



Mainstreaming climate change mitigation actions in Nepal: Influencing factors and processes

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ABSTRACT

This study aims to investigate the influencing factors and the processes for incorporating climate change mitigation actions into policies in the non-environment sector in Nepal. We use semi-structured interviews with policy actors such as national and sub-national policymakers, and respondents from the private sector and international development organizations active in Nepal. We also use thematic, narrative, and focused coding to analyze narrative data obtained from 12 respondents, and qualitative analysis of textual data from six non-environment sector policies to generate insights into the mainstreaming of climate change mitigation actions. A major finding from the study is that global environment-related initiatives like the Paris Agreement and the Sustainable Development Goals, and the green growth concept that aims to mitigate greenhouse gas (GHG) emissions, are influencing the policy discourse in Nepal. Consequently, climate change mitigation actions are integrated either as add-ons or as overriding policy objectives in non-environment sector policies. Our conceptualization of mainstreaming moves beyond the mere integration of policy objectives to focus on the collaborative practices of policy actors, the influencing factors, and the processes for incorporating climate change mitigation actions across non-environment sector policies.

1. Introduction

Many low-income countries, including Nepal, tend to focus more on climate change adaptation than on mitigation. However, the global environment-related initiatives such as the Paris Agreement and the Sustainable Development Goals (SDGs), and environmentally focused economic growth frameworks like green growth, encourage policymakers from low-income countries to focus on climate change mitigation too. For developing countries in Asia, climate change mitigation and green growth have appeared on governments' agendas for a range of reasons, including the desire to achieve energy security, pursuing technological advantages, and addressing local environmental problems (Turner, 2014). Green growth is defined as any strategy "that fosters economic growth and development while ensuring that natural assets continue to provide the resources and environmental services on which our well-being relies" (Organization for Economic Co-Operation and Development (OECD, 2011)). Green growth has broad coverage and application across all critical economic sectors, and its linkage to

development agendas in emerging Asian economies means that climate change mitigation and green growth frequently intersect (Koide, 2017; Turner, 2014). While global environment-related initiatives and green growth (GEIGG) objectives such as reducing resource use and GHG emissions are less prioritized in low-income developing countries than they are in other nations, they have been incorporated into climate policies and nationally determined contributions (NDCs) (Baniya et al., 2021). For example, Nepal's climate change policy (2011 and 2019) and its both NDCs (2016 and 2020) explicitly mention actions to lower the nation's greenhouse gas (GHG) emissions, improve energy efficiency, and reduce the exploitation of forest resources. We investigate GEIGG as influencing factors that encourage policymakers to integrate climate mitigation actions into Nepal's existing non-environment sector policies.¹

The concept of policy integration in environmental policy studies is usually explained by the term 'environmental policy integration' (EPI). EPI is defined as the process of incorporating environmental objectives into non-environment sector policies (Lafferty and Hovden, 2010).

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¹ Non-environment sector policies refer to policies focusing on different policy areas such energy, forest, agriculture, transport, and industry. To shorten the name, these policies are also called sectoral policies throughout this paper.

While environmental objectives such as elements of GEIGG (i.e. climate change mitigation actions) are incorporated into climate policies and NDCs, non-environment sector policies may not have them as primary objectives. The concept of EPI is therefore relevant, as policymakers look to mainstream climate change mitigation actions across economic sectors to deliver global environment-related initiatives effectively whilst trying to green their economic growth. Mainstreaming is generally referred to as integrating an issue into institutions and decisionmaking (Ayers et al., 2014). One prominent definition of environmental mainstreaming is “the informed inclusion of environmental concerns into the decisions of institutions that drive national, local and sectoral development policy, rules, plans, investment and actions” (Dalal-Clayton and Bass, 2009, p. 11). While ‘mainstreaming’ is often used as an alternative term for policy integration, there exist conceptual differences based on the context of use, the field of study, and whether environmental objectives are incorporated as overriding or add-on objectives (De Roeck et al., 2018; Yamin, 2013). The concept of mainstreaming is thought to have come from a development discourse that emphasizes the mainstreaming of gender issues into development policies (Klein et al., 2005). Mainstreaming in the context of climate change involves the integration of measures to address climate change into ongoing sectoral and development decisionmaking (Klein et al., 2005). In this paper, we distinguish mainstreaming and policy integration as separate concepts by using criteria such as policy objectives and impacts, sector and multi-level governance, financial and human resources, and institutional changes.

The mainstreaming of climate adaptation actions in development policies has substantially progressed in comparison to the mainstreaming of climate change mitigation (Adelle and Russel, 2013). The mainstreaming of climate change mitigation in development policies via policy integration was initially discussed by Klein et al. (2005) and Swart and Raes (2007). However, the limited literature in this research domain, particularly after 2010, has motivated the present study, which leverages the concepts of EPI and collaborative governance to investigate the way climate change mitigation actions are incorporated across non-environment sectors in Nepal. Collaborative governance is defined as the processes and structures of public policy decisionmaking that engage people across public agencies, levels of government, private, and civic spheres (Emerson and Nabatchi, 2015). Mainstreaming implies involving policy actors such as governments, civil society, industry, and local communities in the decisionmaking process (Gupta, 2009). This means that mainstreaming takes place within the realm of collaborative governance. While collaboration across sectors is not a panacea, it does encourage policy actors to respond collaboratively to problems that are common to all stakeholders (Bryson et al., 2006).

In addition to NDCs, low-income countries, including Nepal, are also required to develop Nationally Appropriate Mitigation Actions (NAMA). Little to no information about NAMAs from low-income countries means that climate change mitigation is yet to be fully framed across the policies. However, the NDCs produced as part of the Paris Climate Agreement may have encouraged policymakers in low-income countries to consider climate change mitigation. Despite well-developed literature on the mainstreaming of climate change adaptation, we know little about what has been done so far regarding the mainstreaming of climate change mitigation in low-income countries and if GEIGG-related policy discourse has any influence. We build on the climate adaptation mainstreaming literature to discuss the case for the mainstreaming of climate change mitigation in Nepal by emphasizing the influencing factors and the mainstreaming process.² We choose Nepal to study mainstreaming of climate mitigation actions for the following reasons. First, Nepal is a low-income country with an active green growth program. Second,

Nepal receives relatively higher official development assistance (ODA) per capita compared to other low-income countries, meaning the agenda of GEIGG is potentially considered in public policy decisionmaking. Third, Nepal has made an effort to focus on climate mitigation via formulating climate change policy (2011 and 2019) and by submitting the two NDCs (2016 and 2020) to the United Nations Framework Convention on Climate Change (UNFCCC).

The main purpose of this study is to investigate the influence of GEIGG on climate policy discourse, climate mitigation mainstreaming process, and the extent of mainstreaming in non-environment sector policies in Nepal. The rest of the paper is structured as follows: Section 2 presents the theoretical foundations and conceptual framework for conducting the research, Section 3 explains the methodology, Section 4 presents the findings, Section 5 discusses the findings, and Section 6 presents the conclusion.

2. Theoretical foundations and conceptual framework

We consider that the in-country policy discourse linked to GEIGG influences the knowledge and ideas of policy actors. The change in the knowledge and ideas of policy actors and their broader participation in the policymaking process can help decide collectively to integrate climate change mitigation actions into non-environment sector policies. Although the knowledge, ideas, and interests of policy actors may result in diluted and ineffective policies (Koontz, 2003), being responsive to feedback can strengthen the technical aspects of these policies (Anderson et al., 2013; Steele et al., 2010). Most well-informed decisions are characterized by the knowledge and informational resources different people bring to the production of group decisions on any issue (Gigone and Hastie, 1993). In spheres such as environmental regulation and energy policy, policymaking involves highly technical issues and specialized knowledge. It also involves social learning and the exchange of ideas of the policy actors (Hall, 1993). The ideational element of policymaking does not only help decision-makers to interpret potential changes in policy (Capano et al., 2009), but also forms the core of the policy paradigm that determines how policymakers choose one course of action rather than another (Hall, 1993). Policy paradigms include policy goals, objectives, and policy actors’ preferences. Vij et al. (2018) conceptualization of policy paradigm includes framing of policy issues, policy goals, meso-level areas (non-environment sectors), and financial policy instruments. These abstractions of policy paradigm pertain to the concept of mainstreaming that contributes to redefining the policy goals across non-environment sector policies.

Knowledge systems, practices, and institutions for the production, transfer, and synthesis of knowledge are also important in science-policy interactions, especially in the context of global change (Tengö et al., 2014; Cornell et al., 2013). Knowledge and learning are critical drivers for change in knowledge systems within the realm of public policy (Rayner and Howlett, 2017). We consider GEIGG-related policy discourse to influence the knowledge and ideas of policy actors. Therefore, GEIGG is an influencing factor for climate change mitigation mainstreaming in Nepal. National, sectoral, project and local-level governance are considered as “entry-points” for this mainstreaming (Drutschinin et al., 2015). These entry-points are understood as avenues for mainstreaming, as intervening at any of these entry-points by using legal and regulatory instruments, economic policy instruments, and capacity building is a key step towards mainstreaming (Drutschinin et al., 2015; Hugé et al., 2020). Starting with existing policies and practices instead of developing new ones that may require separate institutions and policymaking processes optimizes the use of scarce financial resources (Lebel et al., 2012). This is relevant for a low-income country like Nepal where policy actors vie for limited financial resources in a collaborative environment during policy formulation. An appropriate choice of policy instruments such as the finance-based instrument can avoid the negative interplay between policy actors across sectors and multi-level governance (Henstra, 2016). Therefore, we discuss

² Mainstreaming process(es) refers to the way by which climate mitigation actions are made mainstream policy issue and a prioritised goal in policies across sectors such as energy, forest, agriculture, and industry.

policy instruments that may foster coordination and collaboration between policy actors.

We also explore collaborative governance practices in Nepal by examining the interplay between policy actors when they make decisions about the integration of climate change mitigation actions. Empirical evidence shows that collaborative governance is effective in resolving environmental problems, knowledge gaps, and social learnings. However, the nature of the problem, and the risk that policy actors will free ride on the efforts of others, also need to be considered (Bodin, 2017). Policy actors are the institutions (and individuals) that introduce climate change mitigation mainstreaming. They do so by intervening across entry-points and by changing the policymaking process,³ including the mainstreaming of climate mitigation actions. Collaborative governance introduces the notion of sectoral failure, which is an initial condition for collaboration (Bryson et al., 2006). If sectoral failure is to be considered as a precondition for effective collaborative governance, it can be inferred that the non-environmental sectors may always want to practice collaborative governance when incorporating environmental objectives. This is because, unlike dedicated environment sector organizations, organizations in non-environment sectors are not always adequately equipped in terms of knowledge, experience, and human resources to deliver environmental objectives. The way knowledge, experience, and human and financial resources are optimized across entry-points is a part of the policymaking process for mainstreaming climate change mitigation.

Collaborative governance is integrative in the sense that external drivers (e.g. policy discourse on GEIGG) are taken into consideration (Emerson et al., 2012). Therefore, we consider collaborative governance by identifying four criteria (Table 1) that provide a conceptual basis for discussing the mainstreaming of climate change mitigation actions. The level of mainstreaming is another key consideration as it helps us to understand the extent of integration of climate change mitigation across policies. De Roeck et al. (2018) uses four levels of policy integration – non-integration, coordination, harmonization, and prioritization – to

Table 1

Conceptual criteria for discussing the mainstreaming of climate change mitigation action.

Conceptual criteria	
Policy objectives and impacts	<ul style="list-style-type: none"> Mainstreaming goes beyond the one-dimensional conceptualization of environmental policy integration (EPI) that seeks to integrate issues as policy objectives and not the impacts (Adelle and Russel, 2013).
Sector and multi-level governance	<ul style="list-style-type: none"> Mainstreaming involves distinguishing between the vertical (e.g. sectors) and horizontal (e.g. multi-level governance) dimensions of decision-making (Rauken et al., 2015). However, mainstreaming can also be achieved if only the horizontal dimension of decision-making is materialized (Dovers and Hezri, 2010).
Human and financial resources	<ul style="list-style-type: none"> Mainstreaming is also seen as making efficient and effective use of financial and human resources rather than just designing and implementing policies (Klein et al., 2005).
Institutional changes	<ul style="list-style-type: none"> Theoretically, mainstreaming can be achieved when individuals move beyond their sectoral foci to embrace new ideas, approaches, and modes of operation, for example, when introducing changes to institutional arrangements (Sowman and Brown, 2006). The effectiveness of environmental mainstreaming is measured by the changes implemented in institutions and decisions in order to improve the range of possible outcomes (Dalal-Clayton and Bass, 2009).

³ Policymaking process refers to the way by which policy actors participate in policymaking to finally formulate policies.

highlight that mainstreaming involves the incorporation of issues as overriding objectives, whereas policy integration is reactive and incorporates issues as add-ons. Coordination involves avoiding contradictions between policies. Harmonization implies the realization of synergies between policies, and prioritization involves overriding objectives (De Roeck et al., 2018). Mainstreaming can therefore be regarded as an extreme form of policy integration. Fig. 1 shows the key aspects of mainstreaming, such as the entry-points, drivers/influencing factor, policy actors, and the policymaking process by which mainstreaming occurs. We consider these aspects in order to conceptualize mainstreaming as integrating climate change mitigation actions across policies. This mainstreaming results in changes to areas such as policy objectives and impacts, sectoral and multi-level governance, the efficient use of human and financial resources, and institutional changes. The abovementioned mainstreaming levels are used to discuss the extent of mainstreaming resulting from interventions across entry-points.

3. Methodology

The theoretical foundations and the conceptual framework mentioned above provide a basis to discuss mainstreaming of climate change mitigation in Nepal. Semi-structured interviewing (n = 12) was the qualitative research method chosen to document policy actors' perceptions, knowledge, and experience pertinent to GEIGG concepts. Nepal was chosen as the case country because the climate change policy (2011 and 2019) and NDCs (2016 and 2020) of Nepal include commitments regarding climate change mitigation actions. Although Article 4.6 of the Paris Agreement does not mandate low-income countries to include climate change mitigation actions in their NDCs, Nepal has explicitly mentioned the climate mitigation commitments. The interest of policymakers in climate change mitigation, coupled with an active green growth program in Nepal, makes it a preferred case country for studying the influence of GEIGG on policies and for examining the mainstreaming of climate change mitigation actions into existing policies. While Nepal's share is only 0.027 % of the global GHG emissions, the consequences of climate change are adverse for the mountain ecosystem in Nepal (Macchi, 2010). Thus, hydrological hazards such as storms, floods, landslides, and mudflows have become more frequent and intense in recent years in Nepal (Mainali and Pricope, 2017). Therefore, climate adaptation has been the priority of the government's climate change and cognate policies. However, a three-fold increase in Nepal's GHG emissions per capita in the last two decades means additional policy actions pertaining to climate mitigation (Ritchie and Roser, 2020). Consequently, post-2012 climate agreements, international development partners⁴ have been encouraging developing countries, including Nepal, to use clean energy technologies and achieve greater resource efficiency to lower their GHG emissions (Howard-Grenville et al., 2014). More information about climate change adaptation and mitigation in Nepal is provided in the annex.

We also use deductive content analysis to review non-environment sector policies (n = 6). This method makes it possible to use a small number of content-related categories to test the use of concepts and hypotheses (Elo and Kyngäs, 2008). Fig. 2 shows the approach to data collection and analysis. The semi-structured interviews provided information on the key aspects of mainstreaming, such as entry-points, drivers/influencing factors, policy actors, and policymaking process. Textual data provided information on four conceptual criteria and the level of mainstreaming. The coding of narrative data in NVivo software and the deductive content analysis of textual data provided insights on climate change mitigation mainstreaming in Nepal.

⁴ International development organisations, including bilateral and multilateral agencies that often partner with government and provide technical and financial assistance to deliver development projects.

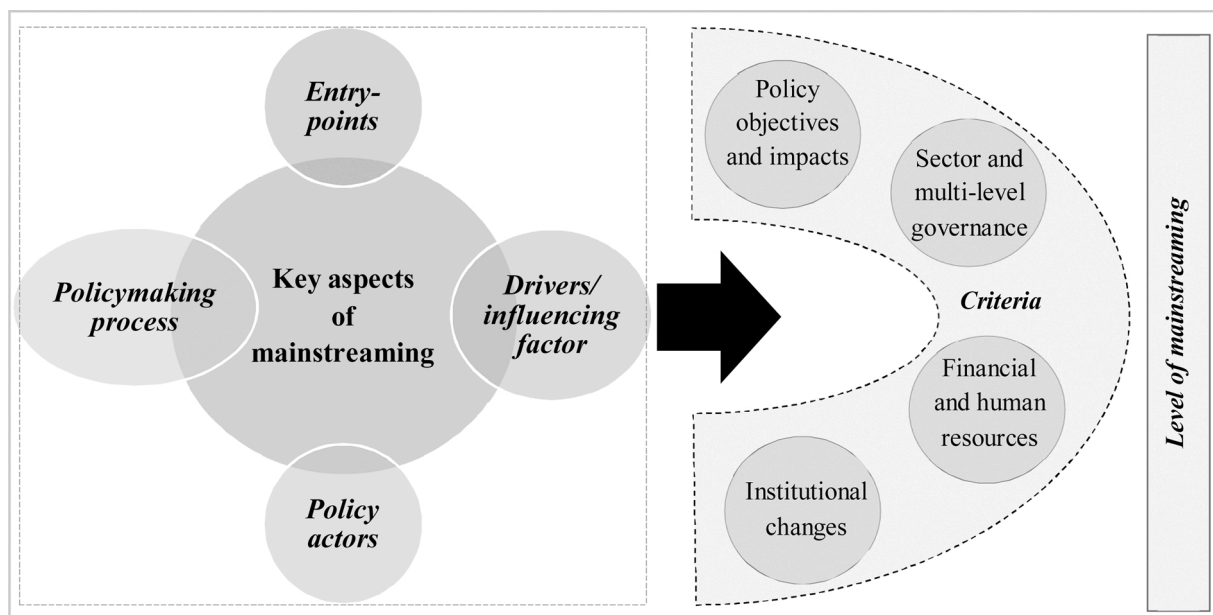


Fig. 1. Conceptualisation of the climate change mitigation mainstreaming based on key aspects, criteria and level of mainstreaming.

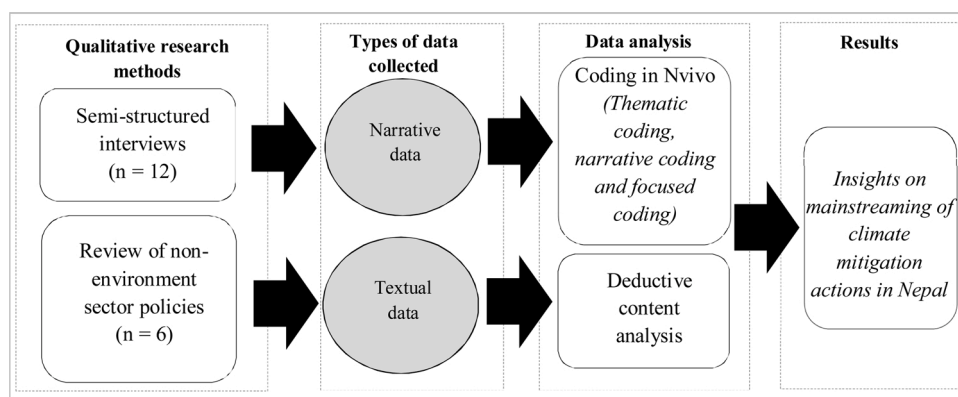


Fig. 2. Methodological approach for data collection and analysis.

3.1. Sampling and data collection

A purposive sampling method was used to recruit 12 respondents across four distinct groups: (i) central government organizations; (ii) local government organizations; (iii) private sector organizations; and (iv) non-government international development organizations. The inclusion criteria were that the participants were mid-level staff and had experience in policymaking. The first group consisted of four national policymakers from central government organizations and the second group comprised three respondents from local government organizations. Respondents from both central and local government organizations were included to examine collaboration across multiple levels of governance. The third group consisted of three respondents from industry associations that are responsible for leading private sector organization participation in environmental policymaking. The fourth group had two respondents from non-government international development organizations that provide technical and financial support to both central and local government organizations of Nepal via official development aid (ODA).

Interview questions were carefully written to ensure consistent phrasing and to highlight three themes: (i) global environment-related initiatives; (ii) green growth; and (iii) policy paradigms. The interview questions were used to collect information on the following topics:

respondents' understandings about climate change mitigation-oriented policies; uncertainties associated with the scale of commitments regarding climate change mitigation actions; policymaking approaches⁵ used; cross-sector collaboration and across multi-level governance; and climate change mitigation objectives in non-environment sector policies. In addition to the prepared 12 questions, further queries were also raised to emphasize any emerging insights. The face-to-face interviews lasted between 60 and 120 min, and the responses were mainly recorded as narrative data. Policy documents such as the National Energy Strategy of Nepal (Water and Energy Commission Secretariat (WECS, 2013); Forest Sector Strategy (2016–2025) (Ministry of Forest and Soil Conservation (MFSC, 2015); Agriculture Development Strategy (2015–2035) (Ministry of Agriculture Development (MAD, 2015); Industrial Policy (2011) (Ministry of Industry, Commerce, and Supplies (MICS, 2011); National Environmentally Sustainable Transport Strategy (MPIT, 2015); and the Reducing Emissions from Deforestation and Forest Degradation (REDD+) strategy (Ministry of Forests and

⁵ Policymaking approaches refer to the way by which policy actors choose to formulate policies. For example, by using collaborative approaches involving broader stakeholders (discursive) or by preferring the advice of few subject matter experts (technocratic).

Environment (MFE, 2015) were also reviewed as part of deductive content analysis to extract textual data.

3.2. Data analysis

The data and information from the 12 respondents were analyzed using two coding cycles to understand the phenomena and explain the proposition that GEIGG-related policy discourse influences the knowledge and ideas of policy actors. The first cycle of coding involved two steps: thematic coding and narrative coding. Thematic coding was followed by further coding which increased the breadth of analysis. A qualitative data analysis tool, NVivo, was used for thematic coding to store information related to the three main themes (global environment-related initiatives, green growth, and policy paradigms). Narrative coding was then used to identify the narrative data pertinent to the three themes. This provided further insights to expand the breadth of analysis. These insights included other GEIGG alternatives that respondents had experienced, and the process of climate mitigation mainstreaming via non-environment sector policies. Narrative research and data are usually interpretive, and they are meant to contribute to an understanding of human experience (Kim, 2020). The narrative data articulated respondents' interpretations of their experiences shared as answers to the 12 main questions. The second cycle of coding synthesized key data and information collected, mainly by follow up questions as more specific information emerged during the discussions. This focused coding method allowed the capture of more analytical items which were then coded under both thematic and narrative codes. Deductive content analysis used data from policy documents to discuss the conceptual criteria and the level of mainstreaming of climate change mitigation actions in non-environment sector policies.

4. Results

4.1. Are global initiatives and green growth influencing the policy discourse in Nepal?

4.1.1. Global environment-related initiatives and green growth as drivers

Most respondents identified the objectives of GEIGG (e.g. reduction of resource use and reducing GHG emissions) as important national, sectoral, and local policy issues. The most prominent global environment-related initiatives, as identified by the respondents, were the Paris Agreement and the SDGs. Green growth and other environment-focused growth agendas such as 'the green economy' and 'sustainable growth' were also seen as influencing the national and sectoral policy issues. A dedicated 'green economy strategy' has been in place in Nepal since 2014. However, this policy has not been fully implemented. Almost half of the respondents saw green growth as a way to create a green economy and address the SDGs. However, unlike the Paris Agreement and the SDGs, the respondents believed green growth had not been sufficiently prioritized in policy discourse. The SDGs were seen as addressing broader socio-economic objectives that aligned well with government priorities. Nevertheless, almost all respondents admitted that green growth is also a broad concept in the sense that it can be applied to all major economic sectors in Nepal: energy, agriculture forestry and other land use (AFOLU), water, transport, tourism, services, manufacturing, and mining. Unlike green growth, global environment-related initiatives are viewed as an indispensable strategic issue that needs to be incorporated across sectoral policies. The respondents highlighted the commitments made by Nepal's government at various international conventions by signing multilateral agreements, for example, at the UNFCCC conference of parties' meetings.

All the respondents mentioned that incorporating GEIGG into national and sectoral policies will help policy actors to collaborate with international development organizations and local non-government organizations. Respondents who were government policymakers or representatives of international development organizations talked about

the merits of fostering collaboration, not only for an economic growth and development, but also for climate change mitigation and adaptation. Some notable advantages of engaging with international development organizations, as highlighted by the respondents, are: an increased ability to apply financial policy instruments; increased stakeholder engagement across sectors and multiple levels of government; and contribution to knowledge systems via the fostering of learning processes. Most respondents mentioned that some sectoral policies have gone through policy reform recently to incorporate the objectives of global environment-related initiatives into non-environment sector policies. ODA from international development organizations was mentioned as being a factor that encouraged policy actors to incorporate objectives of GEIGG, not only at policy level, but also into projects active on the ground. Projects in areas ranging from renewable energy and energy efficiency to REDD are taking advantage of ODA, and these projects may have been difficult for the government to implement without ODA. These active projects support the notion of generating realistic outcomes rather than merely adding on the climate change mitigation actions as policy objectives.

4.1.2. Influence on the knowledge system and ideas of policy actors

The respondents mentioned that they are always willing to adopt the theoretical knowledge, technological advances, and financial incentives associated with GEIGG that come via international development. The policy actors leverage the knowledge gained through GEIGG-related international workshops, capacity building, and training events. Attendees at these international gatherings often discuss different types of policy instruments, policymaking approaches, strategic actions, technological interventions, and successful policy cases. Respondents from central government organizations mentioned that when operating at the external drivers–policy interface, one objective is to understand the visions and policy statements related to GEIGG. A proper interpretation and understanding of the theories, principles, and objectives of GEIGG can help policymakers to explore potential applications; socio-economic benefits; the potential to address resource use and GHG emissions issues at the local level; and opportunities for cooperation with international development organizations.

Whilst the learning process associated with international development contributed to the knowledge system by enhancing the knowledge of individual policy actors, respondents from local government organizations mentioned that their ideas (and technical judgements) are somewhat influenced by central government organizations. Further, the ways in which non-environment sector policymakers interpret GEIGG are influenced by the knowledge and ideas of environmental sector policymakers (e.g. the environment ministry). Central environment sector organizations are the formal institutions that lead responses and coordination for almost all the relevant GEIGG. The knowledge system and learning process are therefore more relevant for environment sector organizations, and they determine the influence that GEIGG will have on non-environment sector policies. Fig. 3 shows the influence of GEIGG on the knowledge and ideas of policy actors that result in changes such as policymaking approaches and sectoral and multi-level governance. The causal relationships between the influencing factors, knowledge, and ideas of policy actors, learning process, policymaking approaches, and collaborative governance are elucidated in following sections.

4.2. Climate mitigation mainstreaming process

4.2.1. Policy alignment as a first step

All respondents who emphasized the importance of incorporating climate change mitigation actions into non-environment sector policies mentioned that policy alignment is the very first step. Policy alignment is the process of aligning non-environment sector policy goals with the objectives of GEIGG. This alignment is likely to happen after the national policymakers commit to incorporating elements of GEIGG (e.g. reduction of resource use and GHG emissions). Policy alignment is linked to

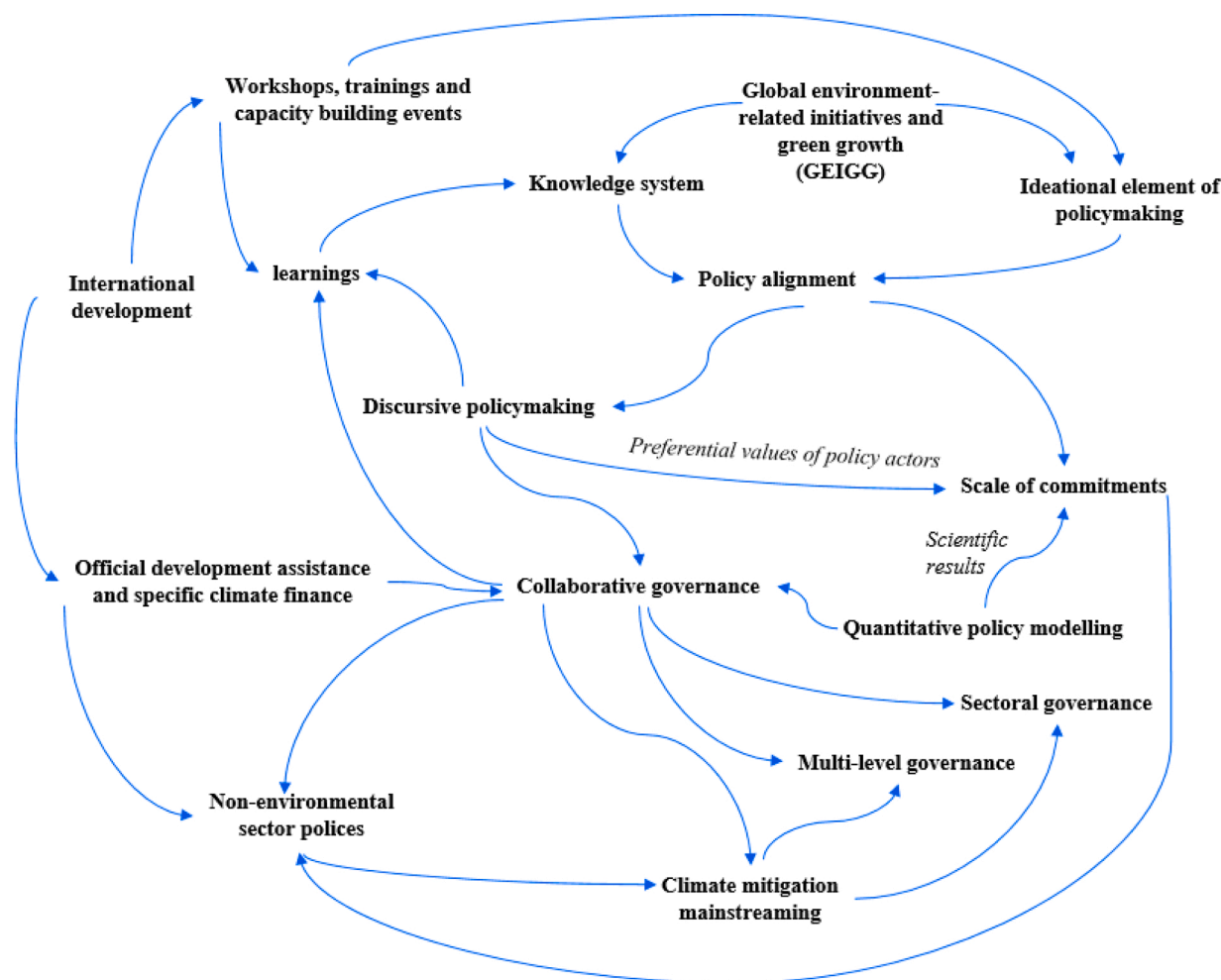


Fig. 3. Causal relationship between influencing factors, knowledge and ideas of policy actors, policymaking approaches, and collaborative governance.

setting the policy direction which indicates how proposed changes to policy will be introduced. The respondents related policy alignment to the knowledge system and learning processes associated with discursive policymaking that uses consultations and collaboration across policy actors. However, the discursive policymaking was blamed for creating uncertainties about issues such as the types of resources the policies should focus on, the magnitude of reductions to resource use and GHG emissions, and the prioritization of sectors. These uncertainties were highlighted as the downsides of using discursive policymaking by most of the respondents. These respondents viewed quantitative policy modelling as a solution. Quantitative policy modelling uses technical methods with less stakeholder consultation. Notwithstanding the uncertainties, policy alignment was deemed sufficient to maintain consistency across non-environment sector polices in terms of incorporating climate change mitigation actions. A few respondents also said that GEIGG self-align with non-environment sector polices, and that the impacts of the uncertainties mentioned above are insignificant. Respondents from central government organizations mentioned that two decades of national experience in dealing with the global environment-related initiatives and concepts like green growth have given them the confidence needed to manage any uncertainties. Further, respondents felt that the ability of environment sector organizations to analyze the potential impacts of incorporating GEIGG on the economy, and the realistic level of climate change mitigation actions the country can commit to, can help manage uncertainties.

4.2.2. Scale of commitments as a metric of mainstreaming

The extent of the commitment to an objective policy goal is usually expressed in terms of a numerical target for a reduction in resource use or a reduction in GHG emissions. The respondents viewed setting these targets as the next step to incorporating elements of GEIGG. Most respondents mentioned that including these targets in the policies involves uncertainties. For example, policy actors from international development organizations and local non-government organizations are usually in favour of radical change in the shortest possible period, whereas private sector stakeholders prefer incremental change over longer periods. The difference in the preferences of different policy actors was identified as one of the main sources of conflict when using a discursive policymaking approach. Therefore, to decide on achievable commitments, respondents from government organizations mentioned that they favoured the use of quantitative policy modelling because the ability to achieve desired reductions in resource use and GHG emissions should be considered more important than the preferences of non-government policy actors. A team of technical experts from key GHG emissions sectors such as energy and AFLOU lead the technical analysis (e.g. quantitative policy modelling) and the ensuing human and financial resource capability assessment. The respondents from non-government international development and private sector organizations emphasized the need for government policymakers to leverage the knowledge system to reflect the objectives and requirements of GEIGG while deciding on the scale of commitments. A few respondents mentioned that having higher commitments in polices implies strong integration of the elements of GEIGG, meaning that the numerical scale of

commitments can be viewed as a metric for measuring the level of mainstreaming.

4.2.3. *Financial policy instruments fostering the collaborative governance*

Information-based, market-based, and finance-based instruments were identified as the preferred policy instruments by the respondents. These policy instruments, particularly the finance-based ones support communities and private sector organizations by creating dedicated financial resources to deploy climate change mitigation actions on the ground. Central government and international development organizations have facilitated the creation of dedicated financial resources such as climate change budget codes, REDD financing, and a climate change fund. These financial resources have brought non-environment sector organizations and local government organizations on board, and have also encouraged them to practice collaborative governance. In the past collaborative governance has been largely ignored, especially in climate change mitigation projects. The respondents mentioned that government policymakers in Nepal have successfully leveraged GEIGG-linked market and financial instruments such as carbon trading under the clean development mechanism (CDM), thereby benefitting the private sector and communities. Other financial incentives such as subsidies for renewable energy and energy-efficient technologies are still covered by a share of ODA received from international development organizations. Quantity-based policy instruments were also mentioned by the respondents as the preferred ones after finance- and market-based instruments. However, quantity-based instruments are connected more with legal and regulatory frameworks, and they therefore provide relatively weak incentives for the private sector and communities. However, quantity-based instruments provide guidelines for private sector organizations and communities for devising their resource use and GHG emissions reduction strategies. This measure is non-regulatory at this stage but is highly encouraged by the government.

4.2.4. *Policymaking approaches and collaborative governance for envisioning realistic goals*

Most respondents mentioned that the discursive policymaking and quantitative policy modelling approaches complement each other. The quantitative policy modelling is mainly used to support decisionmaking associated with discursive policymaking. For example, for technical analysis to support the case for incorporating climate change mitigation actions as policy objectives; and to resolve contentious issues regarding the scale of commitments and priority sectors. The respondents from government organizations viewed quantitative policy modelling as an independent part of policy formulation that was usually favoured by the lead government agencies responsible for developing non-environment sector policies. Lead agencies use quantitative policy modelling to present scientific results that are rarely influenced by the preferential values of non-government policy actors. The private sector respondents mentioned the need to have objective policy statements which refer to reductions in resource use and GHG emissions in quantitative terms. Quantitative policy modelling provides a clear understanding of the financial incentives available and the extent of resource use and GHG emission reduction they can deliver, as explained by the respondents from the private sector and local government organizations.

Aligning the policy objectives and setting the scale of commitments entails agreement between local and central government policymakers. This is usually done in a collaborative environment that involves sectoral and multi-level governance. The respondents from government organizations stated that collaborative governance is part of the policy formulation process per se. However, the private sector and international development organizations thought otherwise, as they said lead agencies can overlook feedback from non-government policy actors. Nonetheless, in non-environment sector policies there could be statements about incorporating the objectives of GEIGG. However, respondents did not view this as a significant policy milestone. Maintaining consistency in clearly stating the realistic goals and targets

across policies are viewed as a key step. Collaboration for setting realistic targets based on individual sector capabilities is an impactful step towards mainstreaming climate change mitigation actions. A few respondents emphasized the need for a collective effort that extended beyond policy design to include delivery. Sectoral growth, job creation, and addressing social issues remain the primary goals of non-environment sector policies. However, the cross-cutting nature of climate change mitigation actions and the availability of international climate finance have encouraged government policymakers to foreground climate change mitigation actions in sectoral and multi-level governance, thereby fostering collaborative governance.

Table 2
Findings from the review of non-environment sector policies of Nepal.

Climate change mitigation actions across four conceptual criteria			
Policy objectives and impacts	Sector and multi-level governance	Human and financial resources	Institutional changes
<ul style="list-style-type: none"> • Promotion of energy efficiency, renewable energy and GHG emissions reduction across residential and industry sectors. • Enhance forest carbon stock by at least 5 % between 2015 and 2025. • Increase the productivity of forest resources (biomass) and intensify sustainable forest management. • Promotion of community-based climate change mitigation measures in Agriculture, Forest and Other Land Use (AFOLU) sector. • Promotion of electric vehicles and minimization of CO₂ emissions from transport. • Reduction of energy use in production processes across industry sector. 	<ul style="list-style-type: none"> • Allocation of responsibilities such as energy management to non-environment sector organizations (forest, industry and transport) and local government bodies. • Coordination across non-environment sectors and local bodies regarding forest, agriculture and energy policy issues. • Enhancement of partnerships and coordination amongst different government agencies for establishing a climate-resilient society. • The approach of the forest sector strategy is consistent with Reducing Emissions from Deforestation and Forest Degradation (REDD) approaches. • Improve access of local communities (Forest and agriculture groups) to carbon benefits generated from REDD. 	<ul style="list-style-type: none"> • Strengthening of the organizational, technical, and leadership capacities of forest, agriculture, transport, and energy sector bodies (both central and local). • Enhancement of institutions' capacity to undertake policy reform and the capacity to regulate policies. • Making use of opportunities for carbon trading under Clean Development Mechanism (CDM) and REDD. • Institutional capacity building and development of human resources to capture carbon credit benefits. • Participation in financing mechanisms for carbon markets. • Access to REDD financing and disbursement to local beneficiaries. 	<ul style="list-style-type: none"> • Creation of energy coordination committee at federal level. • Allocation of responsibilities (climate change mitigation-related) to the water and energy commission. • Creation of separate Renewable Energy Development agency or upgrade of existing Alternative Energy Promotion Centre. • Creation of forest groups at local level with clearly established roles and authority to respond to climate change including mitigation. • Envisioning the creation of forest carbon trust fund via institutional change. • Changes in institutional arrangements and policy reform to attract native and foreign investments in hydropower projects.

4.3. Levels of mainstreaming climate change mitigation actions across sector policies in Nepal

Table 2 shows the findings from the review of non-environment sector policies in Nepal and the way climate mitigation actions are incorporated in Nepal's key sector policies across four conceptual criteria. The National Energy Strategy of Nepal (Water and Energy Commission Secretariat (WECS, 2013); Forest Sector Strategy (2016–2025) (Ministry of Forest and Soil Conservation (MFSC, 2015), and the Reducing Emissions from Deforestation and Forest Degradation (REDD+) strategy (Ministry of Forests and Environment (MFE, 2015) have included climate change mitigation actions as overriding objectives, and hence mainstreaming is prioritized. The National Environmentally Sustainable Transport Strategy (Ministry of Physical Infrastructure and Transport (MPIT, 2015) seems to have realized the advantages of synergies between policies, and this strategy has therefore included climate mitigation actions such as the use of electric vehicles and lowering the GHG emissions from the transport sector. These add-on objectives mean that the level of mainstreaming is harmonization. The Agriculture Development Strategy (2015–2035) (Ministry of Agriculture Development (MAD, 2015) and the Industrial Policy (2011) (Ministry of Industry, Commerce, and Supplies (MICS, 2011) minimize the contradictions between policies by stating that climate change mitigation actions such as reductions in energy use and GHG emissions are key considerations. However, these policies have not addressed climate change mitigation-related policy statements against the sector and multi-level governance, financial and human resources and the institutional changes criteria. Therefore, the level of mainstreaming is limited to coordination.

5. Discussion

This study generated three key insights. First, about the way GEIGG-related policy discourse are influencing climate change mitigation mainstreaming in Nepal. Second, the process by which mainstreaming of climate mitigation actions unfold within the government policy landscape in Nepal. Third, the level of mainstreaming across six non-environment sector policies in Nepal by using De Roeck et al. (2018) indicators for measuring the scale of integration of environmental objectives into non-environment sector policies. These insights explain the causal mechanism between influencing factors (i.e. GEIGG), knowledge and ideas of policy actors, policymaking approaches, and collaborative practice across sectors and multi-level governance to answer how and to what extent the objectives of GEIGG has become a mainstream policy issue in Nepal.

We found that the GEIGG-related policy discourse and the ensuing meetings, workshops, and capacity building events involving policy actors contribute positively to the knowledge system via learnings, and the exchange of ideas between policymakers is strengthened. The influencing factors contributing to the knowledge system and the ideational element of policymaking are a positive step forward for policy actors as the climate change policies (2011 and 2019) and the NDCs (2016 and 2020) mention enhancing the individual and institutional capacity regarding climate mitigation in Nepal. The enhanced capacity of the policy actors could support initial progress on climate mitigation mainstreaming, particularly in transport, agriculture, and industry sectors that are yet to incorporate climate mitigation actions as overriding policy objectives in their sectoral policies.

We observed that climate mitigation mainstreaming starts by aligning the objectives of GEIGG with the non-environment sector policy goals, and the alignment employs discursive policymaking. While discursive policymaking has been criticized for its dependence on unstructured and rhetorical argumentation (Wood, 2015), respondents talked about relying on quantitative policy modelling in a collaborative environment to decide the scale of commitments once alignment has been achieved. Thus, utilizing the evidence-based rhetorical

argumentation appeared as a way to seek a balance between interest-based preferential values of policy actors and the scientific approach, which is a part of an enhanced knowledge system. We found that the scale of commitments expressed as numerical policy targets in non-environment sector policies was understood as an indicator of climate mitigation mainstreaming by respondents. Based on this finding, we suggest that this indicator can complement De Roeck et al. (2018) indicators for measuring the scale of integration as the latter is highly subjective. However, further research on this can shed more light on the suitability of using numerical policy targets as an indicator for understanding the level of climate mitigation mainstreaming.

While the GEIGG-related policy discourse has influenced policy in multiple non-environment sectors in Nepal, the respondents were more interested in climate mitigation being incorporated into projects. Thus, the influence of GEIGG on sectoral policies does seem to have ultimately affected projects active on the ground, as these projects are linked to delivering the objectives of GEIGG across non-environment sectors. The respondents' interest in translating climate mitigation actions in policies into on-ground actions via climate change mitigation projects implies a focus towards delivering the objectives of GEIGG in addition to merely mainstreaming via sectoral policies. The respondents reported, there are several active projects related to the energy and forest sectors, and these sectors contribute more than 40 % of GHG emissions in Nepal (Ministry of Population and Environment (MoPE, 2015). The level of mainstreaming of climate change mitigation actions in these sectors policies (energy and forest) is prioritization, meaning a delivery-focused mainstreaming of climate mitigation in these two sectors. The level of mainstreaming in the agriculture sector is coordination despite this sector contributing about 48 % of GHG emissions in Nepal and several on-ground actions as reported by the respondents (Ministry of Population and Environment (MoPE, 2015; Ministry of Agriculture Development (MAD, 2015). This implies that a sectoral policy can be delivery-focused even with a relatively weak mainstreaming. The transport and industry sectors were reported to have relatively less active projects by the respondents and have a harmonization and coordination level of mainstreaming, respectively. These are insignificant sectors in terms of GHG emissions in Nepal.

A relatively weak level of climate mitigation mainstreaming in non-environment sectors (Transport and Industry) that do not contribute significantly towards the nation's GHG emissions means that policymakers focus more on sectors with higher potential for GHG emissions reduction. The respondents reported that an assessment of each sector's potential to achieve reductions of resource use and GHG emissions was followed by analyses on which to base predictions of sectoral growth and job creation, and to address other environmental issues. The analyses showed other non-climate benefits such as sustainable agriculture, the introduction of electric and low emissions vehicles, and improved indoor air quality in buildings and industries. We found that policy actors consider the advantage of non-climate benefits of climate mitigation actions and cross-sectoral collaboration. Respondents pointed to both of these as encouraging factors to incorporate climate mitigation actions as add-on policy objectives in policies of sectors with relatively least potential to reduce GHG emissions. Therefore, we argue that addressing non-climate benefits of climate mitigation actions via sectoral policies can be accounted as part of mainstreaming. This argument is supported by respondents' information and by the study (Zen et al., 2019), which found that mainstreaming in climate policy encompasses non-climate policy gains such as conservation strategies, environmental management plans, and sustainable developments strategies for different economic sectors.

The respondents linked the GEIGG as an influencing factor for incorporating climate mitigation actions to the country being a signatory to the Paris Agreement and the SDGs. This finding is also evident from the study by Laudari et al. (2021), which identified international obligations and international funding as factors to framing climate actions into Nepal's NDCs instead of framing based on a nationally

determined plan of climate actions by engaging relevant policy actors. In contrast to [Laudari et al. \(2021\)](#) point about not using discursive policymaking approach sufficiently in determining climate actions plan, our findings suggest that climate mitigation mainstreaming process in Nepal have employed both technocratic and discursive policymaking approaches. The respondents talked about using evidence-based rhetorical argumentation while framing climate mitigation actions into sectoral policies. However, regardless of the type of policymaking approaches used, we found that the process by which mainstreaming occurs is hindered by lack of financial resource, limited capacity of policy actors, particularly the local government stakeholders, and multi-level governance related to climate change primarily controlled by the central government organization. [Benson et al. \(2014\)](#) identify the nation's limited technical capacity to analyze potential mitigation strategies as a barrier to mainstreaming. Similarly, [Gomez-Echeverri \(2018\)](#) emphasize the role of policymakers' capacity to develop and implement programs of action using integrative approaches across sectors and geographies. Multi-level governance can also pose challenges, as policymakers at the sub-national level (i.e. local government organizations) depend on higher-level decision-makers ([Gouldson et al., 2016](#)). This seems to be the case in Nepal.

On one hand, effective multi-level governance and collaboration across sectors are challenged by the lack of finance and the limited knowledge capacity of the institutions involved ([Busby and Shidore, 2017](#)). On the other hand, proliferation and fragmentation of climate finance have also challenged policymakers to develop effective and coherent climate change policies that could integrate the measures adopted to combat climate change ([Gomez-Echeverri, 2018](#); [Van Asselt and Zelli, 2014](#)). In the case of Nepal, the respondents reported that international climate finance has strengthened collaborative governance through the creation of climate change budget codes, REDD financing, and the climate change fund. However, the limited capacity of the political and administrative systems, and to some extent, lower income levels have been found to weaken the prospects for incorporating environmental objectives into sectoral policies ([Tosun and Leininger, 2017](#)). This implies that low-income countries like Nepal with limited institutional capacity in terms of financial and human resource might likely struggle to fully implement the objectives of GEIGG even if they are incorporated into sectoral policies. Our findings from the review of chosen policies in this study show significant progress pertinent to human and financial resources, and there are appropriate institutional and administrative changes that can strengthen the climate mitigation mainstreaming.

The institutional and administrative changes, particularly after transitioning into a federal system post-2015, necessitated an increased collaboration between federal, provincial, and local level organizations in formulating policies, plans, and projects related to climate change, including mitigation. Our analysis of the sectoral policies identified several measures towards fostering collaborating governance for climate mitigation across multiple levels of governments, particularly in sectors such as energy, forest and agriculture. The respondents provided further evidence on collaborative governance by pointing at the role of local-level organizations in delivering climate mitigation actions via projects active on the ground while the central level organization lead to access to the international financial resource pertaining to climate change. The recently updated climate change policy ([Ministry of Forests and Environment \(MFE, 2021\)](#)) of Nepal has explicitly mentioned collaboration amongst three levels of government, private sector and non-government organizations, including international development agencies.

Climate change mitigation was hardly a policy issue until the country produced climate change policy in 2011 and the NDC in 2016. Therefore, we suggest that the country can build on its climate adaptation-related progress to prioritize the objectives of GEIGG, especially in the transport, agriculture, and industry sector policies, and subsequently deliver the objectives of GEIGG across all sectors. In this way, climate

mitigation mainstreaming in sectoral policies can be operationalized via more on-ground actions.

6. Conclusion

Our conceptualization of climate mitigation mainstreaming has provided insights into what causes climate mitigation mainstreaming, how the mainstreaming process unfolded, and the extent of mainstreaming. The GEIGG-related policy discourses are influencing the knowledge and ideas of policy actors, thereby affecting the climate mitigation mainstreaming process that involves cross-sectoral approach and multiple levels of government. Our analysis of the chosen policies shows that the level of climate mitigation mainstreaming varies across policies. We identified the levels of climate mitigation mainstreaming as: prioritization for the energy and forest sectors, harmonization for the transport sector, and coordination for the agriculture and industry sectors.

We found that the policy actors utilize both technocratic and discursive policymaking approaches as they deliberate on climate mitigation mainstreaming and its extent across sector policies. The causal relationship between the influencing factors and the collaborative practice between policy actors is such that the collaboration for mainstreaming is led by the central environment sector organization (e.g. the environment ministry). Nevertheless, this is a good starting point for strengthening collaborative governance, especially for aligning policy goals and for setting the scale of commitments that present and future projects on the ground can deliver. The local-level policy actors whose role appeared weak in the mainstreaming process have taken advantage of international development and international finance that have supported on-ground projects that are aimed at delivering climate mitigation actions incorporated in policies.

Finally, we conclude that climate mitigation mainstreaming via sectoral policies and the prospects for the delivery of the objectives of GEIGG via on-ground projects needs to be studied together to understand how mainstream agenda in policies are translated into practice. Our study generated preliminary findings about the notion of on-ground projects linked to climate mitigation mainstreaming. Therefore, we recommend that future studies focus on this to generate additional perspectives, which will benefit the climate mitigation mainstreaming-related literature and the global literature on mainstreaming in a climate policy context.

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CRedit authorship contribution statement

Bishal Baniya: Conceptualization, Methodology, Software, Formal analysis, Investigation, Writing - original draft, Visualization, Project administration. **Damien Giurco:** Conceptualization, Methodology, Validation, Writing - review & editing. **Scott Kelly:** Conceptualization, Methodology, Validation, Writing - review & editing. **Prem Prakash Aryal:** Methodology, Project administration.

Declaration of Competing Interest

The authors report no declarations of interest.

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Appendix A. Supplementary data

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