



# Changing policy paradigms: How are the climate change mitigation-oriented policies evolving in Nepal and Bangladesh?

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## ABSTRACT

The inclusion of climate mitigation actions in the Nationally Determined Contributions and climate policies of low-income countries such as Nepal and Bangladesh means that policymakers are seeking to address both types of responses to climate change. This study assesses changes in policy paradigms pertinent to climate mitigation, in Nepal and Bangladesh for the period from 1992 to 2018. Policy paradigm refers to the framework of policymakers' ideas and strategies that influence the formulation of policies across different aspects. This research develops and uses an analytical framework which considers the following aspects of public policy: (i) problems and focus; (ii) content (policy instruments and financial resources); (iii) institutions and strategic interactions; and (iv) global environment-related initiatives. Relevant policies (18 for Bangladesh and 17 for Nepal) were analyzed and thematically coded using NVivo software. While most aspects showed notable change over time, the institutions and strategic interactions aspect showed only incremental change. Although primarily focussed on adaptation, a new policy paradigm that seems to have emerged post-2005 for Nepal and Bangladesh focuses on low carbon development, access to energy, sustainable transport, and sustainable agricultural practices. To operationalize the new policy paradigms in both countries, economic and market-based policy instruments that utilize the government's internal funding will need to support policies to minimize the impacts of changes in official development assistance.

## 1. Introduction

In the mid-1990s, the focus of climate-related policies in Nepal and Bangladesh was largely on disaster response and relief. The policies have now evolved to focus mainly on climate change adaptation mainstreaming in Bangladesh, and localized action for climate change adaptation in Nepal (Vij et al., 2018). Mitigation, however, has received less attention. The lack of a focus on mitigation in both countries can be attributed to a tendency to focus on adaptation on the part of most developing countries, especially least developed countries (LDCs). Nepal and Bangladesh, both LDCs, are listed as highly climate change vulnerable countries, and most climate-related stressors such as extreme weather events and natural disasters will have an impact on the livelihoods and wellbeing of the people (Werner and van der Geest, 2013). However, recent policies, including non-environment sector policies<sup>1</sup>, dedicated climate policies, and Nationally Determined Contributions (NDCs) under the Paris Agreement - which are collectively referred to as

climate change mitigation-oriented policies throughout this paper - have started to emphasize mitigation.

The focus on climate mitigation appears to be timely as both Nepal and Bangladesh are aiming to become middle-income countries by 2025 (Bhattacharya and Khan, 2018; Rai, 2017; United Nations Department for Economic and Social Affairs (UNDESA), 2019). Nepal and Bangladesh were deemed eligible for LDC graduation in 2018 based on the progress made against each of three LDC graduation criteria: Gross National Income (GNI) per capita, Human Asset Index (HAI) and Economic Vulnerability Index (EVI) (CDP, 2018). However, the UN Committee for Development Policy and the Nepal and Bangladesh governments are expected to review the progress and LDC graduation in next triennial review in 2021 (United Nations Department for Economic and Social Affairs (UNDESA), 2019). Whilst aiming to achieve LDC graduation via increasing economic growth, the income elasticity of resource use<sup>2</sup> could undermine the effectiveness of climate change mitigation-oriented policies.

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<sup>1</sup> Non-environment sector policies refer to policies across different policy areas such as energy, forestry, agriculture, transport, and industry.

<sup>2</sup> In this paper, the term 'resource use' refers to the use of different energy sources, including forest and agricultural biomass resources.

Most of the research on climate change policy discourse in LDCs (Ayers et al., 2014; Vij et al., 2018) has been limited to adaptation, meaning policymakers know little about effective framing and operationalization of climate mitigation actions across relevant policies. The Global South<sup>3</sup> in capitals has historically considered mitigation as an issue of developed countries and have often prioritized climate adaptation (Shrestha and Dhakal, 2019). Therefore, it may be reasonable to assume that policymakers in LDCs have relatively less policy formulation experience regarding climate mitigation-oriented policies than the policymakers in the developed countries. Hussein et al. (2013) identified a lack of systematic evidence on the impact of climate mitigation on the welfare in developing countries. Barbier (2014) pointed out a lack of systematic analysis on the impacts of climate mitigation policies in low- and middle-income countries and suggested that a more comprehensive approach be employed, particularly for analyzing changes in trade and economic growth and poverty. A lack of systematic evidence and a comprehensive approach for understanding the impact of climate mitigation policies insinuates that climate mitigation-oriented policies are at an early stage of policy formulation and implementation. Hence, we know little about how and to what extent framing and operationalization of climate mitigation-oriented actions have progressed across policies in LDCs, including Nepal and Bangladesh. This research gap, coupled with the intention of Nepal and Bangladesh to deliver their NDCs and other climate policies, together with LDC graduation, motivates this paper to investigate changes in policy paradigms pertinent to climate change mitigation-oriented policies in these countries. A policy paradigm is a framework of ideas and strategies that influences policy formulation by specifying policy goals, instruments for achieving the goals, and the problems that policies are meant to address (Hall, 1993; Menahem, 1998).

This study focuses on the period 1992 (date of the Rio Earth Summit) to 2018. The rest of the paper is structured as follows: Section 2 presents the concept of policy paradigms and an analytical framework. Section 3 explains the methodological approach, Section 4 shows the results, Section 5 presents a discussion of the results, and Section 6 concludes the study.

## 2. Policy paradigm: concept and analytical framework

A seminal work of Hall (1993) on policy paradigm introduces the concept as an ideational framework that policymakers use to exchange their ideas to specify the focus of policies during policy formulation. A policy paradigm can also be referred to as a system of ideas that specifies policy goals, instruments used to achieve those goals, and the problems that the goals are meant to address (Menahem, 1998). Additionally, the policy paradigm is understood as any statutory and regulatory framework or model that governs the generation and delivery of policies (O'Sullivan, 1993). While the term 'paradigm' was initially used in Thomas Kuhn's seminal work on scientific revolution to emphasize the sociological importance of scientific theories (Polsby, 1998; Wade, 1977), the concept of policy paradigm is widely used to highlight the way policymakers' ideas are translated into policies (Skogstad, 2011). The concept has become central to policy studies that emphasize the role of ideas in policy change processes (Zittoun, 2015). It has been lauded for signifying the ideational element of policy on mainstream policy studies (Carstensen, 2015, p. 297). The linkage between the ideational element of policy and the institutions policymakers represent makes the policy paradigm more important as the linkage is crucial to understanding policy change (Béland, 2016). Policymakers' ideas are embedded within the institution they represent (Kern et al., 2014). The policymakers' institutions are driven by a mandate that influences policymakers' ideas and how they shape and change policies (Kuzemko, 2013, p. 48). This paper builds on the existing literature on the ideational framework and the

institutionalist perspective on policy change to conceptualize the policy paradigm as a model of policy formulation that can be influenced by the policymakers' ideas and their institutions. We look at how policymakers' ideas and their institutions are changing policy formulation models across the focus of the policies, contents of the policies, strategic interactions between the responsible institutions, and inclusion of global environment-related initiatives' mandates in Nepal and Bangladesh. In this study, global environment-related initiatives pertain to the international climate agreements and other multilateral agreements such as the Sustainable Development Goals (SDGs).

A policy paradigm is a foundation upon which policy ideas are framed, articulated, and implemented (Burns et al., 2009). Additionally, the problems policies are meant to address, decisions on appropriate policy goals, and policy instruments that could help achieve policy goals are also given importance (Hall, 1993). While the earliest application of the paradigm concept in the public policy domain dates to the late 1980s, recent theories on policy paradigms focus mainly on aspects such as the cognitive perspectives of individuals, institutional structures, and strategic interactions between responsible institutions (Burns et al., 2009). The strategic interaction between responsible institutions refers to the way by which policymakers strategize the delivery of their mandates while ideas are shared between the institutions to reflect those into the policies. The change in the context of policy paradigms has been understood as the change in the structure and content of the policy, for example, values, strategies, and instruments (Capano, 2009). Therefore, aspects such as problems, policy goals, policy instruments, and institutional and strategic interactions are emphasized in this study. Policy instruments are crucial content of environmental policies and related decision-making (Goulder and Parry, 2008).

Climate change mitigation policies have not by themselves driven increases in energy efficiency and the use of renewable energy, especially in the absence of long-term economic support mechanisms (Halsnæs et al., 2014). One economic support mechanism in low-income countries is official development assistance (ODA) which supports the financial mechanisms by supplementing government's internal funding. A financial mechanism, understood as a way by which government manages funding for delivering policies, is key because of the importance of ODA and internal funding for effective climate governance in developing countries (Persson, 2008). For climate change and cognate policies in Nepal and Bangladesh, the entities that provide ODA, also called donor agencies, are involved via bilateral or multilateral co-operation (Rahman and Giessen, 2017). Therefore, in addition to formal institutions (i.e., government agencies), donor agencies influence the focus and contents of the policies by forming advocacy coalitions with local non-government organizations, which is essentially considered in any analysis of policy formation (Sabatier, 1998). Global environment-related initiatives such as Climate Agreements can also be viewed as a causal factor as the policies embrace new paradigms that frame climate change broadly as social, political, and cultural challenges (Hermwille, 2016). Global environment-related initiatives influence local non-government entities such as civil society organizations via conferences of the United Nations Framework Convention on Climate Change (UNFCCC), which have played a major role in changing climate policy paradigms in Nepal Bangladesh (Vij et al., 2018). We conceptualize 'changing policy paradigms' as the changes in the latest climate mitigation-oriented policies relative to the earlier version of the same across four aspects: (i) problems and focus of the policies; (ii) contents of the policies, (iii) institutions and strategic interactions, and; (iv) global environment-related initiatives.

The above mentioned four aspects are similar to the Vij et al. (2018) framework for assessing climate policy paradigms that used framing of policy issues; policy goals; meso-level areas<sup>4</sup> (sectors); and financial

<sup>3</sup> The global south is a term often used to refer to low-income countries.

<sup>4</sup> Meso-level policy areas refer to different policy sectors such as energy, agriculture, forest, and industry.

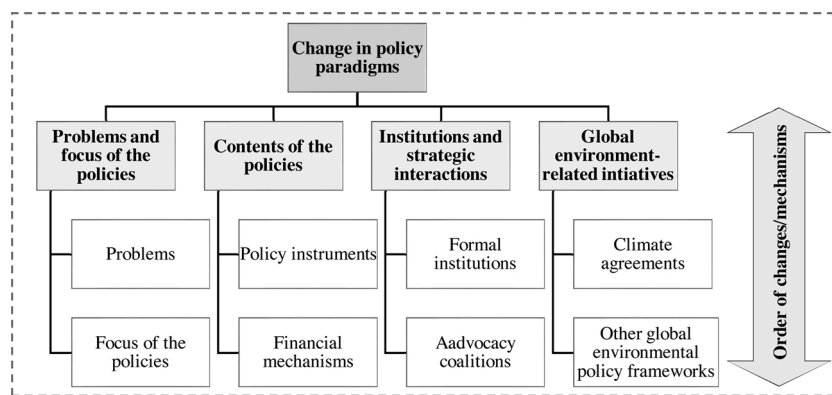


Fig. 1. Key aspects of changes in policy paradigms.

Table 1  
Key aspects of changes in policy paradigm.

Problems and key focus of the policies	Policies are formulated to address problems, and the focus of a policy provides an indication of the problems it is intended to address.
Contents of the policy	A policy comprises policy instruments and financial mechanisms that are supposed to effectively deal with the issues which the policies are designed to address.
Institutions and strategic interactions	Strategic interactions between institutions are driven strongly by the framing of policy ideas of formal institutions and advocacy coalitions.
Global initiatives	Global initiatives are climate agreements and other global environmental policy frameworks such as Sustainable Development Goals and environmental declarations and protocols.

policy instruments. The four key aspects of the analytical framework used by this research emphasize the ever-increasing role of institutions and their strategic interactions and global environment-related initiatives by analyzing meso-level area focused policies (non-environment sector policies) in addition to climate policy and NDCs. While the institutions and strategic interactions, and global environment-related initiatives, are distinct elements to the Vij et al. (2018) framework, we discuss a case for climate mitigation in the context of changing policy paradigms. We consider that ideas and institutions need to be discussed collectively as the influential policymakers and their institution can cause institutional change across others, thus changing the policy paradigm (Carstensen and Schmidt, 2016). The interaction between the ideas and institutions is also profound enough to discuss both together (Schmidt, 2008). The global environment-related initiatives and their international bureaucracies have both cognitive and executive influence on policy formulation (Biermann et al., 2009). While cognitive influence refers to the influence on policymakers’ ideas, executive influence refers to the changes across responsible institutions. A similar conceptualization of policy paradigms coupled with an emphasis on climate mitigation will contribute to advancing of the Vij et al. (2018) framework that has primarily focused on climate adaptation. Fig. 1 shows the four key aspects of changes in policy paradigm and are briefly introduced in Table 1.

While the ideational constructs of policymakers drive changes in policy paradigms (Daigneault, 2014), limited literature about when to consider a paradigm change makes it challenging to understand the change in policy paradigm. The multifaceted processes of policy change, change in the core topic of ideas, the extent of change in ideas and constructs, qualifiers for paradigmatic change, and the influence of non-ideational aspect (e.g., relevant institutions mandates and global environment-related initiatives) make it more complex to study the change in policy paradigm (Capano, 2009; Hogan and Howlett, 2015; Wilder, 2015). When the policy paradigm concept was evolving in its early days, Hall (1993) defined three different orders of change that policies may go through in terms of the magnitude of changes. The

first-order changes involve incremental changes with routinized decision making, second-order changes involve new policy instruments and more strategic actions, and the third-order change is radical in all aspects. Further, Capano and Howlett (2009) note that policy change occurs by four mechanisms: cyclical, dialectic, linear and teleological. Cyclical changes return to the status quo. Dialectic changes focus on negation and synthesis and are primarily driven by ideational constructs. Linear changes are evolutionary without a clear end-point. Teleological change occurs in the direction of an identifiable goal and focuses on policy output. Vij et al. (2018) use layering, drift, and conversion as the modes of changes. Layering is understood as a gradual change such as new policy goals and instruments that co-exist with the previous paradigm (Mahoney and Thelen, 2010). Drift is achieved via change in the existing institutions to accommodate the shifts in the external environment, and the conversion refers to the redeployment of institutions for additional policy purposes (Hacker and Pierson, 2010; Hacker, 2004). We look at Hall’s (1993) order of changes and Capano and Howlette’s (2009) change mechanisms to define changes in policy paradigms. Therefore, policy paradigms are thought to be changed when at least one of four aspects goes through one of three different order of changes via any one of four mechanisms mentioned above (Fig. 1).

### 3. Methodology

We focus on changing policy paradigms in Nepal and Bangladesh by using the analytical framework defined above (Fig. 1). Nepal and Bangladesh are amongst the most climate change vulnerable countries situated in South Asia (see supplementary material) and are prone to climate-related natural disasters such as severe storms, floods, soil erosion, and droughts, thus impacting the livelihood and economy (Bandara and Cai, 2014; Saklani et al., 2020). The climate model projections for the South Asian region show intense and variable precipitation (Shrestha and Aryal, 2011). Therefore, whereas scientific research and climate change negotiations focused on mitigation during the 1990s, LDCs, including Nepal and Bangladesh, prioritized reducing their vulnerability to climate change and later, adaptation (Huq et al., 2011). The mainstreaming of climate change adaptation in Nepal and Bangladesh progressed significantly largely due to the preparation of country-specific National Adaptation Plans of Action (NAPA) under the UNFCCC (Saito, 2013). More recently, both countries have pledged reductions in resource use and greenhouse gas (GHG) emissions despite being insignificant contributors to global GHG emissions (Ministry of Population and Environment (MoPE), 2015, Government of Bangladesh (GoB), 2016). Bangladesh was the first LDC to release its climate change policy in 2009, followed by Nepal in 2011, confirming the widespread interest of these countries in addressing both mitigation and adaptation aspects of climate change (Fisher, 2013).

This research focuses on climate mitigation by drawing ‘textual data’ and by using qualitative content analysis (QCA) of non-environmental

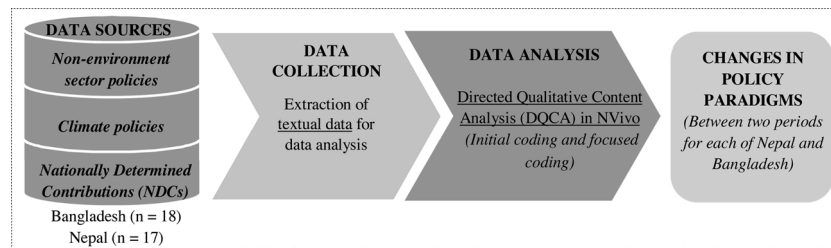


Fig. 2. Methods used for data collection, extraction, and analysis for observing the changes in policy paradigms in Nepal and Bangladesh.

sector policies, climate policies and NDCs (Bangladesh (n = 18) and Nepal (n = 17)) to identify changes in policy paradigms as shown in Fig. 2. The QCA is relatively new to environmental policy research as the method is borrowed from social and health science (Hall and Steiner, 2020). In addition to Vij et al. (2018), Forde et al. (2019) have used textual data from policy documents to investigate evolving policy paradigms about leadership and education. Goldthau (2012) and Kern et al. (2014) have also reviewed energy policy documents to explain changing energy policy paradigms in the UK and globally, respectively. Amidst a limited use of qualitative content analysis of policy texts in environmental policy research, Fitzgerald (2012) suggest a consideration of the authentic, credible, representative, and meaningful policy documents. This research uses climate mitigation-oriented policies formulated by the governments of Nepal and Bangladesh, which satisfy the criteria set by Fitzgerald (2012).

### 3.1. Data sources and extraction of textual data

Firstly, non-environment sector policies, overarching climate policies, and NDCs in Nepal and Bangladesh were identified using a desktop search. The primary inclusion criterion was that the policies contained statements with the following keywords: ‘resource management’, ‘resource efficiency’, ‘energy efficiency’, ‘renewable energy’, ‘GHG emission’, and ‘climate change mitigation’. Further, the policies needed to be in force at some time between 1992 and 2018. Using the inclusion criteria, policies were chosen for a thorough review to identify changes in policy paradigms based on the abovementioned analytical framework. The policies chosen for review are listed in the supplementary material (Tables A1 and A2). The chosen policies were entered in qualitative content analysis software ‘Nvivo’ where text data pertinent to keywords were extracted and stored for analysis. The text data should have a potential for analytical contribution and should also allow for exploration of themes and patterns that is of interest from a research viewpoint (McLellan et al., 2003). Whilst the keywords mentioned above are present in the policies designed after 2005, previous versions of the same policies did not always cover these issues. Despite this, previous versions have been reviewed to determine whether climate mitigation issues were ignored because they were considered less important during the early 1990s. For both Nepal and Bangladesh, changes in policy paradigms were reviewed separately for two periods: from 1992 to 2004 and from 2005 to 2018, because both Nepal and Bangladesh showed a significant rise in resource use and GHG emissions after 2005.

### 3.2. Data analysis

The QCA is best suited for analyzing textual data that utilizes subjective interpretation of the contents through the systematic classification process of coding and identifying themes or patterns (Hsieh and Shannon, 2005). Therefore, we use directed qualitative content analysis, a type of QCA that uses text data and follows a structured process to extend an existing conceptual framework or a theory (Hickey and Kipping, 1996). Directed QCA begins by identifying key concepts as initial coding categories (Potter and Levine-Donnerstein, 1999). We use

the four key aspects of the analytical framework as the initial coding categories which were expanded further using focused coding categories to emphasize the elements of each of the four aspects of the analytical framework (Fig. 1). The focused coding categories segregated textual data pertinent to different elements of each of the four aspects of the analytical framework. A thorough review of the textual data under focused coding categories provided insights into how and to what extent the recent policies evolved across each of the four key aspects and its elements with respect to the earlier policies. Finally, the comparison between the textual data under focused coding categories for two different periods (1992–2004 and 2005–2018) allowed identification of the order of changes and the change mechanisms as defined by Hall (1993) and Capano and Howlette (2009), respectively.

## 4. Results

Table 1 shows the changes in policy paradigms, order of changes, and change mechanisms in Nepal and Bangladesh for the periods 1992–2004 and 2005–2018. Apart from the ‘institutions and strategic interactions’ aspect of the policies that went through a first-order change, other aspects went through second-order changes. The changes in the four aspects of the policies are explained in the following sections.

### 4.1. Problems and key focuses of the policies

The first climate change policy of Bangladesh, the Bangladesh Climate Change Strategy and Action Plan, was developed in 2009. Nepal’s Climate Change Policy was developed in 2011. Prior to these dedicated climate change policies, climate change and resource use issues were rarely mentioned in sectoral policies. After 2005, policies for sectors such as energy, forestry, agriculture, industry, and transport have included policy statements on climate change, and reduction of GHG emissions and resource use that align well with statements in overarching climate policies. The main focus of the climate change policies of both countries is still on climate change adaptation as adaptation is viewed as a bigger problem than mitigation. However, recent sectoral policies, along with the Reducing Emissions from Deforestation and Forest Degradation (REDD+) strategy (2015) of Nepal and the REDD + readiness roadmap of Bangladesh (2012), focus specifically on reduction of GHG emissions and use of biomass resource. The agriculture and forestry sectors contribute about 50 per cent of the total GHG emissions in Nepal and 27 per cent in Bangladesh. The REDD + documents cite a potential to absorb GHG emissions, a high deforestation rate (1.6 per cent per annum for Nepal and 2600 ha per annum for Bangladesh), and potential carbon credits transactions via international REDD funding as motivation to focus on climate mitigation. Therefore, this aspect of the policies has gone through second-order teleological change because of additional strategic actions, and clearly defined policy goals, such as reducing GHG emissions and resource use.

### 4.2. Contents of the policies

The policy instruments preferred in the earlier period were mostly environmental standards with few market-based instruments,

**Table 2**  
Change in policy paradigms for two periods between 1992 and 2018 for Nepal and Bangladesh.

	Policy paradigm 1992–2004	Policy paradigm 2005–2018	Order of changes/ mechanisms
<b>Problems and key focus of the policies</b>	Nepal <ul style="list-style-type: none"> <li>• Generic environmental policies with a focus on quality of environment.</li> <li>• Sectoral policies emphasize sustainable economic growth.</li> <li>• Resource management and conservation are covered under dedicated energy policy and agriculture policy.</li> </ul>	<ul style="list-style-type: none"> <li>• Dedicated climate policy with an emphasis on adaptation and resilience actions over mitigation.</li> <li>• Energy policy and low carbon economic development strategy focus on climate change mitigation, electrification, and energy efficiency across economic sectors.</li> <li>• Management of resources such as forest biomass and other energy resources are included as cross-cutting issues in the sectoral policies, mainly by industry policy.</li> </ul>	Second-order teleological change
	Bangladesh <ul style="list-style-type: none"> <li>• Generic environmental policies focus on quality of environment through sustainable agriculture and forest land management.</li> <li>• Forest, agriculture and energy policies focus on sectoral productivity and resource management, for example managing access to forest biomass and other energy sources.</li> </ul>	<ul style="list-style-type: none"> <li>• Dedicated climate policy with two fold strategy on both mitigation and adaptation.</li> <li>• Sectoral policies includes climate change and renewable energy as secondary issues.</li> </ul>	Second-order teleological change
<b>Contents of the policy</b>	Nepal <ul style="list-style-type: none"> <li>• Environmental standards as a favourable policy instrument, and capacity building of stakeholders as a means to deliver policy.</li> <li>• Official development assistance (ODA) comprise majority of funding required for the delivery of the policy.</li> </ul>	<ul style="list-style-type: none"> <li>• Economic and market-based instruments such as tax rebates, subsidies, concessions, and incentives for private sectors.</li> <li>• Generation of internal funding via local financial institutions, and least developed countries development funds (LDCDF) to supplement ODA.</li> </ul>	Second-order linear change
	Bangladesh <ul style="list-style-type: none"> <li>• Mainly environmental standards and few market-based instruments such as fair prices for sustainably produced agricultural products.</li> <li>• Major source of funding identified as ODA.</li> </ul>	<ul style="list-style-type: none"> <li>• Mainly economic and market-based instruments such as tax rebates, subsidies, concessions, and incentives for private sectors.</li> <li>• International climate finance mechanisms such as green climate fund and funds from global environmental facility to supplement ODA and internal financial mechanisms.</li> </ul>	Second-order linear change
<b>Institutions and strategic interactions</b>	Nepal <ul style="list-style-type: none"> <li>• Participatory approach for the delivery of policy and for sectoral development.</li> </ul>	<ul style="list-style-type: none"> <li>• Stakeholders' engagement and participation for coordination, training and capacity building, and for monitoring the progress of policy delivery.</li> </ul>	First-order dialectic change
	Bangladesh <ul style="list-style-type: none"> <li>• Coordination and partnership for sectoral development and for policy delivery.</li> </ul>	<ul style="list-style-type: none"> <li>• Coordination and partnership research, design and delivery of the policies.</li> <li>• Engaging government institutions at a local level for ground level coordination, and for capacity building, mostly technical.</li> </ul>	First-order dialectic change.
<b>Global initiatives</b>	Nepal <ul style="list-style-type: none"> <li>• None of the global initiatives are mentioned in the sectoral policies</li> </ul>	<ul style="list-style-type: none"> <li>• UNFCCC's climate agreements and Millennium Development Goals (MDGs) seems to have an influence on the sectoral policies. However, it's only the NDC and climate change policy that provides a reference to these global initiatives.</li> </ul>	Second-order linear change
	Bangladesh <ul style="list-style-type: none"> <li>• Agenda 21 of the Rio Earth Summit 1992 seems to have an influence on forestry policy.</li> </ul>	<ul style="list-style-type: none"> <li>• UNFCCC's climate agreements, MDGs and SDGs are strongly mentioned in NDC and in almost all of the key sectoral policies: energy, forestry, and agriculture.</li> </ul>	Second-order teleological change

particularly for Bangladesh. In the later period, both countries have favoured incentive-oriented economic and market-based instruments, while environmental standards are still prevalent. The financial mechanism, previously largely reliant on overseas development assistance (ODA), has evolved to include internal government funding as part of financing the delivery of the policies in the later period. The additional incentives-oriented policy instruments and the strategic move to allocating resources from internal funding mean that this aspect shows second-order linear change for both Nepal and Bangladesh. (Table 2)

#### 4.2.1. Policy instruments

**4.2.1.1. Environmental standards as regulatory instruments.** Environmental standards appear to be an important policy instrument during both the periods under study. This policy instrument was in existence well before 1990 in both countries, and is still preferred to control environmental pollution and promote resource conservation. In fact, in addition to previous general environmental policies such as the Bangladesh National Environmental Policy (1992) and the Nepal Environmental Policy and Action Plan (1993), regulatory frameworks, for example, the Environmental Protection Act (1995) in Bangladesh and the Environment Protection Act (1997) in Nepal, are still in force to

protect the environment from activities in sectors such as forestry, agriculture, transport and industry. Nepal's Vehicle and Transport Management Act (1993) and National Transport Policy (2001) were two separate regulatory frameworks to control emissions of environmental pollutants from transport sector. The National Sustainable Transport Strategy (2015) was formulated in the later period, aiming to address issues beyond environmental pollutants by promoting electric and hybrid vehicles, along with affordable standards for fuel quality to reduce GHG emissions and fossil fuels in the transport sector. For Bangladesh, the Strategic Transport Plan (2005) and its revised version (2015), along with vehicle emissions standards, aims to reduce GHG emissions and consumption of other fossil fuels by using compressed natural gas and improved fuel technology. Therefore, except for the transport sector, it appears that general environmental policies are still the major legal basis for enforcing environmental standards.

**4.2.1.2. Information-based instruments.** Policies during the early 1990s prioritized information-based instruments such as training, capacity building and awareness programs for relevant stakeholders. The National Agriculture Policy of Bangladesh (1999) has a section on creating awareness to reduce the use of chemical fertilizers and pesticides to prevent environmental pollution. The Agriculture Perspective Plan

(1995–2015) of Nepal encourages improvement in agricultural productivity. The updated version of the agriculture policy of Nepal, the Agriculture Development Strategy (2015–2030) has emphasized training and awareness programs on the use of bio-fertilizers. Most recent policies like the Bangladesh National Agriculture Policy (2010), the Bangladesh National Forest Policy (2016), Bangladesh REDD + readiness roadmap (2012), the Nepal Industrial Policy (2011), Nepal REDD + strategy (2015), and the Nepal Forest Sector Strategy (2015–2030) have emphasized the role of broader community participation and the involvement of public sector employees via continuously delivering awareness programs on environmental protection, and climate change mitigation and adaptation. This is in line with Article 11.1 of the Paris Agreement which states the need to enhance the capacity and ability of the developing country party, particularly countries with least capacity, such as the least developed countries for effective climate actions.

**4.2.1.3. Economic and market-based instruments.** Economic and market-based policy instruments were rarely used in policies during the 1990s. However, their use has increased in recent years, particularly after 2005. During the 1990s and until 2005, tax incentives and subsidies were provided to private sector organizations to improve sectoral productivity. However, recent policies have emphasized the need to provide tax rebates, duty concessions, and subsidies to encourage production processes and practices that comply with environmental protection acts and regulations. Bangladesh's Industrial Policy (2010) states that the bio/herbal pesticide industry will be provided with financial incentives. Similar statements are included in Nepal's Industrial Policy (2011) and the Nepal Agriculture Sector Development Strategy (2015–2030). The REDD + strategy of Nepal (2015) used tax incentives to promote private forestry. The Energy Sector Strategy (2010) of Nepal and the Renewable Energy Development Policy (2008) of Bangladesh explicitly state that renewable energy producers will be exempted from value added tax (VAT) and will also be considered for incentive tariffs. Nepal's Renewable Energy Subsidy Policy (2016) explicitly mentions involving local finance institutions in the distribution of subsidies for renewable energy technologies. The greater move towards these policy instruments in Bangladesh and Nepal reflects their incorporation in international biodiversity and climate change and agreements, including payments for ecosystem services. The REDD + strategy of Nepal (2015) and Bangladesh's REDD + readiness roadmap encourage the selling of carbon credits arising from REDD + activities.

#### 4.2.2. Financial mechanisms – internal funding and official development assistance (ODA)

Most of the policies introduced during the early 1990s stated the need to receive financial assistance via foreign aid mechanisms to improve sectoral environmental performance. The National Forest Policy of Bangladesh (1994) proposed to establish a fund that sourced money through ODA to support the implementation of the policy. The updated version of the same policy, the Bangladesh National Forest Policy (2016) promotes bolstering the international funds available under international climate agreements and conventions by establishing an internal conservation fund, an investment fund, and other funds for environmental education and human resource development. Similarly, to deliver its Industrial Policy (2016), the Bangladesh government developed internal funding based financial package and incentives for private sector businesses to invest in environmentally friendly projects. Nepal's Industrial Policy (2011) also mentions the need to provide financial assistance via internal sources for research and development of technologies that could improve the environmental performance of the industrial sector. In contrast, the Industrial Policy (1993) of Nepal created financial provisions such as a concession on income tax and sales tax, but these incentives were targeted more towards increasing the production of goods and services.

Bangladesh's National Renewable Energy Policy (2008) created an innovative financial mechanism using domestic funding for commercial lending and a micro-credit system for the purchase of renewable energy technologies. The National Energy Policy (2005) focused on increasing access to micro-finance, joint ventures and structured loans to improve access to energy for the majority of the population. This policy also stated that it aimed “to reduce the dependence on external donors gradually by internal financing to the extent possible and new mechanisms of project financing”. The National Energy Policy (1995) had stated that Bangladesh lacked the funds to encourage private sector participation in the development of the energy sector, and therefore most of the policy statements were focused on technology development and dissemination. For Nepal, the Rural Energy Policy (2006) created a central rural energy fund. While the government was the major contributor, donor agencies also made some financial contributions. Subsequent energy policies, the National Energy Strategy (2013) and Renewable Energy Subsidy Policy (2016), created a power development fund through internal funding. A separate fund that had a partial contribution from ODA was also created to improve energy access in rural areas.

While the early policies of Bangladesh emphasized ODA more than internal funding for policy implementation, policies designed after 2005 have explicitly mentioned special funds for climate change projects, for example a Green Climate Fund under UNFCCC, REDD + project fund, and the Global Environment Facility. The external funding bodies are still sought for climate change mitigation and adaptation projects despite the recent shift to managing funding from internal sources. The previous energy, forest and agricultural policies of Bangladesh have mentioned ODA as a source in addition to creating local micro-credit facilities and funding from designated private financial institutions. The climate, energy, forest and agriculture policies of Nepal also emphasized foreign investment as a financial source in the early 1990s. However, after 2005, these policies have emphasized a dedicated internal funding based climate change fund, and encouraging local financial institutions as internal sources of funds.

#### 4.3. Institutions and strategic interactions

Interactions between formal institutions and advocacy coalitions are essential for the conceptualization and synthesis of the knowledge required for environmental and sustainability decisions (Videira et al., 2017). During the two periods under study, strategic interactions amongst formal institutions and advocacy coalitions have not changed much for Nepal and Bangladesh. There have been slight changes in the names of the ministries responsible for developing sectoral policies, but there have always been responsible formal institutions looking after the development of sectors like energy, forest, agriculture, transport, and industry. One notable change in the period from 2005 to 2018 is that environmental issues are now pinpointed as an additional consideration by each of the key sectoral ministries in both Nepal and Bangladesh. Another change is that formal institutions have strengthened their engagement with other government organizations at the central and local levels in terms of sharing knowledge and information, and improving their technical capacity to deliver the policies. A third notable change in the 2005–2018 period is that formal institutions have evolved to look after climate change mitigation and resource use issues. Examples include the Sustainable Energy Development Authority of Bangladesh, and a high-level Climate Change Council and a dedicated Climate Change Management Division in Nepal.

Across the vertical dimension, local government institutions were also given responsibilities to head the government-supported local committees for the development of the forestry, agriculture and energy sectors. However, the role of local institutions in policymaking is not explicitly mentioned. However, the NDC of Bangladesh (2016), REDD + readiness roadmap (2012) and the Bangladesh Climate Change Strategy and Action Plan (2009) state about consultations with local and international non-governmental organizations, private sector

organizations, communities and civil society groups. Similarly, the Industry Policy (2010), the Forest Policy (2016), REDD + strategy (2015), the Strategic Transport Plan (2015), and the Agriculture Policy (2018) emphasize government, non-government, and-private sector partnerships for the research, development and delivery of policies. Nepal's Forest Sector Policy (2000) and the National Agriculture Policy (2004) emphasize participatory research and the development of the agriculture and forestry sectors by involving private sector and non-government organizations. The NDC (2015) of Nepal emphasizes the strengthening of both central and local government institutions, and coordination mechanisms that involve the private sector and NGOs, both local and international. Similarly, the Climate Change Policy (2011), the Energy Sector Strategy (2013), REDD + strategy (2015), the National Sustainable Transport Strategy (2015), and the Forest Sector Strategy (2016) emphasize broader stakeholder engagement for research and coordination, capacity building, and monitoring of progress with regard to policy. This aspect of the policies has gone through first-order dialectic changes for both countries, reflecting incremental changes across formal institutions and the way negation and synthesis of ideas and knowledge still focus on capacity building of local level organizations.

#### 4.4. Global environment-related initiatives – climate agreements and other global environmental policy frameworks

It appears as if global environment-related initiatives did not have much influence on policies until 2004. The exception is Bangladesh's Forest Policy (1994), which made a reference to the Rio Earth Summit 1992 by stating that the policy has considered chapter 11 of the UN's Agenda 21 (Combating Deforestation). However, during the period between 2005 and 2018, almost all the policies of Bangladesh made a specific reference to climate agreements, Millennium Development Goals (MDGs) and the Sustainable Development Goals (SDGs). The NDC (2016), the Bangladesh Climate Change Strategy and Action Plan (2009), the Bangladesh Renewable Energy Policy (2008), the REDD + readiness roadmap, the Forest Policy (2016), the Industry Policy (2010), and the Agriculture Policy (2018) all mention the Paris Agreement (2015), the Bali Action Plan (2007), the 1997 Kyoto Protocol, and both the MDGs and SDGs as being important to address through these policies. Therefore, this aspect shows second-order teleological change because of more strategic actions towards global environment-related initiatives that are clearly identified and explained in the policies.

For Nepal, earlier global environment-related initiatives do not seem to have influenced policies. However, more recent policies, especially the ones developed after 2005, mention global environment-related initiatives such as climate agreements and MDGs. For example, the NDC (2015) of Nepal was introduced in the run-up to the Paris Climate Conference, and the Climate Change Policy (2011) identified the MDGs as a reference strategy to meet the nation's development agenda, as well as being a means of addressing climate change issues. While the MDGs have now been superseded by the SDGs, this is not mentioned in any of the existing sectoral policies. The National Sustainable Transport Strategy (2015) references the Bangkok 2020 Declaration on sustainable transport goals for 2010–2020, the Bali Declaration on sustainable transport and Rio+20. Similarly, the REDD + strategy (2015) of Nepal seems to have been generated as a response to the Bali Action Plan (2007) as the policy refers to obligations to initiate GHGs emissions and resource use reductions under various meetings of UNFCCC. The change is therefore second-order linear change because of the strategic actions (transport and REDD + policies) for incorporating the objectives of global environment-related initiatives.

## 5. Discussion

### 5.1. New climate policy paradigm

Changes in the concepts upon which policies are based on influence understanding of the problems that policies are designed to address (Hall, 1993; Kuzemko et al., 2012). Policy and problem are, however, sometimes perceived as separate streams in public policy (Béland and Howlett, 2016). Nevertheless, these streams create a platform for perceiving problems, the actions required to respond to them, and analyses of proposed solutions. The climate policies of both Nepal and Bangladesh identify climate change adaptation as a problem in terms of sustaining the livelihoods of communities and for ensuring economic growth. Further, adaptation and resilience are top priorities for low-income countries in international negotiations on climate change (Ayers et al., 2014). Therefore, the normative position of Nepal and on climate change emphasizes adaptation actions in policies. However, the second order teleological change in the 'problem and key focus' aspect of the policies means a paradigmatic change from solely focusing on climate change adaptation towards embracing new climate policy paradigm that has strategic actions pertinent to climate mitigation. The new climate policy paradigm is characterized by transparency regarding climate change mitigation actions even applicable for developing countries, which is the feature of the present international climate policy paradigm (Hermwille, 2016). The new paradigms in Nepal and Bangladesh are transparent in the sense that climate change mitigation actions are included in the NDCs and their climate policies. Both countries have submitted their NDCs together with the national communication reports to the UNFCCC.

Bangladesh included mitigation for energy access and finance, and Nepal included mitigation for low carbon development in their climate change policies (Fisher, 2013). As both Nepal and Bangladesh move a step further from a traditional focus on climate change adaptation, particularly in the later period, the new climate policy paradigm is therefore characterized by a broader view of problems that was normally understood in terms of the quantity of GHG emissions. There are numerous meso- and micro-level initiatives that are a part of new climate policy paradigms in both countries. For example, sustainable transportation system, reduction of fossil fuels consumption, improved fuels quality, sustainable agriculture practices, conservation of forest area, human resource development, and environmentally sound products. In addition to these initiatives, the new climate mitigation-based policy paradigm in both countries is a positive step towards implementing their NDCs as part of meeting their commitments of the Paris Climate Agreement. However, absolute resource use and GHG emissions are on the rise for both countries since 2005 (World Bank (WB), 2019). The absolute resource use and GHG emissions are projected to increase significantly by 2030 and beyond despite notable improvements in carbon productivity and energy productivity<sup>5</sup> between 1985 and 2016 (Baniya et al., 2021). Therefore, in addition to framing climate mitigation-oriented actions in the policies, the new policy paradigms in both countries could focus on delivering absolute reductions in resource use and GHG emissions. While climate change adaptation remains the main focus, the new policy paradigm that frames climate mitigation broadly co-exists with the adaptation based policy paradigm for both Nepal and Bangladesh (Fig. 3). Therefore, the layering mode of changes seems to be present for both countries as mentioned by Vij et al. (2018). Further, only one occasion of drift and conversion in Bangladesh and none for Nepal in climate adaptation-related policy paradigms (Vij et al., 2018) substantiate the efforts required to strengthen the institutions and

<sup>5</sup> Carbon productivity is defined as the ratio of unit united states dollar (USD) of gross domestic product (GDP) generated per unit of GHG emissions. Energy productivity is defined as the ratio of unit USD of GDP generated per unit of energy used.

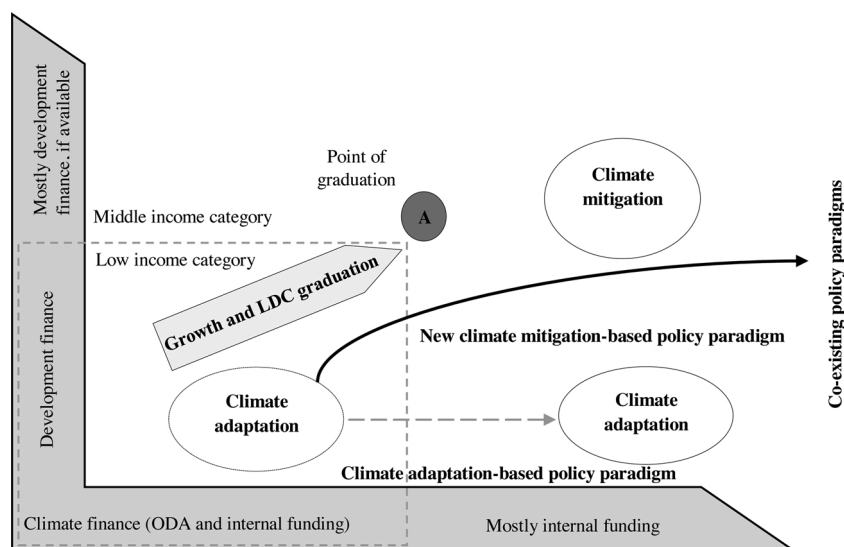


Fig. 3. Changing policy paradigms, financial mechanisms, and least developed country (LDC) graduation.

their strategic interactions not only for climate mitigation but for climate adaptation too.

### 5.2. Institutional interplay and strategic actions

The 'institutions and strategic interactions' category has gone through first-order dialectic changes for both Nepal and Bangladesh. A lack of broader participation of local formal institutions during policy design seems to be a notable weak link in the strategic interactions. Institutional constraints like this have been identified as impacting on policy change (Béland, 2009). However, advocacy coalitions involving international development organizations have driven policy changes in Nepal and Bangladesh (Rahman and Giessen, 2017). The role of these exogenous agents in policy design appears to have been significant for both Nepal and Bangladesh from 2005 to 2018 given the second-order changes in global environment-related initiatives which occurred by linear mechanism for Nepal and by teleological mechanism in Bangladesh. However, the technical capacity of formal institutions at the local level, appears to have been undermining the role of exogenous agents as the majority of policies stated capacity building requirement for local government organizations. In general, the formal institutions at the local level are subjected to ideational power<sup>6</sup> from central government organization, which is defined by Carstensen and Schmidt (2016) as influencing the cognitive and normative beliefs. The first order-change in 'institution and strategic interactions' aspect for both countries is an incremental approach led policy changes via a dialectic mechanism, meaning a non-crisis driven change that is prevalent within discursive institutionalism (Schmidt, 2011). Despite this, teleological change in global environment-related initiatives aspect of policies in Bangladesh, and linear change in Nepal indicate governments' interest to possibly take more strategic actions pertinent to climate mitigation in the future that are in line with international climate commitments.

### 5.3. Potential changes in Official Development Assistance (ODA)

Donor agencies such as the World Bank and United Nations agencies have contributed to the creation of a \$1.3 billion LDC fund under the Global Environment Facility to support climate change adaptation in

<sup>6</sup> The ideational power refers to the policymakers' and their institution's ability to influence the cognitive belief of policymakers' from relatively weak formal institutions, particularly at the local level.

low-income countries (Global Environment Facility (GEF), 2020). The Green Climate Fund (GCF) has apportioned half of the adaptation allocation for LDCs and small island developing states (Antimiani et al., 2017). LDCs can also access the mitigation allocation of the GCF. Additionally, the developed countries have pledged to provide US\$100 billion per year for developing countries by 2020 (Khachatryan et al., 2014). However, the ODA received as a percentage of GNI has significantly decreased for both countries. Nepal's ODA funding as a percentage of GNI decreased from 9% to 5%, while that of Bangladesh decreased from 4.5% to 1% between 1985 and 2016 (World Bank (WB), 2019). In lieu of ODA, government's internal funding has been supporting climate change mitigation actions. Market-based and economic policy instruments such as tax rebates, subsidies, funding from local financial institutions, and other financial incentives are meant to close the financial gaps as per the policies in the later period (2005–2018). The apparent shift from ODA-based climate finance to internal funding seems to be a significant milestone for both Nepal and Bangladesh, especially in terms of being self-sufficient. However, as both countries are targeting LDC graduation, reliance on ODA has to change ultimately. The ODA and climate finance delivery mechanism is likely to change as part of changes in international support measures post-LDC graduation (UNTCAD, 2017). The changes such as an increase in the ratio of loan to grant, a loss of access to LDC specific climate change funds, and a reducing trend of ODA received per GNI means that there is a need to identify funding sources other than ODA for both countries. The contents of the policies have gone through second-order linear changes for both Nepal and Bangladesh. Therefore, the existing policy instruments and financial mechanisms may need to evolve further and probably achieve third-order radical changes to counter the negative impacts of changes in ODA. Fig. 3 shows the relationship between changing policy paradigms, financial mechanisms and the LDC graduation. After point A, if Nepal and Bangladesh succeed in LDC graduation, climate change mitigation actions are likely to become the key focus of their policies in addition to climate adaptation as a result of problems such as significantly increased resource use and GHG emissions.

## 6. Conclusion

Existing policies are still adaptation based. However, the climate change mitigation-oriented policies have evolved significantly in both Nepal and Bangladesh, particularly post-2005, to embrace a new policy paradigm. The new policy paradigm emphasizes climate mitigation for reasons other than the reduction of GHG emissions such as low carbon



development, energy access, sustainable transportation, and sustainable agriculture and is proactive in the sense that it looks to address broader issues. While the new policy paradigms in both countries have considerably framed climate mitigation-oriented actions, delivering absolute reductions in resource use and GHG emissions remains an area of concern, particularly given the requirements of global environment-related initiatives. A potential reduction in the ODA because of the shift in the financial mechanism may further challenge the prospects for delivering absolute reductions in resource use and GHG emissions. Therefore, the new policy paradigms in both countries will have to move beyond policy formulation to deliver climate mitigation-oriented actions. The contents of the policies will also have to evolve further to minimize the negative impacts of any changes to ODA. This would create more opportunities for collaboration between formal institutions and local financial institutions, thus leveraging the discursive institutionalism to enhancing strategic interactions, which currently appear to be weak. A transition from ODA-based financial mechanisms to internal funding, especially after LDC graduation, will enable both countries to leverage progress made on economic- and market-based policy instruments.

Finally, although the literature on policy changes has progressed rapidly, there is a lack of sufficient country-specific studies focusing on climate mitigation-oriented policy paradigms. This study undertook country-specific research by creating and applying the analytical framework, which could be compared with other similar studies or applied in a different context. Further, the global environment-related initiatives have continued to become demanding even for the LDCs. Therefore, this study recommends that future research investigates the role of global environment-related initiatives as an external driver to changes in policy paradigms, particularly for developing and low-income countries where the international development and ODA delivery mechanisms are strong.

#### 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.

#### Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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#### Appendix A. Supplementary data

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