



How climate compatible are livelihood adaptation strategies and development programs in rural Indonesia?



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ABSTRACT

Achieving climate compatible development (CCD) is a necessity in developing countries, but there are few examples of requisite planning processes, or manifestations of CCD. This paper presents a multi-stakeholder, participatory planning process designed to screen and prioritise rural livelihood adaptation strategies against nine CCD criteria. The process also integrated three principles of adaptation pathways: interventions should be (1) 'no regrets' and maintain reversibility to avoid mal-adaptation; (2) address both proximate and underlying systemic drivers of community vulnerability; and (3) linked across spatial scales and jurisdictional levels to promote coordination. Using examples of two rural sub-districts in Indonesia, we demonstrate the process and resulting CCD strategies. Priority strategies varied between the sub-districts but all reflected standard development interventions: water management, intensification or diversification of agriculture and aquaculture, education, health, food security and skills-building for communities. Strategies delivered co-benefits for human development and ecosystem services and hence adaptive capacity, but greenhouse mitigation co-benefits were less significant. Actions to deliver the strategies' objectives were screened for reversibility, and a minority were potentially mal-adaptive (i.e. path dependent, disproportionately burdening the most vulnerable, reducing incentives to adapt, or increasing greenhouse gas emissions) yet highly feasible. These related to infrastructure, which paradoxically is necessary to deliver 'soft' adaptation benefits (i.e. road access to health services). Only a small minority of transformative strategies addressed the systemic (i.e. institutional and political) drivers of vulnerability. Strategies were well-matched by development programs, suggesting that current interventions mirror CCD. However, development programs tackled fewer systemic drivers, were poorly coordinated and had a higher risk of mal-adaptation. We conclude that the approach is effective for screening and prioritising no regrets CCD, but more extensive learning processes are necessary to build decision-makers' capacity to tackle systemic drivers, and to scrutinise potentially mal-adaptive infrastructural investments.

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Introduction

Integrating climate change into development decision-making to achieve 'climate compatible development' (CCD) is a pressing challenge (Mitchell and Maxwell, 2010). Decision-makers must identify interventions which simultaneously achieve the co-benefits of reducing poverty, enhancing communities' capacity to cope with current and future climate and other shocks, and mitigating greenhouse gas emissions (Ellis et al., 2013; Butler et al., 2014a; Suckall et al., 2015). However, the increasing frequency, magnitude and extent of natural hazards caused by global environmental change, the growing exposure of marginalised communities with limited power and agency, and the mismatches between top-down adaptation interventions and local cultural practices and institutions limit effective responses (Hardee and Mutunga, 2009; Artur and Hilhorst, 2012). These decision-making difficulties are becoming recognised by researchers and decision-makers alike, and new assessment and planning approaches that better account for them must be developed (Ranger and Garbett-Shiels, 2011; Conway and Mustelin, 2014).

In this regard, 'adaptation pathways' is gaining prominence as a powerful concept, metaphor, analytical framework and planning tool for helping individuals or agencies in diverse contexts to reframe and diagnose the nature of their adaptation challenges, and reveal the adaptation interventions and their possible sequencing along multiple pathways based on understanding of the types of decisions needing to be made, the lifetimes and flexibility of decisions, and the need for transformation (Werners et al., 2013; Wise et al., 2014). In so doing, an adaptation pathways perspective and approach can provide the necessary guidance and clarity to decision-makers in their planning and implementation of adaptive learning and management for dealing with uncertainty, inter-temporal complexity, ambiguous goals or cross-jurisdictional impacts (Reeder and Ranger, 2011; Haasnoot et al., 2013; Wise et al., 2014). In developing countries, however, there is a need to integrate climate change considerations into rapid and often poorly-coordinated decision-making, and to engage multiple stakeholders, including marginalised communities, into the process (Butler et al., 2014a, 2016a). This requires transitioning the governance of existing planning processes at the relevant scale, and the priming of stakeholders to implement change with improved information, skills and decision-making tools and processes (Butler et al., 2016b).

Three adaptation pathways principles are relevant for the planning of CCD. First, development programs must maintain flexibility and reversibility to avoid foreclosure of future decision options, and should be 'no regrets' to avoid locking communities into undesirable or mal-adaptive development trajectories which are path dependent, disproportionately burden the most vulnerable, reduce incentives to adapt or increase greenhouse gas emissions (Barnett and O'Neill, 2010; Fankhauser et al., 1999; Hallegatte, 2009). Second, development programs should aim to address both proximate and systemic drivers of community vulnerability, which necessitates combinations of responses that simultaneously and sequentially help fulfil immediate basic needs, build resilience, and facilitate transformation of the aspects of the societal context that impede the capacity of decision makers to make well-adapted decisions (Pelling, 2011; Wise et al., 2014). Third, interventions should be linked across spatial scales and jurisdictional levels to promote coordination and further reduce risks of mal-adaptation (i.e. actions that impact adversely on or increase the vulnerability of other systems, sectors or social groups; Barnett and O'Neill, 2010).

There is limited guidance and experience to date, however, on how to design and implement adaptation pathways to support CCD in the context of rural communities' livelihoods in developing countries. In these situations development is an urgent priority, capacity at all levels is limited, social-ecological systems are highly vulnerable to global environmental change, and systemic factors are preeminent amongst the causes of vulnerability. Consequently there is an urgent need to 'leap frog' the Sustainable Development Goals before potentially extreme climate change impacts emerge in the mid- to late century (Butler et al., 2016c). To this end, a 4-year project was carried out in Nusa Tenggara Barat (NTB) Province, Indonesia, to introduce a governance transition for rural development planning. The project mimicked the government's annual integrated top-down and bottom-up village development planning process with relevant decision makers and stakeholders, and introduced them to adaptation pathways principles and the methods and tools required for CCD decision-making. In doing this, the project exposed stakeholders in case study sub-districts to a modified approach to their standard planning process and built their capacity for CCD planning (Butler et al., 2016b).

This project, its methods and results are the focus of this special issue (Butler et al., 2016a). Other papers present the participatory processes and associated tools developed and tested, including the analytical framework used in planning workshops (Butler et al., 2016c), mapping of stakeholders' knowledge cultures (Bohensky et al., 2016), modelling tools (Rochester et al., 2016; Skewes et al., 2016), climate projections (Kirono et al., 2016; McGregor et al., 2016), and qualitative and quantitative evaluations (Butler et al., 2016b; Liu et al., 2016). This paper examines the final stage of the participatory planning process, which integrated the perspectives of multi-level stakeholders to determine prioritised adaptation strategies for case study sub-districts. The objectives of this paper are to (1) present the process and tools developed to formulate CCD, and (2) analyse the resulting strategies relative to the three principles of adaptation pathways discussed above, and thus reflect on the method's strengths and weaknesses.

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