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Policy Coherence and Interplay between Climate Change Adaptation Policies and the Forestry Sector in Nepal

Sunita Ranabhat¹ · Rucha Ghate¹ · Laxmi Dutt Bhatta¹ · Nand Kishor Agrawal¹ · Sunil Tankha²

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Abstract

Least Developed Countries are likely to be hit the hardest by climate change and need focused efforts towards adaptation. Nepal recognizes that it needs to integrate climate change adaptation into various policies, but limited understanding of how to make these policies coherent is among the factors that hinder effective adaptation action. This can lead to wasted resources and lost opportunities. This paper applies concepts from policy coherence for development frameworks and policy content analysis to examine coherence in Nepal's climate and forest policies—and discusses the factors hindering effective implementation. The policies are analyzed at the horizontal/external level at three layers—motivation, measures, and planned implementation process. The paper finds that policies are more consistent on motivation level and adaptation measures, but are less coherent on implementation. The National Adaptation Programme of Action (NAPA) is more explicit in identifying institutions, organizations, roles and responsibilities, resource allocation (financial), and a monitoring and evaluation plan for climate change adaptation while other policies such as Climate Change Policy 2011, National Biodiversity Strategy and Action Plan 2014–2020, Forest Policy 2015, and Forest Sector Strategy 2016 have critical gaps in this area. This paper concludes that formulation of a policy, articulating targets, and mobilizing financial resources are in themselves not sufficient to effectively address climate change adaptation. Policy-based legislation is required, together with development of a supportive collaborative multi-stakeholder approach at different levels of governance, backed up by effective, collaborative monitoring and enforcement.

Keywords Adaptation · Climate change · Forestry sector · Least developed countries

Introduction

It is widely accepted that the least developed countries (LDCs) are likely to be the hardest hit by climate change, with the greatest threat being to the poor (Hallegatte et al. 2011; IPCC 2014). Many LDCs like Nepal are considered highly vulnerable to the impacts of climate change, with political instability, development failure, poor governance, and corruption exacerbating the climate crisis and compounding the problems resulting from fragile geography and underprivileged socioeconomic conditions (Sharma

2011). Moreover, limited capacity to cope with hazards associated with climate change impacts will accentuate the impacts (Kates 2000). Timely planned adaptation activities are essential to reduce the impacts of climate change. Nepal has been taking climate change adaptation measures at local level to help support the 1.9 million people considered to be highly vulnerable and the 10 million at risk from climate change (MoE 2010). The country is considered to be among the top 20 nations reporting adaptation initiatives (Ford et al. 2015), and its adaptation program was evaluated as among the top five by the United Nations Framework Convention on Climate Change (UNFCCC) Conference of the Parties held in December 2015 (COP 21). Nevertheless, the question remains whether Nepal is adequately prepared to adapt to climate change.

The Intergovernmental Panel on Climate Change (IPCC) describes adaptation as “adjustments in natural or human systems in response to actual or expected climatic stimuli and their effects which moderate harm or exploit beneficial opportunities” (IPCC 2014). Climate change adaptation can

✉ Sunita Ranabhat
sunita.ranabhat@icimod.org
sunita.ranabhat@gmail.com

¹ International Centre for Integrated Mountain Development (ICIMOD), Kathmandu, Nepal

² Erasmus University Rotterdam, Rotterdam, The Netherlands

be autonomous or planned. It is not considered to be an isolated area of policy, rather it needs to be integrated with other efforts, with a climate change dimension mainstreamed into all areas of policy making (Mickwitz et al. 2009; Urwin and Jordan 2008). The recent 2015 Paris Agreement called for the Parties to integrate adaptation into relevant socioeconomic and environmental policies and actions (England et al. 2016). Such mainstreamed approaches would help to increase policy coherence, minimize duplication and contradictory policies, avoid mal-adaptation, deal with trade-offs and capture opportunities for synergies (Jordan and Lenschow 2010; Juhola and Westerhoff 2011; Kok and de Coninck 2007).

In addition to mainstreaming into other sectors, the UNFCCC has also highlighted the need for policy coherence between climate change adaptation and mitigation policies, pointing to the synergies possible between the two. The idea has intuitive appeal as it connects mitigation and adaptation with natural resource management, biodiversity conservation and, in the case mitigation services through forests, afforestation and combatting deforestation. A classic example of such coherence is afforestation initiatives which contribute to local level adaptation by protecting against landslides and run-offs while also providing carbon sequestration. The contrary is also a possible danger, such as when development initiatives which are ostensibly related to increasing resilience and reducing vulnerability would, if their environmental impacts are misunderstood or under-emphasized, exacerbate climate change and its impacts, especially at the local level. Thus, policy coherence between climate change mitigation and adaptation policies is also important.

Policy coherence is desirable (May et al. 2005) because different policies interact at the operational level and this can influence their effectiveness (Oberthür and Gehring 2006). Huttunen et al. (2014) demonstrated that supportive policies in one sector are made inefficient by unsupportive policies, instruments, and practices in others. It is thus important to know whether different but related policies share common goals, as well as whether they are contradictory in any way (Behboudi et al. 2015). The need for policy coherence is more acute for LDCs because better coordination and coherence will reduce duplication and fragmentation and, efficiently pool and utilise limited resources to achieve common objectives (Duraiappah and Bhardwaj 2007).

Despite recognition of the importance of integrating climate change adaptation into sector policies, this happens in practice infrequently. Studies on policy coherence in the natural resources sector find that few have taken climate change adaptation needs into account (e.g., Gomar et al. 2014; Kalaba et al. 2014; Makkonen et al. 2015; Nilsson et al. 2012) and this is the case in developed as well as

developing countries. Urwin and Jordan (2008) found sectoral policies in the United Kingdom rarely addressed adaptation, while in Malawi, Zambia, and Tanzania, England et al. (2016) found that water, agriculture, and climate change related policies and strategies are strongly focussed on disaster management and planning rather than on adaptation. Challenges also exist in policy implementation. Nilsson et al. (2012) illustrated the problem with examples from the European Union (EU) in which policies were coherent at the level of objectives but contradictory at the level of implementation. Studies on policy coherence and climate change adaptation in developing countries are rare, and this is especially the case for Nepal. As a LDC, Nepal has hardly contributed to climate change but is highly vulnerable to its impacts. Policy makers recognize the importance of climate change and they have integrated these concerns into sectoral policies, paying attention to both adaptation and mitigation issues. Nevertheless, lack of policy coherence remains among the many factors that could hinder effective adaptation action (Regmi and Bhandari 2012),

Given the number of major new policies which have been developed and adopted in a relatively short period of time, in most cases through donor financed initiatives, the question arises whether these policies are coherent amongst themselves or whether they are contradictory and create significant trade-offs. Moreover, these policies are in sectors where different interests are in tension both in terms of strategies and interests. For example, forest sector strategies need to mediate between the competing interests of income generation through the exploitation of timber and non-timber forest products and the demands of forest and biodiversity protection, which also contribute to climate change mitigation and adaptation. Thus, examining coherence within Nepal's climate change policy frameworks is important.

In this paper, we therefore try to find out how coherent are Nepal's various policies on climate change adaptation by studying the documents formulated after the policy development process was sensitized to the impacts of and vulnerability to climate change. In particular, we focus on Nepal's national level forest, biodiversity, and climate-related policies for adaptation. We do so because like in many other LDCs, in Nepal too, livelihood systems of the poor are often closely linked to the environmental services, especially those from forests, which play an important role in reducing vulnerabilities and provide opportunities for formulating adaptation strategies (Bele et al. 2011). Moreover, forest conditions are deteriorating and biodiversity is suffering as a result of climate change (MoE 2010).

This study employs concepts from the policy coherence for development (PCD) framework and uses content analysis on several policies relevant to climate change

adaptation in Nepal to analyze the degree of coherence in these policies at horizontal level, asking following research questions:

- What are the motivators, measures and implementation plan for integrating climate change adaptation in the policies of developing countries like Nepal? And,
- How coherent are the forestry sector and climate change policies in Nepal in addressing climate change impacts?

In doing so, our analysis will provide (a) more comprehensive understanding of the Nepal's integration to climate change adaptation in sectoral policies, (b) give information about the factors hindering the effective implementation of the policies in terms of identifying where policy inconsistencies lie, and (c) suggest ways of addressing them.

Climate Change Initiatives in Nepal

Nepal has taken several measures to deal with climate change at a policy level. It joined the international treaty on climate change—the UNFCCC—in 1992 and included climate change in its national agenda (GoN 2011a). The Sustainable Development Agenda prepared in 2003 included climate change concerns in the development pathway (Tiwari et al. 2014). Nepal has actively participated in international climate negotiations, and was chair of the LDC Co-ordination Group for two years in 2013 and 2014 under the UNFCCC process.

The Constitution of Nepal (2015) addressed the environment, which is associated with climate, and Nepal's Three-Year Interim Plan (the 11th Three Year Plan, 2007/08–2009/10) gave priority to the climate change agenda. In line with national and international commitments related to climate change, Nepal developed several policies, including the National Adaptation Programme of Action (NAPA) 2010, Climate Change Policy 2011, and Local Adaptation Plan of Action (LAPA) 2011, and endorsed Climate Resilient Planning (NPC 2011), and the Mountain Initiative 2010, among others. In December 2015, Nepal submitted its Second National Communication to UNFCCC. A Low Carbon Economic Development Strategy, REDD + Strategy, and National Action Plan (NAP) are in the process of formulation.

Nepal's government has constituted a Climate Change Council (CCC) under the chairmanship of the Prime Minister for high level coordination and climate change related policy formulation and implementation. Similarly, a Multi-Stakeholder Climate Change Initiatives Coordination Committee (MCCICC) has been formed under the chairmanship of the Secretary of the Ministry of Science, Technology and Environment (MoSTE), focusing on effective coordination and implementation of collaborative programs on climate

change. The committee has representatives from relevant ministries and institutions, international and national non-government organizations, academia, the private sector, and donors (MoE 2010). More recently, the government declared its intention of establishing a climate change centre to conduct climate change research and monitoring.

The government has adopted a Climate Change Budget Code system to facilitate tracking of climate expenditure and maintenance of financial records to help build a climate financing framework (NPC 2012). It allocated 10.4% of its 2013/14 budget (5.8% direct, 4.6% indirect) to climate funding (GoN 2014), which increased to 10.7% of total budget in 2014/15 and 19.5% in 2015/16 (5.7% direct, 13.8% indirect). More than half of Nepal's climate finance comes from bilateral and multilateral funding (Dixit et al. 2016). Between 1997 and 2014, donors committed US\$ 652.4 million to climate finance (Bird 2011), and various national adaptation projects are ongoing supported by various bilateral and multilateral funding agencies, including the UNFCCC, the UN, and INGOs (Dixit et al. 2016). Between 2009 and 2014, USD 538.24 million was invested in adaptation activities, of which 44.4% was allocated to forest and biodiversity, 16.4% to disaster risk reduction, 3.2% to capacity building activities, 9.1% to agriculture and food, 0.01% to urban settlements, and 26.9% to other sectors (Oxfam 2014).

Nepal's original forest and biodiversity related policies such as the Master Plan for the Forestry Sector (MPFS) 1988–2011, Revised Forest Sector Policy 2000, and National Biodiversity Strategy 2002 were formulated before climate change was fully recognized as an issue and did not include any climate change elements. Following substantial changes in the socio-political, economic, and environmental context of the country, the government has revised many policies and included climate change as an integral component. Climate change issues—both adaptation and mitigation approaches—have been included in the Forest Sector Strategy 2016, Forest Policy 2015, and National Biodiversity Strategy and Action Plan 2014–2024, among others. These efforts are in line with the understanding that success in adapting to climate change will depend on meaningful policy integration and the extent to which policies support each other in addressing climate change issues (Mickwitz et al. 2009). Despite, the integration of climate change adaptation in both climate change and sectoral policies, there is lack of studies on policy coherence between climate change adaptation and forest sector policies, especially in Nepal.

Policy Coherence: Definitions and Analytical Frameworks

In recent years, the study of policy coherence has gained increased attention (Harahap et al. 2017) though the issue is,

as Carbone (2008) notes, “contentious”. Policy coherence has been defined as “synergies and systematic support towards the achievement of common objectives within and across individual policies” (Hertog and Stross 2011, cited in Nilsson et al. 2012) while May et al. (2005) indicate that “policy coherence is a relative term that relates to the degree of integration of relevant components (of a policy)”. Coherent policies are expected to reduce conflicts and contradictions and promote synergies between and within different policies (Carbone 2008; Nilsson et al. 2012), leading to better efficiency and reducing competition for the same budgets and resources (Akhtar-Schuster et al. 2011).

While policy coherence is relevant across the board, PCD has resonated more strongly because of the inherent and heightened risk of contradictions in development interventions. PCD emerged in the donor community when it was noticed that developed countries’ aid and non-aid policies, often in the competing arenas of aid and trade, were often working at cross purposes and cannibalizing initiatives in developing countries. In recognition of this, PCD was integrated into fundamental law of the EU in 1992 and embedded in the European Consensus on Development in 2006. PCD has also been championed by the Organization of Economic Cooperation and Development (OECD) since the 4th High Level Forum on Aid Effectiveness in Busan, Korea. PCD, therefore, includes not just a focus on avoiding contradictory policy approaches across and within sectors but increasingly a focus on trying to create and leverage synergies among different policy arenas. Indeed, EU aid policies are one of the key areas in which policy coherence has been studied and debated (Carbone 2008).

PCD is an especially relevant issue for climate change policies across the LDCs, including Nepal, because most climate and cognate sector policies in these countries are developed in close cooperation with a multitude of donors. As policy incoherence is caused not only by political, administrative and insitutional reasons, but even by cognitive reasons (Hoebink 2005a, 2008) as a lack of knowledge concerning the wider effects of policy decisions and conflictng legitimate interests may easily lead to policy incoherence (Siitonen 2016). Thus, identifying the presence and degree of policy incoherence is in itself a useful first step as it begins to indicate the presence of problems in the minds of policymakers. To measure the degree of policy coherence various conceptual frameworks have been developed such as policy integration, policy interaction, or policy consistency (Harahap et al. 2017). Policy coherence studies have tended to focus either on procedural aspects (OECD 2002; CEC 2009; Kivimaa and Mickwitz 2009) or on policy output aspects (Nilsson et al. 2012; Kalaba et al. 2013; Makkonen et al. 2015; Harahap et al. 2017). The former focus on policy making processes while the latter focus on assessing policy outputs, which

can be done at three levels: policy objectives, policy instruments, and implementation practices (Nilsson et al. 2012).

Our study engage more with this latter perspective on policy coherence in terms of its content. In this approach, the investigation of policy objectives provides an extensive view of the extent, which may involve significant trade-offs, that are embedded within the policies under consideration. Therefore, the motivation behind the different components in policies is an important factor of study. When policy is considered as a form of practice including planning, formulation of targets and measures, and implementation (Larsen and Powell 2013), it is necessary to explore the cohrence in those motivators that influence policy making, especially if policy making is largely driven by external factors as in the case of climate change adaptation in LDCs (Ojha et al. 2015). Meanwhile, the study of the policy instruments or measures provides a more grounded approach to potential interactions among the policies, indicating key areas of potential conflict, synergies and trade-offs. Finally, implementation schemes illustrate which agencies and organizations play complementary or overlapping roles and to which extent these are compatible. In addition, looking at implementation plans can provide information about relevant gaps that could negatively affect policy execution and provide clues on how to avoid these.

Policy coherence can also be analysed vertically and horizontally. Vertical policy coherence refers to “coherence between different levels of government” (Geerlings and Stead 2003), while horizontal policy coherence refers to “coherence between policy areas at one level” (Nilsson et al. 2012). In the EU and OECD, these levels are identified as internal, intra-governmental and inter-governmental, multilateral and multistakeholder. In our research, we focus mostly at the national level which includes also the donor community. Combining these insights and buidling on (Nilsson et al. 2012), we analyzed policy coherence in terms of its content at horizontal/external level at three policy layers: motivation, measures, and planned implemenation process.

Methodology

We analyzed five documents (see Table 1) to discover the underlying motivation for including climate change adaptation provisions. This can help show whether the attention given to climate change adaptation is essentially just ticking boxes to fulfill requirements or is a thought-out action. Since forests can play a contribution in reducing the vulnerability of society to climate change (Locatelli et al. 2010), we further analyzed the policies to see whether forest-related climate change adaptation measures are

Table 1 Policy documents reviewed and their key provisions on climate change adaptation

Document	Year of publication	Key provisions on climate change adaptation	Ministry
National Adaptation Programme of Action (NAPA)	2010	<ul style="list-style-type: none"> • More than 80% of fund allocation for ground-level climate change activities • Sector-wise prioritized adaptation measures for implementation, monitoring, and evaluation. 	Ministry of Population and Environment (MoPE)
Climate Change Policy (CCP)	2011	<ul style="list-style-type: none"> • Implementing priority actions identified in NAPA • Support for climate-friendly and resilient socioeconomic development, • Building capacity and technology development, transfer, and utilization • More than 80% fund allocation for ground-level climate change activities. • Conducting climate change related research 	MoPE
National Biodiversity Strategy and Action Plan (NBSAP) 2014–2020	2014	<ul style="list-style-type: none"> • Implementation of ecosystem-based adaptation programs • Promoting environmentally-friendly farming systems and climate smart agriculture programs • Adopting climate smart planning by community forest user groups (CFUGs) by 2020 • Promoting payment for ecosystem services (PES) as an income generating activity by forest dependent local communities • Promoting sustainable forest management for climate change resilience of forests 	Ministry of Forest and Soil Conservation (MoFSC)
Forest Policy (FP)	2015	<ul style="list-style-type: none"> • Increasing the capacity of local communities to adapt to the negative impact of climate change on ecosystems • Adaptation and mitigation friendly forest management plans as per land use • Access to technology, financial resources, and capacity development 	MoFSC
Forest Sector Strategy(FSS) 2016–2025	2016	<ul style="list-style-type: none"> • Increasing awareness and capacity of all stakeholders to respond to climate change • Implementing forest-related provisions of NAPA and LAPA • Promoting income diversification • Enhancing forest resilience to climate change • Ecosystem/community-based adaptation 	MoFSC

mentioned and whether these are consistent. Furthermore, we analyzed the policies for coherence in the policy implementation process, including the implementation plan, financial and human resource allocation for implementation, and monitoring and evaluation (M&E), as this is an important element for ensuring timely implementation (Saito 2013). Within the implementation plan, we tried to discover (1) whether changes are suggested in institutional set up in order to better handle climate change adaptation, (2) whether responsibilities have been allocated for each institution at different levels of governance, and (3) whether or not the timeline for implementation has been fixed.

According to Sharp and Richardson (2001), policy coherence and interaction are manifested in policy documents, plans, and programs, as well as institutional structures. Nepal's National Adaptation Programme of Action (NAPA), was adopted in 2010. NAPAs provide a process for LDCs to identify priority activities that respond to their urgent and immediate adaptation needs to climate change (Hardee and Mutunga 2010); sectoral policies formulated after adoption of the NAPA would be expected to incorporate a climate change adaptation dimension. Therefore, we identified policies related to climate change, forest, and biodiversity formulated after adoption of the NAPA. We collected these documents either by using internet search or by visiting the concerned ministries (Table 1). These policies were selected purposefully to find the coherency between climate change policies and forest sector policies.

Policy documents were analyzed using content analysis (Berelson 1952), which is a widely used method for analyzing policy coherence (Duraiappah and Bhardwaj 2007; Kalaba et al. 2014). Based on the factors mentioned in Table 2, we deductively coded each policy to see whether they include an adaptation component and whether they are coherent with each other. We entered all the coding and analyzed in them in Excel. Further, we supplemented the information from the documents with a review of the academic literature, press releases, and other government documents.

Table 2 Factors for policy coherence analysis

Factor	Aspect reviewed
Motivation	Drivers for integrating climate change adaptation in policies
Measures	Forest-related adaptation measures identified in policies
Implementation plan	Institutional set up, role, and allocation of responsibilities; timeline
Resources	Financial, human
Monitoring and evaluation	Implementation follow up, reporting, exchange of experience, incorporation of new knowledge

Results

Policy Consistency in Integrating Climate Change Adaptation

Five major motivators for the inclusion of climate change adaptation in policy were identified in the documents (Table 3). The one motivating factor mentioned explicitly in all five documents is the observed impact of climate change and the need for the country to respond strategically to the changing climate. The NAPA provides detailed information on observed climate change impacts in six major areas, including forests and biodiversity. The Climate Change Policy (CCP) also acknowledges, although briefly, changes in the annual rainfall cycle, intensity of rainfall, length of drought periods, and increase in temperature, and the impact of these on different sectors. Similarly, the National Biodiversity Strategy and Action Plan (NBSAP) states that climate change is a major threat to biodiversity and the people who depend on it, particularly in the form of a shift in agro-ecological zones, spread of invasive alien plant species, and depletion of wetlands, among others. Both the Forest Policy (FP) and the Forest Sector Strategy (FSS) highlight climate change as a major issue likely to impact forests and forest-dependent communities.

Donor commitment on climate finance is another factor influencing policy, as both member states and beneficiaries are supposed to revise policies towards addressing climate change impacts. Nepal's major policy documents on forests, biodiversity, and climate change all tend towards tapping international climate finance. At the same time, foreign aid plays an integral part in policy formulation and implementation. For example, the NBSAP was prepared with financial support from the Global Environment Facility (GEF) through the United Nations Environment Programme (UNEP). Similarly, the United Nations Development Programme (UNDP), GEF, the Danish Embassy, and the UK Department for International Development (DFID) all contributed to Nepal's NAPA project.

Table 3 Driving factors for integrating climate change adaptation as identified in policy documents

Factor	NAPA	CCP	NBSAP	FP	FSS
Observed climate change and its impacts	a	a	a	a	a
Gain international support	a	a	a	a	b
Compatibility with other policies	a	a	b	a	a
Being signatory to international treaties	a	a	a	b	b
Projection of climate change and its impacts	a	c	c	c	c

a = explicit, b = implicit, c = not mentioned

Both the forest sector and climate change policies have integrated climate change adaptation to ensure compatibility with the NAPA. The FSS notes “implementing the forestry-related provisions of NAPA through participatory, transparent, community-based and gender and socially inclusive approaches” as the major goal, while the CCP mentions “implementing priority actions identified in the NAPA”. Nepal’s Three-Year Development Plan, which is referred to as the National Development Plan (MoE 2010), is in line with Nepal’s NAPA and states that the “adaptation programme will have been implemented in the areas designated by the NAPA”. Thus, Nepal’s development goals and the six thematic areas identified under the NAPA process seem to interface well with each other.

As a signatory to the UNFCCC and having ratified the Kyoto Protocol, Nepal is mandated to focus on managing climate change impacts either by formulation of new policies or by integrating climate change into sectoral policies. This is recognized explicitly in three of the documents and implicitly in the others. The NAPA was prepared in order to report on the country’s urgent and immediate adaptation needs in relation to climate change, while the CCP states that formulation of the new policy is to inform the parties of the UNFCCC about the implementation of the convention.

The projected impacts in Nepal of climate change as identified in some studies (e.g., OECD 2003; NCVST 2009) are only mentioned in the NAPA, which refers to the likelihood of marked warming with reduced snowfall and ice coverage, increased climatic variability with more frequent extreme events (cloudbursts, floods, droughts), and an overall increase in rain in the wet season but decreased rainfall in the mid-hills.

Policy Consistency in Identifying Forest Related Adaptation Measures

Forest plays an important role not only in mitigating climate change but also in adaptation. It is crucial that forest-based adaptation measures are included in adaptation policies and practices, as they can help reduce social vulnerability (Locatelli et al. 2010). It is important to remember that the forest itself also needs to adapt to the detrimental effects of climate change. The forest-related adaptation measures identified in the five policy documents are summarized in Table 4.

Sustainable forest management is widely recognized in all the policies as an instrument for addressing the impacts of climate change, especially for communities living in proximity to forest. The CCP clearly mentions “prioritizing and implementing programmes on the sustainable management of forest to address climate change impacts”, while NAPA promotes sustainable forest management to deal with climate change impacts. The NBSAP, FP, and FSS

Table 4 Policy consistency in forest-related adaptation measures

Measure	NAPA	CCP	NBSAP	FP	FSS
Sustainable forest management	I	I	I	I	I
Forest fire control	I	I	I	I	I
Sustainable water and soil conservation	I	I	I	I	I
Management in landscape level/ river basin level	I	I	I	I	I
Study and research	I	I	I	I	I
Awareness and capacity building of stakeholders	I	I	I	I	I
Income generation and empowerment	I	I	I	I	I
Community participation	I	I	I	I	I
Integrated planning among the sector	I	I	I	I	I
Management of wetlands	I	N	I	I	I
Management of non-timber forest products (NTFPs)	I	N	I	I	I
Control of invasive species	I	N	I	I	I

I identified, *N* not identified

highlight the need to increase forest area and productivity and ensure biodiversity conservation through sustainable management in order to improve climate change resilience.

In addition to anthropogenic factors, the risk of forest fire has almost doubled due to climate change (Khadka 2009; Schlossberg 2016), and forest fire control measures are identified in all the policies as needed for forest conservation. The NAPA advocates community-based forest fire management practices, the CCP and FP state that revenue generated from the sale and use of forest products will be used for forest fire control, and the FSS mentions the use of locally applicable technologies for managing fire.

All the policies include sustainable water and soil conservation and management at landscape or river basin level as an adaptation measure against climate change, and they all prioritize conducting research, in particular to assess vulnerability and risk to communities and ecosystems. They all emphasize the importance of awareness raising and capacity building of stakeholders—communities, NGOs, civil society, government officials—both through local institutional strengthening and by direct strengthening of capacity and mobilization.

The policies all acknowledge the fact that income generation and community development activities ultimately raise the living standard of communities and thus their adaptive capacity to climate change, and all propose efforts towards income diversification among the most vulnerable groups, while the CCP explicitly considers forest resources as a means for developing alternative livelihoods. All documents mention community participation in the

management of forest resources and implementation and planning of adaptation measures and other activities. And they all highlight the need to undertake integrated planning and implementation of adaptation measures among the different sectors, which is essential due to the intertwined nature of climate change and natural resources.

There are some inconsistencies between the CCP and the NAPA and sectoral policies in identifying forest related adaptation measures. For example, all policies except the CCP identify the management of wetlands, management of non-timber forest products (NTFPs), and control of invasive species as adaptation measures. Overall, the NAPA, NBSAP, FP, and FSS are more explicit in identifying forest-based adaptation measures than the CCP.

Policy Coherence in the Implementation Process of Climate Change Adaptation

The coherence of the different policy documents in terms of the suggested implementation process is summarized in Table 5.

Implementation plan

Clarity in defining the role of institutions in policy is needed to ensure effective implementation of plans and programs; without this, lack of ownership could increase conflict among implementing institutions. The NAPA and CCP clearly mention the Ministry of Population and Environment (MoPE) as the focal ministry for climate change issues. The MoPE is responsible for overall coordination of adaptation policy, for implementation at the local level, and for coordination among stakeholders and partners. The NBSAP, FP, and FSS also mention this ministry as responsible for cross-sectoral collaboration on climate

change response. MoPE's coordinating role at the policy level is supported by a CCC formed under the chairmanship of the Prime Minister. The NAPA also mentions formation of a Multi-stakeholder Climate Change Initiative Coordination Committee (MCCICC) under the chairmanship of the secretary of MoPE which aims to foster a unified and coordinated climate change response in Nepal (MoE 2010), but this provision is not mentioned in the other policy documents. Only the NAPA mentions the need to set up institutions at different levels of governance in order to implement climate change adaptation measures, and it provides details of the institutions required (Climate Change Program Coordination and Monitoring Unit and Regional Technical and Support and Coordination Unit at central level, Project Coordination Committee at project level, and District Coordination Committee at local level), in most cases with details of the representatives who should be included. The CCP talks about establishing a Climate Change Centre as a semi-autonomous technical institution for formulation and implementation of climate change-related programs and research, but lacks clarity on the participants. The CCP also mentions strengthening existing institutions working on climate change issues, expanding the function of existing climate-related institutions, and forming a working group for the implementation of policies and programs. None of the sectoral policies explicitly mention the need to set up an institution to address the climate change agenda. The FSS does state the need to strengthen the institutional capacity of existing institutions and to change organization of the forestry sector to respond to climate change, while the NBSAP and FP mention the need to establish institutions at different levels for overall coordination and monitoring of the biodiversity and forest management agenda, but don't describe a specific institutional set up for addressing climate change.

The NAPA explicitly lays out the roles and responsibilities of each institution described for implementing adaptation actions from central level to local level. The CCP gives a broader overview of the roles played by central level institutions. The NBSAP allocates the responsibility for implementing priority actions to already established agencies (government and non-government). While the FSS mentions the Ministry of Forest and Soil Conservation (MoFSC) as the key actor for responding to climate change in cross-sectoral collaboration with MoPE at national level. The NAPA, NBSAP, and FSS set a clear timeline for implementing policies in practice, but the CCP and FP do not.

Resources

Only the NAPA lays out a clearly estimated budget for implementing adaptation measures—US\$ 350 million. The

Table 5 Implementation process of climate change adaptation

Factors	NAPA	CCP	NBSAP	FP	FSS
Implementation plan					
Institutional set up	a	a	b	b	b
Allocation of responsibilities	a	b	b	c	b
Timeline	a	c	a	c	a
Resources					
Financial	a	b	b	b	b
Human	c	c	c	c	c
Monitoring and evaluation					
Implementation follow up	a	a	b	b	b
Reporting	a	a	b	c	b
Exchange of experience	a	a	b	c	b
Incorporation of new knowledge	a	c	c	c	b

a = explicit, b = implicit, c = not mentioned

CCP does not estimate the direct cost but does mention the establishment of a climate change fund for implementing programs related to climate adaptation and resilience, to be provided by the government, bilateral and multilateral agencies, national and foreign individuals, and organizations such as the UNFCCC. The NBSAP, FP, and FSS mention using funds received from the government, bilateral and multilateral agencies, the UNFCCC, and others to implement the activities mentioned in the policies, including climate change adaptation activities. Over the past three years, the government has increased the budgetary allocation for climate funding – from 10% of the total budget in 2013/14 to 19% in 2015/16. None of the policies address allocation of the human resources needed to carry out adaptation and mitigation measures.

Monitoring and evaluation

According to Ford et al. (2013), M&E is a “means for evaluating the effectiveness of adaptation support, informing governance at various levels on adaptation support, justifying funding allocation, and communicating to the public on adaptation”. Sound M&E is a way to reduce incoherence and increase synergy in the implementation of various policies (Picciotto 2004). In Nepal, the MoPE is primarily responsible for M&E of the implementation of the NAPA and CCP; MFSC is responsible for M&E of the implementation of forest sector policies; and the M&E sub-committee of the National Biodiversity Coordination Committee (NBCC), which has representatives from among government ministries, NGOs, academic and research institutions, and experts, is responsible for M&E of NBSAP implementation.

All five of the policies analyzed highlight the need for M&E, but the NAPA and CCP are more explicit than the sectoral policies on M&E related to climate change adaptation activities. The NAPA specifies that MoPE will be responsible for central level M&E, which will be administered by the Climate Change Programme Coordination and Monitoring Unit. District and local monitoring is to be carried out by local institutions. The M&E arrangements for the CCP are similar to those for the NAPA. The NBSAP, FP, and FSS only mention a broad M&E process for all forest and biodiversity activities. All policies acknowledge explicitly or implicitly the importance of following up on implementation activities to ensure timely improvement in any that are lagging behind schedule. The NAPA, CCP, and NBSAP indicate a central level reporting mechanism on the success or failure of activities, in the form of an annual or progress report, while the FSS mentions a mechanism for reporting progress to the National Forestry Forum (NFF) (annually) and to the public at large (via the web). All these policies have a provision to make the reports public. Only

the FP lacks a clear provision for reporting progress. The NAPA also discusses the need to incorporate new knowledge, both to ensure timely adjustments in ongoing projects and to design future adaptation projects; this is also mentioned broadly in the FSS, but is not mentioned in the CCP, NBSAP, or FP.

Discussion and Conclusions

Nepal has realized the seriousness of the impact of climate change. It is a signatory to various climate-related treaties, and is a beneficiary of financial incentives offered for integrating climate change issues. Biesbroek et al. (2010) identified a number of incentives in addition to financial ones that have motivated countries in Europe to develop their own National Adaptation Strategies and to take action, including public pressure, compelling information on climate change, and extreme events. As signatories to international treaties, most developing countries are adopting relevant environmental policies. However, access to climate finance from international agencies and donors has played a major role as it has helped policy formation on adaptation to climate change which countries such as Nepal may not have been capable of on their own (Helvetas 2011; Ojha et al. 2015). Both scientific facts and local perceptions of the changing climate have persuaded governments to integrate specific provisions to tackle climate change in various policies, however no clear hierarchy can be discerned among the various motives (Biesbroek et al. 2010).

The role of forest in enhancing livelihoods at the micro level and mitigating climate change at the macro level has been widely acknowledged in many studies (e.g. Locatelli et al. 2010; Nkem et al. 2010; Pandey et al. 2016). In Nepal, forest-related adaptation activities are important in all sectors of development including infrastructure, livelihoods, and agriculture. Besides supporting forest and biodiversity conservation, the adaptation activities also support livelihoods and local employment, promote water availability, and support agriculture and livestock (GoN 2011b). Nepal's adaptation action plan prioritizes conservation and management of forests as an adaptation strategy and allocates more than 40% of climate finance to it, clearly indicating the importance of forests in adaptation to and mitigation of climate change impacts.

Policies may be coherent in their stated objectives, and even in the instruments proposed to achieve the objectives, but lack of synergy at implementation level can prove to be a major hindrance (Nilsson et al. 2012). Policies need to be clear regarding the implementation process including specifying the institutional structure for implementation, the role and responsibilities within implementing institutions, the required resources, the timeline, and arrangements for

M&E. In Nepal, the MoPE has been identified as the focal agency for dealing with climate change adaptation through climate-related policies, and as the cross-sectoral collaborating agency. However, there is a lack of coherence in defining the role of the CCC and MCCICC in sectoral policies. Although Nepal has shown a serious commitment to climate change response by formulating a climate sensitive budget, revising policies to make them climate sensitive, and setting up institutions at different levels, it is still trailing behind in making these functional. For example, the CCC which is designated as the apex political body responsible for guiding climate change policies has been almost dormant since 2012. This indicates that the government may be prioritizing other policies for implementation, even though climate change adaptation is a national agenda as made clear in all the documents analyzed here. A similar situation has been observed in Cameroon (Brown et al. 2010), which also give high priority to mitigation and adaptation measures related to climate, but find these superseded by even more urgent problems like poverty reduction and employment generation. In pluralist societies due to political interest conflict between parties and pressure groups, it may not be possible to find optimal solutions that satisfy all parties concerned and achieve all the prioritized objectives (Hoebink 2005b).

We therefore conclude that Nepal's climate change adaptation policies broadly defined are substantially coherent in their stated objectives, motivations and instruments but are less so in implementation and M&E, where the responsibilities are poorly defined and fragmented across multiple agencies. We find this to be an area of major concern.

Successful implementation of any policy depends on the organizational structure and work culture of an organization. In Nepal, despite the provision of institutional reforms for policy implementation, often only limited success is achieved due to the lack of clarity on roles and responsibilities (Regmi et al. 2014). A dearth of financial resources can also play a role, but at times lack of success is more the result of a lack of flexibility with respect to the changes needed in the social-political, economic, and environmental context (GoN 2016a). A failure to allocate appropriate human resources, both qualitative and quantitative, can also lead to a failure of policies as implementation becomes unfeasible; lack of adequate staff for management and enforcement of policy implementation can be a major impediment (Dongol and Heinen 2012). Similarly, M&E, an important factor in ensuring implementation of a policy, can prove to be ineffective in the absence of clear and specific rules and responsibilities.

An unstable political situation, low institutional capacity, inadequate human resources, lack of supporting legislation, and lack of communication among implementing agencies

can all create challenges to implementation and hinder intersectoral synergy (Dixit et al. 2016). Nepal has been successful in local level adaptation activities, but these are mainly concerned with urgent and immediate adaptation programs rather than long-term adaptation strategies, with more than 80% of adaptation priorities at local level related to livelihood concerns rather than risk reduction (Regmi and Bhandari 2013). In other words, these are primarily development projects and secondarily climate change adaptation initiatives. The concern is how sustainable these adaptation programs will be. Many are implemented in project mode with short-term funding from donor agencies, and although most of the climate change-related policies mention that more than 80% of the climate change budget should be transferred to local people, in practice the low institutional capacity means that less than half of the funds are actually transferred at VDC, DDC, or municipality level (Dixit et al. 2016).

Absence of ownership, lack of inter and intra sectoral coordination, and limited networking and information sharing from central to ground level also hamper coherent policy implementation. Although various institutions have been established or are in the process of being set up for the climate change agenda, as yet there is no real synchronized policy implementation in Nepal. The institutions identified by the NAPA are not acknowledged by the other policies for implementing climate change adaptation activities. At the same time, implementation of project-based programs for climate change adaptation involves different institutional mechanisms based on donor agencies, which sometimes overlap or contradict each other. A similar lack of coordination has also been observed in sectoral policies in Zambia, another LDC (Kalaba et al. 2014). Since effective and collaborative monitoring and enforcement of policy is vital for the successful climate change adaptation, we recommend that there should be collective agreement between climate change policies and sectoral policies for both monitoring and law enforcement by defining institutions, and their roles and their responsibilities.

Many studies have identified a multi-stakeholder engagement approach at different levels of governance as a means of increasing coherence and overcoming barriers to implementation (Atela et al. 2016; Regmi et al. 2014). The NAPA mentions use of a multi-stakeholder approach at different levels of governance for policy formulation and implementation. Nevertheless, the provisions are vague and we recommend that these approaches be more clearly spelled out to involve the relevant stakeholders at all levels of policy design and implementation.

Policies are guidelines, legislative provisions are the real instruments to implement a policy, thus policies require supporting legislation (Helvetas 2011). Inadequate legal frameworks hinder policy implementation (Colchester et al.

2006). In order to operationalize the climate change adaptation policies, it is first necessary to formulate a legal instrument for the CCP and amend the Forest Act and Forest Regulations to include climate change aspects. Five years after the CCP was formulated, a lack of legal instruments, low institutional capacity, and insufficient resources are still creating challenges to timely implementation. Therefore, we would recommend that the Nepalese Parliament legislate appropriately on implementing the climate change adaptation policies it has adopted, including with respect to the Forest Act and Forest Regulations.

An area for further research regards resource adequacy and mobilization. Implementing policies requires the necessary resources, but the question remains whether Nepalese institutions have sufficient resources and technical capacity, including for effective monitoring and enforcement. Even though the recent fiscal year budget for 2016/17 has given priority to developing the national capacity for addressing the impacts of climate change (GoN 2016b), the implementation of many critical initiatives remains unfunded. This is partly because Nepal also faces governance challenges at all levels as a result of political instability (Dongol and Heinen 2012) and this has affected fiscal planning and the central budgeting system and had a marked impact on the government's other development programs (Regmi and Bhandari 2012). Resolving this will be critical to addressing climate change impacts in Nepal.

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Compliance with Ethical Standards

Conflict of Interest The authors declare that they have no conflict of interest.

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