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Developing and applying a five step process for mainstreaming climate change into local development plans: A case study from Zambia

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ABSTRACT

Climate change is a cross-cutting issue and, as such, is most effectively addressed when mainstreamed in development planning. Assessing climate risk and mainstreaming adaptation into development plans ensures that hard-won development gains are not undermined, and that future development interventions are resilient in the face of a changing climate. We outline a five step process to mainstream climate change into development plans. The five steps are: preparation; current and future gender-sensitive climate risk assessment; climate risk screening to see how proposed activities are affected by climate risk; options to adapt and enable climate-resilient development; and implementation, monitoring and evaluation. The process is underpinned by theory on climate risk assessment and robust decision making, and informed by participatory methodologies and expert elicitation. It was applied to District and/or Integrated Development Plans in 6 districts in Western and Southern province of Zambia under the Pilot Program for Climate Resilience. Findings show that it is a useful methodology that can be applied in data-constrained environments with minimally-trained expertise to assess climate risk and enable adaptation and climate-resilient development.

1. Introduction

Climate change is a cross-cutting issue that has implications across development sectors. As a result, mainstreaming climate change into development plans is likely to be more successful than addressing it in isolation through sectoral climate change policies or plans. Ensuring that climate change is taken into account in integrated development planning has two benefits. First, it ensures that development gains will not be undermined by climate risk. Second, it offers the opportunity to build adaptive capacity and resilience in the face of climate change, so that the risk of future adverse impacts is minimised.

Whilst there are many reasons for mainstreaming climate change into local development plans in sub-Saharan Africa, there are a number of barriers to the process (Benson et al, 2014). Global climate models are the mechanism through which we are able to project future climate conditions. Although they can be downscaled, the various approaches still have limitations in their ability to plausibly and accurately represent the multitude of micro-level influences on climate (Hewitson et al, 2014). Although there are development planners and sectoral planners at local level, there is unlikely to be the technical expertise that can discern between various climate projections (Pasquini et al, 2015, 2013; Shemdoe et al, 2015). Combined with insufficient technical expertise, lack of

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data also impedes the capacity for highly technical impact assessments (Girvetz et al., 2014). Despite these constraints, however, action cannot be postponed as climate change threatens to undermine hard-won development gains and exacerbate vulnerability of people and the environment. Instead it is necessary to use the information that exists and employ "good enough" methods in a risk management approach (Durose et al, 2017; Daron et al, 2015; IPCC, 2014). In order to address this need, a five step process for mainstreaming climate change into local development plans was developed and refined following use in Zambia.

2. Why mainstream climate change in development plans?

Like most cross-cutting issues, climate change poses a risk to many development sectors and thus addressing it cannot be achieved by placing it in a silo (Agrawal and Lemos, 2015; Reid and Huq, 2014). Instead it should be mainstreamed, or integrated, into existing priorities. There is a two way relationship between climate risk and development plans: i.e. climate risk may affect development plans; and development plans may affect climate risk.

On the one hand, the development goals in a plan may be affected by climate risk. Take, for example, a drought-prone district with the strategic objective of attaining food security using a programme of agricultural development which has, as a key project, the promotion of a water-intensive crop such as lowland rice. If the district is exposed to drought (as the climate hazard) there will be vulnerability, since lowland rice is dependent on adequate water supply. The likelihood of a negative impact (production losses) is high – resulting in high climate risk which threatens the attainment of the strategic objective of food security.

On the other hand, the development goals may affect climate risk by increasing vulnerability. Take, for example, a flood prone district with the strategic objective of increasing the availability of housing for a growing population, using a programme of low cost housing that will be implemented through a project that involves construction of 50 units of subsidised housing. If climate hazards are not considered, these houses may be planned to be built in an area which is likely to become regularly subjected to flooding. By placing additional people at risk of exposure to flooding, this development plan increases climate risk and raises the chances that the benefits of investments will be undermined.

Additionally, the development goals and programmes may increase climate risk through contributing to climate change (and thus the likelihood of a climate hazard). This is the case for activities that contribute to greenhouse gas emissions, for example through deforestation.

3. Theoretical underpinnings

3.1. Climate risk assessment

This method follows the IPCC's approach to risk assessment, where the risk of negative impacts of climate change is dependent not only on exposure to the hazard itself, but also vulnerability to that hazard and the extent to which vulnerability may be offset by adaptive capacity (IPCC, 2014). Building resilience comes from reducing risk, and thus can be done by reducing vulnerability or increasing adaptive capacity.

Climate hazards include incremental change in temperature and various elements of rainfall variability (including distribution throughout the year), as well as extreme events such as droughts, floods, heat waves and storms. Vulnerability contains two elements: biophysical and social. Biophysical vulnerability reflects how the environment exposed to the hazard is affected by it. An increase in sea level of 50 cm will not reduce land on a sharp coastline in the same way it would on a gently sloping gradient. Social vulnerability reflects how the people and socio-economic systems exposed to the hazard are affected by it. Social vulnerability (and adaptive capacity) is dependent on financial, physical, social, natural and human capital (Brooks et al., 2005; Yohe and Tol, 2002; Adger and Kelly, 1999). At local level it may be that one village is exposed to a drought but that an elderly woman is at greater risk than a working age man. Her social vulnerability is higher because of her dependence on natural resources and poorer health means that her livelihood is vulnerable to a reduced availability of water; compared to the man who is better educated and mobile and earns his living through non-natural resource-dependent commercial enterprise (e.g. a shopkeeper). Social vulnerability is also contingent upon factors such as gender, ethnicity and age. To reflect this, gender-sensitive approaches to climate risk assessment are being advocated, and will also be followed here (Bunce and Ford, 2015; Morchain et al, 2015). Nuanced understandings of the nature of vulnerability are essential to identify how to build resilience through adaptive capacity, so that hazard exposure does not necessarily give rise to negative impacts.

3.2. Robust decision-making

The traditional approach to adaptation and building resilience was based on a top-down "predict-then-act" approach, relying on global climate model projections of future conditions. However, global climate models embody uncertainties. Whilst local planners are adept at dealing with uncertainty in spheres in which they are confident, in fields new to them – such as climate change – this can lead to confusion (Gottschick, 2015; Hallegatte, 2009). The lack of certainty in information impedes the identification of an optimal decision, and hence can cause delays in proactive adaptation. To overcome this challenge, the process of mainstreaming climate change is contingent upon an approach of robust decision making. Robust decision making (RDM) is an alternative evaluation tool where the focus is on identifying options that will be appropriate under a range of plausible future climate scenarios (Watkiss et al, 2015). RDM has been widely used in developed countries (Hallegatte et al, 2012; Lempert and Groves, 2010). However, it is also adaptable for use in developing countries, for example where stakeholder-led elicitation of vulnerabilities can substitute where data