Women in a focus group talked about the benefits of the local investment in a water pan for women and how this had reduced their time collecting water for domestic use and for livestock. Members of the WAPC were also engaged in the CAPC meetings and other county-level processes and do more vertical interactions were encouraged through the process.

Capacity building and co-generation: the CAPC process brings together a range of stakeholders, including WAPC members, to deliberate on different investments. This process allows individuals to better understand other people's points of view. Our interviews showed that at the county level the multi-sectoral linkages were not new but built on and strengthened existing relationships. The resource-mapping process allowed more co-generation of evidence, bringing together community members, county technical staff and mapping specialists to generate a county-wide resource that also validated community knowledge and made the resources and the usage patterns visible to technical staff, increasing their capacity to understand and plan for differentiated impacts for different groups. The individuals involved in the WAPCs

also gained capacity in terms of their confidence and ability to articulate their views and make the necessary connections to technical and government staff to call on them when needed for climate-relevant and other services. Women members of the WAPC talked about how previously they were never called to meetings held by the local chiefs as it was assumed the chiefs and elders could represent their views. Now, however they are more recognised as being able to contribute suggesting a change in understanding by some men in the community. Although some women also noted how older women were less confident to speak in the focus groups in front of their elders and more confident male leaders. There were clear capacity benefits from engagement for particular women, with one individual now working as an assistant chief building at least partly on the WAPC experience. The resilience assessment also brought together technical officers and community members, thereby opening up the possibility of changing understandings.

Iterative reflection on progress: the process in Isiolo at county level did not plan to go through the cyclical learning and reflection process, although the CAPC could do this through its regular meetings if it wished. At ward level, however, community consultations allowed communities to reflect on the choices they made during the resilience assessments in 2010–11 and see if they wanted to make any changes. Monitoring visits and M&E data collection also checked that investments were being implemented well and building resilience as planned.

Challenging institutions, norms and practice: the approach has been to work with existing institutions and so any challenging of practice is done incrementally. The participation of pastoralist groups and re-energisation of local institutions can be seen as challenging current planning norms. However, in other ways the institutional norms constrain longer-term action owing to short planning timeframes and lack of resources. Given annual planning cycles, it is also unclear how well this process would be able to support or prepare for non-linear change.

In summary, all four elements of a social learning approach were present in some form in the devolved climate finance process in Isiolo. The process brought together different stakeholders in a range of settings often in an informal capacity building approach that allowed them to learn each other's point of view and support building shared understanding. The participation of individuals involved in the ward committees allowed them to gain a range of capacities such as confidence and the ability to articulate their views as well as making social networks necessary to link with government and technical services when needed. In terms of the differential impacts on marginalised groups, the process has focused on

engaging pastoralist communities who have historically been marginalised within the local planning system. It is not clear from the research done in this case study, how much the view of marginalised groups within these communities are reflected in the planning process. Women and young people have representatives in the committees which is an important first step, but further work would be needed to understand which women and which young people are able to articulate their views. Structures are in place for iterative reflection but so far incentives and planning cultures have not supported using them for more in-depth looped learning. The form of institutional change focuses on working within the system to challenge norms around participation and the devolution of decision-making.

4.4 Comparison of the three case studies

In this section we discuss the differences and similarities between the three case studies. We also discuss how these affect the findings on the role of social learning in managing climate uncertainty across them.

First, the three projects are different sizes in terms of funding. ACCRA in Uganda has had limited funding to execute its interventions. To cope, it has implemented a series of small interventions over a period of six years, as opposed to one large one. As another potential coping mechanism, the consortium has primarily worked as a facilitator within existing systems and structures for climate change planning. One implication of this is that change is more likely to be incremental, and institutions are not challenged as intensely. The work in Gangtok was also only a small project. In contrast, in Gorakhpur and Isiolo, the work had more sustained funding sources and was better resourced, so could be planned over longer periods with more ambitious aims. In both Gorakhpur and Isiolo this led to the establishment of special structures to guide the work, through which social learning could happen, rather than only working through existing government structures as in Uganda and Gangtok.

Second, the three programmes are in different phases of implementation. Following the development and validation of climate change indicators for national-level monitoring tools in Uganda, funding has ended but ACCRA continues to engage with key government stakeholders in anticipation of official approval and adoption of the indicators. These tools will presumably affect the way planning for climate change and uncertainty takes place at district level, but these changes are some way off. In Gangtok work is ongoing but engagement is still light-touch owing to resource constraints. In Gorakhpur work is coming to an end, but GEAG is continuing its engagement with the area and stakeholders through other work. The work in Isiolo is ongoing, although funding is under negotiation and future plans are uncertain.

Last, the roles of social learning and climate science were different in each intervention. In Uganda, ACCRA took a learning-based approach that overlaps significantly with key aspects of the four dimensions of social learning identified in section 3. That said, climate uncertainty specifically was not a topic that ACCRA's interventions focused on, and the use of climate science did not feature strongly either. In India, the approach taken was explicitly built on a shared learning approach that had many of the dimensions identified in our framework (although challenging institutions was less explicit given the context of working with urban governments). The approach to climate change varied according different stakeholders' interest and motivation, but was based on climate science for the region, with some consideration of uncertainties in Gorakhpur among some officials. Isiolo did not have an explicitly learning-based approach, but one built on participation and engagement. Nevertheless, we identified most of the key dimensions of social learning as being part of the theoretical approach, with varying degrees of success in implementation. Climate change has been introduced to local communities through resilience assessments and workshops on climate information, but so far this has not played a major role in investment decisions, which have focused on immediate needs. Climate information had not yet played a role in the CAPC's decisions.

5

Discussion

The following sections discuss how the key dimensions of the planning and implementation process might support the particular challenges from climate uncertainty that we have identified.

5.1 Engagement and participation

In our framework we have suggested the following theoretical links between engagement and participation and addressing climate uncertainty:

- Co-generated evidence is more robust in addressing uncertainty because it takes into account a range of types of evidence with different levels of uncertainty, assumptions and knowledge bases. The trust and relationships developed during the process of co-generation support dealing with this type of evidence, cutting across capacity building, understanding and co-generation, and iteration.
- Stakeholders' perspectives go beyond traditional sectors as new connections are made or strengthened (multi-sectoral).
- The different timeframes stakeholders use help to broaden priorities and assess longer-term implications, leading to better understanding of the linkages between short-term and longer-term decisions.
- Including insights from marginalised groups in a meaningful and robust way makes decisions more attentive to power relations and institutional barriers, as well as differentiated impacts

Across the case studies, participation and engagement of a wide range of stakeholders including marginalised groups was frequently identified as a priority. However, the extent to which that was done and how much it supported addressing the specific challenges of climate change was mixed.

The facilitators in Gangtok used a simplified framing of climate change within participatory processes to engage stakeholders, which limited the extent to which these groups engaged with the concept of uncertainty but allowed them to engage a wide range of actors. In terms of how participation supported more robust evidence generation, the evidence generated in Gangtok and Gorakhpur built on a range of stakeholder experiences and different forms of knowledge that could help build robustness. In Gangtok, ICLEI SA facilitated a more open process than had previously been used in the city, including participants such as local academics, parastatal bodies, ward counsellors and municipal officers. This allowed a wider range of inputs into the city resilience plan and understanding of urban systems. ICLEI SA provided the climate input and relied more on scientific predictions than local knowledge of climate impacts.

More marginalised groups were included in both processes but to different extents. In Gangtok, although ward councillors attended the SLDs, in the one we observed they did not play an active role; the needs of more vulnerable households and communities were rarely explicitly discussed, nor were the impacts of the proposed interventions broken down in terms of who they would affect and in what ways. These observations suggest that while the process might over time enable generation of more robust evidence that takes into

account differentiated impacts on marginalised groups, barriers to full participation currently exist and the range of issues considered is more limited than might be needed to take full account of different forms of knowledge and experience. In Gorakhpur, there was a real focus on bringing the perspectives of marginalised groups on the urban periphery into the process, and into more formal planning spaces. Some members of the city steering committee had a fairly narrow view of engagement that was based on teaching communities how to adapt and giving them the information they needed. This suggests that although different forms of knowledge might be used, they might not have similar status or weighting to co-generate understanding of more robust responses to climate uncertainties or one that is more attentive to different vulnerabilities. For example, a member of the environmental forum described how “we used to go and have a conversation with the citizens so they should know what they have to do”.¹ However, GEAG team members thought this was changing over time as different groups of stakeholders interacted more, and others talked about a two-way learning process. Indeed, shaping the positions more influential actors took could be seen as a potentially significant outcome.

Gangtok had a real focus on multi-sectoral participation at municipal level. Initial evidence shows this has had some effect on bringing together and creating new relationships, and trust between different departments within the municipal corporation that could support multi-sectoral planning for climate uncertainty. Gorakhpur has had more of a focus on linkages between communities and planning officials rather than cross-departmental engagement within the municipality; there is less evidence of the process addressing multi-sectoral issues within municipal structures. In Gangtok some officials were exposed to longer planning timeframes through engagement with town planners and water engineers, which may have built some understanding of the concept, but this was not an explicit part of the process. In Gorakhpur, with the focus on local impacts and understandings of climate change discussions remained largely on shorter timeframes without explicit participation or perspectives on longer timeframes.

In both cities, in terms of where project staff have access and where they think there is most potential to effect change, pragmatism strongly drove the initial framing of who to engage with and how. This has implications for addressing climate change uncertainties through the links outlined above. While these pragmatic entry points might be necessary first steps, it is worth considering whether over time it will be possible to

overcome barriers to engaging other constituencies – either communities or municipal actors. The risk of failure is also higher when attempting to engage particular groups meaningfully, and take on forms of knowledge that are more controversial within certain institutional settings. It is worth noting that the work in Gangtok was within a much tighter timeframe and needed to produce a city resilience strategy within a condensed engagement process. There was not much room for failure, therefore. The engagement in Gorakhpur over 6–7 years had much longer to be embedded and for GEAG to identify what was working and what was not in terms of learning processes and how they might help address climate change in the longer term.

In Bundibugyo district in Uganda, engagement may have contributed to community members' ability to address specific aspects of climate uncertainty, but it is too early to say definitively. In Harugale sub-county, where ACCRA supported the NAPA pilot, community members were engaged in iterative action and reflection cycles through NAPA committee meetings and farmer field schools. These learning cycles fostered experimentation that ultimately led to participants successfully carrying out activities such as tree planting, soil and water conservation, and building energy-saving stoves. These activities have the potential to increase the resilience of participants' households and the sub-county as a whole. The 2.5 year process also created trust and built relationships; with participation in the activities, these results have the potential to help community members cope with uncertain evidence in the future. This could manifest itself, for instance, through further joint experimentation with methods for soil and water conservation and tree planting in the face of incomplete and unreliable climate data. The trust and relationships seemed to span gender, villages and even districts. We take the sustainability of the NAPA committee as an indication of the strength and potential of this network to contribute to adaptation solutions, even if evidence is uncertain in the future. Government officials at district level, however, were not engaged in such iterative learning cycles and do not appear to have specific strategies for dealing with uncertain evidence.

The strategic engagement of district government officials from different sectors in capacity development – centred on climate change adaptation mainstreaming in government policy and validating relevant indicators for government monitoring tools – has helped stakeholder groups develop better understanding of the multi-sectoral impact of climate change, and thus the cross-sector cooperation required for managing climate uncertainty. By bringing stakeholders from

¹ Interview with local hotelier (member of environmental forum), 28.06.2015, Gorakhpur.

different levels together through activities such as field visits for national officials, ACCRA's approach has also helped stakeholders develop a better shared understanding of climate change adaptation issues. Community consultations and vulnerability assessments that captured the views of women potentially helped stakeholders to understand the different impacts of climate uncertainty on marginalised groups – specifically women – but evidence of this connection is limited. Furthermore, Uganda has promoted gender awareness and sensitivity for around a decade, instituting a Ministry of Gender and building gender into national development plans as a crosscutting issue. The emphasis on gender appears to have trickled down to communities in Bundibugyo, as shown by parish bye-laws that require all community groups to be 50 per cent women, and by NAPA committee members' clear understanding of the different impacts of climate change and adaptation measures on women and men. Although women are involved in the NAPA committee and farmer field schools, and in planning for climate change more generally through standard planning processes involving community consultations, we did not find evidence that other marginalised groups are being included in – or excluded from – planning for climate change, aside from the membership of two disabled people in the NAPA committee.

Participation and engagement in Isiolo county was through the formalised structures of the CAPC and WAPCs, as well as engagement in broader planning processes such as developing a resource map. The resource mapping was a particular example of co-generation that seemed to have been insightful for different stakeholders. One of the facilitators said:

“when coming up with natural resource management maps, you can see a lot of information is coming from communities that even the technical people couldn't understand. So technical people have also provided information as well as communities, but communities have provided more information.”²

This suggests that this type of process brought together different forms of knowledge (including from more marginalised communities) and presented it in such a way that it could be useful for addressing climate uncertainties. Members of the county committees were able to discuss multi-sectoral issues and learn from each other and community members through processes such as resource mapping, so the institutions seem to address this challenge of climate change planning. The annual planning cycle did not provide much scope for considering longer timeframes and the focus was on shorter-term gains

Some county committee members saw participation as more of a consultative or one-way transfer of information, as was the case for some stakeholders in Gorakhpur. One CAPC member told us that “we have the Ward Adaptation Planning Committee – they come to us and we give our technical input”³. This suggests that while more marginalised groups are engaged and participating, some stakeholders see their inputs within a certain hierarchy of evidence and the understanding of differentiated needs may not have changed. The WAPCs themselves have elected representatives from the community who are selected through public meetings and deliberation. While this is an open process, there are likely to be structural and cultural barriers and norms as to which candidates put themselves forward, are chosen, and are able to articulate specific needs. Therefore the most vulnerable may not be included in this process. It is not clear how these institutions might help bring the needs of people within more marginalised communities to the fore, and how these perspectives might be included in thinking about climate uncertainties.

Looking across the case studies, there is some evidence that engagement and participation can address the challenge of multi-sectoral planning issues; and, depending on how attentive the process is to power and structural issues, bring marginalised groups into the planning process. Participation within the three case studies was often conceived around ‘marginalised groups’ or communities as one group without a disaggregated analysis of how different groups (gender, age, ethnic groups) were able to participate in each form of engagement. Several of the cases had separate groups for women or posts on committees reserved for women, or specific evidence collected on the vulnerability of women and some initial evidence shows that differential needs of different women or other groups were better understood amongst some stakeholders through this process. However, apart from some evidence from focus groups in Kenya it is not clear how much different groups benefited from the plans and activities put in place in each context. Another interesting part of the engagement of marginalised groups was the use of different strategies within the three cases to how marginalised groups should be brought into social learning processes. One strategy was to support direct engagement that brought all stakeholders together to learn directly as in Isiolo County in Kenya. The other was to use NGO staff or facilitators to bridge the gaps between engagement of different actors and play a knowledge brokering role (as in Gorakhpur, India and Bundibugyo District in Uganda). The social learning literature emphasises

² Interview with RAP staff, 20.09.2016, Isiolo County.

³ Interview with CAPC member, 23.09.2016, Isiolo County.

this direct engagement but in some of the case studies the facilitated approach also seemed a strategic way to bridge large social divides in a challenging institutional setting.

What seems more challenging here, however, is how participation and engagement address challenges of longer timeframes and uncertain evidence. Very few examples of these issues were brought up explicitly through the process or ways to help participants consider options beyond their recent experience. It may be that these two challenges of climate uncertainty were seen to be too challenging to introduce and not of interest or immediate relevance to participants. In some cases it appears there was a trade-off between strategically introducing climate change through short-term issues of immediate relevance to participants and introducing the concept of longer timeframes and/or uncertainty, which by definition is not immediately relevant; the former forces the latter to be done later on in the process, and is more likely to lead to action around current variability and known problems in the short-term. It is not clear how participatory and learning-based processes might enable communities or local governance structures to consider the need for long-term or non-linear perspectives.

As discussed in the literature review, engagement in governance and participation in government structures is part of a complex network of state-citizen relationships, with implications for the barriers to involving certain constituent groups, and this could include climate vulnerable communities who have not traditionally been engaged in planning processes. One way to consider this and the implications for climate uncertainty might be to conceive of the planning arena more broadly by including a focus on how informal governance mechanisms interact with the formal government sphere in this context, and how this might be better supported to allow the climate-related needs of all groups to be well articulated and integrated.

5.2 Capacity development and building shared understanding

We can identify the following theoretical linkages between building capacities and understanding and addressing the dimensions of climate uncertainty:

- Better understanding of multi-sectorality and co-generation processes can build understanding of complex issues.

- Increased understanding can increase motivation to look at longer-term drivers and impacts, while co-generating evidence can build a more complex picture over time. Stakeholders understand the impacts of climate change and are motivated to address them, and maladaptive consequences are better understood.
- Understanding differentiated needs of marginalised groups enables these dimensions to be considered in responses to climate change

In the cities in India, capacity building was both formal and informal. In Gangtok several interviewees identified mechanisms by which the capacity of municipal staff had been built in a semi-structured way through the creation of new pathways for interacting with and learning from colleagues elsewhere in the municipal government. This learning seems to have been largely instrumental: interviewees described it as helping them to perform their roles more effectively, rather than in strengthening their understanding of the nature of climate uncertainty, or transforming their approach to urban governance more broadly. However, this understanding of the needs and perspectives of others could be useful in addressing climate uncertainty in the future and understanding multi-sectoral issues. In Gorakhpur, longer and more intensive engagement enabled different types of capacity building to take place. While the direct focus for capacity building was much more on individuals and communities in peri-urban areas of the city, perhaps more transformational changes in capacity took place through changes in the nature of relationships that individuals had within communities and with external institutions. Discussions in the peri-urban ward of Moharipur indicated at least the potential for more systemic change, with farmers not only gaining technical knowledge, but also developing relationships with agricultural extension officers and other officials who could provide more structural and substantial support on an ongoing basis. This provides evidence that some approaches might be better understood by all groups, although changes in capacity and understanding would also be needed within formal urban structures as well for these to be acted upon. As discussed in the preceding section, there was some evidence of changing attitudes within the environmental forum in Gorakhpur, and among members of the steering committee, who started to talk more about interactions with the community being a two-way process.

The longer-term engagement in Gorakhpur could have had the potential to build lasting capacity in municipal officials, and this certainly took place to an extent. As one respondent explained:

“First of all they are realising what is climate change, before they knew nothing. And what is the impact of that climate change they were also not very aware. So we just inculcate some knowledge about the climate change, and they realise that climate change should be one of the factors for the planning process for the city.”⁴

At the same time, the systems within the Indian civil service that lead to high levels of staff turnover and lack of specialisation can make it difficult for changes to have lasting effects. However, increased capacity and support for certain officials could yield long-term and meaningful changes. In Gorakhpur, the disaster management department recognised changing patterns in the monsoon, which meant that the period of operation for the Emergency Operation Centre each year was officially extended, thus dealing with trends in climate and recognising their unpredictable nature. This shows some specific evidence of consideration of uncertainty and longer timeframes through increased understanding and capacity in one context, although wider engagement and understanding or motivation to consider longer timeframes within municipal governance was largely missing.

In Bundibugyo, throughout ACCRA's history of engagement with the district inclusive capacity development for district officials on climate change mainstreaming has been crucial in reframing decision makers' understanding of climate change adaptation as a crosscutting issue. That said, climate uncertainty was not specifically mentioned in these capacity-development activities. Although district officials have developed multi-sectoral planning processes that will presumably help them to address climate uncertainty as well as adaptation issues, we do not yet have evidence of any planning explicitly related to climate uncertainty. Capacity development of national level officials on the multi-sectoral nature of climate change impacts and solutions has also influenced national planning processes to some extent, although the sustainability of the changes that have been made to coordination remains to be seen, and how much this can be attributed to the learning processes is unclear. At community level, during the NAPA pilot capacity development focused on specific skills that helped to build community members' climate resilience (eg energy-saving stove construction), but the pilot largely technical in nature and did not necessarily increase the community members' ability to engage in learning processes. The theory of change exercises held with communities during the development of climate change adaptation indicators for the district are a

better example of capacity development that increased different stakeholders' ability to learn from each other, as it helped communities to speak the same 'language' as government officials regarding climate change. That said, in ACCRA's interventions such opportunities for different stakeholder groups to learn from each other have been mostly horizontal, rather than vertical.

We did not find evidence that capacity development activities are contributing to managing other aspects of climate uncertainty. Given that capacity development did not focus on climate science or data, it did not contribute to stakeholders' ability to deal with uncertain evidence or explicitly address long or unpredictable timeframes.

In Isiolo there has also been formal training for CAPC and WAPC members on, for example, how to conduct resilience assessments, roles and responsibilities of the committees, climate change and climate information, and resource mapping. There has also been a focus through the CCCF process on informal interactions that support capacity transfer, either through WAPC members learning more about the technical aspects of their projects by engaging with technical officers or through county officers having more exposure to community priorities and experience of managing climate variability. The co-generation processes in relation to resource mapping, discussed in the previous section, seem to have played a role in allowing stakeholders to better understand each other's perspectives and building understanding of different groups' use of natural resources, and different climatic conditions. There were few changes in relation to longer-term effects and uncertain evidence as these were not a focus of capacity building or informal interactions. This approach brought more marginalised groups into regular contact with formal county planning processes. It seems to have strengthened the voice of these groups in such processes and to some extent the perception of these groups and their needs within government.

Looking across the three cases, we see that in some cases capacity development has helped increase consideration of the different impacts of climate uncertainty on marginalised communities, and the multi-sectoral nature of impacts in planning processes. We saw some evidence of views and understandings around the needs of marginalised groups shifting through the engagement and participation, as well as increasing capacity (in terms of social networks, confidence and skills) amongst some individuals in those marginalised groups to advocate effectively for their needs. In Gorakhpur key stakeholders in the city's environmental forum seemed to be shifting their

⁴Academic (member of steering committee and environmental forum), 29.06.2016, Gorakhpur.

views towards the urban poor and what could be learnt from engagement with these groups, whilst in Isiolo County some processes such as the resource mapping allowed the different forms of knowledge of different groups to be validated and brought together. This helped build understanding of the differentiated needs of groups depending on different resources. In terms of capacity within community groups, focus groups in Isiolo County and Gorakhpur suggested that an important improvement was the capacity of these groups to organise, to understand how to engage with government officials and to generate the social networks to be able to do this. This is particularly interesting as this set of capacities is not directly linked to addressing climate change, but would allow individuals in these groups to advocate for their immediate needs around climate change.

But few explicit attempts have been made to develop capacity in relation to longer timeframes and uncertain evidence. There was also little evidence that bringing different communities together meant that these dimensions of uncertain evidence and longer timeframes emerged organically. Of particular interest in the Indian and Kenyan examples is that the act of bringing people together for a specific task, such as an SLD or resource mapping, can build capacity and understanding of others' perspectives, even if that was not the explicit aim. In both cases the capacity of community groups to articulate their needs and make the right connections to help further their claims was a tangible outcome from the broader processes.

5.3 Iterative reflection and action

The following linkages have been identified between iterative reflection and action, and addressing climate uncertainty:

- Decisions that are made on the basis of evidence when this is available or sufficient allow for build-up of information, reflection on uncertainties and identification of necessary information for decisions.
- As unintended consequences across sectors are noted or deemed to be important they can be added in.
- Iterative reflection and action enable decisions to be taken at the most appropriate time based on the evidence available and the need for planning.

As unintended effects become apparent, particularly the differentiated impacts on marginalised and/or vulnerable groups, they can be incorporated into planning.

In Gorakhpur and Gangtok we found little evidence of genuine formal iteration and reflection that interviewees could comment on, despite being a core aspect of the ACCCRN and IAP theoretical model. Although the SLD model promotes loop learning, this feature rarely came up in discussions with individuals involved in the process in the two cities; similarly, little emphasis was placed by the facilitators on revisiting underlying values or opening up the possibility of failure. When evidence was needed it was formally commissioned from technical experts, and then included in committee meetings and SLDs. However, in Gorakhpur committee members also visited wards to observe and engage with the work on the ground, which helped shape ongoing activities.

GEAG in Gorakhpur and – to a lesser extent – ICLEI SA in Gangtok were both involved in critical internal reflection on how best to achieve their aims and altered their inputs accordingly. While this can be seen as single-loop learning, the barriers to achieving iteration within municipal structures appear to be considerable. Slippage occurred between iteration and repetition; for example, does revisiting or going over an old decision constitute iteration or just repeating processes for new participants? In these cases there was little evidence of iteration being used to make decisions as and when they became needed, or to incorporate more evidence as it emerged. This may be partly because of the longer timeframes needed for such processes to be useful or to be instigated. Timeframes largely followed project schedules rather than responding to new or emerging information.

In Bundibugyo the only example of sustained iterative learning was during the NAPA pilot that ACCRA supported in Harugale. There the NAPA committee and other community members participating in the farmer field schools – which were set up to share the knowledge and skills trainers gained during their visit to another district – regularly met to compare results and challenges encountered while implementing NAPA activities. In addition to improving the adaptation and resilience outcomes of the activities, these reflection and action cycles improved community members' understanding of the different impacts on different stakeholder groups (primarily women versus men), and the interconnected nature of climate change impacts on different aspects of life and livelihoods. As different impacts emerged for different individuals, they could be reflected on collectively. The decision of the district and sub-county to extend the pilot by a year and a

half, and the eagerness of the committee to bring back the activities (contingent on further funding) and their willingness to spearhead such an effort, are all testament to the sustainability of the outcomes of the social learning-oriented process. In contrast, although other NGOs, such as Red Cross, have implemented similar activities in Bakonzo, they do not appear to have involved a strong collective, iterative learning element, and no enduring group like the NAPA committee is available to help community members engage in decision-making on climate change adaptation. It is worth noting that ACCRA's strategy of primarily working within existing government structures and systems – many of which present barriers to collective, iterative learning – prevented this dimension from being a focus of ACCRA's approach at other levels.

In Isiolo the main iteration built into the process was the annual cycle of making local investments and M&E around those investments. Once an investment was made, the implementation was tracked and then its impact on building resilience monitored and evaluated. As the government official overseeing the process told us, “The M&E – see the reports, it adds value. [On] the monitoring visits we see things that need to be improved, without monitoring some key lessons could not be addressed”⁵. However, the reflection process was clearly challenging within a government system where M&E has been more based on activities undertaken and budget spent, rather than on achieving results, especially results around building resilience to climate change. There was also little evidence of learning going beyond the first loop (ie looking at improvements in current investments). However, additional activities that the communities led on supporting a bill on natural resource management could suggest some form of double-loop learning, where those involved have recognised the need to adjust the system within which the investments are taking place. There was little evidence of decisions being reconsidered after new evidence emerged, apart from the communication of climate information, which the country government did and led to community leaders considering their plans in light of the forecast (this was part of regular government process). Annual planning cycles drove the timing of decisions rather than emergence of new evidence.

Overall, therefore, further work is needed to develop approaches to iterative reflection that can support the management of climate uncertainties. Iteration ought to be able to help stakeholders to cope with uncertain evidence and differential impacts on marginalised groups, providing a space to feed in new information on the climate context and impacts as this emerges.

It could also encourage stakeholders to consider longer timeframes by breaking the process of thinking about the future down into shorter cycles of action and reflection, with room for experimentation. However, all three case studies illustrated the challenges involved in building iteration into existing processes and encouraging reflection beyond single-loop learning. In all three cases, structures and systems that could accommodate – and were probably designed to incorporate – periods of reflection or assessment were present, but it appears that incentives for (critical) reflection are insufficient. Part of this could be owing to the project-based nature of some of the case studies, where there was not enough time to build iteration into government planning processes, which may take place over five-year cycles, for example; in other cases iteration was simply not prioritised by the facilitators in practice, despite being part of the theoretical approach.

Few of the iterative processes had a way of considering the differentiated impacts on marginalised groups. Indicators were often at an aggregated or systems level and so even if these processes had been functional, it would be challenging for the differential impact on marginalised groups to be fully considered. There are however other ways for the differentiated impacts on marginalised groups to be taken into account within iterative processes such as more sustained engagement in these processes by these groups and/or participatory feedback mechanisms.

5.4 Challenging institutions, norms and practices

The following linkages have been identified between challenging institutions, norms and practices, and addressing climate uncertainty:

- Challenging institutions may help to change norms and expectations around the need for quantified trend data and may help to validate evidence from a wider range of sources with differing assumptions of validity, certainty, and so forth.
- Challenging institutional silos and norms within sectors, such as short-term planning timeframes, could help address aspects of uncertainty.
- Challenging institutional practices could encourage stakeholders to listen to and take into account of the differentiated impacts on marginalised groups and livelihoods, including recognising the particular needs and priorities of women.

⁵ Interview with NDMA Officer, 21.09.2016, Isiolo County.

The SLD process in both Gorakhpur and Gangtok largely appears to have taken a pragmatic approach to challenging institutions. The key actors involved had to take a strategic decision about whether to change the norms and practices of the municipal corporations and other bodies by pushing and challenging them from outside, or by working more tactically from within; they have tended to choose the latter. Where possible they have used agreed on norms and legal frameworks as a basis for encouraging change. For example, while the 74th Amendment to the Indian Constitution defines the role and authority of urban local bodies, in several areas non-compliance with this amendment is the norm. However, its existence provides the opportunity for organised actors in cities to challenge government institutions at a range of scales to do things differently. A 74th Amendment Committee has been set up in Mahewa ward in Gorakhpur.

Efforts have been made through the ACCCRN process to create new institutional structures within the Municipal Corporation in Gorakhpur, notably with the establishment of a climate change cell. This is intended as a mechanism to bring together key departments with the city to ensure climate change concerns are being adequately addressed. However, in practice it appears that this group has met only once and is highly dependent on the support and participation of the municipal commissioner. In Gangtok, there have been suggestions by stakeholders in the SLDs to create new bye-laws and increase coordination between departments, but as yet no clear strategy for change exists. There is therefore some suggestion of challenging institutional silos, but work remains to be done in this area.

Perhaps the most effective means of changing how urban institutions function has been through implementing new ways of working. In Gangtok, this involved how the SLDs themselves were organised: using a non-hierarchical discussion style that brought together municipal officials, NGOs, academic institutions, and ward councillors in a setting in which they all seemed able to speak freely; several interviewees commented that this was novel and greatly appreciated. In Gorakhpur, the longer-term participatory approach was at the core of creating new individual and institutional relationships that took building resilience more seriously, particularly in relation to low-income and other marginalised groups. If transformation is seen as something that can be gradual as well as disruptive, then these changes may signal the start of new means of institutional engagement that could have longer-term and significant effects. There was limited evidence of challenging institutional norms in relation to timeframes

and use of scientific data, apart from in Gorakhpur where the disaster management authority had changed the timing of emergency support based on evidence provided. Perhaps as a precursor to this change, engaging with other actors in the SLDs was making some stakeholders more aware of other people's planning cycles, and this could lead to challenging norms in other areas over time.

In Bundibugyo, through multiple interventions over a five-year period, ACCRA challenged district officials to shift their view of climate change from an environmental issue to a crosscutting one, to mainstream adaptation in the district's five-year development plans, and to develop more inclusive planning processes. One example of ACCRA's efforts to challenge institutions is the district-level workshop held during the climate change adaptation mainstreaming intervention. The workshop took national-level officials to visit communities in a mountainous district and develop a better understanding of the reality of climate change impacts for vulnerable groups. It also brought together representatives of different ministries and departments to learn from each other about the relevance of climate change to different sectors, and to strategise on ways to integrate climate change into the plans for each sector.

Institutional challenging did not focus on planning for longer timeframes; influencing this kind of shift is difficult when working at district level within entrenched government systems that include five-year planning cycles mandated at the national level. ACCRA's approach also did not explicitly involve working with uncertain evidence, although it encouraged district development plans to make room for action – albeit without a stress on reflection that should follow in a social learning-oriented reflect-act cycle – even in the absence of certain evidence. There were some examples at district level of working groups, such as the disaster risk reduction working group, which formerly developed plans for coping with uncertain evidence and uncertain timeframes; but these groups are largely dormant when national ministries do not provide funding and other incentives.

In Isiolo, the whole CCCF mechanism in some ways challenges existing systems and practices by channelling funds down to county level and using a community prioritisation exercise to allocate funds – and thereby challenging norms around marginalised groups. The establishment and support of the WAPCs, the allocation of funds for them to run their own affairs, as well as the rules supporting their choices – that the CAPC can only give technical support not overrule priorities – all serve to challenge institutional norms about where power lies and who has the knowledge

and experience to make planning decisions. The resource maps allowed local knowledge to be validated and used in county processes, and this challenged norms about whose knowledge is useful in different contexts. Within the communities themselves it is less clear how norms may have been challenged around who is involved in decisions, given the overlap with customary institutions and the representative nature of women and young people in the committees – a step towards more inclusion but with little evidence of how meaningful that will be. Using the resource maps and resilience assessment challenged the kind of information that decisions can be based on, but did not challenge planning timeframes.

The case studies show the difficulty of challenging norms and practice in bureaucratic contexts. This is especially true when the approach or the topic itself is innovative and external actors need to align with government priorities and find champions to build ownership; this often limits external actors to an incremental approach aligned with existing discourses and approaches. That said, evidence in Uganda shows that ACCRA successfully challenged government at the district level and perhaps also the national level –

by engaging multiple sectors and capacity building on climate change adaptation mainstreaming – to plan for climate change in a way that reflects the multi-sectoral nature of climate change impacts. These efforts did not, however, explicitly incorporate the concepts of climate uncertainty, uncertain evidence or long timeframes. In another example, both the Indian cities and Isiolo CCCF mechanism succeeded in challenging contexts in promoting an alternative approach to working through climate-related issues, with a focus on including marginalised groups; this involved some level of challenging institutions, and systemic change. This has led in some instances to allowing the continuation of other institutional norms, such as those around longer timeframes and types of evidence to ensure alignment of priorities with key stakeholders, and also to minimise the extent of institutional change required in a short period of time. All of the case studies played some role in challenging norms around the participation and engagement of marginalised groups, although this had not yet extended in many cases to challenging understandings around differential impacts within those groups.

6

Conclusions

Across the three cases, we see that actors who support or lead planning and implementation processes around climate change have engaged stakeholders using an approach that is at least partly predicated on social learning. The case studies provide evidence that the processes of participation and engagement, and capacity development, have led to changes that will help address some of the challenges of climate uncertainties. This help takes the form of increasing stakeholders' understanding of different perspectives, supporting and amplifying the perspectives of marginalised groups, and increasing stakeholders' capacity to consider climate change as a multi-sectoral issue. There was some evidence that involvement of women in committees and specific evidence generation around women and more marginalised groups helped build up a better understanding of the differentiated impacts and needs of different groups including women. Capacity was also shown to have been built amongst some of these groups to articulate their needs and reach the right individuals within formal government structures, although the evidence of resulting changes in understanding and prioritisation amongst decision-makers towards the differential impacts and needs of these groups was less strong. Significant challenges remain around integrating iterative reflection into practice, given the lack of incentives around critical reflection and action over time. Efforts to challenge institutions have succeeded in several instances, primarily where they have taken the form of challenging practice within agreed parameters, or re-instigating institutional practices that have fallen out of use.

Despite these successes in addressing the need for multi-sectoral planning and consideration of impacts on marginalised groups, real challenges remain in developing effective processes and catalysing institutional changes needed to adequately address other issues of climate uncertainty, including uncertainties in evidence and the long timeframe of climate change. None of the case studies discussed here could address these two issues substantively for a variety of reasons to do with stakeholder buy-in, project timeframes and objectives, capacity, and motivation.

We argue that given these initial results and the remaining gaps in knowledge and practice a concerted effort is needed to learn more about the value of different processes in addressing future climate uncertainties, including how the four dimensions drawn from social learning might be included. We suggest that taking a process-based approach to managing climate uncertainties allows these uncertainty-based challenges to be addressed and included explicitly. We also suggest that such an approach should focus on how the process itself builds the capacities, knowledge and relationships necessary to support first short-term, and then longer-term decision-making and action, rather than relying only on the existence of a 'plan', strategic document or climate information system, or creating a dichotomy between shorter and longer time frames. In comparison with a purely technocratic method, the approach we suggest would also allow a more explicitly political perspective, with an appreciation of power, incentives and interactions in relation to data and decision-making.

To address these gaps and build knowledge about how a process-orientated approach to adaptation could be made most effective in different contexts, we argue that further action-orientated research is needed. This should focus on:

- **Building evidence and understanding** on how **process-oriented approaches** to planning for adaptation can improve outcomes. This should explore key elements of process across the four social learning dimensions, paying extra attention to addressing the conditions needed to carry out the more challenging aspects of climate planning and implementation, such as iterative reflection and challenging institutions and systems, which are recognised as theoretically important, but with little evidence of successful application. This can in part be achieved by learning from existing experience in relation to local climate planning and looking at process factors, which help in systematising learning and deliberating on implications across disciplines, research and practice, and geographies.
- **Integrating considerations of power, politics and decision-making** into the structure of how processes are designed and tracked, aiming to maximise the likelihood that these can be negotiated to ensure resilient outcomes for marginalised groups.
- **Local experimentation** is essential to understanding what works in different contexts. This would involve working with policymakers, practitioners, and businesses to develop and test process-oriented interventions that improve planning with respect to climate uncertainties; while at the same time fostering buy-in between stakeholders – across levels and sectors – to better understand how to encourage the move from planning to mobilisation and action.

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Acronyms

ACCCRN	Asian Cities Climate Change Resilience Network
ACCRA	African Climate Change Resilience Alliance
ASAL	Arid and semi-arid land
CCAF	County climate change fund
CAPC	County adaptation planning committee
GEAG	Gorakhpur Environmental Action Group
IAP	ICLEI ACCCRN Process
ICLEI SA	ICLEI South Asia
ISSET	Institute for Social and Environmental Transitions
NAPA	National Adaptation Plan of Action
NGO	Nongovernmental organisation
PDIA	Problem Driven Iterative Adaptation
SLD	Shared learning dialogues
TAMD	Tracking Adaptation Measuring Development
WAPC	Ward adaptation planning committees

Related reading

Brooks, N and Fisher, S (2014) Tracking Adaptation Measuring Development: a step by step guide. Toolkit. IIED, London. <http://pubs.iied.org/10100IIED/>

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Annex 1

Interviewees and focus groups by country

Uganda: Research undertaken 31/08/2016 – 9/9/2016

ROLE AND ORGANISATION	LEVEL
ACCRA International Coordinator, Oxfam	Programme
Senior Economist, Office of the Prime Minister	National
Climate Change Officer, Climate Change Department – Ministry of Water and Environment	National
Head, Climate Change Department – Ministry of Water and Environment	National
Local Government Inspector, Ministry of Local Government	National
District Environment Officer, Bundibugyo District	District
District Natural Resources Officer, Bundibugyo District	District
Bompomboli Boundary Group Leader and Officers, Bulambuli Sub-County	Local
LC3 Chairman, Bulambuli Sub-county	Local
Community Development Officer, Bulambuli Sub-County	Local
National Agricultural Advisory Services Officer, Bulambuli Sub-County	Local
Sub-county Chief (standing in for the Parish Chief), Bulambuli Sub-County	Local
NAPA Committee members, Bulambuli Sub-County (focus group)	Local
District Principal Assistant Secretary, Bundibugyo District	District
Planner, Bundibugyo District	District
Water Officer, Bundibugyo District	District
Health Officer, Bundibugyo District	District
Forest Ranger, Bundibugyo District	District
Community Development Officer, Bundibugyo District	District
LC3 Chariman, Bukonzo Sub-County	District
Sub-county chief, Bukonzo Sub-County	Local
Parish chief, Bukonzo Sub-County	
Parish chief, Bukonzo Sub-County	
Bukonzo Sub-County community members (focus group)	Local
Independent Consultant; trainer during the TAMD indicator work with communities Climate Change Officer, CCD MoWE; trainer during the TAMD indicator work with communities	Programme

Kenya: Research undertaken 11/9/2016 – 16/9/2016

ROLE	ORGANISATION
County Drought Coordinator, Isiolo and Chair of the CAPC	National Drought Management Authority (NDMA)
Coordinator of MTAP and Member of the CAPC	Medium Term ASAL Programme (MTAP)
Coordinator of ASDSP, Isiolo and Member of the CAPC	Agricultural Sector Development Support Programme (ASDSP)
County Director of Metrology and Member of the CAPC	Kenya Metrological Services
County Veterinary officer and Member of the CAPC	Veterinary services
County Director of Environment	National Environment Management Authority
Chief Officer Environment	County Government
County Planning officer and Member of the CAPC	County Development Planning
Project staff working on the CCAF Two programme officers/CCCCF Director	Resource Advocacy Programme
Chairs/Secretaries/Treasurers of WAPC in Kinna ward (focus group)	Community members
Women involved in the WAPC and other local institutions in Kinna ward (focus group)	Community members
CEC Water, Environment, Livestock	County government
County Assembly Deputy Speaker	County government
Sub-county administrator (Batula)	Sub-county government

India: Research undertaken 20/06/2016 – 01/07/2016

ROLE AND ORGANISATION	CITY
GEAG Project staff Group meetings One on one discussions with project staff and director	Gorakhpur
Official from the District Disaster Management Authority	Gorakhpur
Associate Professor, Department of Civil Engineering, University of Technology and member of steering committee	Gorakhpur
Municipal Commissioner	Gorakhpur
Town planner (retired)	Gorakhpur
Hotelier and member of the environmental forum	Gorakhpur
Retired academic and member of the environmental forum	Gorakhpur
Residents of Mahewa ward involved in ACCCRN (focus group)	Gorakhpur
Residents of Moharupur ward involved in ACCCRN (focus group)	Gorakhpur
Women involved in ACCCRN in Moharupur ward (focus group)	Gorakhpur
ICLEI SA Project staff	Gangtok
Official in the Department of Science and Technology, Government of Sikkim	Gangtok
ECOSS – Eco Tourism and Conservation Society of Sikkim (environmental NGO) Director	Gangtok
Official in Forestry Department, Government of Sikkim	Gangtok
Assistant Geography Professor, Government College	Gangtok
Official in State Disaster Management Authority	Gangtok
Asst. Chief Engineer and Junior Engineer, Water Supply and Public Health Engineering Department	Gangtok
Project Director, State Investment Program Management and Implementation Unit; Urban Development and Housing Department, Government of Sikkim	Gangtok
Ward Councillors from wards 6, 8, 9, 17, 3 (group discussion)	Gangtok
Walk and talk with councillor in ward 8 (group discussion)	Gangtok
Observation of shared learning dialogue	Gangtok

Significant uncertainties around future climate change challenge the implementation of policies and programmes. Mobilising action that can respond to climate change and be flexible enough to learn from new experiences as well as adapt to unknowns is difficult, given traditional short-term timeframes, sector silos and the predominantly top-down nature of planning cycles. Process-driven approaches, such as social learning, offer a more flexible approach to tackling climate uncertainties. These approaches place the emphasis on building the capacity, knowledge, evidence and stakeholder relationships necessary to support first short-term and then longer-term decision making and action.

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Knowledge
Products