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# Climate policy integration in the land use sector: Mitigation, adaptation and sustainable development linkages

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### ABSTRACT

This article re-conceptualizes Climate Policy Integration (CPI) in the land use sector to highlight the need to assess the level of integration of mitigation and adaptation objectives and policies to minimize trade-offs and to exploit synergies. It suggests that effective CPI in the land use sector requires i) internal climate policy coherence between mitigation and adaptation objectives and policies; ii) external climate policy coherence between climate change and development objectives; iii) vertical policy integration to mainstream climate change into sectoral policies and; iv) horizontal policy integration by overarching governance structures for cross-sectoral coordination. This framework is used to examine CPI in the land use sector of Indonesia. The findings indicate that adaptation actors and policies are the main advocates of internal policy coherence. External policy coherence between mitigation and development planning is called for, but remains to be operationalized. Bureaucratic politics has in turn undermined vertical and horizontal policy integration. Under these circumstances it is unlikely that the Indonesian bureaucracy can deliver strong coordinated action addressing climate change in the land use sector, unless sectoral ministries internalize a strong mandate on internal and external climate policy coherence and find ways to coordinate policy action effectively.

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## 1. Introduction

The 5th Assessment Report of the Intergovernmental Panel on Climate Change calls for a form of development that ‘combine[s] adaptation and mitigation to realize the goal of sustainable development’ (Denton et al., 2014). The main justification for this integrated approach to climate change adaptation and mitigation is that climate resilience, or the ability of socio-ecological systems to recover from climate change impacts, and consequently to adapt to climate change, is linked to whether we also achieve climate change mitigation (New et al., 2011). Combining the two climate policy objectives requires exploitation of synergies, minimization of trade-offs and development of institutional linkages between adaptation and mitigation (Swart and Raes, 2007).

Somewhat surprisingly, the literature on climate policy integration (CPI) has rarely examined the interactions between climate change adaptation and mitigation in depth. It has instead typically discussed mainstreaming climate change: integrating *either* climate change mitigation *or* climate change adaptation with sectoral policies (Adelle and Russel, 2013). CPI studies draw heavily on environmental policy integration (EPI) literature and highlight the importance of addressing trade-offs between climate change and sectoral policy objectives, indicate that mainstreaming is critical to support sustainability, highlight the distinct nature of timing of mitigation and adaptation, and the lack of linkages between the two climate change objectives in certain sectors (Jordan and Lenschow, 2010; Klein et al., 2005; Kok and de Coninck, 2007; Wilbanks et al., 2007). The linkages between mitigation and adaptation are more often considered in studies by climate change and international development scholars. These studies find that in the land use sector integrated approaches to mitigation and adaptation can help to reduce risk of impact damages, can help

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local people to address trade-offs and exploit synergies in agriculture and forestry and reduce threats to biodiversity and food security (Ravindranath, 2007; Verchot et al., 2007; Yohe and Strzepek, 2007). The major constraints to such integrated approaches are the gaps in knowledge about trade-offs and synergies at the local level and between local and global scales (Jones et al., 2007; Locatelli et al., 2015).

This paper develops a new conceptual framework for analyzing CPI that incorporates climate change mitigation with adaptation aims as opposed to focusing only on mainstreaming mitigation or adaptation into development policies. This redefines the concepts of internal and external CPI to consider the interactions between mitigation and adaptation. The framework is then used to examine CPI in the Indonesian land use sector, to analyze the evolution of the climate change policy architecture, and to explore how climate change, land use and development policies address interactions between these multiple policy objectives.

**2. Framework for integrating mitigation with adaptation in climate policy**

This section outlines the revised analytical framework for CPI that includes the integration of mitigation with adaptation policy objectives. The framework builds on the concepts of policy coherence among multiple policy objectives and vertical and horizontal dimensions of policy integration (Lafferty and Hovden, 2003; Persson, 2007). Yet, in the literature there is little consistency in the use of terms ‘policy coherence’ and ‘policy integration’. Their meaning has been interpreted differently and they are sometimes used interchangeably (Adelle and Russel, 2013; den Hertog and Stroß, 2013; Nunan et al., 2012; Russel and Jordan, 2010; Scobie, 2016). For analytical purposes we follow Nilsson et al.’s (2012) suggestion to use ‘policy coherence’ to refer to policy outputs and outcomes, or the consistency of multiple policy objectives and associated implementation arrangements, and ‘policy integration’ to refer to the integration of governance arrangements (administrative and organizational structures) and policy making processes. Consequently, we define CPI as the integration of multiple policy objectives, governance arrangements and policy processes related to climate change mitigation, adaptation and other policy domains. We discuss below the three key building blocks of the analytical framework in more detail.

*2.1. Integrating mitigation and adaptation objectives*

Unlike other definitions of CPI (Adelle and Russel, 2013; Kok and de Coninck, 2007), ours explicitly refers to integrating the two climate change objectives of mitigation and adaptation. In the land use sector there are many direct, indirect, positive and negative linkages between mitigation and adaptation (Locatelli et al., 2015). For example, adaptation strategies such as soil conservation can help sequester carbon (Maraseni et al., 2012). Yet, nitrogen fertilization and energy-intensive irrigation can increase carbon

emissions (Moser, 2012). Similarly, carbon market revenues can contribute to adaptation through diversification of livelihoods and improved resilience to climatic shocks (Campbell, 2009). Other mitigation measures, such as fast growing tree monocultures aimed at maximizing carbon sequestration may hinder adaptation (Ravindranath, 2007). The existence of these linkages means that it can be advantageous to integrate the two climate change objectives: doing so when devising climate change policies in the land use sector can avoid incoherence in policy design and lead to more effective outcomes.

Positive interactions generate co-benefits when a policy or action intended to achieve improved adaptation (or mitigation) outcomes also have a positive impact on mitigation (or adaptation). An approach is integrated if a policy or action is intended from the outset to contribute to both outcomes simultaneously to achieve synergies between them. But mitigation and adaptation co-benefits can also originate from non-climate policy objectives and actions and vice versa. These interactions are the most relevant ones for mainstreaming climate change objectives into sectoral policies. Negative impacts of mitigation or adaptation policies on one another and of non-climate policy objectives on either mitigation or adaptation are instances of trade-offs (Locatelli et al., 2015) (Table 1). This is not to say that integrated approaches require the merger of mitigation and adaptation institutions, policies or actions. They do, however, require the consideration of both objectives simultaneously in order to exploit synergies and minimize trade-offs (Swart and Raes, 2007).

*2.2. Internal and external climate policy coherence*

The interactions between mitigation and adaptation constitute the second building block of the analytical framework: the distinction between two different dimensions of climate policy coherence. The CPI literature refers to policy coherence as the consistency of climate change and non-climate policy objectives, also referred to as mainstreaming climate change (Adelle and Russel, 2013). Along similar lines, the EPI literature distinguishes between internal policy coherence, which refers to interactions between policy objectives within a single policy domain, and external policy coherence, which refers to interactions between different policy domains (Nilsson et al., 2012). However, the CPI and EPI literatures do not explicitly consider coherence between mitigation and adaptation objectives.

We refer to *internal climate change policy coherence* as coherence between climate change mitigation and adaptation, independently from whether it happens within or across policy domains (cf. Nilsson et al., 2012). In other words, *internal climate change policy coherence* refers to mutually beneficial practices (synergies and co-benefits) and the reduction of negative interactions (trade-offs) between mitigation AND adaptation. This kind of climate policy coherence has seldom been investigated in depth in the CPI literature. Conversely, we refer to *external climate change policy coherence* as positive interactions supporting mutually beneficial

**Table 1**  
 Types of interactions between adaptation, mitigation and non-climate objectives and actions.

General categories	Interaction categories	Label
Co-benefits/trade-offs	Adaptation with mitigation co-benefits/trade-offs	A → +M; A → -M
	Adaptation with other co-benefits/trade-offs	A → +O; A → -O
	Mitigation with adaptation co-benefits/trade-offs	M → +A; M → -A
	Mitigation with other co-benefits/trade-offs	M → +O; M → -O
	Non-climate action with co-benefits/trade-offs for adaptation	O → +A; O → -A
	Non-climate action with co-benefits/trade-offs for mitigation	O → +M; O → -M
Integrated approach	Integrated approach (simultaneous consideration of A and M objectives)	A&M → +A + M

M = mitigation; A = adaptation; O = non-climate policy objectives and actions; → ' results in'; + positive impact; - negative impact.

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