



How climate policies can translate to tangible change: Evidence from eleven low- and lower-middle income countries

Philipp A. Trotter^{a,b,c,*}, Imran Mannan^d, Aoife Brophy^{b,e}, Delight Sedzro^f, Abdulmutalib Yussuff^d, Francis Kemausuor^g, Yacob Mulugetta^d

^a Schumpeter School of Business and Economics, University of Wuppertal

^b Smith School of Enterprise and the Environment, University of Oxford, UK

^c Chair of Operations Management, RWTH Aachen University, Germany

^d Department of Science, Technology, Engineering and Public Policy, University College London, UK

^e Said Business School, University of Oxford, UK

^f Marine Engineering Department, Regional Maritime University, Ghana

^g The Brew-Hammond Energy Centre, Kwame Nkrumah University of Science and Technology, Ghana

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ABSTRACT

Formally adopting climate change mitigation policies does not necessarily translate to tangible change on the ground. Here, we analyse 31 semi-structured interviews with climate policy government officials and consultants from 11 low-income and lower-middle income countries (LMICs) as well as the respective climate policy context, and find high average degrees of perceived discrepancies between formally adopted climate change mitigation policies and their actual implementation. Our results suggest that for our LMIC sample, both the global political process to limit climate change and domestic environmental threats have been key to drive the formal adoption of climate change mitigation policies, but have had limited effect on implementation. By contrast, momentum for implementation of climate change mitigation initiatives and projects on the ground emerges where climate policies are firmly embedded within economic and social development policies, the economy and society are comparably well-positioned to embrace the associated change, and where they have been governed by cross-ministerial institutions capable of implementing wider climate-compatible development pathways. Thus, to help translate climate policy into action, national LMIC governments and the international community need to find context-specific ways to successfully integrate climate with economic and social development policies, identify and build on feasible opportunities and competitive advantages through which the local economy can benefit from green growth, build adequate social capital, and actively create institutional spaces and processes for well-equipped and meaningful cross-ministerial co-benefit governance. The importance of unlocking co-benefits for implementing climate policies underlines both the urgency with which the international community needs to increase finance for LMICs for climate change mitigation, as well as the associated development opportunities.

1. Introduction

A lei não pegou (The law didn't stick)

- Expression in Brazil

To minimise the risks of global warming beyond 1.5 °C, climate change mitigation policies are required in both industrialised and emerging economies (IPCC et al., 2018). While the gap has been reduced

by a full degree between 2010 and 2021, as of mid-2021, pledges by countries worldwide are still estimated to lead to 2.4 degrees of global warming by 2100 (Climate Action Tracker, 2021). For industrialised countries, the implications of a 1.5 °C target are comparably clear: Given their high-income status, their historic responsibility for climate change and the crucial need to achieve a just transition (Bel and Teixidó, 2020), these countries ought to transition to net-zero emissions as quickly as possible (van Soest et al., 2021). For setting climate policies, this has allowed for a comparably straight-forward, top-down way of using

* Corresponding author. Smith School of Enterprise and the Environment, University of Oxford, UK.

E-mail address: philipp.trotter@smithschool.ox.ac.uk (P.A. Trotter).

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net-zero ambitions to guide mitigation efforts. Dynamics of a virtuous circle of increasing pledges by means of “soft reciprocity” (Dubash, 2020; Falkner, 2016) have helped to lead over 100 national governments to either adopt or consider adopting net-zero goals (van Soest et al., 2021).

In low- and lower-middle income countries (LMICs), however, the drivers of climate change mitigation policies are less clear given significantly lower per capita emissions and high budgetary constraints for inducing change. Most LMICs have signed the Paris Agreement and submitted their National Determined Contributions (NDCs). Yet while the academic literature and the public discourse have focused on pledges inscribed in NDCs and national climate policies to judge the gap to 1.5 °C (Bel and Teixidó, 2020; Climate Action Tracker, 2021; Pauw et al., 2020; van Soest et al., 2021), there can be sizable gaps between the ambitions stated in climate policies and what is actually being implemented (Dubash, 2020). This issue is particularly salient in LMICs where a range of context-specific institutional, economic, environmental and social barriers may limit or decelerate implementation and affect the available choice of policy instruments (Dubash et al., 2013; Giles et al., 2021; Laudari et al., 2021), and where reliable data on monitoring and evaluation of climate policy implementation are scarce (Sekamatte, 2018). Despite growing evidence that a sustainable energy transition towards solar and wind is likely to be economically favourable for many LMICs (Chakravarty and Somanathan, 2021; IRENA, 2021; Mercure et al., 2021; Oyewo et al., 2020), there is growing evidence of such transitions being limited in LMICs (Alova et al., 2021; Steckel et al., 2015, 2020), raising questions regarding the extent to which signing the Paris Agreement and formally adopting climate policies are changing outcomes on the ground. Yet neither the reasons behind this discrepancy nor suggestions for how it can be overcome are well-understood in the literature.

To address this gap, to the best of our knowledge, our paper is the first to empirically study and compare the drivers and barriers for adopting climate policies and for implementing them to drive change on the ground in LMICs. By policy adoption (also referred to as development, creation or design), we mean the process of government bodies formulating and formally agreeing to policy objectives and strategies, while policy implementation (also referred to as action), is focused on translating the objectives into specific policy instruments and ensuring that these instruments lead to tangible action in different sectors of the economy (Dubash et al., 2013; Garibaldi et al., 2014). Our paper allows us to make three contributions to the literature. First, based on a framework we develop for categorising climate policy drivers (section 2), on qualitative data we collected from conducting 31 semi-structured interviews with climate policy makers and consultants from 11 different LMICs (section 3) and the corresponding climate policy landscape (Appendix C), we analyse the differences in concrete drivers of formal climate policy adoption versus their implementation on the ground (section 4). Second, we study how exactly these individual drivers work in LMIC context, identifying a total of 15 different associated mechanisms (section 4). Third, based on our results, we suggest a set of interventions that leverage the identified drivers to help turn climate policies into tangible change on the ground (section 5).

2. Background

2.1. Drivers and barriers of climate change mitigation policies in LMICs

Compared to high-income countries where policies have focused on abatement of current emissions as well as taking responsibility for historical emissions, mitigation in LMICs largely means ensuring that future development pathways are low-carbon (Adenle et al., 2017). There has been a focus in many LMICs on policies for adaptation as opposed to mitigation despite the potential for synergies between mitigation and adaptation (Shrestha and Dhakal, 2019). Creating the foundation for the emissions associated with development to be lower

than a business-as-usual approach is thus a critical part of mitigation in LMICs contexts. This becomes especially important considering the mounting evidence that current growth trajectories in low-income countries continue to rely on fossil fuels (Alova et al., 2021; Steckel et al., 2015, 2020), leading to a potential lock-in of pollution inefficiencies in infrastructure (Granoff et al., 2016). Hence, there is a need to better understand what drives climate change mitigation policies adoption and implementation in LMICs (Adenle et al., 2017; Granoff et al., 2016).

Recent studies that have considered climate change mitigation in LMICs converge around two main categories of drivers: internal and external (Garibaldi et al., 2014; Zimmer et al., 2015). Firstly, internal drivers relate to domestic objectives. The literature on co-benefits has been particularly influential in considering the domestic benefits of climate policy as a means of reconciling development and climate goals (Ostrom, 2010). Co-benefits refer to the positive effects climate policies might have on other goals. India, for example, has been at the forefront of this discourse with a focus on co-benefits since their 2008 National Action Plan on Climate Change (Mayrhofer and Gupta, 2016). This literature has focused on the synergies between climate and economic benefits, sometimes conceptualised as climate-compatible development in LMICs (Mitchell and Maxwell, 2010). More recently, there have been several efforts to broaden the concept to include key social and justice objectives (Ficklin et al., 2018a; Wood et al., 2017). Recent empirical studies have similarly considered many types of co-benefits related to climate policies, with studies related to health (Haines, 2017; Markandya et al., 2018; Scovronick et al., 2019) and air quality (Li et al., 2018; Tibrewal and Venkataraman, 2021) in particular dominating the empirical literature (Karlsson et al., 2020). Other types of co-benefits such as energy security (Chaturvedi, 2016; Dhar et al., 2017) and reducing poverty and inequality (Campagnolo and Davide, 2019) have also started to receive more attention. Mayrhofer and Gupta (2016) classify co-benefits into four overarching categories: political, environmental, economic and social. Approaches to co-benefits have focused on identifying the size of different categories as a means of directly improving the underlying incentives (and reducing barriers) for climate policy, ensuring stakeholder support for climate policy and incorporating co-benefits into climate models and policymaking processes (Karlsson et al., 2020; Ürge-Vorsatz et al., 2014).

Secondly, external drivers of climate change mitigation policies are those shaped by the international community. They have not received as much attention in the literature to date for LMICs. International, top-down approaches have been salient vehicles for climate policy adoption globally (Jordan et al., 2015; Rayner, 2010). Fulfilling international obligations can be a critical driver for LMICs to adopt climate policies (Laudari et al., 2021). Through the alignment between the UN's Sustainable Development Goals (SDGs) and the IPCC processes, there is an increasing international pressure on LMICs to enter the climate policy sphere. As a result, there may be political repercussions from the international community if LMICs choose not to engage (Trotter et al., 2018). Furthermore, overcoming financing barriers will be needed to underpin climate policies and accelerate low-carbon development (Adenle et al., 2017). Attracting climate finance can provide economic benefits. For example in the case of Vietnam, the increasing share of aid portfolios being allocated to sustainable development and green growth is seen as an opportunity for the country to gain international financial support and technical assistance (Zimmer et al., 2015). Moreover, constructive engagement in international climate change mitigation contributes to establishing a good international reputation for Vietnam as a ‘reliable partner’ in the region, which could then have positive spillovers to other policy arenas, such as trade negotiations or investment treaties (Zimmer et al., 2015). Countries with good governance tend to be chosen for climate mitigation finance by donors, providing additional incentives for cementing a strong political reputation (Halimanjaya, 2015) and capturing first mover advantage in attracting finance (Zimmer et al., 2015). There are also environmental as well as

political incentives for countries within the same region to cooperate in developing climate mitigation plans. Recent empirical work on China’s climate mitigation policies for example identifies co-benefits associated with transboundary impacts of national policies for the wider region (Li et al., 2018). Although there are calls for a greater focus on regional efforts (Adenle et al., 2017; Garibaldi et al., 2014; Zafarullah and Huque, 2018), these efforts also require strong political will and institutional structures.

Building on these combined insights from the literature, Table 1 suggests a framework and provides associated potential examples of climate policy drivers. Its four driver categories are based on Mayrhofer and Gupta’s (2016) classification of political, environmental, economic and social co-benefit types which they derive from their in-depth literature review on co-benefits of climate policies. The drivers of climate policy adoption and implementation are naturally linked very closely to the associated expected outcomes, or benefits, of these policies, suggesting that Mayrhofer and Gupta’s classification is similarly applicable for our case. In our framework, we extend the “social” category Mayrhofer and Gupta propose to “socio-cultural” to explicitly include and capture additional potential cultural drivers of climate policy adoption and implementation such as specific cultural and/or religious beliefs, self-conceptions and practices which may have an impact on climate policy making. We furthermore group potential social responsibility drivers of climate policy making under this category (Table 1). Finally, we combine these four categories with Garibaldi et al.’s (2014) and Zimmer et al.’s (2015) suggested distinction between internal and external drivers to yield a mutually exclusive and cumulatively exhaustive classification framework of climate policy drivers. The table builds on recent empirical examples and reviews as well as our own assessment.

2.2. Climate policy adoption versus implementation

While there is growing understanding of and attention to the drivers of climate change mitigation policies in LMICs, the empirical work to date has not systematically distinguished drivers for policy adoption from policy implementation. There is a growing body of literature, however, that suggests the importance of this distinction. Laudari et al. (2021) show the disconnect between Nepal’s Nationally Determined Contribution (NDC) to the Paris Agreement, and the limited institutional, budgetary and on-the-ground impact to which it has actually led. Due to potentially large discrepancies between policies on paper and tangible action on the ground, Dubash (2020) argues that the latter is

Table 1

Framework for different potential drivers and barriers of climate change mitigation policies and policy-induced action in LMICs and exemplary drivers and barriers mapped against the framework.

	Political	Environmental	Economic	Socio-cultural
Potential internal drivers/barriers	<ul style="list-style-type: none"> • Domestic political gains from pushing climate action policies • Effective governance and high institutional capacities • Support from key stakeholders • Political will • Politicians’ awareness/ understanding of climate change • ... 	<ul style="list-style-type: none"> • Reducing future vulnerability to climate change • Experience with the environmental consequences of climate change • Reducing local pollution • Preserving local biodiversity • Other local benefits • Limited fossil fuel resources • ... 	<ul style="list-style-type: none"> • Promoting sustainable and ‘green’ economic growth and jobs • Favourable starting point to capitalise on green growth • Economic inability to deal with consequences of climate change • Perceived necessity to continue domestic fossil fuel industry support • ... 	<ul style="list-style-type: none"> • Energy/food/water security • Social responsibility for general wellbeing of the population • Other local benefits • NGO and public lobbying • Local cultural beliefs, self-conceptions and practices • ...
Potential external drivers/barriers	<ul style="list-style-type: none"> • Building international alliances • Achieving international recognition • Desire to lead regional efforts in climate change mitigation • International commitments/ pressure • International collaboration • ... 	<ul style="list-style-type: none"> • Preventing regional and global environmental damage • ... 	<ul style="list-style-type: none"> • First mover advantage for attracting Climate Finance • Attracting global aid into Green Growth • Renewable energy generation as an international resource • Reduction of international business interests in fossil fuels • ... 	<ul style="list-style-type: none"> • Solidarity with vulnerable communities globally • Shared social responsibility for wider human well-being • Concerns about migration due to climate change • Shared cultural and religious identities or motivations • ...

Sources: Zimmer et al., (2015), Garibaldi et al., (2014), Mayrhofer and Gupta (2016), Li et al., (2018), Adenle et al., (2017), Laudari et al., (2021), authors’ analyses

indeed a better indicator for the ambition level of climate policies than the former. Identifying similar discrepancies, recent work on barriers to implementing climate policies in LMICs has highlighted the importance of connecting to the needs and the awareness of local communities (Batidzirai et al., 2021; García de Jalón et al., 2015; Giles et al., 2021; Wreford et al., 2017). Demonstrating benefits to particular sectors of the economy and society as a whole can thus be critical for successful uptake of new modes of agriculture and energy access. These findings are consistent with indications from the co-benefits literature that policies with a focus on poverty and development are more likely to be implemented (Garibaldi et al., 2014). In summary, based on existing literature, we would expect internal drivers to be particularly important for the implementation of climate change mitigation policies.

By contrast, for policy adoption, we would expect external drivers to be salient given the nature of the top-down governance of climate policy and the increasing pressure over the past few years for LMICs to join international climate policy processes through developing NDCs (Pauw et al., 2020). At the same time, there is evidence demonstrating the importance of information and awareness for the adoption and implementation of policies at a national level (e.g. Alvi et al., 2020 in Bangladesh and Pakistan), suggesting that there are connections between drivers for adoption and implementation. Our focus on assessing the drivers for policy adoption and implementation across multiple country contexts allows us to delve deeper into the reasons behind these various drivers and barriers.

3. Methods and data

3.1. Case country selection

Our research uses semi-structured interviews and qualitative data analysis to study the drivers of climate policy adoption and implementation in LMICs. Our approach to select our country cases is informed by two key aspects. First, the intention of our research is not to identify every single sub-mechanism that helps to drive either the adoption or the implementation of climate policies, but rather to focus on the most salient differences in quality and type of drivers between adoption and implementation. Hence, we follow Weller et al.’s approach of item salience (Weller et al., 2018) for choosing our sample size, concentrating on reaching saturation of the most salient drivers rather than obtaining full thematic saturation. Second, since contexts across the 79 LMICs in the four world regions where they exist (Europe, Africa, Latin America and the Caribbean and Asia) vary significantly, we

wanted to ensure regional balance in selecting our country cases. To do so, we pre-determined the number of countries sampled from each of the four world regions with LMICs for any given overall number of country cases which could be required to reach item salience. This can be done by minimising the average difference between the ratio of selected and total number of LMICs in the four regions and the ratio of all selected countries and the total number of LMICs globally (unless no country was selected in a particular region). The actual cases within the world regions were then selected randomly. Table A in Appendix A shows the resulting distribution of country cases by world region for different total LMIC sample sizes. We obtained a satisfactory level of item salience (in our case the most salient drivers of climate policy adoption and implementation) after conducting interviews in eleven country cases, corresponding to sampling seven randomly selected LMICs from Africa, three from Asia and one from Latin America and the Caribbean (Table 2). It is key to note here that our intention is not to represent any one specific region through our sampling. Throughout the paper, we do not attempt to derive any region-specific insights. Policy dynamics and drivers are often context-specific, so it would not be adequate in our view to represent all LMICs in one world region by the subset we have chosen here. Instead, the purpose is to find salient drivers of climate policy adoption versus implementation across different types of LMICs, and the sampling we deployed was designed to ensure that we sampled from a diverse set of LMICs in different world regions.

3.2. Research approach and data collection

Our study focuses on qualitative data obtained through semi-structured interviews with country-level experts to study the different drivers between climate policy adaption and implementation. We chose to let the country-level experts' knowledge guide us in terms of assessing whether there are market disconnections between formally adopted climate policies, and tangible action on the ground, and what their respective drivers are. Relying on qualitative assessments is in part due to limited possibilities to assess these gaps quantitatively (Höhne et al., 2018; King and Van Den Bergh, 2019). Höhne et al. (2018) demonstrate that there is no straight-forward approach to measuring and comparing the ambition of different countries' climate policies. Ranking countries by their climate policy ambition and the level of actual implementation is difficult to do because it is highly country-specific, and cuts across all sectors of the economy as well as affects environmental and social issues. King and Van Den Bergh (2019) attempt to normalise the targets in the NDCs across countries. Albeit being an incomplete measure, it shows that our LMIC case examples are widely distributed in terms of the degree with which they have committed to change (albeit several countries not being listed due to a lack of quantitative greenhouse gas emission reduction target). The Climate Change Performance Index (Burck et al., 2019) is a notable attempt at a multi-sector measure for climate policy implementation, but this index only covers 57 countries and the EU, and not a single one of our 11 country cases is included. In this study, we thus

Table 2
Sampled low-income and lower-middle income country (LMIC) cases and split by region.

Region	Total number of LMICs	Sampled cases	Share of total number of LMICs in the region [%]
Europe	3	–	0
Asia	23	Myanmar, Pakistan, Vanuatu	13
Latin America and Caribbean	7	Bolivia	14
Africa	46	Angola, Benin, Ethiopia, Ghana, Nigeria, Uganda, Zimbabwe	15
Total	79	11	14

rely on our interviewees' expert opinion on what they believe is the level of progress on climate policy implementation, and, more importantly, what the underlying drivers have been in their respective countries.

We conducted at least two interviews in every country, and 31 in total, between March 2020 and January 2021 (Table 3). All interviewees were from the respective countries and actively involved in the countries' respective environmental sectors, working either as consultants or as direct government officials on climate policies. The consultants were based in different organisations, either specialised energy and climate consultancies, academia or NGOs. We intentionally mixed respondents from government and consultancies to both get an adequate inside view of climate policy adoption and mitigation, but also an account by external consultants. Individual answers can differ depending on the individual beliefs and orientation of respondents. This issue is dealt with by ensuring a sufficiently large enough sample size of different country contexts and interviewees, and deploying the item salience approach we discuss in section 3.1. Appendix B provides an extensive albeit exemplary list of full-text quotes which the result sections 4.2 and 4.3 reference, Appendix C provides a brief narrative of major climate policies in all 11 country case examples. A total of 21 of our semi-structured interviews were undertaken either in person or via video conference online and subsequently transcribed. To overcome restrictions due to the COVID-19 pandemic, we furthermore sent a set of open questions to ten further interviewees electronically, and they responded in written form. Interview questions were largely reflective of the framework established in sections 2.1 and 2.2, focusing on the drivers and barriers of both domestic climate change mitigation policy adoption and implementation. Interviewees were furthermore asked to explain the state of national climate policies, and comment on the degree of consistency between adopted climate policies and their implementation. The average interview length was roughly 52 min.

3.3. Data coding and analysis

The analysis involved the main processes of data reduction, data

Table 3
Overview of interviewees.

Selected country	Interviewee type	Code
Angola	Local policy consultant	ANG1
	Local policy consultant	ANG2
	Local policy consultant	ANG3
Benin	Local policy consultant	BEN1
	Government	BEN2
Bolivia	Local policy consultant	BOL1
	Local policy consultant	BOL2
	Local policy consultant	BOL3
	Local policy consultant	BOL4
Ethiopia	Government	ETH1
	Local policy consultant	ETH2
Ghana	Government	GHA1
	Local policy consultant	GHA2
	Local policy consultant	GHA3
	Government	GHA4
Myanmar	Government	MYA1
	Local policy consultant	MYA2
Nigeria	Government	NIG1
	Local policy consultant	NIG2
	Government	NIG3
	Local policy consultant	NIG4
Pakistan	Local policy consultant	PAK1
	Government	PAK2
Uganda	Local policy consultant	UGA1
	Government	UGA2
	Government	UGA3
	Government	UGA4
Vanuatu	Government	VAN1
	Government	VAN2
Zimbabwe	Government	ZIM1
	Local policy consultant	ZIM2

display and conclusion verification (Miles and Huberman, 1994). To reduce the collected data, we used first-cycle coding of the interview data (Saldaña, 2021) according to the framework in Tables 1 and i.e. we coded quotes by the different driver types (internal versus external and either political, environmental, economic or socio-cultural). To minimise biases, the coding of all interview data by framework category and salience of the driver within the quote combined the individual assessment of both the first and second authors. They then jointly assessed each quote and agreed on a classification. In terms of coding, we treated quotes regarding barriers (i.e. when interviewees provided reasons for why policy adoption or implementation have been difficult or unsuccessful) in a similar fashion to when interviewees mentioned a driver (i.e. why policy adoption or implementation has been successful). Where a single quote or passage was clearly attributable to more than one driver simultaneously (for example where an interviewee simultaneously discussed environmental and economic drivers of a government’s motivation to help prevent extreme weather events), we attributed this passage to all relevant driver categories individually.

After observing several qualitative differences within these driver categories, we used second-cycle coding to identify the individual drivers within each category, and clustered quotes by these individual drivers. Each subsection of the results section (section 4) presents detailed tables with exemplary quotes coded by driver type (first-cycle) and actual driver (second-cycle). We then created heat maps to display the participants’ perceived importance of the 16 categories of factors affecting climate policy. This allowed us to distil patterns and compare them for the adoption and the mitigation of climate change mitigation policies. We discovered that certain drivers were largely dominant within one of these two realms, while others were critical for both, which we summarise in the last sub-section of the results.

4. Results

This section first presents evidence of the perceived discrepancy between climate policy adoption and its implementation on the ground, before analysing and, critically, comparing the respective drivers in detail. The findings of differing drivers for the design and adoption of climate policies in our LMICs cases versus actual implementation on the ground are summarised in tabular form and briefly discussed in section 5 of the paper.

4.1. Discrepancy between climate policy adoption and implementation

Our results show that there is a considerable disconnect between the level of ambition stated in national climate policies and countries’ NDC since 2015 on the one hand, and the extent to which these policies have been implemented and translated to tangible action since then on the other. In nine out of eleven of our LMICs cases, interviewees explicitly discuss this salient discrepancy (Table 4). Most statements resembled interviewee ANG2 who stated that “[t]here is a big gap between policies, what is in the NDCs, and what is happening on the ground”, and went on to allude to a number of examples where a climate policy resembles an “idea [that exists] only on paper”. This finding appears to imply that different dynamics may drive adopting climate policies on paper and their implementation. Notably, Ethiopia and Benin were the only two countries in our sample where no interviewee perceived stark contrasts between formally adopted policies and implementation. Both countries have institutionalised cross-ministerial governance processes to implement climate policies, and have been dedicating state finance (in addition to external loans, grants and private finance) towards them and their associated programmes (see Appendix C). It is key to note, however, that the absence of such perceptions by national-level experts in our sample does not mean that no gaps between climate policy adoption and their implementation status may not exist in either of these two countries. Such gaps are difficult to measure quantitatively in the short to medium term, which is why assess expert opinion is key to help assess

Table 4

Exemplary evidence for discrepancy between formally adopted climate policies and implementation.

Exemplary quotes	Country (Interviewee)
“[Climate change] is quite high on the agenda. That is, in terms of policy. In terms of implementation, that is a different story ... If you look at our INDC, they were quite ambitious ... Like the idea to plant trees and protect our forests. That idea is only on paper, the amount of trees being planted is insignificant. The amount of forest cut down for logging purposes is huge. So there is a discrepancy between what was promised in 2015 and what actually took place since 2015 Another issue is on oil. We are developing new oil projects, new refineries. So although the government says “lets diversify our economy so it does not depend on oil so much, most of the projects, I would say 80% of investments, are for oil and gas There is a big gap between policies, what is in the NDCs, and what is happening on the ground.”	Angola (ANG2)
“There’s a lot that we already know about climate and a lot of policies [have been] made, but from what I was seeing in Angola is that [little] of that was being applied [after the Paris Agreement]. ... Evaluation and auditing of these policies and the changes they have brought are minimal.”	Angola (ANG3)
“There are public policies and government declarations of support [around climate change mitigation], but the actions of the last few years have contrasted with such policies.”	Bolivia (BOL3)
“We have ratified all the conventions on climate change, [but] there is a lack of political will to implement these climate policies.”	Ghana (GHA2)
“Climate change policies are being drafted but there is no decisive action for implementation.”	Ghana (GHA3)
“[W]hen [the government] looked into the INDCs, it was just like plain words, you know, ‘we’ll increase the forest area’, ‘we will do renewable energy by 9 GW’, but they really did not look into how much ... mitigation our country is actually going to do.”	Myanmar (MYA2)
“In Nigeria, there has been an absence of clear and enabling legislation. Policy is aspirational and doesn’t have force of law, and you cannot hold anybody accountable for not following the policy. If you don’t follow or implement the policies, nothing happens.”	Nigeria (NIG3)
“There is a lot of lip service to climate change, however, actual work on the ground is largely limited.”	Pakistan (PAK1)
“There is a big problem with translating government climate policies into action, currently it cannot be done.”	Pakistan (PAK2)
“Enforcement of policies remains a challenge. This is a very common problem for environmental policies [in Uganda]. For example, the ban on single-use plastic bags in Uganda has never been enforced.”	Uganda (UGA1)
“The policies are there, but the policies are not law in the strict sense - there is a lot of flexibility on the ground.”	Uganda (UGA4)
“Designing ambitious climate policies has become easier in the last 5 years, [but] implementing ambitious climate policies has become a lot more difficult for us.”	Vanuatu (VAN1)
“There are a lot of programmes, a lot of policies. ... But they are not financed. These [programmes] are not moving along.”	Zimbabwe (ZIM1)

them, but by no means a perfect indicator.

4.2. Drivers of climate policy adoption

Fig. 1 summarises the type of drivers each interviewee has mentioned to be salient for climate policy design and adoption in their respective countries. It suggests that in general, internal political and environmental, as well as external political drivers have been most commonly associated with adopting climate policies in the 11 LMICs in our sample. The subsequent sections detail these internal and external drivers, respectively. Table 5 and Table 6 map a range of different exemplary quotes provided in full in Appendix B to the related driver types and drivers, forming the basis of the analysis in these two sub-sections, respective.



Fig. 1. Overview of climate policy adoption drivers identified and discussed by the 31 interviewees that participated in this study. Note: A field coloured in green implies that the corresponding interviewee identified the respective driver type as a salient feature explaining why climate policies have been adopted in their respective country. Interviewees in bold denote national government officials, non-bolded ones denote national government-external policy consultants. . (For interpretation of the references to colour in this figure legend, the reader is referred to the Web version of this article.)

4.2.1. Internal drivers and barriers

In terms of internal drivers of climate policy adoption in the LMICs in our sample, political and environmental factors were most frequently discussed by our interviewees, followed by economic and socio-cultural drivers, albeit to a lesser degree (Fig. 1). Table 5 maps key exemplary quotes to each driver type and driver, some of which are used in the below narrative.

Coding internal political drivers identified three associated distinct drivers, namely (1) political leadership, (2) the ability to coordinate different actors and ensure collaboration, and (3) having adequate capacities. Firstly, while it is not surprising that several interviewees mentioned political leadership to be key for policy adoption (see Quotes 1–4 by MYA2, BOL3, ETH1 and NIG1 in Appendix B), the case of Ethiopia suggests that it is especially important to ensure consistency in political leadership between different governments. As ETH1 mentions when discussing the reasons behind what ETH1 perceived as

comparably wide-ranging climate policies in Ethiopia, “[t]here has been a consistent commitment across three Prime Ministers, which gave the climate strategy high level political backing” (Quote 3).

Second, drafting climate policies often implies a certain level of cross-ministerial coordination. In the case of Myanmar, MYA2 explains that institutionalising this coordination through the Environmental Conservation Department allowed the climate policy crafting process to be persistent enough to design integrated and wide-spanning mitigation policies (Quote 7). Where this is absent, it has frequently been described as a key barrier for climate policy making. Discussing the case of Zimbabwe, ZIM1 states that “[t]he big challenge is the systems thinking. Ministries are too often confined to their space. But which policies address the system aspect of climate change? We have not figured that out yet” (Quote 9, also see Quotes 6 and 8 by ANG2 and NIG1, respectively).

Third, dedicating sufficient capacities to climate policy drafting and design is critical, with interviewees referring to a policy design team of

Table 5
Selected evidence for internal drivers of climate policy adoption (see Table B in the Appendix for full verbal quotes).

Driver type	Driver/barrier	Exemplary quotes (interviewee) as listed in Table B
Political	Political leadership	Quote 1 (MYA2), Quote 2 (BOL3), Quote 3 (ETH1), Quote 4 (NIG1), Quote 5 (UGA4)
	Ability to coordinate and ensure cooperation	Quote 6 (ANG2), Quote 7 (MYA2), Quote 8 (NIG1), Quote 9 (ZIM1)
	Adequate capacities	Quote 10 (BEN1), Quote 11 (BOL1), Quote 12 (BOL3), Quote 13 (NIG3), Quote 14 (UGA2), Quote 15 (VAN2), Quote 16 (ZIM2)
Environmental	Experience of extreme weather events	Quote 17 (ANG2), Quote 18 (BEN2), Quote 19 (BOL3), Quote 20 (ETH1), Quote 21 (GHA1), Quote 22 (MYA1), Quote 23 (NIG1), Quote 24 (PAK2), Quote 25 (UGA1), Quote 26 (UGA3), Quote 27 (VAN1), Quote 28 (ZIM1)
	Realising environmental co-benefits	Quote 29 (BEN1), Quote 30 (MYA1)
Economic	Realising economic co-benefits	Quote 31 (BEN1), Quote 32 (ETH2), Quote 33 (GHA4), Quote 34 (VAN1)
Socio-cultural	Realising social co-benefits	Quote 35 (BEN1), Quote 36 (ETH1), Quote 37 (VAN2), Quote 38 (GHA2)
	Societal readiness for change	Quote 39 (ZIM1), Quote 40 (UGA2)

Table 6
Selected evidence for external drivers of climate policy adoption (see Table B in the Appendix for full verbal quotes).

Driver type	Driver/barrier	Exemplary quotes (interviewee) as listed in Table B
Political	Global political drive towards climate policies	Quote 41 (ANG2), Quote 42 (ANG3), Quote 43 (BEN2), Quote 44 (BOL1), Quote 45 (GHA1), Quote 46 (MYA1), Quote 47 (MYA2), Quote 48 (PAK2), Quote 49 (UGA1), Quote 50 (UGA4), Quote 51 (VAN1), Quote 52 (ZIM1), Quote 53 (ZIM2)
	External support for climate policy design	Quote 54 (NIG3), Quote 55 (UGA2), Quote 56 (VAN2)
Environmental	Global environmental climate change impact	Quote 57 (BEN2), Quote 58 (GHA2)
Economic	Foreign investment	Quote 59 (BEN1), Quote 60 (UGA4), Quote 61 (VAN1)

sufficient size (Quote 13, NIG3), collecting data for evidence-based policy making (Quote 10, BEN1) and, critically, being aware and knowledgeable about the long-term socio-economic opportunities associated with climate change mitigation (Quotes 12, 14, 15, 16 by BOL3, UGA2, VAN2, ZIM2, respectively). This latter point has been discussed as a reason why climate policies are not as aggressively pursued in most LMICs in our sample, while they have been critical in Benin and Ethiopia (Appendix C). UGA2 for instance mentioned that “[green] jobs, these things, they are on a low level of awareness of politicians, and of the population” (Quote 14).

Environmental drivers were the second most frequently discussed among all driver and barrier types of climate change mitigation policy adoption in our country cases. The most commonly associated driver our interviewees mentioned was the experience of extreme weather events domestically, phenomena witnessed in all of the LMICs in our sample. For instance, NIG1 said that “climate risks stand out in my opinion, [such as] issues of abnormal weather patterns, flooding, etc. So, the hazards are there to see and disrupting human activities” (Quote 23), leading policy makers to act. Notably, first-hand experience of extreme weather events can change policy makers’ behaviour: ZIM1 explains that the recent large-scale destruction caused by cyclone Idai in the country helped to nudge different ministries to overcome their previously siloed approach

to climate policy making, as “[p]eople from the Ministry of Finance have now started to attend the global meetings on climate change” (Quote 28). This development may have an impact on how the Zimbabwean government spends state funds, with climate policy implementation currently receiving little state finance (Appendix C). Such shared experiences can thus foster the degree of cooperation between different ministries and other institutions, an important feature of climate policy making (see this section). Realising environmental co-benefits such as decreasing land degradation (Quote 29, BEN1) and conserving natural resources (Quote 30, MYA1) are further, albeit considerably less frequently discussed drivers of adopting climate change mitigation policies. In the case of Benin, however, and in contrast to a case like Zimbabwe, they have been important to make the case to commit public finance to implementing climate change mitigation policies (Appendix C).

Internal **economic drivers** have played a secondary role for climate change mitigation policy design and adoption in most of the LMICs in our sample. Again, however, Benin, Ethiopia, and to an extent Ghana, stand out again, as interviewees made statement relating to realising economic co-benefits as an important driver for the design process of climate change mitigation policies. In Ethiopia, backed up by long-standing senior political leadership, transferring the country to middle-income status via a climate-compatible pathway is firmly anchored in the country’s national development vision, making this vision a cross-Ministerial driver for climate policies (Quote 32, ETH2). Notably, the country implemented a dedicated Climate Resilient Green Economy Strategy (CRGE) in 2011, several years ahead of the Paris Agreement warranted countries to reduce emissions, in a bid to combine climate and economic development policies and profit from the green transition (Appendix C). BEN1 similarly discusses climate change mitigation policies in broad terms of economic development, indicating their close link to the country’s envisioned development pathways (Quote 31). GHA4 even reframes the concept of co-benefits, putting economic benefits above environmental ones for “creating opportunities for socio-economic development and human-wellbeing, through implementation of projects which creates jobs, grows GDP and so forth. The reduction of GHG is mainly seen as a co-benefit” (Quote 33). Ghana’s National Action Programme to Combat Drought and Desertification, adopted as early as 2002, fits into this narrative, where overcoming economic hardship caused by droughts and desertification were the primary motivation, with environmental improvement seen as additional benefits (Appendix C).

Finally, interviewees have discussed (1) realising socio-cultural co-benefits and (2) the general societal readiness for change as internal **socio-cultural drivers** of policy adoption. First, consistent with interviewees’ assessment of Ethiopian and Beninese decision makers being conscious of long-term socio-economic gains of climate policies, both BEN1 and ETH1 explain that their climate change mitigation policies are in part driven by their perceived need to protect natural capital for their people to thrive socially and culturally (Quote 35, 36). In Vanuatu, a country severely threatened by the effects of climate change, VAN1 assesses that achieving the Sustainable Development Goals is contingent on mitigating climate change (Quote 37), a sentiment that is also repeatedly reflected in Vanuatu’s official government policies (Appendix C). Second, statements by UGA2 and ZIM1 suggest that climate policies benefit from societal readiness for climate policies (Quote 39, 40), a sentiment shared by other interviewees. In their countries, they assess societal awareness (ZIM1) and trust in the government (UGA2) to be low, respectively, leading to climate policies not being “high up on their agenda.” These examples show that a lack of internal support from civil society can be a barrier for climate change mitigation policy making in some of the LMICs in our sample, but, similarly to internal economic drivers, do not appear to have been a critically important, primary driver across LMICs overall (both Uganda and Zimbabwe have adopted climate policies despite these issues).

4.2.2. External drivers and barriers

Political drivers were by far the most critical external, and indeed overall driver of climate policy adoption in the LMICs in our sample. A small number of interviewees also discussed environmental and economic external drivers, while external socio-cultural factors were not mentioned by any interviewee (Fig. 1). Table 6 summaries exemplary quotes for the external drivers.

Two main external **political drivers** are salient in our data, namely (1) the global political drive towards climate policies, and (2) the external support LMICs have been getting for climate policy design. First, global efforts to foster a green transition, as evidenced by the Paris Agreement and associated global political and policy processes, were the most frequently mentioned single driver for why the LMICs in our sample adopted climate policies, being a salient feature of close to all of our interviewees from the 11 different LMICs. Interviewees from a majority of the countries in our sample explained that their countries would have been unlikely to adopt climate policies without this global push. This can be true even in the presence of existential climate change-related environmental threats such as for Vanuatu, with VAN1 suggesting that "[a]s far as I know, all our commitments to climate change or climate targets relate to the Paris Agreement" (Quote 51). Our data reveal a range of related mechanisms in terms of their degree of applied external pressure: On one end of the spectrum, MYA2 explained that the "Paris Agreement really provided that platform for the government ... to really see what we need to contribute in terms of climate policy" (Quote 47), suggesting that information spreading and global alignment rather than actively applied pressure was key for Myanmar's policy drafting. Similarly, rather than experiencing active pressure, for ANG2, "[t]he key driver is just following the global trend: Doing something for the climate looks nice internationally" (Quote 41). On the other end of the spectrum, however, a number of interviewees have said that LMICs have experienced "pressure" (Quote 49, UGA1), a "push" (Quote 43, BEN2) or "obligations" (Quote 45, 48 by GHA1 and PAK2, respectively) to adopt climate policies due to the combination of being aid-dependent and international donor organisations viewing the climate crisis as highly important. In the words of UGA4, "[i]nternational donors are setting the agenda for climate change" (Quote 50), with climate policy being "almost entirely driven by donors" (Quote 53, ZIM2). As a consequence of this external pressure, some interviewees suggest that local circumstances have not received enough attention (Quote 44, BOL1). Notably, in addition to the drive from Western governments, some interviewees also mentioned pressure dynamics within regional peer groups. For instance, ANG3 stated "[w]hy does Angola even have climate policies? I think it's really just about following the global movement ... even looking at the other African countries, it's to say that we're not staying behind" (Quote 42). Similarly, UGA1 mentioned the work from "regional bodies from neighbouring countries, for example the East African community" (Quote 49) as being important for regional drive towards adopting climate policies.

Second, a related mechanism is the quickly increasing external support for drafting climate policies. In a telling example, NIG3 explains that "[i]n the last 10 years, the number of development agencies supporting climate change issue in Nigeria has quadrupled. So currently ... we've got at least seven international partners all supporting Nigeria's revision of the NDC. And these development agencies have also, to a great extent, facilitated our climate ambition and policy" (Quote 54). In Uganda and Vanuatu, UGA2 and VAN2 similarly give credit to international donors for technical assistance in policy drafting and lobbying for the importance of climate change outside the core ministry realm, respectively (Quote 55, 56).

It should be noted that we found one example in our interview data where external political pressure to deliver on climate goals has led to a more cautious approach when defining climate policy targets. MYA2 reported that in Myanmar, "[p]eople in the Ministry, they were not ready to have the original renewable energy target from their national energy sector policy in the NDCs because they are worried about what the consequences can be if they do not meet that target. ... So they decreased it for the NDC."

Furthermore, apart from political drivers, only two interviewees have mentioned external **environmental drivers** as being salient drivers of climate policy making in our LMICs sample. When contrasted to the high salience of extreme weather events occurring within national boundaries, this result suggests that climate policy making can get a particular push from domestic experience of some of the potential consequences of climate change first-hand.

Finally, external **economic drivers** were mentioned by five interviewees, all focusing on the anticipated greater ability of LMICs with climate policies in place to attract foreign investment, or an equivalent fear of missing out on potential green investments. Speaking about Vanuatu, VAN1 points out that "without committing the country to the Paris agreement, how can we source international financing if we're not partners of such conventions?" (Quote 61). Viewing the presence of international finance as the key driver of climate policy adoption, UGA4 explained that "[w]ithout this prospect of [international] finance, I am not sure how much of this climate change thing would actually have an impact on policies here" (Quote 60).

4.3. Climate policy implementation and action

Fig. 2 shows the type of drivers that each interviewee discussed in the context of implementing climate policies on the ground in their respective countries. The subsequent sections again discuss associated internal and external drivers, respectively. The analysis in both of these sub-sections is based on Table 7 and Table 8 which map the exemplary full-text quotes provided in Appendix B to these internal and external drivers, respectively.

4.3.1. Internal drivers and barriers

Our results suggest that internal political, economic and socio-cultural drivers are particularly important for climate policy implementation (Fig. 2). Table 7 maps the quotes in Appendix B on the respective driver types and drivers.

Our data suggest that internal **political drivers** have been a salient driver and/or barrier for both adoption and implementation of climate policies in our LMICs cases. In terms of implementation, we identify four related drivers, namely (1) political leadership, (2) the ability to coordinate and ensure cooperation, (3) adequate capacities, and (4) political stability. While the first three of these drivers have been similarly present for climate adoption, there appears to be a noticeable difference in their quality: According to our interview data presented in the subsequent paragraphs, internal political drivers for policy implementation appear to be more difficult to attain than those that drive policy design and adoption. First, similarly to policy adoption, several interviewees pointed to the importance of political leadership to implement climate change mitigation policies and to achieve impact on the ground. Speaking of Nigeria, NIG1 stated that "political will is much more important than economic drivers [to implement climate policies]." Where political will is absent, implementation of climate policies is unlikely to happen (Quote 63, 65, 66, 67 by GHA2, PAK1, UGA3 and ZMI2, respectively). For instance, while Uganda, Pakistan and Zimbabwe have all formally adopted climate policies (Appendix C), our interviewees questioned whether there was sufficient political push to drive change on the ground. For instance, UGA3 mentioned that "[t]he political will is too low for climate change to really be high on the agenda. ... There are policies, but how much will they change?" (Quote 66), and ZIM2 simply states "[t]here is no political will to move on climate change" (Quote 67). The need for political leadership is especially salient when measures are introduced which may be met with resistance. For the case of Ethiopia, ETH2 explains that "[i]nternal drivers have been important throughout, but more important now as the country is introducing instruments such as green taxes" (Quote 62).

Second, interviewees suggest that implementation is often not possible without coordination across ministries (Quote 68, 72, 73, 76 by ANG1, GHA4, MYA1 and PAK2, respectively). Benin constitutes an

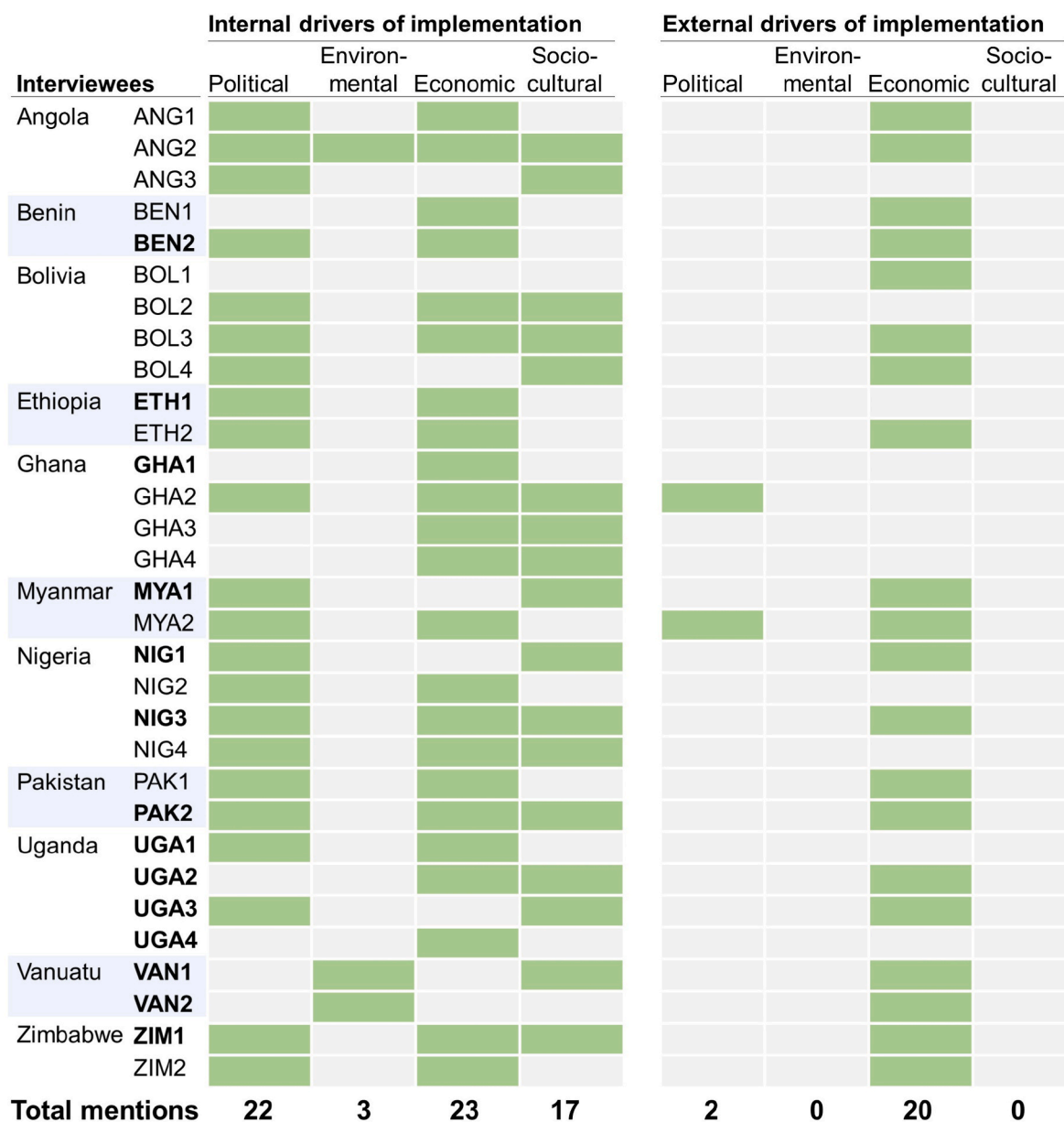


Fig. 2. Overview of drivers of climate policy implementation identified and discussed by the 31 interviewees that participated in this study. Note: A field coloured in green implies that the corresponding interviewee identified the respective driver type as a salient feature of whether climate policies have been implemented to create tangible outcomes in their respective country. Interviewees in bold denote national government officials, non-boldded ones denote national government-external policy consultants. (For interpretation of the references to colour in this figure legend, the reader is referred to the Web version of this article.)

insightful example of how to foster such cooperation. In an effort to capture economic, socio-cultural and environmental benefits of climate policy, the country has institutionalised the associated coordination needs (Quote 69, 70 by BEN1, BEN2, see also Appendix C): “The Ministry for Environment and Sustainable Development [brings together] Agriculture, Water, Environment, Infrastructure, Sanitation, City development, ...and environmental concerns are central to this. So, this has made this idea [of a green development opportunity] more powerful, you see political leadership ... and they are promising action on the ground” (Quote 70, BEN2). For similar reasons, Ethiopia has similarly implemented a centralised and integrated governance structure housed within the Prime Minister’s office (see Appendix C), working “across the sectors” to “address [climate policy implementation] in a systemic way” (Quote 71, ETH2). By contrast, in the majority of cases in our sample, interviewees discussed issues

arising from what NIG2 called a “poor institutional implementation framework” (Quote 75), i.e. policy implementation institutions and processes not suitable for implementing climate policies across sectors. For instance, despite the critical importance of decentralised political drive for implementing climate policies on the ground (Quote 74, NIG1), in Pakistan, “only two districts have specific climate policies, the others do not know how to implement this” (Quote 76, PAK2), making it difficult for centrally adopted climate policies to be implemented in the districts.

Third, interviewees suggest that implementing climate policies requires high skill levels. On a systems level, being able to properly integrating low-carbon concepts into their country’s envisioned development trajectory was repeatedly mentioned as a key barrier (Quote 77, 79, 82 by BOL2, MYA2 and ZIM1, respectively). In several instance, there was a perceived lack of awareness about the economic

Table 7
Selected evidence for internal drivers of climate policy implementation (see Table B in the Appendix for full verbal quotes).

Driver type	Driver/barrier	Exemplary quotes (interviewee) as listed in Table B
Political	Political leadership	Quote 62 (ETH2), Quote 63 (GHA2), Quote 64 (NIG1), Quote 65 (PAK1), Quote 66 (UGA3), Quote 67 (ZIM2)
	Ability to coordinate and ensure cooperation	Quote 68 (ANG1), Quote 69 (BEN1), Quote 70 (BEN2), Quote 71 (ETH2), Quote 72 (GHA4), Quote 73 (MYA1), Quote 74 (NIG1), Quote 75 (NIG2), Quote 76 (PAK2)
	Adequate capacities	Quote 77 (BOL2), Quote 78 (ETH1), Quote 79 (MYA2), Quote 80 (NIG3), Quote 81 (PAK2), Quote 82 (ZIM1), Quote 83 (MYA2), Quote 84 (NIG1)
	Political stability requirements	Quote 85 (ANG2), Quote 86 (VAN2)
Environmental	Experience of extreme weather events	Quote 85 (ANG2), Quote 86 (VAN2)
Economic	Realising economic co-benefits	Quote 87 (BEN2), Quote 88 (BOL2), Quote 89 (ETH1), Quote 90 (GHA2), Quote 91 (GHA3), Quote 92 (NIG3), Quote 93 (PAK2), Quote 94 (VAN1)
	Domestic funding	Quote 95 (ANG1), Quote 96 (BEN1), Quote 97 (GHA4), Quote 98 (MYA2), Quote 99 (NIG3), Quote 100 (UGA1), Quote 101 (ZIM1), Quote 102 (ZIM2)
	Economic readiness for change	Quote 103 (ANG3), Quote 104 (ANG2), Quote 105 (BEN2), Quote 106 (UGA2), Quote 107 (UGA4)
Socio-cultural	Realising social co-benefits	Quote 108 (NIG3), Quote 109 (UGA3)
	Societal readiness for change	Quote 110 (ANG3), Quote 111 (BOL3), Quote 112 (BOL4), Quote 113 (GHA3), Quote 114 (GHA4), Quote 115 (MYA1), Quote 116 (UGA2), Quote 117 (VAN1), Quote 118 (ZIM1)

Table 8
Selected evidence for external drivers of climate policy implementation (see Table B in Appendix B for full verbal quotes).

Driver type	Driver/barrier	Exemplary quotes (interviewee) as listed in Table B
Political	Global political drive towards climate policies	Quote 119 (GHA2), Quote 120 (MYA2)
Economic	Foreign investment	Quote 121 (ANG2), Quote 122 (BEN1), Quote 123 (BOL3), Quote 124 (BOL4), Quote 125 (ETH2), Quote 126 (MYA1), Quote 127 (MYA2), Quote 128 (NIG1), Quote 129 (NIG3), Quote 130 (PAK2), Quote 131 (UGA4), Quote 132 (VAN1), Quote 133 (ZIM1), Quote 134 (ZIM2)
	Reducing foreign debt	Quote 135 (ANG1)

and socio-cultural co-benefits of climate action (see for instance Quote 82, ZIM1).

Fourth, political stability, both in security (Quote 83, MYA2) as well as policy regime (Quote 84, NIG1) terms has been mentioned to be particularly important for climate policy implementation. NIG1 explains that following a political transition between governments, “[a] Lagos State [climate change mitigation] programme as a government and private sector partnership ... was successful until a policy summersault brought about by political transition. ... The political leadership that followed was simply not interested.”

In terms of **environmental drivers**, while the majority of interviewees explained that in their countries, extreme weather events and

the associated environmental threats are directly linked to a push for climate policy adoption, two interviewees also mention them in the context of concrete climate action on the ground (Quote 85, 86 by ANG2 and VAN2, respectively): Where their impacts are particularly devastating, they can cause added challenges and delays for the implementation of climate change mitigation projects.

In contrast to adopting climate change policies, internal **economic drivers** were consistently mentioned by interviewees as reasons why climate policies are being implemented, or, where they were absent, why their implementation is not a high priority. We identify three such drivers, namely (1) realising economic co-benefits, (2) the dedication of domestic finance, and (3) the economic readiness of the private and public sectors for climate change mitigation-compatible programmes. First, achieving economic development is a key priority in LMICs. Thus, where climate action is seen as a vehicle for economic development, decision makers are considerably more likely to try to press ahead with the implementation of climate policies and build momentum towards tangible action on the ground (Quote 87, 88, 89, 90, 92, 93 by BEN2, BOL2, ETH1, GHA2, NIG3 and PAK2, respectively). In the case of Ethiopia, “[i]mplementing climate policies is essential to the country’s development mission” (Quote 89, ETH1). Approaching a similar narrative, in Benin “there is really a chance for a sort of a green economy, creating jobs, diversifying from oil, even in green agriculture I think some people in government, in the Ministry of Environment and Sustainable Development in Benin, they are trying push for this narrative, for a more green economy” (Quote 87, BEN2). Indeed, all 11 LMICs in our sample possess abundant renewable energy resources which, according to our interviewees, helps with the realisation of economic co-benefits of climate change mitigation such as creating jobs, expanding electricity access and fostering knowledge transfer (Quote 87, 89, 90, 94 by BEN2, ETH1, GHA3 and VAN1, respectively). By contrast, a key reason for a discrepancy between adoption and implementation can be that these systemic connections to other sectors are not captured in climate policies implementation plans (ANG1, MYA2, UGA2, ZIM1).

Second, committing financial resources from the natural budget is seen as a key enabler and accelerator for implementing climate policy instruments and inducing change on the ground (Quote 100, UGA1). Yet strained national budgets and large gaps to key indicators of sustainable development have meant that in several cases, implementing climate policies have not been viewed as a high priority issue, especially where there are no firm intentions to capture economic co-benefits (Quote 95, 97, 98, 99, 102 by ANG1, GHA4, MYA2, NIG3 and ZIM2, respectively). Emphasising the myriad needs of Nigerians, NIG3 explained, “The biggest challenge, of course, is there are too many competing needs and therefore climate change was not really looked at as priority and therefore it didn’t get the kind of attention it deserves” (Quote 99). In Zimbabwe, this lack of domestic funds and the associated continued reliance on external support (see Appendix C) can render existing climate-compatible development programmes obsolete. ZIM1 explains that “[t]here is a Green Industry Initiative, but it has not been financed” (Quote 101).

Third, interviewees suggest that system inertia in the LMICs’ current economy can be difficult to overcome, implying a low ability and readiness of the private and public sector to adapt to new economic development pathways. ANG3 assesses that “[t]he private sector is not yet ready for green jobs. The structures are not yet there in the economy” (Quote 103), while BEN2 cites issues with integrating the private sector into green transition visions present within the government (Quote 105). This can become more difficult where vested interests in carbon-intensive development trajectories are salient such as the prospects of generating fresh revenue from fossil fuel exports. In such contexts, UGA2 argues that climate policies that manage to stop “pumping the oil will required a lot of convincing” (Quote 106).

Finally, internal **socio-cultural drivers**, similarly to economic drivers, appear to be significantly more pronounced for climate change mitigation policy implementation than for adoption. Two key drivers were repeatedly mentioned, namely (1) realising social co-benefits, and (2) the societal readiness for co-benefits. First, implementing climate policies can be driven by their ability to address pressing social concerns such as improved health, increased food security, improved inclusion and decreased poverty (Quote 108, NIG3). At the same time, however, ensuring social co-benefits can also come at a cost where green development leads to traditional, fossil-fuel dominated parts of the economy getting less support (Quote 109, UGA3).

Second, while aspects regarding the lacking readiness of society was mentioned as a barrier for climate policy adoption, our data suggest that this barrier is markedly more salient in the context of actual implementation on the ground. Building the adequate skills and structures to realise the potential benefits from green transitions is critical; a gap in such socio-cultural capital was mentioned in several interviews which tends to manifest itself as projects get implemented (Quote 110, 111, 113, 116 and 117 by ANG3, BOL3, GHA3, UGA2 and VAN1, respectively). For instance, ANG3 argued that “[t]here needs to be capacity building [to implement policies], this lack of sensitivity is not just from politicians, it’s really the society in general, we have a huge issue with education in Angola” (Quote 110). Similarly, a societal reluctance to change becomes obvious as policies move from adoption to implementation (Quote 116, UGA2). Conversely, pressure from civil society has been mentioned to play an important role in pushing policy makers to not only adopt policies, but drive for their implementation in their national contexts (Quote 115, 118 by MYA1, ZIM1).

4.3.2. External drivers and barriers

Interviewees frequently mentioned external economic drivers to be important for climate policy adoption in the LMICs in our sample. The focus on external economic drivers differs notably from that on external political drivers when discussing climate policy adoption (section 4.2.2). Neither external environmental nor external socio-cultural drivers were described as being particularly important for climate policy implementation in our 11 LMIC cases. In a similar fashion to preceding sections, Table 8 maps exemplary quotes given in full-text fashion in Appendix B as evidence for the key external drivers.

To start with, the almost complete absence of external **political drivers** is noteworthy given that this category of drivers has been the most salient (both qualitatively and quantitatively) of all drivers of climate policy design and adoption (section 4.2). This result seems to suggest that the international community and the Paris Agreement process are primarily successful at inducing the design and adoption of climate change mitigation policies, but are currently less impactful in ensuring that these declared policies achieve impact on the ground. MYA2 mentions the regulations of the economic Nationally Appropriate Mitigation Actions (NAMA) instruments as an example where their complexity can indeed delay climate-beneficial projects (Quote 120).

In terms of external **economic drivers** of climate change mitigation policy implementation, the dominant driver was the availability of foreign investment. The implementation of a large portion of the NDCs submitted by LMICs as part of the Paris Agreement is conditional on receiving external finance (Quote 126, 128, 130, 132 by MYA1, NIG1, PAK2 and VAN1, respectively). ZIM2 points out the importance of foreign finance in the context of absent political leadership on climate change mitigation, stating that “[w]ith financial resources, we can do everything. We can even overcome low political will. They will eventually get behind it if there is money and progress” (Quote 134). Following a similar logic, UGA4 asserts that “[i]nternational finance has helped a lot. Without this finance, I am not sure how much of this climate change thing would actually have an impact on policies here.” NIG1 mentions an example of

concrete climate actions being implemented for the city of Lagos, something which has been possible due to international financial assistance (Quote 128). This issue is especially salient where funding has been too low to realise projects, with MYA1 saying that “[t]he lack of international financial support by donors for climate change action and [new] infrastructure is holding the country back from implementing climate policies” (Quote 126, see also Quote 123, BOL3). Furthermore, ETH2 and NIG3 explain that there are positive windfalls from external finance, namely attracting technical and financial know-how into their respective countries (Quote 125, 129). Result-based finance, verified through rigorous monitoring and evaluation, was mentioned as a key potential instrument to ensure that green finance has the impact external donors are desiring (Quote 129, NIG3). It should be noted, however, that a high degree of foreign investment can also constitute a barrier towards implementing climate policies, namely where such investment has historically been supporting carbon-intensive industries. For instance, BOL4 explains that “[t]here are interests from Iran, Russia, Cuba, Venezuela and China in Bolivia’s extraction and production industries. This is a challenge for implementing climate policies” (Quote 124).

In addition to foreign investment, ANG1 mentions that reducing foreign debt is a further critical driver of climate policy implementation, as it frees up critically needed financial resources to invest in green infrastructure and industry (Quote 135).

4.4. Results summary: patterns of climate policy adoption versus implementation drivers

Table 9 summarises all identified salient drivers and indicates whether they have been specifically salient for policy adoption, implementation, or both. External political drivers have been crucial for adoption, but have not been frequently mentioned as drivers of domestic policy implementation. Similarly, external economic drivers are critical for implementation, but have only played a secondary role in climate policy adoption in the LMICs in our sample. Furthermore, when compared to our results for adopting climate policy, internal drivers appear to be either similarly (for political drivers) or, notably, significantly more salient (for economic and socio-cultural drivers) in fostering (or hindering) implementation. Implementation of climate change mitigation policies appears to be considerably more dependent on the economic and socio-cultural context within each country, indicated by the salience of economic and societal readiness for climate-compatible development, and whether or not policy makers, the finance community and civil society have been able to incorporate climate-compatible development pathways into these contexts. By contrast, formally adopting climate policies does not depend on the economic and societal readiness of LMICs in the same way as policy implementation and its resulting momentum for a green transition on the ground does.

In addition, while internal political drivers are salient in both policy adoption and implementation, our results suggest that implementation can take a deeper level of commitment, coordination and integrative skills. The complexities surrounding coordination and system-wide integration of climate policies into development pathways tend to become real once climate policies are supposed to be implemented, not least requiring firmer commitments than at the adoption stage. Finally, it should be noted that as Figs. 1 and 2 suggest, these results and patterns in general do not vary greatly by different type of interviewees, i.e. either government official or external policy consultant.

5. Conclusion and policy implications

In this paper, we developed a framework to group different types of climate policy drivers, and interviewed 31 government officials and climate policy consultants in 11 LMICs to understand how exactly

Table 9
Summary of identified internal and external drivers and their relative salience for climate policy adoption versus implementation.

Driver scope	Driver type	Drivers	Salience of drivers for climate policy adoption versus implementation on the ground		
			Predominantly or exclusively adoption	Both	Predominantly or exclusively implementation
Internal	Political	Political leadership		X	
		Ability to coordinate and ensure cooperation		X	
		Adequate capacities		X	
		Political stability			X
	Environmental	Experience of extreme weather events	X		
		Realising environmental co-benefits	X		
	Economic	Realising economic co-benefits			X
		Domestic funding			X
		Private sector readiness for change			X
		Existence of cheap low-carbon resources			X
Socio-cultural	Realising social co-benefits			X	
	Societal readiness for change			X	
External	Political	Global political drive towards climate policies	X		
		External support for climate policy design	X		
	Environmental	Global environmental climate change impact	X		
	Economic	Foreign investment			X
		Efficient climate finance access processes			X
		Reducing foreign debt			X

different internal and external political, environmental, economic and socio-cultural drivers work for climate policy adoption and implementation. Our results suggest that while all LMICs in our sample have adopted climate policies, there are large perceived discrepancies to actual implementation in most of them. Based on the 15 different drivers we identify, we find that while internal political drivers such as political will, functioning institutions and adequate cross-ministerial governance are key for policy adoption and implementation, external political process such as the Paris Agreement and the underlying UNFCCC processes have been crucial only for adoption, but do not appear to markedly drive concrete implementation. By contrast, both external economic support, and especially internal economic and social co-benefits are critical for implementation. They allow us to derive recommendations related to both LMIC governments and the international community.

With regards to LMIC governments, our results reveal several insights into how budget-constrained countries have managed to use climate policies to induce tangible change. Both Benin and Ethiopia stand out as being viewed as comparably successful in building momentum for implementing climate change mitigation policies and driving change on the ground. In both countries, there has been a strong and visible, and especially in the case of Ethiopia, long-standing political focus on both adopting climate policies that are a firmly embedded within broader national development strategies rather than functioning as additional policies, and committed state resources to these programmes (cf. [Mayrhofer and Gupta, 2016](#); [Appendix C](#)). While financial and human resources remain ample constraints, both countries have institutionalised cross-sectoral climate policy governance. Arguably, capturing co-benefits has critical top-down and bottom-up components. Top-down, it appears to be key for governments to communicate them through senior officials, and embed them in long-term development plans and policy strategies. These co-benefit strategies need to be implemented via supportive policy instruments capable of attracting in private investment which are key to open up and grow green markets ([Steffen et al., 2018](#)). To maximise the chances of success, such green industrialisation policies should be aligned with existing resources and capacities in the respective economies to maximise competitive

advantages and thereby enable rapid implementation ([Andres and Mealy, 2021](#); [Mealy and Teytelboym, 2020](#)). Recent work by [Mercure et al.](#) suggests that given the dynamics of the global energy transition, quick decarbonisation is especially economically advantageous for fossil fuel importers as they can re-invest money into domestic low-carbon energy development programmes which was previously spent on expensive energy imports, boosting GDP and job creation in the process ([Mercure et al., 2021](#)). Bottom-up, governments furthermore need to increase the innovative capacity for sustainable development solutions capable of delivering on green growth ([Schot and Steinmueller, 2018](#)). In addition to technologies, driving sustainable business model innovation capable of navigating market challenges in LMICs is critical for delivering value to end-users and scaling green solutions ([Haney et al., 2019](#)). Designing production and revenue models that can capture and deliver value for sustainable development is where the private sector has a critical role in driving the implementation of policies as such models directly show their economic and social benefits. Furthermore, governments in LMICs need to help build sufficient social capital which enables collective action and fosters cooperation within a society ([Paul et al., 2016](#)), attributes that are key for the type of social capital required to implement climate policies ([Adger, 2010](#)). Such social capital may be possible to be built by first creating weak ties such as one-way information transfer within communities, which can lead to mutual collaboration relations over time ([Ingold, 2017](#)). Critically, [Adger](#) suggests that vulnerable groups are often excluded from decision making and as a group possess particularly low levels of social capital, thus deserving enhanced attention to ensure justice while implementing climate policies ([Adger, 2010](#)). Ultimately, this problem warrants further research in LMIC settings to better understand its context-specific dynamics.

With regards to lessons for the international community, we find that international support geared towards creating economic and social benefits through climate-compatible policies is key for LMICs to not only formally adopt climate policies and issue pledges, but for driving implementation and action the ground. Our results suggest that in addition to current efforts, this includes a focus on (1) adequate finance instruments for projects that address sustainable development benefits

simultaneously, (2) developing cross-ministerial climate-compatible development pathways, and (3) helping LMICs to be ready to capture co-benefits. First, capturing co-benefits is likely to require both sufficient domestic and international financial resources channelled via appropriate financial instruments to projects that are capable of delivering on environmental, economic and socio-cultural goals (Trotter, 2021). Where such projects are comparably novel and untested, suitable finance instruments need to specifically de-risk such co-benefits projects in order to accelerate green growth development pathways (cf. Steffen and Schmidt, 2019). High-income countries, despite increasing contributions, have so far missed their climate finance commitment of US\$100 billion per year by 2020 to help tackle climate change in LMICs (OECD, 2020). Given the magnitude of change required for the green transition and the importance of unlocking co-benefits for translating climate policies into action analysed in this paper, the committed funding for LMICs to date is insufficient by a large margin (see also Averchenkova et al., 2020). Pooling financial resources from different realms to fund and de-risk integrated projects capable of achieving sustainable development benefits across sectors has the potential to reap synergies through bundling. Second, there appears to be a need for the international community to expand its technical support for LMICs to design evidence-based low-carbon development pathways. Most climate change mitigation policies focus on the targets they aim to achieve, but lack critical implementation detail of how countries can get to these targets in ways that foster their broader development goals (Laudari et al., 2021). Third, the international community can help to build the necessary institutional, economic and human capital which can turn formally adopted climate policies into action on the ground (Batidzirai et al., 2021). The domestic private sector needs to be equipped with the necessary financial and human capital to create jobs in green technologies and services (Trotter and Abdullah, 2018). Institutionally, our results point to the critical importance of building technical skills and adequate policy processes to coordinate and drive cooperation across ministries, as well as across central and sub-national governments (cf. Stritzke et al., 2021).

To summarise, translating climate policies into effective and just climate action in LMICs requires a concerted effort from national policy makers and the international community, as well as from academia

(Ficklin et al., 2018b; Mayrhofer and Gupta, 2016), the finance sector (Steffen and Schmidt, 2019) private sector (Leventon et al., 2015) and civil society (Ficklin et al., 2018a; Wood et al., 2017). Specifically, the nature of the drivers which accelerate policy implementation imply that social and economic co-benefits of climate change mitigation policies need to be institutionalised in existing development policies and governance processes to provide much more active support of the local economy to enable green innovation, build the adequate social capital to be able to embrace the change, and create spaces for meaningful cross-ministerial and decentralised governance processes.

CRedit authorship contribution statement

Philipp A. Trotter: Conceptualization, Methodology, Formal analysis, Investigation, Resources, Data curation, Writing – original draft. **Imran Mannan:** Formal analysis, Investigation, Resources, Visualization, Data curation, Writing – original draft. **Aoife Brophy:** Investigation, Writing – original draft. **Delight Sedzro:** Methodology, Investigation, Resources. **Abdulmutalib Yussuff:** Investigation, Resources. **Francis Kemausuor:** Investigation, Resources, Writing – review & editing. **Yacob Mulugetta:** Investigation, Resources, 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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Appendices.

Appendix A: Country case selection by world region for different overall sample sizes.

Table A

Number of selected cases per world regions that minimises the maximum ratio of selected LMIC cases per world region and total LMICs in that world region

Overall sample size	Selected cases per world regions with minimum regional bias			
	Africa (N = 46 ¹)	Asia (N = 23 ¹)	Latin America and the Caribbean (N = 7 ¹)	Europe (N = 3 ¹)
1	1	0	0	0
2	1	1	0	0
3	2	1	0	0
4	3	1	0	0
5	4	1	0	0
6	4	2	0	0
7	5	2	0	0
8	6	2	0	0
9	6	3	0	0
10	6	3	1	0
11 ²	7	3	1	0

¹ Numbers indicate the total number of LMICs in the respective world regions.

² Selected in this study.

Appendix B. Qualitative data details of key quotes

Quote number	Exemplary quote	Country (Interviewee)
Quote 1	"Leadership from the top of government is important to put climate policies on the map. Before top government people were involved, almost no one talked about climate policies in the government. ... Now I would say it is really gaining a lot of political momentum from the highest level, even at the ministry level to the highest level, given that they want to engage"	Myanmar (MYA2)
Quote 2	"Although Bolivia identifies with many of the current climate initiatives (Kyoto Protocol, SDGs, Paris Agreement etc.) it remains distant in its participation and commitment."	Bolivia (BOL3)
Quote 3	"The country needs to act internally first and foremost, then it can be taken seriously internationally. ... It is responding to the inevitable climate change, aiming for Ethiopia to gain leadership status as a forward mover country. ... There has been a consistent commitment across three Prime Ministers, which gave the climate strategy high level political backing."	Ethiopia (ETH1)
Quote 4	"We have a president that is leading from the front on the issue of climate change. I would say that the political will at the Federal level is there."	Nigeria (NIG1)
Quote 5	"There is a lot of room for more awareness among politicians for climate issues."	Uganda (UGA4)
Quote 6	"Intersectoral coordination is very poor. They don't talk to each other but rather fight over resources. There is an intersectoral committee for climate change, but they have not meet for three years now"	Angola (ANG2)
Quote 7	"The Director General of the Environmental Conservation Department had played a really strong role [in the policy design process], he was reaching out to all the departments regarding the targets because Myanmar set targets for that [cover] agriculture and forestry and other land uses, and energy, ...but they will be looking into other areas like aviation, marine transportation, and transportation in general as well ... bringing about a change is always not very easy. So, it was like a continuous effort, ...not only one time effort, the [Director General] was reaching out again and again, and different levels"	Myanmar (MYA2)
Quote 8	"The issue of inclusivity too is important because the government sometimes does not plan for some part of the state. This could be a threat in a situation of climate footprints arriving in those areas that receive no government attention."	Nigeria (NIG1)
Quote 9	"The big challenge is the systems thinking. Ministries are too often confined to their space. But which policies address the system aspect of climate change? We have not figured that out yet."	Zimbabwe (ZIM1)
Quote 10	"There is a huge institutional challenge [in terms of] a lack of reliable data to develop climate policies."	Benin (BEN1)
Quote 11	"One of the main obstacles [for drafting policies] is that the majority of political leaders are inexperienced in issues of climate change."	Bolivia (BOL1)
Quote 12	"The socio-economic impact of these policies will be seen in the long-term, but the political and economic vision of the country is limited to the short and medium term."	Bolivia (BOL3)
Quote 13	"10 years ago, the climate change office under the Ministry of Environment had only 2 or 3 officers. But today it's been elevated into a full fledged department with a Director and with the complement of close to a hundred staff all addressing various thematic climate change issues."	Nigeria (NIG3)
Quote 14	"Green jobs, these things, they are on a low level of awareness of politicians, and of the population. Many people think that environmentally friendly technologies are too expensive."	Uganda (UGA2)
Quote 15	"More education and awareness is required for the leaders to support climate ambitious policies Vanuatu has limited capacity and resources to do research and set climate policies."	Vanuatu (VAN2)
Quote 16	"I am not sure government understands the long-term impact of climate change."	Zimbabwe (ZIM2)
Quote 17	"We have had lots of droughts and floods in our country. ... As a consequence, the government has become concerned with climate change"	Angola (ANG2)
Quote 18	"We see climate change happening in here [in Benin]. The impact on the ground is there, [with] droughts and floods affecting the people here."	Benin (BEN2)
Quote 19	"Vulnerability of the country to climate events is an important driver why the government is looking at climate policies."	Bolivia (BOL3)
Quote 20	"Ethiopia is highly impacted by climate change – no other option but for the government to take action to reverse loss of ecosystems"	Ethiopia (ETH1)
Quote 21	"Physical experiences of weather change and its effect on food production and energy were one of the drivers why Ghana adopted climate policies."	Ghana (GHA1)
Quote 22	"The tremendous impacts of climate change are witnessed throughout the country from lowland to high mountainous areas and thus the country has paid much attention to reduce the negative impacts of climate change"	Myanmar (MYA1)
Quote 23	"The climate risks stand out in my opinion. Issues of abnormal weather patterns, flooding, etc. So, the hazards are there to see and disrupting human activities."	Nigeria (NIG1)
Quote 24	"The floods in Pakistan have moved the issue up the agenda, putting some pressure to come up with fitting climate policies"	Pakistan (PAK2)
Quote 25	"Climate change is only seriously considered after a climate related disaster e.g. floods, long droughts, etc."	Uganda (UGA1)
Quote 26	"A crucial reason for us to set climate policies is because we are seeing the impact of climate change in our country now. Farmers are complaining, the rains this year have been unpredictable. We need to change something."	Uganda (UGA3)
Quote 27	"The climate change perspective is one of the top priority agendas for the country given the recent climate issues of Vanuatu's and the Pacific Island countries, the group of countries that are most vulnerable to disasters."	Vanuatu (VAN1)
Quote 28	"When cyclone Idai struck, that has changed the government's mind. Climate change moved up on the agenda because of it They were not able to deal with the consequences of that cyclone, so efforts are being made to ensure Zimbabwe does its best that this does not happen again People from the Ministry of Finance have now started to attend the global meetings on climate change."	Zimbabwe (ZIM1)
Quote 29	"The government wants to be achieving neutrality in terms of land degradation, and preservation of forests and sustainable reduction of deforestation."	Benin (BEN1)
Quote 30	"Exploiting natural resources has a lot of economic gains; most of the climate policies are geared towards conserving these resources."	Myanmar (MYA1)
Quote 31	"Through these climate policies, Benin would like to achieve sustainable economic growth and a reduction of poverty. This was a key driver"	Benin (BEN1)
Quote 32	"Climate policies are important for Ethiopia's development vision ... to become a middle-income country by 2025"	Ethiopia (ETH2)
Quote 33	"Also, Ghana is setting climate policies as a means of creating opportunities for socioeconomic development and human-wellbeing, through implementation of projects which creates jobs, grows GDP and so forth. The reduction of GHG is mainly seen as a co-benefit rather than a driving, and understandably so because Ghana is an extremely low emitter."	Ghana (GHA4)
Quote 34	"The primary objective of climate policy making is [addressing] climate change issues, but on the other hand, you're stimulating growth in terms of economic development, you're creating more jobs."	Vanuatu (VAN1)
Quote 35	"The government aims to achieve a perpetuation of cultural manners through the preservation of biodiversity [through its climate policies]."	Benin (BEN1)
Quote 36	"The government has realised that people's livelihoods are directly dependent on natural capital. It's even in their national development policy. There was no other option ... than to address problems of food security through climate policies."	Ethiopia (ETH1)
Quote 37	"Climate Change is the top agenda for Vanuatu because it directly affects the country's capability to achieve its Sustainable Development Goals."	Vanuatu (VAN2)
Quote 38	"The country should reduce losses in agriculture and fishing yields which occur because of climate factors and threaten national food security."	Bolivia (BOL1)
Quote 39	"People are aware of climate change, but are less aware of what government can do to help prevent it. So climate policies are still not high up on their agenda."	Zimbabwe (ZIM1)
Quote 40	"Climate policies are looked at negatively by the population. Everything that comes from government is looked at suspiciously by default in Uganda."	Uganda (UGA2)
Quote 41	"The key driver is just following the global trend: Doing something for the climate looks nice internationally."	Angola (ANG2)

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Quote number	Exemplary quote	Country (Interviewee)
Quote 42	"Why does Angola even have climate policies? I think it's really just about following the global movement. And ... I would say even culturally, Angolans like to say, yeah, we're doing this or we're up here, ...even looking at the other African countries, it's to say that we're not staying behind."	Angola (ANG3)
Quote 43	"The push from the donors to do something on climate change has been absolutely critical for this issue. They have raised a lot of questions, and there was a need to provide policies in response."	Benin (BEN2)
Quote 44	"[Climate change programmes] seek to fulfil international agreements, rather than take into account the actual state of deforestation or the different characteristics and goals of different regions, in such a way that the results have not been positive given the cost of investment [in the programmes]"	Bolivia (BOL1)
Quote 45	"We ratified all the conventions on climate change and we are supposed to honour our obligations. It is not bad either because it has pushed us to some right things for our country."	Ghana (GHA1)
Quote 46	"Climate policies in Ghana are mainly driven by external factors such as the SDG 13 on climate actions, the Paris Agreement, etc."	Myanmar (MYA1)
Quote 47	"The Paris Agreement really provided that platform for the government ... to really see what we need to contribute in terms of climate policy"	Myanmar (MYA2)
Quote 48	"The Paris Agreement was key as it now means obligations for Pakistan to adopt these policies on climate"	Pakistan (PAK2)
Quote 49	"Pressure from external organisations and development partners was the key driver to accelerate the climate policy drive in Uganda. ... But also, regional bodies from neighbouring countries, for example the East African Community."	Uganda (UGA1)
Quote 50	"International donors are setting the agenda for climate change."	Uganda (UGA4)
Quote 51	"As far as I know, all our commitments to climate change or climate targets relate to the Paris Agreement."	Vanuatu (VAN1)
Quote 52	"The entire momentum in Zimbabwe was facilitated by the UN, even before the Paris Agreement. Without the momentum from UNDP, there would have not been a lot of awareness among ministries."	Zimbabwe (ZIM1)
Quote 53	"Climate policy is almost entirely driven by donors."	Zimbabwe (ZIM2)
Quote 54	"In the last 10 years, the number of development agencies supporting climate change issue in Nigeria has quadrupled. So currently in the revision of our NDC, we've got at least seven international partners all supporting Nigeria's revision of the NDC. And these development agencies have also, to a great extent, facilitated the enablement our climate ambition and policy."	Nigeria (NIG3)
Quote 55	"The international donors, I have to give them credit, they have put in a lot of support, on the technical side, and also in terms of convincing people outside our Ministry that we need to pay attention to climate change."	Uganda (UGA2)
Quote 56	"Technical assistance and financial support through multilateral and bilateral development partners is critically important to assist the country to ... do research and set climate policies."	Vanuatu (VAN2)
Quote 57	"Global climate change dynamics have been a driver for setting these policies. The heating climate, the weather is changing, and there is a need to address this."	Benin (BEN2)
Quote 58	"The threats posed by climate change at both local and global level have been why these policies are there."	Ghana (GHA2)
Quote 59	"The availability of external funding can be a lever to define ambitious policies."	Benin (BEN1)
Quote 60	"International finance has helped a lot. Without this prospect of [international] finance, I am not sure how much of this climate change thing would actually have an impact on policies here."	Uganda (UGA4)
Quote 61	"Without committing the country to the Paris agreement, how can we source international financing if we're not partners of such conventions?"	Vanuatu (VAN1)
Quote 62	"Internal drivers have been important throughout, but more important now as the country is introducing instruments such as green taxes."	Ethiopia (ETH2)
Quote 63	"There is a lack of political will to implement the [climate] policies."	Ghana (GHA2)
Quote 64	"Political will is the key enabler because our governors/government have so much power ... to leverage once the will is there. Whenever ... government decides to make something a priority, the money will come, so from a government perspective, political will is much more important than economic drivers [to implement climate policies]."	Nigeria (NIG1)
Quote 65	"Acceptance has to be internal to the government in order for climate policies to be sustainable and have an impact."	Pakistan (PAK1)
Quote 66	"The political will is too low for climate change to really be high on the agenda. ... There are policies, but how much will they change? I am not sure"	Uganda (UGA3)
Quote 67	"There is no political will to move on climate change."	Zimbabwe (ZIM2)
Quote 68	"There is no coordination ... in implementing or promoting climate policies. ... [For policy implementation], there must be a closer relationship between the central government and the local government through decentralised processes."	Angola (ANG1)
Quote 69	"The ambition through these drivers of climate policies is to streamline cooperation between institutions within the country to create a collective fight against climate change."	Benin (BEN1)
Quote 70	"To bring these different aspects [of development] together, Benin has [founded] the Ministry for Environment and Sustainable Development. Agriculture, Water, Environment, Infrastructure, Sanitation, City development, they are all involved, and environmental concerns are central to this. So, this has made this idea [of a green development opportunity] more powerful, you see political leadership in this one, and they are promising action on the ground."	Benin (BEN2)
Quote 71	"The government led from the PM office in a centralised way because climate change was seen as an intersectoral issue. Unless you have a working team across the sectors, you cannot address it in a systemic way. ... Still, there are some institutional coordination problems. ... Ministries are still siloed."	Ethiopia (ETH2)
Quote 72	"The discussion on climate change in Ghana is largely among a few practitioners/actors and environment related line ministries as well as among a few researchers. Discussions on issues bothering on climate change is missing in the debates of politicians and political party manifestos and promises, meaning the power brokers are silent on it"	Ghana (GHA4)
Quote 73	"Poor administrative systems are a challenge [for implementing climate policies]. This is hindering how fast they can be put into action."	Myanmar (MYA1)
Quote 74	"Local political leadership has been very critical for all the climate ambition milestones recorded in Lagos city ... Government ministries, departments, and agencies [design] their projects or programmes to ensure they have climate [mitigation]-related impacts."	Nigeria (NIG1)
Quote 75	"There is a poor institutional implementation framework. There are large problems of getting different people to agree on what to do, on where to focus"	Nigeria (NIG2)
Quote 76	"Only 2 districts [in Pakistan] have specific climate policies, the others do not know how to implement this."	Pakistan (PAK2)
Quote 77	"There is no clear vision, organisation or participation of experts which would lead to concrete impacts and the effective channelling of resources."	Bolivia (BOL2)
Quote 78	"Technological literacy is low generally, which makes it difficult to integrate solutions into sectors."	Ethiopia (ETH1)
Quote 79	"There are some capacity gaps in terms of understanding this future trajectory. Some politicians, they need to see that the technology works before they want to implement them."	Myanmar (MYA2)
Quote 80	"We need some kind of ... legal framework to ensure that businesses, both public and private sectors are held accountable on the basis that if you pollute, you pay. If you deploy sustainable solutions, you are incentivized or rewarded."	Nigeria (NIG3)
Quote 81	"There is commitment, but not sufficient groundwork. In part, this is because there is no funding to build capacities in the provinces"	Pakistan (PAK2)
Quote 82	"Policy makers are not aware of the full economic benefits of implementing climate policies."	Zimbabwe (ZIM1)
Quote 83	"Donors also starting to get a lot of interest because Myanmar always falls to be one of the top five vulnerable countries in the world. But the investment environment needs to be there for donors, the peace and stability and all that stuff."	Myanmar (MYA2)

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Quote number	Exemplary quote	Country (Interviewee)
Quote 84	"One of such barriers [to implementing climate policies] is lack of political commitment following change of political leadership after transition ... A Lagos State [climate change mitigation] programme as a government and private sector partnership ... was successful until a policy summersault brought about by political transition ... the political leadership that followed was simply not interested."	Nigeria (NIG1)
Quote 85	"We unanimously passed the Paris Agreement, everybody clapped their hands, but the reality on the ground is different. ... Only when you have climate emergencies happening, then people go into a panic mode."	Angola (ANG2)
Quote 86	"The continuous exposure of Vanuatu to climate change and natural disasters like category five cyclones, volcanoes, earthquakes and tsunamis, <i>el Niño</i> and <i>la Niña</i> to name a few is hindering Vanuatu's economic and sustainable development."	Vanuatu (VAN2)
Quote 87	"Benin has been very keen to increase energy access, and they see a benefit of focusing on renewables to do that. It is using natural resources that we have here. So there is really a chance for a sort of a green economy, creating jobs, diversifying from oil, even in green agriculture Some people in government, in the Ministry of Environment and Sustainable Development in Benin, they are trying push for this narrative, for a more green economy, to give this narrative more visibility, so that we see this as an opportunity for development."	Benin (BEN2)
Quote 88	"Economically, there is desire for increased development [as a result of implementing more ambitious climate policies]"	Bolivia (BOL2)
Quote 89	"It has been Ethiopia's vision to become a middle-income country by 2025, while preserving its natural capital. ... Implementing climate policies is essential to the country's development mission. ... Ethiopia's economy is highly dependent on the natural environment, and so introducing the rural population to new technology and knowledge for transformation was seen as essential by the leadership."	Ethiopia (ETH1)
Quote 90	"What can make these [climate] policies and plans work is if we can realise job creation opportunities in the field of renewable energy."	Ghana (GHA2)
Quote 91	"One thing that helped was that we can use this momentum for improv[ing] access to electricity through the use of renewable energy sources and the building of indigenous capacity in technology for renewable energy sources."	Ghana (GHA3)
Quote 92	"Part of what drives the climate action under [Nigeria's] NDC is the need to ... attain high economic growth at a lower carbon trajectory, ... and create jobs. ... The best way is to tie [climate policy instruments] to broader economic development of the country."	Nigeria (NIG3)
Quote 93	"For the provinces to engage, the people to engage, we need more of an integrated approach. ... Action plans should be developed that address the many needs of people."	Pakistan (PAK2)
Quote 94	"We have the resources. Vanuatu is in a location where it has abundant sunlight. You talk about hydro, wind and so forth - why not utilise it so it can drive you towards the ambition of zero CO2 emissions?"	Vanuatu (VAN1)
Quote 95	"Angola had 30 years of war and created a fragile society and a government concerned with military and state security. A large slice of the national budget is spent on maintaining the army, armaments and security system personnel rather than on matters of climate change and green jobs and so forth."	Angola (ANG1)
Quote 96	"The poverty of the population ... makes other problems a non-priority. That is where the limited public finance in the country goes, to ensure that poverty is lowered"	Benin (BEN1)
Quote 97	"The major barrier is financial. Most of these policies are ambitious, e.g. the NDC, and require huge financial resources to implement. Unfortunately, there is literally no funding allocated from the national budget to support climate actions."	Ghana (GHA4)
Quote 98	"There is no clear budget plan for implementing [the climate policy] across ministries. Ministries were hesitant to provide any budget planning for the implementation of these plans, so it's unclear what will happen"	Myanmar (MYA2)
Quote 99	"The biggest challenge, of course, is there are too many competing needs and therefore climate change was not really looked at as priority and therefore it didn't get the kind of attention it deserves."	Nigeria (NIG3)
Quote 100	"Implementation of climate policies is hampered by government resources and efforts [being] concentrated in other development areas such as infrastructure, education, healthcare, etc."	Uganda (UGA1)
Quote 101	"There is a Green Industry Initiative, but it has not been financed. There is keen interest in green action, but these are more expensive than normal development activities, so this is extra tough We don't mind how we develop [economically], but we have to develop."	Zimbabwe (ZIM1)
Quote 102	"The funding is from donors, there is very little from the national budget dedicated to climate change When we designed the climate policy, we recommended government to devote 10% of the national budget to fighting climate change. But they have almost put nothing."	Zimbabwe (ZIM2)
Quote 103	"The private sector is not yet ready for green jobs. The structures are not yet there in the economy. ... The focus has been on oil and gas, on these types of technologies, and parts of the private sector, they are built around that."	Angola (ANG3)
Quote 104	"In Angola, most energy projects are still oil-based, most investment is too. They are focused on short-term economic gains, trying to add currency, to make profit."	Angola (ANG2)
Quote 105	"The problem is that the climate policies are not very visible [outside government]. The private sector is not well integrated, and it is not well positioned to make the transition"	Benin (BEN2)
Quote 106	"There has been a big push for oil and gas with the argument that oil and gas bring jobs, attracts the chemical industry ... not pumping the oil will require a lot of convincing!"	Uganda (UGA2)
Quote 107	"Both for the public and the private sector, climate change is still a new concept, they have not yet embraced it in most of their projects."	Uganda (UGA4)
Quote 108	"Climate action is also driven by the need to reduce poverty, increase social inclusion [and] increase food security."	Nigeria (NIG3)
Quote 109	"If you want to promote green growth, green jobs, you absolutely must provide alternative solutions for people who made a living with the old technologies. Many people are selling firewood, charcoal, they have motorcycles running on diesel. You can't just put these people out of business, that's unsustainable."	Uganda (UGA3)
Quote 110	"There needs to be capacity building [to implement policies], this lack of sensitivity is not just from politicians, it's really the society in general, we have a huge issue with education in Angola."	Angola (ANG3)
Quote 111	"Education around sustainability is preliminary and is not enough to overcome the obstacles that prevent the country implementing ambitious climate policies at the national level."	Bolivia (BOL3)
Quote 112	"As long as the people are not conscious of climate issues, it will be difficult to implement policies."	Bolivia (BOL4)
Quote 113	"There are human and socio-cultural challenges that I see as important barriers for implementing ambitious climate policies, a lot of awareness and information barriers exist"	Ghana (GHA3)
Quote 114	"We need human capacity development to drive climate policies. Such capacity is needed in the areas of expertise and skills to conduct on-ground studies and assessment to identify challenges and opportunities; perform investment and business appraisals; create local awareness and mobilise communities support."	Ghana (GHA4)
Quote 115	"Environmental activists, climate activists and protesters, founders of some private organisations, they are raising these issues, they care about what [change] is really happening."	Myanmar (MYA1)
Quote 116	"People are reluctant to change - they want their food to be prepared a certain way, and so I don't know if they want to switch to clean energy."	Uganda (UGA2)
Quote 117	"One other key issue in the past is understanding - the knowledge of the people in terms of what institutions like the Ministry of Climate Change are trying to do so. I feel that there's not enough awareness in the country; it's not duly informed on climate related issues."	Vanuatu (VAN1)
Quote 118	"Lobbying from NGOs and from some parts of the public is helping to enable people at the Ministry of Environment to push forward with climate policies."	Zimbabwe (ZIM1)
Quote 119	"Ghana is putting in efforts to meet the country's Intended Nationally Determined Contribution (INDC). The obligation we have from this is key, and we are honouring it with some projects."	Ghana (GHA2)
Quote 120	"The NAMA instrument is very important ... it really can help. But the process to access climate funds is very complicated. We applied three times for NAMA support and never got it. It can take 3-4 years to get the funding, this is too long, too difficult."	Myanmar (MYA2)

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Quote number	Exemplary quote	Country (Interviewee)
Quote 121	"The way how green finance has grown makes it really attractive now to invest in these things."	Angola (ANG2)
Quote 122	"There is a large lack of funding to implement our ambitious policies."	Benin (BEN1)
Quote 123	"Bolivia finds itself far from the financing mechanisms to monetise or leverage carbon credits, a mechanism which could drive and incentivise the private sector."	Bolivia (BOL3)
Quote 124	"There are interests from Iran, Russia, Cuba, Venezuela and China in Bolivia's extraction and production industries. This is a challenge for implementing climate policies."	Bolivia (BOL4)
Quote 125	"External financing helps to bring technical experts to fill the gap in domestic technical capacity."	Ethiopia (ETH2)
Quote 126	"The lack of international financial support by donors for climate change action and [new] infrastructure is holding the country back from implementing climate policies."	Myanmar (MYA1)
Quote 127	"There has been a growing interest of Chinese solar companies, these Chinese bidders are winning solar auctions. ... [But] the cost of capital is so high that foreign investment is still limited."	Myanmar (MYA2)
Quote 128	"The international support and technical assistance on climate change which we are receiving are also key enablers. For instance, [an international NGO] is funding a city-level climate action plan which we are currently developing for Lagos city."	Nigeria (NIG1)
Quote 129	"Nigeria has been working with UNFCCC, the World Bank and others on results-based finance instruments. These can really drive emissions down when you get money for results. ... Nigeria is looking at instruments to implement to get this money."	Nigeria (NIG3)
Quote 130	"Funds from bilateral and multilateral sources, co-financing: this is all critical now to make projects happen."	Pakistan (PAK2)
Quote 131	"International finance has helped a lot. Without this finance, I am not sure how much of this climate change thing would actually have an impact on policies here."	Uganda (UGA4)
Quote 132	"If you're not on healthy terms in terms of financing your implementation of the policies, then you need to look abroad."	Vanuatu (VAN1)
Quote 133	"If external money stops financing fossil fuels, then it's unlikely it will be expanded."	Zimbabwe (ZIM1)
Quote 134	"With financial resources, we can do everything. We can even overcome low political will. They will eventually get behind it if there is money and progress."	Zimbabwe (ZIM2)
Quote 135	"There is the need to negotiate the financial debt with China and other countries. This is suffocating the national budget and reducing investments into infrastructures, health, education and eco-tourism."	Angola (ANG1)

Appendix C. Brief overview of climate policy landscape in this paper's country cases

Angola

In its INDC, Angola elaborates its plans to reduce GHG emissions up to 35% unconditionally by 2030 as compared to the business-as-usual (BAU) scenario (base year 2005). In addition, it is expected that through a conditional mitigation scenario, the country could reduce emissions an additional 15% below BAU levels by 2030. In achieving its unconditional and conditional targets, Angola expects to reduce its emissions trajectory by nearly 50% below the BAU scenario by 2030 at an overall cost of over US\$14.7 billion. Given its extreme vulnerability to climate change impacts in some key economic sectors, Angola's INDC also includes priority adaptation actions that will enable the strengthening of the country's resilience towards the attainment of the Long Term Strategy for Development of Angola (Republic of Angola, 2015).

Angola ratified the United Nations Framework Convention on Climate Change (UNFCCC) in 2000, and the Kyoto Protocol in 2007. Since then, the government has been making efforts to establish policies and regulation to protect the environment and address climate change. However, Angola still suffers the impacts of a devastating civil war that started in 1975 and lasted until 2002, after Angola gained its independence from Portugal. As a result of this long conflict, institutions face organisational deficiencies and there is a general lack of human resources in the country (Nachmany et al., 2016).

In 2011, Angola worked out a National Adaptation Programme of Action with a key focus on the sectors of agriculture, coastal zone, biodiversity, forests, ecosystems, water and, health (Republic of Angola, 2011). The 2013–2017 National Development Plan (PND, in Portuguese) was the first medium-term plan drafted within the framework of the new Constitution of Angola. Some of the activities planned by the PND are relevant to climate change: the improvement of meteorological centres and services; the promotion of afforestation and reforestation; the adoption of measures to control floods and droughts; the promotion of decentralisation and diversification of energy sources (e.g. small hydroelectric plants, hydro, solar, wind and biomass); and the improvement of public transportation at the municipal, provincial and inter-provincial levels (Nachmany et al., 2016).

Benin

Benin joined UNFCCC in 1994 and rolled out its First National Communication in 2002, followed by the second and the third in 2011 and 2019, respectively. In 2003, the country's National Committee on Climate Change was established to follow, support and implement UNFCCC-related work (Republic of Benin, 2003). Among the committee members was the then Ministry of the Environment, Housing and Town Planning (MEHTP). Under the MEHTP, the National Sustainable Development Commission (NSDC) was established to integrate environmental considerations into policies, strategies, programs and sectoral development projects. In 2006, the environmental issues were restructured into the Ministry of the Environment and Nature Protection (MENP) and, in a ministerial reformulation in 2016, both environmental and sustainable development agenda were integrated into a ministry of its own, the Ministry of Living Environment and Sustainable Development (MLESD). The Ministry had a focus on the implementation of climate and environmental policies in a multitude of realms affected by climate change, for instance in terms of reforestation and protection of natural and forest resources, water and sanitation, housing, urban development, land mapping and territorial planning, pursuing a goal of fostering the climate-compatibility of development (Republic of Benin, 1992, 2006, 2016b).

Regarding the GHG balance, Benin is considered a sink, since the CO₂ absorption capacity of the forests exceeds the emissions of the other sectors. Therefore, through its first submitted INDC from 2015, Benin focuses on the implementation of a series of policies and measures for mitigation in the energy and agricultural sectors. The national target is to reduce its emissions (excluding the forestry sector) by approximately 16% during the period 2021–2030 compared to the BAU scenario, with the share of conditional contributions expected to be three times the unconditional share. An additional contribution on carbon sequestration in this period can be made by limiting the annual rate of deforestation (23.9 MtCO₂eq) and creating more planted forests (8.1 MtCO₂eq), but this will deeply depend on international funding (Republic of Benin, 2016a).

Considering the need to strengthen and adapt the country to the effects of climate change and the commitment to reduce GHG emissions, the

government of Benin passed the Low Carbon and Climate Resilient Development Strategy in 2016 (Republic of Benin, 2016c). Targets of this document by 2030 are to avoid the emission of at least 12 MtCO₂eq against a 2016 baseline and the sequestration of at least 163 MtCO₂eq by 2030. The financial resources required for the implementation are mobilized through state investment, loans, grants and donations from multilateral and bilateral partners. In an attempt to regulate climate change consequences over the short, medium and long-term, Benin passed the law No. 2018/18, establishing a framework for taking adaptation measures to protect air, land, water, and other natural resources. Additionally, the document foresees carbon taxes, conditional on the annual finance law (Republic of Benin, 2018).

Bolivia

Bolivia's INDC clearly listed its climate targets on a sectorial basis. On the energy front, Bolivia expects its share of generation from renewable sources to increase to 79% by 2030 from 39% in 2010. In relation to forests and agriculture, the country expected to eliminate illegal deforestation by 2020 and increase its net forest coverage to 54 million hectares in 2030 compared to 52.5 million hectares in 2010. With regards to water, a target to triple water storage capacity by 2030 (3,779 million m³ by 2030 vs. 596 million m³ in 2010) has been set alongside a target to achieve 100% drinking water coverage by 2025. However, it did not set a quantitative target for its GHG emissions (The Plurinational State of Bolivia, 2015).

Bolivia ratified the UNFCCC in 1994 as a non-annex I party and has been vocal in international climate change debates. Its national approach differs from many countries that have followed the models of UNFCCC annex I countries. Bolivia begins from the premise that wealthy industrialised countries owe a "climate debt" or "climate deficit" both to the Earth (as a political subject) and to states that are not historical polluters. It calls for significant transfer of funds from countries with a "climate debt" to developing countries as payment, or reparation; as well as for increased technology transfer so that poorer countries may develop using cleaner, more efficient technology (Nachmany et al., 2015).

The country sent out three National Communications to the UNFCCC each in 2000, 2010 and 2020, discussing detailed adaption measures for water, forests, human health and, agriculture. The Second National Communication to the UNFCCC (2009) reports that Bolivia is nearly self-sufficient in terms of electric energy consumption and that "the government's goal is to turn Bolivia into an energy powerhouse in the region" (The Plurinational State of Bolivia, 2009).

Ethiopia

Through its Intended Nationally Determined Contribution (INDC), Ethiopia intends to limit its net GHG emissions in 2030 to 145 Mt CO₂e or lower. This would constitute a 255 MtCO₂e reduction from the projected 'business-as-usual' (BAU) emissions in 2030 i.e. a 64% reduction from the BAU scenario in 2030. Ethiopia also intends to undertake adaptation initiatives to reduce the vulnerability of its population, environment and economy to the adverse effects of climate change, based on its Climate Resilient Green Economy Strategy (Federal Democratic Republic of Ethiopia, 2015).

Ethiopia submitted its first and second national communication reports to UNFCCC in 2001 and 2015 respectively, but its first official climate action was taken through its National Adaptation Programme of Action (NAPA) in 2007 in an attempt to combat incessant droughts and erratic rainfalls (Federal Democratic Republic of Ethiopia, 2007). NAPA made the necessary institutional arrangements required to successfully implement adaptation projects.

One of Ethiopia's most important climate policies, the Climate Resilient Green Economy Strategy (CRGE) came into action in 2011, 4 years before the Paris Agreements, with agriculture, forestry, power and transport as its four main pillars. Prime Minister Meles Zenawi implemented the accompanying "CRGE initiative" (Federal Democratic Republic of Ethiopia, 2011) to ensure the implementation of the CRGE. This initiative has had a strongly inter-ministerial governance approach, including representation from the ministries tasked with energy, urban development, forestry, agriculture, transport, industry and health, while the Prime Minister's office overseeing coordination. This policy is aimed at realising green growth potential in the country, adjusting the economic system in line with climate change mitigation while focusing on capturing key economic and social benefits in the process. It had a strong implementation component from its inception, with an initial focus on finance instruments for low-carbon generation technologies, supportive programmes for energy-efficient cookstoves, instruments to monetise emissions reductions from livestock, and instruments to ensure forest protection and reforestation. This policy went on to become a cornerstone for all of their subsequent 5-year growth transformation plans (Federal Democratic Republic of Ethiopia, 2011).

Ghana

Ghana's emission reduction goal according to its INDC in 2015 was to unconditionally lower its GHG emissions by 15% relative to a business-as-usual (BAU) scenario emission of 73.95MtCO₂e by 2030. It proposed that an additional 30% emission reduction can be attained if external support in terms of finance, technology transfer and capacity building is made available to Ghana for implementing the mitigation actions. Ghana also submitted an adaptation goal and priority adaptation policy actions in agriculture, water management and infrastructure planning (Republic of Ghana, 2015).

In many parts of Africa, desertification has contributed to the increasing poverty of the people and the gradual but irreversible degradation of the ecosystem and Ghana has long been recognized as highly vulnerable to it (Environmental Protection Agency, 2002). Ghana's first effective policy towards tackling desertification came in 2002 through the National Action Programme to Combat Drought and Desertification with a focus on agriculture, land use, soil, mining, vegetative cover, bushfires, infrastructure, and energy management.

The Environmental Protection Agency (EPA) is responsible for coordinating Ghana's national climate change strategy. Line ministries and other public sector institutions (the National Development Planning Commission, Forestry Commission, Energy Commission, Ministry of Food and Agriculture, Ministry of Lands and Natural Resources, Ministry of Power, and the Ministry of Environment, Science, Technology and Innovation) direct mitigation, adaptation and clean energy policies and activities.

Ghana's First National Communication to UNFCCC was submitted in 2001, followed by the second and the third in 2011 and 2015 respectively. Identifying an immediate need to act upon climate adaptation and disaster resilience, Ghana laid down extensive strategies in its National Climate Change Adaptation Strategy (NCCAS) for promoting sustainable development and poverty reduction (Republic of Ghana, 2012). In an effort to renew its efforts on sustainable forest management and reduce deforestation, Ghana also announced a REDD+ Strategy (Reducing emissions from deforestation and forest degradation) in 2015 (National REDD+ Secretariat, 2015).

Myanmar

The Global Climate Risk Index ranks Myanmar as the world's second most affected country by extreme weather events; accordingly, the country considers climate change an important challenge to its socio-economic development (Eckstein et al., 2021; [The Republic of the Union of Myanmar, 2019a](#)).

The mitigation contribution for the Myanmar INDC submission in 2017 addresses actions and policies in the areas of forestry and energy. However, the document does not include the estimated reduction of GHG emissions. In the forestry sector the main goal is to reach, by 2030, a coverage of 40% of the national territory with areas of permanent forest estate (reserved forest, protected public forest and protected area systems). Regarding energy supply, actions are intended to provide access to electricity for about 6 million inhabitants in rural areas, with 30% coming from renewable sources. Greater utilisation of the country's hydroelectric potential is highlighted as a key objective in the sector. Energy efficiency-related measures have also been drawn up, such as reducing electricity consumption by 20% compared to forecasts and distributing approximately 260,000 energy-efficient cooking stoves by 2030 ([The Republic of the Union of Myanmar, 2015](#)).

The Myanmar Climate Change Alliance (MCCA) was established with the aim of strengthening the country's capacity to develop sectoral strategies related to climate change. Through this alliance, Myanmar received financial support from the European Union between 2013 and 2017 and developed the Climate Change Policy, passed in 2019, the Climate Change Strategy, approved in 2019, and the Sustainable Development Plan 2018–2030, passed in 2018. These documents aim to ensure that actions over the long-term can transform Myanmar into a low-carbon and resilient country, which is able to develop sustainably ([Grantham Research Institute, 2020](#)).

The most recent policy that addresses climate change is the Myanmar National Environmental Policy, passed in 2020. This policy provides long-term strategic guidance on Myanmar's environmental and climate objectives, besides recognising and integrating Myanmar's obligations under the Paris Agreement ([The Republic of the Union of Myanmar, 2019b](#)).

Nigeria

Nigeria submitted its INDC in 2015 and proposed that it would make an unconditional contribution of 20% below BAU that is consistent with its then development trends and government policy priorities. They include improving energy efficiency by 20%, setting up off-grid solar PVs to generate 13 GW of renewable electricity for rural communities, and ending gas flaring. It also contains detailed strategies for transitioning from personal vehicles to mass transit. Conditional on receiving international support in the form of finance and investment, technology and capacity building, Nigeria promised to make a significant additional contribution. The combined policies and measures can deliver in a cost-effective manner and reduce emissions 45% below BAU. Nigeria's key focus would be to achieve an increased level of energy efficiency and a significant reduction in the use of generators, while providing access to energy for all Nigerians ([Federal Republic of Nigeria, 2015](#)). In the latest round of INDC submissions ahead of the COP26 meeting in the UK in 2021, Nigeria is also considering the implementation of a carbon tax, receiving technical assistance from the UNFCCC's (Collaborative Instruments for Ambitious Climate Action) CiACA initiative.

Nigeria joined UNFCCC in 1994 and rolled out its First National Communication in 2003 along with setting up a department in its ministry that is responsible for Climate related policies and their implementation ([Federal Republic of Nigeria, 2003](#)). In an attempt to address its struggle with agriculture, power generation and impacts from floods, the vulnerability assessments from the subsequent national communications helped the country devise effective adaptation strategies like the 'National adaptation strategy and plan of action on climate change for Nigeria' (NASPA-CCN). This was a major milestone in Nigeria's policy context which planned detailed projects addressing agriculture (crops and livestock), all water resources, forests, biodiversity, health and sanitation, human settlements and housing, energy, transportation and communications, industry and commerce, disaster, migration and security, livelihoods, and vulnerable groups (Building Nigeria's Response to Climate Change (BNRCC) [Building Nigeria's Response to Climate Change Project, 2011](#)).

More recent policies include the National Agricultural Resilience Framework which was deployed in 2015 with the purpose of tackling climate variability effects on agriculture ([Nigerian Federal Ministry of Agriculture and Rural Development, 2015](#)).

Pakistan

After considering the existing potential for mitigation in the country, Pakistan in its INDC intended to reduce up to 20% of its 2030's projected GHG emissions, subject to the availability of international grants to meet the total abatement amounting to about US\$ 40 billion at 2015 prices ([Government of Pakistan, 2015](#)). The mitigation strategies of Pakistan focus more on the sectors of agriculture and energy supply/demand, while the adaptation strategies aim to tackle the ongoing issues in irrigation, water supply, risk management and building climate resilient infrastructure ([Government of Pakistan, 2015](#)).

Since signing the United Nations Framework Convention on Climate Change (UNFCCC) in 1992 and ratifying the treaty in 1994, the Pakistani government has taken actions to fulfil its commitments under the convention. The Ministry of the Environment (MoE) drafted the National Climate Change Policy in 2011 to provide a policy framework to steer Pakistan towards climate-resilient development ([Government of Islamic Republic of Pakistan Ministry of Environment, 2012](#)). The Ministry of Climate Change (previously called the Ministry of Environment) developed the 'Framework for Implementation of Climate Change Policy', which outlines adaptation actions and proposed implementation through 2030, with particular focus on water, agriculture and livestock, coastal areas, Indus deltaic region, forests, disaster preparedness, energy, transport, urban planning, industries and other vulnerable ecosystems ([Climate Change Division of, 2014](#)).

The most recent climate action proposals were integrated into Pakistan's Vision 2025, with elaborate goals to achieve environmentally sustainable growth ([Ministry of Planning Development and Reform, 2015](#)).

Uganda

Uganda submitted its INDC in 2015. According to its INDC, Uganda will focus on implementing a series of mitigation policies and measures in the energy supply, forestry and wetland sectors. In the BAU scenario, the estimated emissions in 2030 will be 77.3MtCO₂e/year. The estimated potential cumulative impact of the policies and measures could result in a reduction of GHG emissions of approximately 22% by 2030 compared to BAU. Uganda also communicates its goal of achieving a total of at least 3,200 MW of renewable electricity generation capacity by 2030, up from 729 MW in 2013. Its

priority sectors for adaptation include agriculture, forestry, water, infrastructure, energy, health and risk management particularly in urban areas.

Uganda is largely an agricultural country; 85% of Ugandans live in rural areas and 73% survive out of subsistence agriculture, with the sector contributing up to 90% of the country's exports (Ugandan Ministry of Water and Environment, 2014). Climate variability has severely affected the agriculture and fishery industries in the past two decades; the first official action in response to this was the 'National Adaptation Programmes of Action' in 2007. This policy promoted a strong institutional foundation for executing the following nine projects: Community Tree Growing Project, Land Degradation Management Project, Strengthening Meteorological Services, Community Water and Sanitation Project, Water for Production Project, Drought Adaptation Project, Vectors, Pests and Disease Control Project, Indigenous Knowledge (IK) and Natural Resources Management Project and, the Climate Change and Development Planning Project (Republic of Uganda, 2007).

After joining the UNFCCC in 1992, Uganda rolled out two national communications each in 2002 and 2014. The Ministry of Water and Environment includes a climate change department which is responsible for the planning and implementation of climate change-related mitigation and adaptation strategies for Uganda (Uganda Ministry of Water and Environment, 2015). The assessments over the past two decades paved the way for the latest major Ugandan climate policy - the National Climate Change Policy in 2015 - which proposed sector-specific strategies for both adaptation and mitigation in the following areas: agriculture and livestock, fisheries and aquaculture, transport, forestry, wetlands, biodiversity and ecosystem services, health, energy, wildlife and tourism, human settlements and social infrastructure, disaster risk management, vulnerable groups, REDD+, energy and transport.

Vanuatu

Being ranked as the world's most vulnerable country for natural calamities according to the Commonwealth Vulnerability Index, climate change is likely to impact all sectors that are pertinent to the sustainable development of Vanuatu (Ministry of Climate Change et al., 2014).

The mitigation contribution for the Vanuatu INDC submission is a sector-specific target of transitioning to close to 100% renewable energy in the electricity sector by 2030. This target would replace nearly all fossil fuel requirements for electricity generation in the country and be consistent with the National Energy Road Map (NERM) target of 65% renewable energy by 2020. The mitigation would thus reduce BAU emissions in the electricity sub-sector by 100% and in the energy sector as a whole by 30%. The Government of Vanuatu has refrained from adding adaptation targets to its INDC and instead chose to reiterate its adaptation priorities set in its key national policies such as the National Adaptation Program of Action (NAPA) and the National Climate Change and Disaster Risk Reduction Policy. Achieving these targets is highly dependent on the funds being made available from external sources of aid (Government of Vanuatu, 2015).

In terms of climate change impacts and risks, the nations of the Pacific Islands have been highly visible to the international community. In 1999, Vanuatu prepared its first National Communication to the UNFCCC and then went on to ratify the Kyoto Protocol in 2001. The communication was primarily focused on mitigation strategies in the sectors of agriculture, human health, water resources, coastal development, and fisheries (Republic of Vanuatu, 1999). The government made some major institutional changes in 2007 in order to facilitate smoother planning and implementation of mitigation strategies (Netatua Pelesikoti, Republic of Vanuatu, 2007).

In the last decade, the ministry of Climate Change, Meteorology & Geo-Hazards, Environment, Energy and Disaster Management ran extensive vulnerability assessments in additional sectors like transport and tourism (Ministry of Climate Change et al., 2014). These assessments helped develop new policies such as the Vanuatu Climate Change and Disaster Risk Reduction Policy in 2016 and the National Policy on Climate Change and Disaster-Induced Displacement in 2018.

Zimbabwe

Zimbabwe submitted its INDC in 2015 and proposed a mitigation target to reach 33% below the projected BAU energy emissions per capita by 2030. This contribution was subject to many factors, most notably support from high-income countries relating to finance, technology and capacity. It also communicated an adaptation contribution, detailing the country's short and long-term adaptation visions, goals, and targets in agriculture, disaster management and irrigation supply.

Prior to the INDC, Zimbabwe actively participated in international negotiations on climate change from as far back as 1992. It was among the first countries to sign and ratify the UNFCCC in 1992 and also acceded to the Kyoto Protocol in 2009. Although Zimbabwe is constrained by its lack of human, institutional and financial resources, it has continued through the years to formally support the United Nations' efforts to curb the escalation of GHG emissions (Zimbabwe Ministry of Environment, 2014).

Zimbabwe's National Communications to the UNFCCC were done in 1998, 2013 and 2017, with a principal focus on improving practices in agriculture, forestry, power supply in rural areas and power supply for its industrial units (Republic of Zimbabwe, 2013). With external support, the Republic of Zimbabwe set up a Climate Change Management Department in 2013 as a dedicated institution empowered to handle climate-related activities (Zimbabwe Ministry of Environment, 2014). In 2014, this department took over the implementation activities of one of the country's most important climate policies: The National Climate Change Response Strategy, which had a significant budget allocated to water, agriculture, and transport.

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