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Integrating climate change and livelihood within public investment policies: A cross-country assessment in South Asia (India, Nepal, and Sri Lanka)

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Abstract

This study explores the extent to which governments in India, Nepal, and Sri Lanka prioritize public investment policies and climate change–related challenges in budgeting processes and how livelihood strategies related to climate change are executed through local government budgets. Data were collected in two stages: content analysis followed by semistructured interviews and focus group discussions with a range of stakeholders. The findings show that all three countries have clear national priorities for investing in climate change. However, their national priorities are not integrated effectively with policies and programs at the local level.

This study outlines several issues to be addressed. First, weak capabilities are more concerning than availability of funds, making capacity building a priority. Second, a wider range of investments is needed, not just targeting physical capital but also mobilizing the available human, social, and knowledge capital. This effort would help to align public investments in climate change with community interests and livelihood strategies. Third, budgets and public financial management systems are important for the effective allocation of resources and delivery of priorities and investments to address climate change at the grassroots level. However, such allocations will only be made if (a) the fiscal space is available to do so, (b) relevant policies are elaborated, and (c) persons with the power to allocate those resources are interested in allocating them to climate policies.

Governments are urged to consider “climate-smart spending” as a policy area and to set up mechanisms to ensure that centrally allocated climate change budgets reach the grassroots level. Appropriate measures are needed to scrutinize the reporting, performance evaluation, and monitoring of climate change–related budgeting and investment. Finally, all three countries have potential to encourage private sector investment and promote public-private partnerships. Making climate change a part of the higher education curriculum is critical.

This paper is a product of the PEFA Research Competition 2020: The Interplay of Climate Change and Public Financial Management. The PEFA Research Paper Series provides open access to PEFA-sponsored research to disseminate quickly knowledge that contributes to ongoing discussions about public financial management (PFM) around the world. The broader objectives of the PEFA Research Competition are to contribute to addressing gaps in knowledge on fiscal management, how to improve PFM systems, and the practical implementation of PFM reform. The papers carry the names of the authors and should be cited accordingly. The findings, interpretations, and conclusions expressed in the papers are entirely those of the authors. They do not necessarily represent the views of the PEFA Program or those of the PEFA partners.

Integrating climate change and livelihood within public investment policies: A cross-country assessment in South Asia (India, Nepal, and Sri Lanka)

Prepared for PEFA (a partnership program of the European Commission, International Monetary Fund, World Bank, and the governments of France, Luxembourg, Norway, Slovak Republic, Switzerland, and United Kingdom)

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Abbreviations

ADB	Asian Development Bank
BIOFIN	Biodiversity Finance Initiative
CCFF	Climate Change Financing Framework
CCMD	Climate Change Management Division
CRPFM	Climate Responsive Public Financial Management
CSR	corporate social responsibility
DoECC	Directorate of Environment and Climate Change
FY	fiscal year
GDP	gross domestic product
IFC	International Finance Corporation
KILA	Kerala Institute of Local Administration
LAPA	Local Adaptation Plan for Action
LAPCC	Local Action Plan on Climate Change
MoECC	Ministry of Environment and Climate Change
MoEFCC	Ministry of Environment, Forests, and Climate Change
NAP	National Adaptation Plan
NAPA	National Adaptation Program of Action
NAPCC	National Action Plan on Climate Change
NARMIN	National Association of Rural Municipality in Nepal
NCAP	National Clean Air Programme
NDC	Nationally Determined Contributions
NGO	nongovernmental organization
NICRA	National Initiative on Climate Resilient Agriculture
PEFA	Public Expenditure and Financial Accountability
PFM	public financial management
PIM	public investment management
PPP	public-private partnership
REDD	Reducing Emission from Deforestation and Forest Degradation
SAPCC	State Action Plan on Climate Change
SDG	Sustainable Development Goals
UNFCCC	United Nations Framework Convention on Climate Change
UNDP	United Nations Development Programme

Executive summary

Climate change is the biggest concern and challenge of this century, imposing significant effects on livelihoods and development. Developing countries are especially vulnerable to the impacts of climate change. South Asia, home to nearly a quarter of the world's population, serves as a striking example. Extreme weather and climate-related disasters, including avalanches, erratic rainfall, droughts, cyclones, floods, and landslides, have become increasingly frequent in recent years. To address the impact of climate change and to comply with the 2015 Paris Agreement, the governments of India, Nepal, and Sri Lanka have submitted their Nationally Determined Contributions (NDC) to the United Nations Framework Convention on Climate Change (UNFCCC). To achieve their NDC goals, these countries have introduced a range of climate change–related policies, strategies, frameworks, and action plans.

However, dealing with the impacts of climate change and achieving sustainable growth require effective allocation of resources and large-scale public investment. The extent to which developing countries such as India, Nepal, and Sri Lanka will be able to prioritize climate change–related issues is unclear, given the challenges they face in eradicating poverty, developing infrastructure, and improving the living conditions of their populations. This study explores the extent to which government authorities in India, Nepal, and Sri Lanka are prioritizing public investment policies and climate change–related issues in their budgeting processes and how local government budgets are executing livelihood strategies related to climate change.

This study draws on desk-based research and interviews in the field. The first stage of data collection included an in-depth analysis of climate change–related government documents such as climate change policies, action plans, strategies, rules and regulations, budget speeches, economic surveys, and progress reports on the Sustainable Development Goals (SDGs). This effort was followed by field studies conducted in all three countries—Kerala State in India, the Koshi River zone and region (Provinces 1 and 2) in Nepal, and Western Province in Sri Lanka—consisting of semistructured interviews with a range of stakeholders.

All three countries have prioritized climate change issues, focusing mainly on renewable energy, sustainable agriculture, habitat, transport, waste, water, and disaster management. Significant amounts of resources have been allocated through the budget, and public investment has increased in these sectors with a view to combatting the impacts of climate change. However, the limited availability of resources and investment, particularly at the local government levels, has hampered achievement of the intended objectives. Nevertheless, the emphasis on private sector investments and public-private partnerships has created opportunities in all three countries, not only to meet their NDC goals and address the impacts of climate change, but also to pursue sustainable development and growth in the longer term.

While climate change policies and strategies appear to be well developed at the central level in all three countries, they are poorly integrated into the state- and local-level budgeting process. Policies and strategies issued at the central level emulate those prevailing in advanced Western countries. For example, Nepal has developed advanced policies, plans, budget codes, and frameworks for climate change and is in the process of preparing its National Adaptation Plan (NAP). However,

these policies and plans are poorly integrated at the provincial and local levels, and local and provincial governments often do not consider them a priority during the planning and budgeting process. The situation is similar in India, where climate change–related policies, plans, and legislative frameworks prevailing at the central level have limited influence on ground-level action. Lack of government budgetary support is one of the main challenges in achieving the ambitious targets set at the central level. Sri Lanka has set climate change–related targets and SDGs, but the extent to which the objectives are integrated at the state and local levels is unclear due to a lack of reliable and integrated data sources. While climate budgets are yet to be prepared in India and Sri Lanka, both countries have established disaster management centers and other government institutions through which to channel climate funding.

Due to lack of awareness, shortage of funding, and poor environmental leadership, local government authorities are often overcommitted to mitigating short-term disaster recovery and relief mechanisms, which compromises the long-term climate change agenda. The gap between community awareness and climate change impacts is significant in all three countries. In turn, public investments in climate change priorities are misaligned with community interests and livelihood strategies. This misalignment is exacerbated by limited community involvement and participation in climate change activities. We therefore recommend that governments implement proactive awareness programs in climate change, encompassing all key stakeholders and community groups (civil society organizations, media, nongovernmental organizations, and political parties). Climate change should also be part of the higher education curriculum in all three countries.

We urge governments to set up mechanisms to ensure that the centrally allocated climate change budget reaches the grassroots level as well as vulnerable and marginalized communities. Reviewing existing or potential incentive systems in the three countries would also enhance the climate response at the subnational level. Appropriate measures should therefore be put in place to scrutinize the reporting, performance evaluation, and monitoring of climate change–related budgets and investments. Regarding access to climate finance, all three countries have opportunities to encourage private sector investment and promote public-private partnerships in energy, transportation, and waste management, areas that are outlined in their NDCs and SDGs as being climate significant. In the context of tight fiscal positions, increasing debt, and limited external funding, governments will have to use domestic resources to finance climate-friendly investments. Therefore, we urge the governments to consider “climate-smart spending” as a policy area.

1. Introduction

Climate change has become the greatest threat to humankind. According to a recent Oxfam report, “Amidst the global health and economic crises, the climate crisis continues to grow” (Gore, Alestig, and Ratcliffe 2020). The catastrophic impacts of climate change on lives, livelihoods, ecosystems, and development are well documented (Mall et al. 2019; Richards and Schalatek 2017). Developing countries are especially vulnerable to the impacts of climate change, and South Asia, home to nearly a quarter of the world’s population, serves as a striking example. Different types of extreme weather and climate-related disasters—avalanches, erratic rainfall, drought, cyclones, floods, and landslides—have become increasingly frequent in the region. A collective regional response is therefore needed, with a view to addressing hazards and vulnerabilities caused by climate change. Yet research documenting the impacts of climate change in South Asia is limited (Mall et al. 2019).

Climate change has triggered unpredictable social, environmental, and economic consequences in South Asia, threatening the livelihoods of the poor at the local level. To address the impact of climate change and to comply with the 2015 Paris Agreement, the governments of India, Nepal, and Sri Lanka have submitted their Nationally Determined Contributions (NDC) to the United Nations Framework Convention on Climate Change (UNFCCC).¹ In its NDC, each country has set goals to address the impacts of climate change, and each country has introduced a range of climate change policies, strategies, frameworks, and action plans and allocated resources to achieve these goals. Following this effort, each country is prioritizing public sector involvement in and commitment to adapting to and mitigating climate change–related challenges.

In assessing governments’ commitment to achieving climate change objectives, the Public Expenditure and Financial Accountability (PEFA) has introduced a Climate Responsive Public Financial Management (CRPFM) framework (PEFA 2020). With 14 key indicators, the CRPFM framework aims to assess the extent to which a country’s public financial management (PFM) system supports the achievement of climate change adaptation and mitigation strategies as set out in its NDC. Globally, the private response to climate change has often proved to be inadequate; as an alternative to public subsidies, public-private partnerships (PPPs), where the public regulator plays a more active role in the choice of investment, have been gaining ground (Buso and Stenger 2018).

The Asian Development Bank (ADB) estimates that, without enough investment, climate change–related costs will rise over time, resulting in a significant loss of annual gross domestic product (GDP)—in the range of 1.8 percent in India, 2.2 percent in Nepal, and 1.2 percent in Sri Lanka by 2050 (ADB 2014). An International Finance Corporation (IFC) report highlights the potential opportunity and need for climate investments to improve climate resilience and achieve low-carbon growth in the South Asian region (IFC 2017). Both reports indicate the importance of public investment management to reduce the social and environmental impacts of climate change, achieve sustainable growth, and ultimately achieve the country’s Sustainable Development Goals (SDGs).

¹ For the NDC Registry, see <https://www4.unfccc.int/sites/NDCStaging/Pages/All.aspx>.

Focusing on the significance of public sector involvement and commitment, this report examines how three South Asian countries have prioritized public investment policies, in line with the challenges experienced in their specific context. Focusing on India, Nepal, and Sri Lanka, it addresses the following research objectives:

1. The extent to which the central government prioritizes public investment policies and climate change–related challenges
2. How local government authorities incorporate the priorities set out by the central government in the budgeting process
3. How the livelihood strategies related to climate change are executed through local government budgets—in particular, the impact of climate change on livelihood strategies in three flood-affected regions of India (Kerala State), Nepal (southern Koshi River belt, Province 1 and 2), and Sri Lanka (Western Province).

This report examines the interplay between climate change and public financial management. More specifically, it focuses on how climate change interacts with public investment policies as a means of adapting to and mitigating the impacts of climate change. The analysis covers both central and local government levels. At the central level, it reviews the rules and regulations, budgets, and other documents relating to climate change policies and investments. At the local level, it analyzes how these policies and investments affect livelihood strategies through budgeting.

The report delivers contextually based empirical evidence, suggesting the reforms and approaches that local governments in the region and beyond can adopt in the budgeting process to mitigate the impacts of climate change. In addition, it identifies a regional approach through which to fight climate change in South Asia. In the wider context of emerging economies, the report offers donors, policy makers, governments (local, state, and central), and researchers evidence-based approaches to managing the impacts of climate change.

The remainder of the report is structured as follows. Section 2 reviews the background literature, including climate change policies in India, Nepal, and Sri Lanka. Section 3 outlines the research approach, data collection methods, and data analysis. Section 4 presents the results of the desk-based research, and section 5 presents the findings of the field study. Section 6 discusses the results obtained. Section 7 provides a short conclusion and offers recommendations.

2. Background literature

According to the Intergovernmental Panel on Climate Change, “Warming of the climate system is unequivocal, and since the 1950s, many of the observed changes are unprecedented over decades to millennia” (IPCC 2014, 2). Moreover, “Climate change has not slowed down, and its connection with human well-being and poverty is increasingly visible.”² Colenbrander, Dodman, and Mitlin (2018) argue that poor and marginalized people will suffer most from the impacts of climate change. An integrated approach is required, coupled with a strong policy framework through which to identify public investment priorities, coordinate with multiple stakeholders and beneficiaries, and allocate financial resources in the affected areas. The management of financial resources has garnered significant attention due to growing concerns among international donors and funding agencies over inefficiencies and lack of accountability. In the context of emerging economies, a regional approach to climate finance is proposed that incorporates various climate-related activities and public investment priorities to deal with the challenges more effectively.

Recent academic literature (Gilmore and St. Clair 2018) and policy documents (Irawan, Heikens, and Petrini 2012) have discussed the role of budgeting—an integral part of climate finance—in addressing climate change. Various international forums, such as the Paris Agreement 2015, also stress the important role that the budget can have in tackling climate challenges. Governments (both central and local authorities) in developing countries face structural and operational complexities in making decisions regarding climate change policies and investment priorities and incorporating them in the budgeting process. A limited amount of work discusses the incorporation of climate challenges into central government policies (for example, Bachner, Bednar-Friedl, and Knittel 2019; Nicholson, Beloe, and Hodes 2016). Even less is known about how local government authorities, particularly in the developing world, can align their priorities for climate change investments within their budgeting process (Cohen 2012; Musah-Surugu, Ahenkan, and Bawole 2018).

Local governments have the primary responsibility for and authority to deliver climate change investment priorities at the grassroots level (IPCC 2014; OECD 2010; UN-Habitat 2011). Amid dwindling resources, they are required to devote a considerable amount of their time integrating centrally imposed investment policies and implementing a climate change budget in their jurisdiction. For example, cities contribute approximately 80 percent of the total global greenhouse gas emissions and account for more than 60 percent of the global population, which is likely to reach 80 percent by 2050 (Setiadi and Lo 2019). Ensuring that additional funding is available to address such climate-related issues is a key concern of many local governments, as are the efficient allocation and reporting of climate funds and the execution of climate (environmental) accountability and climate auditing (Cohen 2012; Musah-Surugu, Ahenkan, and Bawole 2018). Adhering to the requirements laid down in the United Nations Development Programme (UNDP) Climate Change Financing Framework (CCFF) is paramount in addressing issues relating to climate accountability and auditing (Nicholson, Beloe, and Hodes 2016).

² See <https://www.worldbank.org/en/topic/climatechange/overview>.

However, scant attention has been devoted to understanding how reforms in current budgeting practices might enable local authorities to incorporate climate change-oriented public investment policy priorities. The CRPFM proposes an indicator for “budget alignment with climate change strategies” (CRPFM-1), which aims to measure the extent to which climate change strategies are reflected in national budgets (PEFA 2020). CRPFM-1 consists of six basic and six additional elements. The six basic elements are (1) preparing climate change strategic plans; (2) costing climate projects and initiatives; (3) accounting for climate-related public investment plans; (4) aligning climate-related expenditure policy proposals; (5) aligning tax policies with national climate change strategies; and (6) aligning climate-related annual expenditure and tax estimates with budget estimates for the first year. With reference to climate-responsive public investment management (CRPFM-5), the 2020 CRPFM proposes four assessment criteria: (1) climate-related provisions in the regulatory framework for public investment management; (2) climate-related project selection; (3) climate-related provisions for project appraisal; and (4) reporting from entities in charge of implementation. However, studies investigating the extent to which the Climate Change Financing Framework is incorporated in local government budgets are lacking. In addition, concerns have been expressed about the extent to which the priorities of local governments correspond to the priorities of the central government. For instance, overlap in the structure of local governments tends to result in deviations between central and local government priorities (Gilmore and St. Clair 2018).

To incorporate the CCFM in the budgeting process, local governments need to consider two issues: the interaction of their climate change objectives with their livelihood resources (natural, economic, human, and social capital) and strategies (agricultural intensification, livelihood diversification, and migration) and the impact of these objectives on the livelihood choices of local households (Paavola 2008; Scoones 1998; Tian and Lemos 2018). In the absence of a standard means of addressing climate-related impacts on livelihood resources and strategies, several measures are useful for the discussion: the protection and effective management of natural resources such as soil, forests, and water; easy access to the market; and public investments in rural infrastructure, health, education, and social welfare (Paavola 2008). More specifically, ground-level livelihood strategies relating to climate change priorities need to be aligned with the United Nations SDGs,³ which recommend incorporating climate action before attempting to align central government investment priorities (Reckien et al. 2019). The literature provides little evidence of this alignment. Moreover, the extent to which local authorities’ approach to climate change integration, development planning, and implementation contributes to the effectiveness of proposed climate change strategies is not clear (for example, Cohen 2012; Reckien et al. 2019; Setiadi and Lo 2019). As Reckien et al. (2019, 958) suggest, “More general studies on local climate policy effectiveness and success of planning for climate change at the local level are urgently needed.”

³ See <https://www.un.org/sustainabledevelopment/>.

3. Methodology

Focusing on India, Nepal, and Sri Lanka, this study draws on qualitative research to collect and analyze secondary and primary sources of data to study (1) the extent to which the central government prioritizes climate change–related challenges in its public investment policies, (2) how local government authorities incorporate these priorities into the budgeting process, and (3) how the livelihood strategies relating to climate change are executed through local government budgets. First, we analyzed the content of climate change and public investment policy–related government documents, and then we facilitated semistructured interviews and focus group discussions with key stakeholders.

To gain a broader understanding of climate change issues and public investment priorities set by the governments of India, Nepal, and Sri Lanka, we analyzed the texts, narratives, numbers, pictures, and images embedded in published official government documents using the qualitative content analysis method (Hsieh and Shannon 2005; Schreier 2012). Content analysis uses a “set of procedures to make valid inferences from text” (Weber 1985, 9) and seeks to “analyze published information systematically, objectively, and reliably” (Guthrie et al. 2004, 287). Content analysis provides “new insights and increases a researcher’s understanding of particular phenomena” (Krippendorff 2013, 24); it is also used to discover and describe the focus of an individual, group, or institution (Hsieh and Shannon 2005; Schreier 2012; Weber 1985).

The examination included official government documents, published in both English and local or national languages, that are publicly available on the official websites of government agencies. The key documents selected for the study addressed the policies, plans, strategies, frameworks, acts, and rules and regulations relating to climate change. The documents examined are cited throughout the text.

The period of investigation covered five years, starting from fiscal year (FY) 2015/16 to FY 2019/20. This five-year time frame corresponds to the period in which all three countries submitted their NDC to the UNFCCC, setting out their climate change–related priorities, plans, and targets. In addition, we reviewed the budget speeches (FY 2015/16 to FY 2019/20),⁴ economic survey reports (FY 2015/16 to FY 2019/20),⁵ SDG reports, and NDC documents produced by government agencies in each country. Although these documents primarily reflect commitments and achievements made after the Paris Agreement, we also reviewed reports, papers, and documents issued prior to the agreement to provide context. Most of the documents referred to in this report are publicly accessible via the webpages of government agencies. Our search yielded a total of 106 documents (42 for India, 40 for Nepal, 21 for Sri Lanka, and 3 for South Asia), the majority of which are written in English. To supplement our findings, we also reviewed newspaper articles (both local and international), research papers, and reports produced by international organizations

⁴ Budget speeches are available for India at <https://www.indiabudget.gov.in/bspeech.php>; for Nepal at <https://www.mof.gov.np/>; and for Sri Lanka at <https://www.treasury.gov.lk/budget/speeches/archive#2020>.

⁵ Economic survey reports are available for India at <https://www.indiabudget.gov.in/economicsurvey/>; for Nepal at <https://www.mof.gov.np/>; and for Sri Lanka at <https://www.cbsl.gov.lk/en/publications/other-publications/statistical-publications/economic-and-social-statistics-of-sri-lanka>.

such as the World Bank, the ADB, and the United Nations. This data triangulation served to validate our findings and ensure their accuracy (Guthrie et al. 2004; Milne and Adler 1999).

Considering the reliability, validity, and accuracy of the data collection and coding, analysis, and interpretation of results (see Guthrie et al. 2004; Krippendorff 2013; Milne and Adler 1999; Schreier 2012; Weber 1985), we used sentences as the unit of analysis rather than words, keywords, paragraphs, or pages. The efficacy of this approach is outlined in other work (for example, see Brennan, Daly, and Harrington 2010; Milne and Adler 1999). This unit of analysis makes it possible to account for contextual elements, capture meaning, and identify themes and categories more accurately. Although some scholars prefer to analyze the word count, arguing that the most repeated word represents the matter of greatest concern, the use of synonyms and the context in which the word is used can have an impact on this type of inference (Weber 1985). Milne and Adler (1999, 243) argue, “As a basis for coding, sentences are far more reliable than any other unit of analysis.”

Two co-investigators were involved in coding, categorizing, and developing themes in each country’s NDC documents. These themes were then discussed with three other co-investigators who were familiar with the particular country and context (Schreier 2012; Weber 1985). The themes and content analysis are presented in section 4 of this report.

The second phase of data collection consisted of a field study in which semistructured interviews⁶ were conducted with a wide range of stakeholders (for the interview questions, see appendix A). Participants included officials from central, state, provincial, and local governments, politicians, policy makers, local experts and consultants (for example, experts on climate, climate finance, forests, mountains, soil conservation, irrigation, and water),⁷ and academics, as well as flood victims, beneficiaries, farmers, and local residents from the flood-affected area under study (Kerala in India, Koshi River and zone in Province 1 and 2 in Nepal, and Colombo, Gampaha, and Kalutara Districts in Western Province in Sri Lanka) and representatives of nongovernmental organizations (NGOs) and local charities. In total, 64 remote (telephone or online) interviews were conducted (20 in India, 20 in Nepal, and 24 in Sri Lanka). The details of participants are provided in appendix B.

In addition to the 64 interviews, three focus group discussions were held with residents and other stakeholders. Interview participants were selected based on their involvement in climate change–related policies, plans, strategies, and budgeting (both at the central and the state or local levels). Participants included individuals from flood-affected areas, local residents who had been affected by flooding, NGO representatives involved directly or indirectly in a flood relief program, and other stakeholders. Most of the interviews were conducted in the local language (Malayalam, Nepali, Sinhala), depending on the convenience and preference of the participants, while some interviews were conducted in English. All interview transcripts, notes, and audio recordings were

⁶ All of the interviews were conducted remotely by our local partner following the ethical guidelines of the University of Essex, United Kingdom.

⁷ These local experts and consultants have advised the government on climate change–related issues (for example, mitigation and adaptation) and preparation of NDC and NAP documents. Some of them have been involved in developing climate change–related policies, acts, regulations, and strategies.

analyzed by our local partners and three co-investigators, who are also native speakers of Malayalam, Nepali, and Sinhala.

The interview data enabled us to examine and validate our content analysis findings by comparing them with the views expressed by informants on governments' policies, plans, strategies, rules, and regulations in each country. The primary data provided insights into the extent to whether policies have been implemented as intended at the grassroots level.

4. Findings from the document analysis

4.1. Climate change and investment priorities in India

India has been at the forefront of developing a climate change agenda clearly outlining its commitment to achieving the SDGs. Following the National Environment Policy in 2006, the national government started the National Action Plan on Climate Change (NAPCC) in 2008, establishing eight core missions to bring developmental objectives in line with the climate change agenda: the National Solar Mission, the National Mission for Enhanced Energy Efficiency, the National Mission on Sustainable Habitats, the National Water Mission, the National Mission for Sustaining the Himalayan Ecosystem, the National Mission for a Green India, the National Mission for Sustainable Agriculture, and the National Mission on Strategic Knowledge on Climate Change. These missions set multipronged, long-term, and integrated strategies for achieving key climate change goals (Jha 2014).

The Ministry of Environment, Forests, and Climate Change (MoEFCC) coordinates and supervises the formulation of NAPCC policy. In line with the objectives of the NAPCC, state governments are expected to propose State Action Plans on Climate Change (SAPCCs). A broad structure has been provided to state governments, which includes the statement of issues or problems; assessment of ongoing initiatives; mechanisms to identify key actors and major gaps in action; the selection of a prioritized list of actions; the mapping of key elements following specific project proposals; and the time frame for implementation.

The structure is less detailed regarding the source of funding (Ministry of Environment, Forests, and Climate Change, India 2010). Although the MoEFCC has approved 19 SAPCCs developed by 27 out of 29 states (Sharma, Muller, and Roy 2015), concerns have been raised about the financial and strategic compatibility of the SAPCCs and the NAPCC (CBGA 2017). Along with the NAPCC and SAPCCs, the government has introduced various climate change initiatives focusing on both the national and local levels. These initiatives include the Climate Change Action Program, the National Conservation Act, the National Policy for Farmers, the National Electricity Policy, and the Integrated Energy Policy (CBGA 2017). The 2015/16 economic survey forecasts a minimum budget of US\$2.5 trillion to meet the 2030 climate change goals set out in the intended NDC. In 2017 the Indian government allocated 2.6 percent of gross domestic product (GDP) to climate adaptation projects, leaving a funding gap of US\$38 billion (CBGA 2017). However, the government has steadily increased the budgetary allocation for the MoEFCC, from Rs 16.8 billion

in FY 2015/16 to Rs 26.58 billion in FY 2019/20 and Rs 31 billion in FY 2020/21 (2020 budget speech).

As a means of implementing climate change strategies, the Climate Change Finance Unit was established in 2011 under the Department of Economic Affairs of the Ministry of Finance. Climate finance is understood primarily as budgetary outflows and is funded through various taxes, subsidies, government-backed market mechanisms, and other revenue sources at both the national and state levels. As proposed in the Climate Finance Architecture, the national government, state governments, civil society organizations, international donor agencies, bilateral development agencies, private investors, and public and private banks play an important role in India's climate financing (CBGA 2017). In support of the NAPCC, the government provides funding from other sources, including the National Clean Energy Fund, the National Adaptation Fund, the Climate Change Action Plan, the Compensatory Afforestation Funds, and the National Disaster Response Fund. In July 2017, a goods and service tax was introduced, replacing the clean energy cess, and a new act was enacted—the Taxation Laws Amendment Act, 2017—to regulate climate financing.

The prime objective of the government's climate-responsive budgeting is to integrate climate change-related public expenditures into the national budget (CBGA 2017). While several states (for example, Kerala) have taken initiatives to integrate climate change expenditures into their subnational budgeting, climate change efforts have yet to be integrated into state government budgets (Goel 2018). Climate finance practices in India are highly fragmented, with no clear mechanism for integrating NAPCC and SAPCC policies or for coordinating multiple stakeholders. India reiterated its commitment to addressing climate change in the 2021 budget proposal: "India submitted its NDC, under the Paris Agreement in 2015 on a 'best effort' basis, keeping in mind the development imperative of the country. Its implementation effectively begins on 1st January 2021. Our commitments as action will be executed in various sectors by the Departments/Ministries concerned through the normal budgeting process" (2021 budget speech, sec. 78).

Climate investment in India has resulted in improvements in waste and water management, transportation, and renewable energy, especially in urban settlements where the population is expected to reach around 609 million by 2030.⁸ However, several missions such as the Mission for a Green India, whose aim is "protecting, restoring, and enhancing India's diminishing forest cover and responding to climate change," have been severely hampered by inadequate government funding (Kukreti 2019). The national government also requires the private sector to contribute to and invest in environmental initiatives. For instance, the Company Act 2013 requires companies with a net worth of Rs 5 billion or more, turnover of Rs 10 billion or more, or a net profit of Rs 50 million or more in any fiscal year to spend at least 2 percent of their net profit on charitable activities such as poverty eradication, education, women's empowerment, reducing child mortality and other diseases, social business projects, and environmental sustainability (Ministry of Corporate Affairs, India 2013, sec.135). Table 1 presents the actual budgetary expenses for climate change-related ministries and departments in India.

⁸ See "India's Intended Nationally Determined Contributions: Working towards Climate Justice," at <https://www4.unfccc.int/sites/ndcstaging/PublishedDocuments/India%20First/INDIA%20INDC%20TO%20UNFC%20CC.pdf>.

Table 1: Actual budgetary expenses for climate change–related ministries and departments in India, FY 2015/16–FY 2019/20

Expenditure profile	2015/16	2017/18	2019/20 ^a
Department of Agriculture, Cooperation, and Farmers' Welfare	15,926.04	37,396.72	94,251.62
Department of Agricultural Research and Education	5,386.26	6,942.92	7,523.37
Ministry of Environment, Forests, and Climate Change	1,521.12	2,626.61	2,537.71
Department of Drinking Water and Sanitation	11,081.18	23,938.77	18,264.26
Ministry of New and Renewable Energy	226.02	3,644.62	3,308.83
Ministry of Petroleum and Natural Gas	31,286.74	33,192.06	42,812.20

Source: Government of India (https://www.indiabudget.gov.in/exp_budget.php).

a. Provisional actual expenditure.

The following sections discuss the government's commitment to prioritizing public investment for achieving India's NDCs, including key challenges—renewable energy, sustainable habitat, sustainable transport, waste management, water management, sustainable agriculture, and disaster management—set out in the NAPCC.

4.1.1. Renewable energy

With the aim of ensuring the efficient use and conservation of energy, the government enacted the Energy Conservation Act no. 52 in 2001 (Ministry of Power, India 2001). The Energy Conservation Act and its subsequent amendments provide regulatory and financial authority relevant to energy conservation at both the national and state levels. The National Electricity Policy was enacted in 2005 with the primary aim of making electricity available to everyone (Ministry of Power, India 2005). Electricity demand is expected to increase from 777 terawatt-hours in 2012 to 2,499 terawatt-hours by 2030. In line with the NDCs and NAPCC, the government has set a clear goal of generating 175 gigawatts of renewable energy (100 gigawatts from solar, 60 gigawatts from wind, 10 gigawatts from biopower, and 5 gigawatts from small hydropower) by 2022 (National Institution for Transforming India 2015). With all of these initiatives, it is expected that 40 percent of India's total energy will be generated from renewable sources by 2030 (International Renewable Energy Agency 2014).

India has made considerable progress in its commitments by increasing the share of power generation capacity from renewable, hydroelectric, and nuclear sources. As of 2020, 38 percent of the target had already been met, 2 percent short of the NDC target set for 2030. As part of promoting renewable energy, the Ministry of New and Renewable Energy introduced the National Wind-Solar Hybrid Policy 2018, which sets guidelines for establishing large-scale hybrid wind-solar plants (Ministry of New and Renewable Energy, India 2018). Additionally, in 2018 the government introduced the National Energy Storage Mission to promote on-demand creation, indigenous manufacturing, research and development, and policy guidance (NITI Aayog, India 2018a). The government is also promoting investments in renewable energy such as solar and wind power. With the support of the State Bank of India and the World Bank, the government plans to install 40 gigawatts of rooftop solar panels by 2022 (Kumar et al. 2018). The Ministry of New and Renewable Energy has implemented the National Biogas and Manure Management Program with a view to promoting renewable energy use by individual households (Ministry of New and

Renewable Energy, India 2019). Since its inception, the program has installed around 5 million biogas plants.

Air pollution is a key challenge for India, killing 1.24 million persons in 2017 alone, according to a recently published study in *The Lancet Planetary Health* (Chatterjee 2019). To address the pollution problem, the government has introduced various programs and schemes, mainly the Continuous Emission Monitoring System, the Common Effluent Treatment Plants project, the Fly Ash Utilization Policy, and the National Air Quality Index. In 2019 the MoEFCC launched the National Clean Air Program (NCAP), which aims to reduce air pollution between 20 percent and 30 percent by 2024 (Ministry of Environment, Forests, and Climate Change, India 2019).

The Central Pollution Control Board, in collaboration with the state pollution control boards and the pollution control committees, initiated the National Air Quality Monitoring Program to combat air pollution, which established 680 monitoring centers in 300 major cities, covering 29 states and 6 union territories (NITI Aayog, India 2018b). In addition, Rs 44 billion was allocated in 2020–21 to formulate and implement plans for tackling air pollution, targeting cities with populations above 1 million.

The central government has urged all state governments to develop and implement plans for ensuring cleaner air in cities with populations above 1 million. In support of these initiatives, the Saubhagya (Prosperity) Yojana Scheme was launched in 2017 to provide electricity to poor households in both rural and urban areas.⁹ Under the supervision of the Rural Electrification Corporation, the Saubhagya Scheme had electrified 26.04 million households by March 31, 2019, thanks to an investment of Rs 16.32 billion. In 2019 the government announced a new target for generation capacity: 450 gigawatts of renewable energy by 2030, one of the most ambitious targets in the world.

4.1.2. Sustainable habitat

The Sustainable Habitat Mission emphasizes energy efficiency, with a focus on building energy efficiency in urban settings through the promotion of energy-efficient practices and public transport. The nodal agency is the Ministry of Housing and Urban Affairs. Under this scheme, the government has invested in the Atal Mission for Rejuvenation and Urban Transformation and the Smart City Initiative. Similarly, green buildings and construction are one of the largest investment priorities in India. Under the Housing for All Program, the government has announced public investments of Rs 20 million in urban homes and Rs 10 million in rural homes by 2022 (KPMG India 2014). The government has also set policy priorities to encourage sustainable construction and green buildings as part of its NAP and NDC. For instance, an energy conservation building code was introduced in 2017, setting minimum energy and energy-neutrality standards for new buildings (Ministry of Power, India 2017). Similarly, the Ministry of New and Renewable Energy has introduced a green rating system for habitat assessment (Ministry of New and Renewable Energy, India 2010).

⁹ See <https://www.recindia.nic.in/saubhagya>

4.1.3. Sustainable transport

In line with the NDCs and NAPCC, the government has set public investment priorities to ensure safe, smart, and sustainable green transportation networks. These priorities include investment in rail networks and electric vehicles, the introduction of fuel efficiency standards, the imposition of taxes on petroleum products through deregulations, and the encouragement of low-carbon transport methods and practices. Investment in rail and road transportation continues to be prioritized. In a recent study, the IFC forecasts, “Climate-smart investment in transport infrastructure, amounting to \$250 billion between 2018 and 2030, will be instrumental in helping India achieve its target of lowering the emissions intensity of its economy” (IFC 2017, 62).

The Climate Policy Initiative 2020 notes a 43 percent increase in average annual finance in FY 2017/18 compared to the previous year, attributed mainly to capital expenditure on mass rapid transit projects and the sale of electric three-wheelers (Aggarwal 2020). More recently, the government has pledged to comply with the EV 30@30 campaign, with a target of having at least 30 percent of new vehicles be electric by 2030 (Clean Energy Ministerial n.d.). In 2015 it launched the Green Highways (Plantation, Transplantation, Beautification, and Maintenance) Policy, with the aim of planting trees along highways (Ministry of Road Transport and Highways, India 2015). This initiative has developed greening and eco-friendly highway corridors throughout the country and helped to reduce air pollution.

4.1.4. Waste management

Solid waste management has been a key concern in India over the years. According to the Ministry of Housing and Urban Affairs, approximately 150,000 tonnes of solid waste are generated in the country on a daily basis, out of which approximately 90 percent (135,000 tonnes) is collected (Lok Sabha, Unstarred Question no. 4553). However, only 20 percent of the solid waste is recycled; the remaining 80 percent is dumped in landfills. Under the Solid Waste Management Policy introduced in 2016, the government plans to establish at least one waste treatment plant in areas with more than 1 million inhabitants. The government has enacted policies for other categories of waste as well, including rules for managing plastic, electronic, biomedical, hazardous, construction, and demolition waste. In 2019 a total of 1,531 waste-to-compost plants, 37 biogas and biomethanation plants, 26 waste-to-electricity plants, 6 construction and demolition waste plants, and 4 refuse-derived fuel plants were in operation (Statista 2021).

The new waste management policies introduced stricter regulations and compliance requirements both in industrial and in household settings. These policies encourage private sector investments in solid waste management through PPP agreements (ICRA Consulting Services 2011). The government has also initiated the nationwide Clean India Mission (Swachh Bharat Mission) to eliminate open defecation and enhance solid waste management (Ministry of Drinking Water and Sanitation, India 2017). The 2021 budget allocates Rs 123 billion to support this mission.

4.1.5. Water management

India is the biggest consumer of freshwater in the world. India's NDC and NAPCC, which focus on efficiency in water use, aim to generate a database and promote the implementation of web-enabled water resource information systems. The demand for clean water for drinking, agriculture, and industrial consumption has been rising steadily over the years. By 2030, India's water demand is expected to be twice as high as supply. The rise in urban settlements is placing priority on public investment in clean water and wastewater management (NITI Aayog, India 2019). According to NITI Aayog's Composite Water Management Index, 75 percent of households still do not have access to clean drinking water, 84 percent of households do not have access to piped water, 70 percent of water supplied to households is contaminated, and 21 cities are expected to run out of water (NITI Aayog, India 2019).

Nonetheless, significant achievements have been made through PPP investments. For instance, a PPP between the Mangalore City Council and the Mangalore Special Economic Zone extended a 350-kilometer wastewater pipeline to feed into three water treatment plants (Majumder and Dasgupta 2017). The Namami Ganga Program (Clean Ganga Mission), launched in 2015 with a budgetary allocation of Rs 200 billion, is one of the largest government investments in this area. The government claims that investments made under the Clean Ganga Mission have improved water quality in many respects.

4.1.6. Sustainable agriculture

The agriculture sector contributes around 16 percent of India's GDP and employs more than 50 percent of the total workforce. According to the Food and Agriculture Organization of the United Nations, "70 percent of its [India's] rural households still depend primarily on agriculture for their livelihood" (FAO n.d.). The National Policy for Farmers 2007, enacted by the Ministry of Agriculture, emphasizes "increased productivity, profitability, institutional support, and improvement of land, water, and support services apart from provisions of appropriate price policy, risk mitigation measures" (Ministry of Agriculture, India 2007). Yet labor hours lost due to higher heat and humidity are expected to reduce the country's GDP by between 2.5 percent and 4.5 percent (around US\$150 billion to US\$250 billion) by 2030 (McKinsey Global Institute 2010).

The government has invested a considerable amount of money to promote sustainable and smart agricultural infrastructure. Examples include the development of rain-fed areas, on-farm water management, soil health management, sustainable agriculture monitoring, modeling and networking, knowledge-sharing activities, and creation of market opportunities. The 2021 budget allocates Rs 2,830 billion to support the agriculture sector, including irrigation and rural development. Several national strategic action plans have also been developed to promote sustainable agriculture, including the National Mission on Sustainable Agriculture, the Pradhan Mantri Krishi Sinchayee Yojana, the National Initiative on Climate Resilient Agriculture, and the Paramparagat Krishi Vikas Yojana (Press Information Bureau, India 2020). A scoping study of PPP investments in the irrigation and drainage sector concludes, "Due to a long gestation period, prolonged life cycle, and limited scope of viability gap funding, there may not be enough opportunities for involving private investments in irrigation infrastructure development" (ADB 2013, p. iii).

In 2011 the Ministry of Agriculture and Food Processing launched the National Initiative on Climate Resilient Agriculture (NICRA) network to help the agriculture industry to adapt to climate change and mitigate climate vulnerabilities through strategic research and development initiatives.¹⁰ For example, the government has implemented policies and offered budgetary support to encourage farmers to use organic and traditional fertilizers.

4.1.7. Disaster management

Headed by the prime minister, the National Disaster Management Authority is charged with disaster management. The Disaster Management Act 2005 sets the institutional and legal provisions for disaster management.¹¹ In 2009 the National Disaster Management Authority issued the National Policy on Disaster Management, enabling effective and efficient disaster prevention, mitigation, preparedness, and response practices at both the national and state levels (Ministry of Home Affairs, India 2009). Additionally, the policy provides guidelines for financial arrangements, capacity development, knowledge management, and research and development. In responding to the need for disaster management, the government allocated Rs 15 billion in FY 2020/21 through the national budget. These allocations target specific areas, such as the National Disaster Response Force and the National Cyclone Risk Mitigation Project, as well as activities such as development of disaster management infrastructure. Administered by the Ministry of Home Affairs, the National Disaster Management Fund was initiated to provide funding for severe natural disasters when state disaster funds are inadequate. For FY 2020/21 the government allocated Rs 29.3 billion to the National Disaster Management Fund, an increase of 5 percent from the previous budget (Rs 27.9 billion).

A recent report by the Climate Policy Initiative (2020) reveals that average green finance investments over the last few years stood at around US\$19 billion, which is far lower than the required investment of US\$170 billion per year. The public sector contributes only 29 percent of green investments. The limited budgetary support poses a significant challenge in fulfilling India's ambitious targets. Irrespective of this, green finance-related investments outpaced average GDP growth of 7.2 percent in 2016–18 (Aggarwal 2020). Green-related investments have substantial potential to drive economic growth in India. However, given the cross-cutting nature of multisectoral missions, tracking the progress achieved is challenging, as is monitoring the execution of climate change policies and strategies. Legislative frameworks appear to have limited influence on ground-level action, and budgetary support remains inadequate for achieving the set climate goals.

4.2. Climate change and investment priorities in Nepal

Although Nepal contributes a mere 0.027 percent to global greenhouse gas emissions, it is one of the world's most vulnerable countries to climate change (National Planning Commission, Nepal 2020). Annual temperatures rose 0.06°C between 1975 to 2005 (Kathmandu Post 2017), and Nepal

¹⁰ For more information, see <http://www.nicra-icar.in/nicrarevised/index.php/home1>.

¹¹ See <https://ndma.gov.in/>.

is at great risk of glacier melt and flooding (Upreti 2020), with several glacial lakes at high risk of bursting. Nepal is especially prone to earthquakes and recently experienced several high-magnitude earthquakes. The most recent one was a 7.8 magnitude earthquake on April 25, 2015, followed by a second tremor on May 12. These earthquakes killed nearly 9,000 people, injured 22,300 others, and destroyed or damaged more than 800,000 houses (BBC 2016). More than 1 million people in Nepal are affected every year by climate-related disasters such as floods, landslides, and droughts (Ministry of Environment, Nepal 2010). The economic impact of climate change is estimated to be around 1.5 percent to 2 percent of GDP (CDKN 2013; 2019/20 economic survey).

Given the country's extreme vulnerability, climate change is a key priority for the government of Nepal. Numerous policies and programs have been developed, strategies formulated, and actions undertaken in the last decade to address the adverse consequences of climate change.¹² Even before signing the 2015 Paris Agreement, Nepal had launched initiatives at both the central and local levels to address the social, environmental, and economic impacts of climate change—that is, to limit the rise in temperature, reduce carbon dioxide emissions, and protect the lives and livelihoods of climate-vulnerable communities. For instance, the government developed the Climate Change Policy in 2011, prepared a National Adaptation Program of Actions (NAPA) in 2010, and implemented Reducing Emission from Deforestation and Forest Degradation (REDD) in 2008. NAPA sought to “assess and prioritize climate change vulnerabilities and identify adaptation measures” (Ministry of Environment, Nepal 2010, 7), identifying five areas where the impact of climate change is very high: (a) agriculture and food security, (b) water resources and energy, (c) forests and biodiversity, (d) public health, urban settlement, and infrastructure, and (e) climate-related disasters. NAPA categorizes all 75 districts of the country into five groups according to a vulnerability index—that is, very high, high, moderate, low, and very low. This index is designed to reflect the extent to which the districts are exposed to natural hazards, such as flooding, landslides, glacial lake outbursts, and droughts. The objectives of the NAPA are useful for integrating climate change adaptation into existing policies, plans, and activities (Regmi, Star, and Leal 2016). However, their implementation has been weak in the absence of an effective mechanism for coordinating between government departments.

Nepal is a signatory to the Paris Agreement, the Kyoto Protocol, and the Sendai Framework. The country's Climate Change Policy 2019 (Ministry of Forests and Environment, Nepal 2019) aims to build resilient ecosystems, improve the capacity of disadvantaged people, reduce carbon emissions, promote a green economy, and use resources effectively for mitigation and adaptation (National Planning Commission, Nepal 2020). Other policies, acts, and regulations relating to climate change are in effect, including the National Environmental Policy 2019, the Environment Protection Act 2019, the Environment Protection Rules 2020, the National CCFF 2017, the National Policy for Disaster Risk Reduction 2018, the National Forestry Policy 2018, and the National REDD+ Strategy 2018 (Ministry of Forests and Environment, Nepal 2018, 2019; National Planning Commission, Nepal 2020). Nepal submitted its first NDC in 2016¹³ and its second one in December 2020. The country is in the process of developing its NAP to improve resilience and integrate climate change policies, strategies, and activities in all government sectors, with a particular focus on seven themes: (a) agriculture and food security, (b) water resources and

¹² See <https://www.mofe.gov.np/>.

¹³ See <https://www4.unfccc.int/sites/NDCStaging/Pages/All.aspx>

energy, (c) public health and water, sanitation, and hygiene, (d) urban settlement and infrastructure, (e) forests and biodiversity, (f) climate-induced disasters, and (g) tourism and natural and cultural heritage (Ministry of Forests and Environment, Nepal 2018).

While the country's Energy Policy seeks to maximize hydropower potential and increase the availability and use of renewable energy, the Environment-Friendly Vehicle and Transport Policy sets targets for promoting the use of electric vehicles and increasing their share by 20 percent. As indicated in the NDC (Ministry of Population and Environment, Nepal 2016), the government seeks to maintain at least 40 percent of the country's total area under forest cover, to achieve 80 percent electrification through renewable energy sources by 2050, and to build climate-resilient communities through private sector participation. International organizations and development partners appreciate these climate-related rules, regulations, and policies. However, their implementation is challenging, especially at the local level where the impact of climate change is especially acute.

The Local Adaptation Plan for Action (LAPA) was enacted in 2011 to integrate climate change into local development plans (Ministry of Environment, Nepal 2011). Many local governments have implemented LAPA with the financial and technical support of the United Kingdom government, the European Union, and the UNDP; 90 village development committees and 7 municipalities have also implemented LAPA as part of supporting vulnerable communities to deal with the impacts of climate change (Ministry of Population and Environment, Nepal 2016). The framework was revised in 2019.

The Climate Change Financing Framework is another important measure that is used to integrate climate change and climate finance into national planning and budgeting. According to the Ministry of Finance, the framework aims to facilitate the integration of climate change-related national policies and strategies into the budgeting process. In particular, it is used to allocate "public funds based on priorities in a more coordinated and systematic manner" (Ministry of Finance, Nepal 2017, 6). As the National Climate Change Policy indicates, "At least 80 percent of the amount will be ensured for implementation of programs at the local level" (Ministry of Forests and Environment, Nepal 2019, 20) The CCFF is a useful tool for ensuring that the allocated funding will reach the country's most vulnerable communities.

In addition, the government has undertaken several steps to integrate the CCFF into its traditional budgeting system. Following the country's climate public expenditure and institutional review held in 2012–13, the government introduced a climate change expenditure tracking system (or budget code) to provide a baseline for future scenarios (Ministry of Finance, Nepal 2017; National Planning Commission, Nepal 2012). The following areas are central to climate change-related activities: sustainable management of natural resources; climate-resilient infrastructure; prevention and control of climate-related health hazards; management of landfill sites and sewage treatment; sustainable use of water resources for energy, fisheries, irrigation, and safe drinking water; food safety and security; and preparedness for climate-related disasters. The integration of a coding system into the budgeting and planning process was announced with a view to prioritizing investments that support and reduce the adverse impacts of climate change (National Planning Commission, Nepal 2012). In 2016, 20 percent of the national budget was allocated to addressing climate change issues, including adaptation and mitigation activities (Ministry of Finance, Nepal

2017). In order to enhance the effectiveness and efficiency of public financial management in allocating resources to climate change, the budget management information technology system was also upgraded. The upgraded system enables the government to track and generate reports on climate budget allocation and expenditures, applying sectoral disaggregated data. Enforcement of the framework is expected to enhance the effectiveness of PFM. However, as with other climate-related regulations, the framework suffers from a lack of coordination across the sectors and limited ability to track the climate investments funded by community-based organizations, NGOs, and international NGOs.

Nepal has adopted several measures related to climate adaptation and mitigation. The percentage of climate expenditure in the budget has increased over the years. As evident in budget speeches of the last seven years (since FY 2013/14), the government’s spending on climate change has risen more than sevenfold (table 2). This increase includes costs for climate-resilient reconstruction related to the 2015 earthquakes.

Table 2: Government spending on climate change in Nepal, FY 2013/14 to FY 2017/18

Nepalese rupees, billions

Budget details	2013/14	2014/15	2015/16	2016/17	2017/18
Total national budget	517.24	618.1	819.46	1,048.92	1,278.99
Total climate budget	53.47	66.34	159.34	201.61	393.35
Climate budget as % of total budget	10.34	10.73	19.45	19.22	30.76

Source: 2013–18 budget speeches (<https://www.mof.gov.np/>).

Nepal’s 2011 and 2019 Climate Change Policy highlights the importance of establishing a climate change fund and of implementing at least 80 percent of the total budget at the community or local level. However, inadequate resources are available to support climate change–related projects and pursue mitigation and adaptation strategies. To address this gap in funding, the government is encouraging investments from the private sector and has sought foreign direct investment. International organizations and development partners such as the UNDP, the European Union, and the World Bank have been supporting climate change–related programs and projects, including the pilot Climate Resilience Improvement Project, funded by the World Bank, the Nepal Climate Change Support Program funded by the UK Department for International Development, and the Green Climate Fund.

The private sector dominates Nepal’s economy, the education and health sectors, in particular. The importance of private sector investment is also echoed in the annual budget speeches. For instance, while delivering a speech on the government’s policies and program for FY 2020/21 (*Niti tatha Karyakram 2077–78*), President Bidya Devi Bhandari emphasized the importance of promoting private sector investment in climate change (Office of the President of Nepal 2020). The PPP strategy has therefore brought to the fore the need to invest more in climate change and in sectors such as infrastructure development. In 2015 Nepal formulated its PPP Policy 2072, which seeks to attract and use “the private sector’s investment for public benefits as only national treasury and government’s sole investment are not enough to achieve extensive growth and provide adequate and quality services” (Ministry of Finance, Nepal 2015, 6). By involving the private sector and using the PPP model, the government aims to address five priorities (under its mitigation actions) indicated in the NDC report: climate-friendly agriculture, renewable energy, sustainable transport

system, waste management, and infrastructure development (Ministry of Population and Environment, Nepal 2016). Key priorities set out in the report are discussed below.

4.2.1. Clean energy

The Alternative Energy Promotion Centre, a government body established in 1996, is authorized to promote the use of renewable energy (solar, micro hydro, and biomass energy) technologies in the country.¹⁴ The center aims to reduce Nepal’s dependence on traditional sources of energy and improve the livelihood of rural populations. The government has enacted a range of policies and frameworks to support the use of renewable energy—for example, the Rural Energy Policy 2006, the Renewable Energy Subsidy Policy 2016, and the National Renewable Energy Framework 2017. These policies and frameworks aim to provide clean and affordable renewable energy to the entire population of Nepal by 2030. While the country’s population is largely dependent on traditional sources of energy and renewable energy constitutes just 1 percent of total energy use, the government has set a target of reducing dependency on fossil fuels by 50 percent and achieving 80 percent electrification through renewable energy by 2050. These targets are explicit in the NDC document. The use of renewable energy is also highlighted in the 2019 budget speech: “Renewable energy will be used in the transport sector, and use of electric vehicles will be encouraged to reduce air pollution in urban areas. Electric buses will be brought into operation in Kathmandu Valley and in major cities of all seven provinces and nearby areas through partnerships among the federal, provincial, and local level as well as the private sector” (2019 budget speech, 23).

The country has the potential to generate thousands of megawatts of electricity through hydropower—enough not only to meet the needs of its population, but also to export renewable energy to neighboring countries, mainly Bangladesh and India, where demand for energy is growing quickly. However, so far, limited resources have impeded the realization of this energy potential. The government has come up with the slogan “*Nepalko Pani Janatako Lagani*” (Nepal’s Water, Nepal’s Investment) to encourage citizens, civil servants, nonresidents, and the private sector to invest in renewable energy.

4.2.2. Forests

Nepal’s government has emphasized the use, conservation, and development of the forest sector. Nepal enacted its first Community Forestry Rules in 1978 to engage the local community in forest management. Several acts, rules, and laws for the conservation and protection of forests have been introduced. In particular, the Forest Act 1993 established and institutionalized the concept of community forestry. Forests cover 6.4 million hectares, equivalent to 44.7 percent of the country’s total land area. The government seeks to maintain at least 45 percent of the land as forests (National Planning Commission, Nepal 2020). In its NDC, Nepal committed to reducing emissions by at least 5 percent by 2025 through the enhancement of forest carbon stock. In her speech to parliament in May 2020, the president of Nepal emphasized the importance of “*Samridhi ko lagi Ban*” (“Forest for Prosperity”) and highlighted a plan to involve the private sector in developing and promoting the forest industry.

¹⁴ For information on the Alternative Energy Promotion Centre, see www.aepc.gov.np.

4.2.3. Environmentally sustainable transport system

In the last two decades, the number of private vehicles has risen dramatically in the Kathmandu Valley. The amount of road area and other infrastructure development have not kept pace (Pokharel and Acharya 2015). Anecdotal evidence suggests that, in the past decade alone, the number of vehicles increased threefold in Kathmandu. Public transport in the valley includes micro, mini, and large buses and tempos, all of which are small-capacity vehicles, exacerbating traffic congestion and contributing to air pollution. According to the World Health Organization, “The annual average air pollution concentration is five times above the World Health Organization air quality guidelines,” posing a serious risk to public health (WHO 2019). An estimated 35,000 people die annually in Nepal due to illness caused by air pollution, mainly from vehicle emissions (Awale 2019).

Nepal enacted the Environment-Friendly Vehicle and Transport Policy in 2014. The policy sets out several targets: reduce vehicle emissions and increase the share of environment-friendly (that is, electric) vehicles to 20 percent of the country’s total transportation fleet by 2020; promote conversion of other fossil fuel–run vehicles to electric ones; and subsidize the purchase and use of electric vehicles. However, issues relating to infrastructure development, route permits, charging stations, and battery recycling, among others, have compromised implementation of the policy. In the 2019 budget speech, the finance minister emphasized the development of railway infrastructure, the promotion of electric vehicles, and the role of PPP: “Renewable energy will be used in the transport sector; and use of electric vehicles will be encouraged to reduce air pollution in urban areas. Electric buses will be brought into operation in Kathmandu Valley and in major cities of all seven provinces through partnerships among the federal, provincial, and local level as well as the private sector” (2019 budget speech, 23).

The following year, the finance minister outlined the government’s plans to address the problems related to traditional transport and the implementation of an environment-friendly public transport system. In addition, the government plans to develop an electric rail network by 2040, which is intended to support mass transportation.

4.2.4. Agriculture

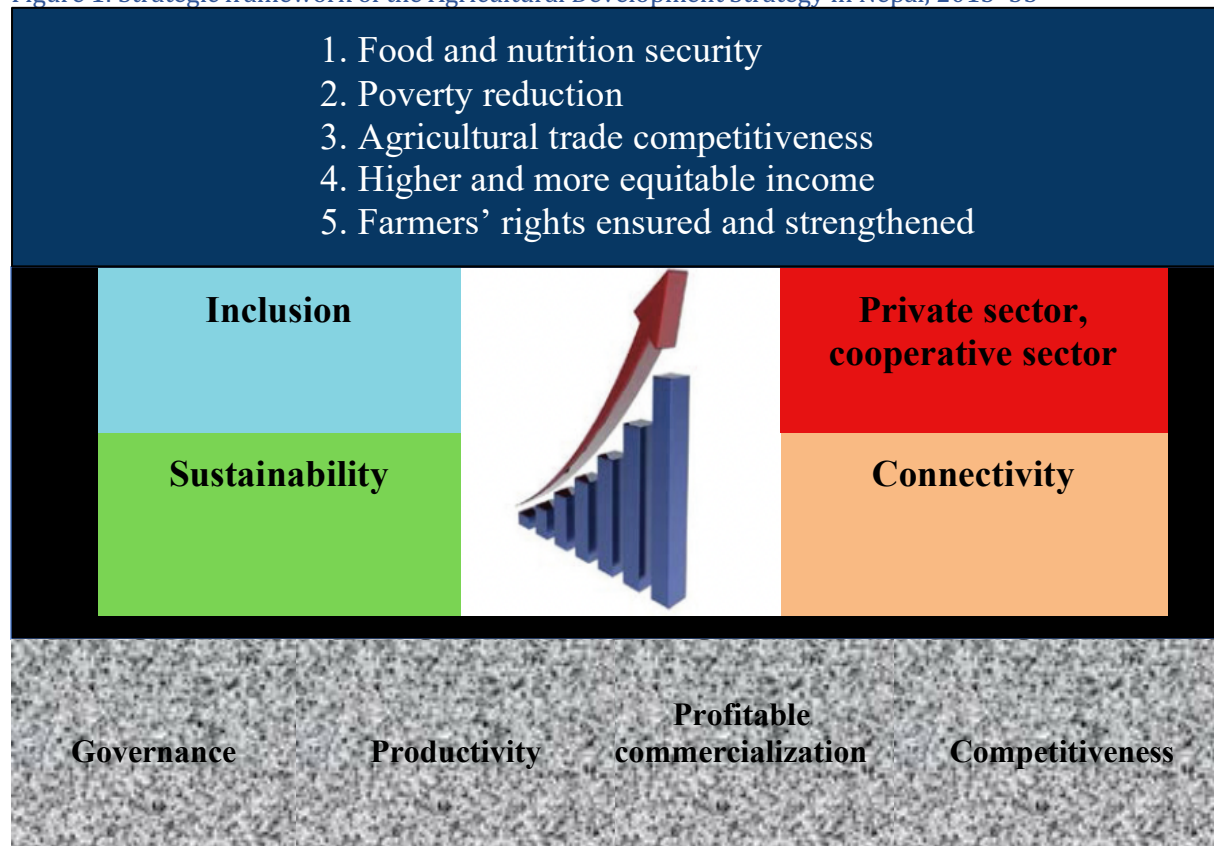
The agriculture sector is the backbone of the country. The sector employs 65 percent of the total population and contributed 26.98 percent of GDP in FY 2018/19 and 27.59 percent in FY 2017/18.¹⁵ However, productivity and competitiveness are relatively low, and employment is seasonal.

Agriculture is especially vulnerable to the impacts of climate change. The country is experiencing altered weather conditions and extreme events, such as droughts, floods, and landslides, on a more frequent basis. For example, 144,000 hectares of cultivated land were damaged due to natural disasters in FY 2017/18, and almost 39,000 hectares of paddy, wheat, vegetables, and ponds for fishery were damaged due to floods and dry weather in FY 2018/19.

¹⁵ See <https://www.moald.gov.np/>; <https://mof.gov.np/en/archive-documents/economic-survey-21.html?lang=>.

To address this issue, as well as to enhance land and agricultural productivity and improve the livelihood of farmers, the government introduced the National Agroforestry Policy 2019. The policy sought to increase the production of agricultural, livestock, and forest products, create livelihood opportunities, and develop a climate-resilient ecosystem. The government also developed an Agriculture Development Strategy (2015–35), which includes five dimensions (food and nutrition security, poverty reduction, agricultural trade competitiveness, higher and more equitable income, stronger farmers’ rights) and a road map for the sector (Ministry of Agriculture and Development, Nepal 2016). The strategic framework is presented in figure 1.

Figure 1: Strategic framework of the Agricultural Development Strategy in Nepal, 2015–35



Source: Ministry of Agriculture and Development, Nepal 2016, 5.

These policies and strategies are intended to achieve a sustainable and competitive agriculture sector. The Ministry of Finance allocated NPR 34.8 billion for development of the agriculture and livestock sector in the FY 2018/19 budget (2019 budget speech). The following year, the budget for agriculture and irrigation was increased to NPR 41.4 billion. However, despite the government’s efforts and investment to support the sector, the budget allocated to the agriculture sector remains inadequate (that is, 2.8 percent). To achieve the objectives of the Agroforestry Policy 2019, promote climate-friendly agriculture practices, and increase the productivity of the land and agricultural products, the government is encouraging private sector involvement through the commercialization of agricultural products.

4.2.5. Waste management

Solid waste management has become an important environmental issue in Nepal (ADB 2013). The government presented its plan for managing waste in its NDC and has issued several policies related to waste management—the Solid Waste Management Act 2011¹⁶ and the National Policy on Solid Waste Management 1996 being the key ones. While these acts and policies encourage the public to reduce, reuse, and recycle solid waste, the effective management of waste remains challenging. In particular, the issue of waste management in the Kathmandu Valley has become increasingly problematic. Piles of garbage are left on the streets of Kathmandu, uncollected and stinking, which can have a serious impact on public health and the environment (Kathmandu Post 2018).

According to the findings of a survey conducted by the ADB on solid waste management for all 58 municipalities in Nepal in 2012, the daily average amount of household waste generated was 170 grams per capita per day, while the amount of business waste generated was 4 kilograms per school, 1.4 kilograms per office and shop, and 5.7 kilograms per hotel or restaurant (ADB 2013). Household waste in Nepal consists of 66 percent organic waste, 12 percent plastic, 9 percent paper products, 5 percent other, and 3 percent glass. Studies suggest that 75 percent of the waste produced in the Kathmandu Valley is biodegradable and could be composted (Kathmandu Post 2018). Opportunity clearly exists for private sector investment in waste management in Nepal (IFC 2017).

4.3. Climate change and investment priorities in Sri Lanka

The Sustainable Sri Lanka—2030 Vision and Strategic Path, proposed by the Presidential Expert Committee in 2019, sets “balanced, inclusive, and green growth” strategies, incorporating both short- and long-term climate change issues (Presidential Expert Committee, Sri Lanka 2019). Prior to introducing the Sustainable 2030 Strategic Vision, the government initiated the NAP for Climate Change Impacts in Sri Lanka 2016–2025 through the Climate Change Secretariat (Ministry of Mahaweli Development and Environment, Sri Lanka 2016a). In line with UNFCCC guidance, the NAP focuses on nine sectors: food security; agriculture, livestock, and fisheries; water resources and the coastal and marine sector; health; human settlements and infrastructure; ecosystems and biodiversity; tourism and recreation; agricultural exports and industry; and energy and transportation. The government appointed a Parliamentary Select Committee to establish a Sustainable Development Council aimed at sustainable growth, and the Sustainable Development Act no. 19 of 2017 provides a legal framework and a national policy for implementing the SDGs (Government of Sri Lanka 2017). The legal framework is based on local context and practices, with a view to creating greater stability and longevity over time (Abeysinghe, Dambacher, and Byrnes 2017).

Sri Lanka’s NDC sets well-defined targets and action plans for climate change mitigation, adaptation, loss and damage, and implementation (Ministry of Mahaweli Development and

¹⁶ See Nepal Law Commission, <http://www.lawcommission.gov.np/>.

Environment, Sri Lanka 2016b). In line with the NDC and the NAP, the government has set public investment policy priorities at both the national and local levels. However, limited guidance on financial allocations and fund-raising procedures severely hinders implementation (Centre for Environment and Development 2017). The primary source of funding is heavily reliant on external agencies and internal government sources; however, government funding is constrained by fiscal and monetary challenges. Public funding cannot provide the resources required for adaptation, and, thus, seeking alternative sources of funding is inevitable.

The National Adaptation Fund was established as part of a resource mobilization mechanism and integrated with the government's annual budget allocation for a specified period. Sri Lanka is a member of the UNDP-managed Biodiversity Finance Initiative (BIOFIN) (IUCN 2018). With support of the IFC and BIOFIN, the Central Bank of Sri Lanka has proposed a road map for sustainable finance (Central Bank of Sri Lanka 2019). The road map aims to promote and facilitate sustainable finance practices in addressing sustainability issues. It consists of six key pillars: financing Vision 2030; environmental, social, and governance integration into the financial market; financial inclusion; capacity building; international cooperation; and measurement and reporting. Similarly, the Sri Lanka Banks' Association introduced the Sri Lanka Sustainable Banking Initiative as a means of promoting sustainable investment priorities (Sri Lanka Banks' Association 2015). Recently, the Colombo Stock Exchange became a member of the United Nations Sustainable Stock Exchanges Initiative. In 2016 having become a member of the IFC-supported Sustainable Banking Network, the Central Bank of Sri Lanka introduced its road map, with the aim of promoting sustainable finance practices and investment priorities in the country (Central Bank of Sri Lanka 2017). Sri Lanka's public climate investment policy prioritizes six areas: waste management; renewable energy; organic farming and sustainable agriculture; urban water management; sustainable transport; and disaster management. PPP is popular for climate investment projects, involving both local and international partners. The following sections discuss the key priorities identified in government documents.

4.3.1. Renewable energy

Sri Lanka has almost reached the 100 percent target for electrification in most areas, including power generation, transmission, and meeting increased demand (World Bank 2019). In line with the NDCs and NAP, during the last 10 years, the government has invested a considerable amount of money in renewable energy and liquefied natural gas. With the aim of sourcing 70 percent of energy from renewable sources by 2030 and 100 percent by 2050 (ADB 2017), the government is seeking local investments to add 1,000 megawatts of solar energy by 2023 (Ministry of Power and Energy, Sri Lanka 2015). Implemented through the Sustainable Energy Authority, the government has set clear priorities for reducing the amount of energy generated through imported fossil fuels. The Sri Lanka Energy Sector Development Plan for a Knowledge-based Economy 2015–2025 provides guidance on how to become energy self-sufficient using renewable and domestic energy sources by 2030 (Ministry of Power and Energy, Sri Lanka 2015).

In 2021 the government proposed building two new natural gas power plants with generation capacity of 600 megawatts and converting one large-scale power plant (Kerawalapitiya) from coal to natural gas. In doing so, the government expects to reduce energy costs by SL Rs 15 billion. The 2021 budget also proposes adding 500 megawatts of solar energy by investing in solar panels

that would generate 5 kilowatts of power to 100,000 houses, offering each participating household lower interest rates. To support drip irrigation, the government has made public its plan to invest in solar panels in more than 10,000 small and medium commercial agro-enterprises. Each entrepreneur will be offered SL Rs 150,000. Furthermore, to achieve electricity for all by 2021, the government aims to invest SL Rs 750 million in rural solar energy projects. As proposed in the 2021 budget, the government has declared a seven-year tax holiday for all renewable energy investment projects. Supported by the Board of Investment facilities and tax concessions, the government is also promoting investment in offshore wind and floating solar plants exceeding 100-megawatt capacity. As proposed in the NDC and NAP, the country has already installed 400 megawatts of mini hydro, 128 megawatts of wind, 51 megawatts of land-mounted solar, 17 megawatts of biomass, and 120 megawatts of rooftop solar power (World Bank 2019).

Despite these figures, investment in the energy sector is inadequate, given the rise in energy demand in the country. For instance, the World Bank has suggested that Sri Lanka needs to reconsider its publicly financed projects and explore the potential of private sector involvement to cope with rising energy demand (World Bank 2019). Sri Lanka will need a total investment of US\$7 billion by 2026: US\$5.0 billion in generation, US\$1 billion in transmission, US\$229 million in distribution, and US\$512 million in planned demand-side management programs. Sri Lanka will need to invest between US\$35 billion and US\$38 billion in order to achieve the 100 percent renewable energy target by 2050 (ADB 2017).

4.3.2. Waste management

Among other climate change challenges, waste management has become a key climate investment priority in Sri Lanka. In support of the NDC, the National Solid Waste Management Strategy gives priority to minimizing waste, recovering resources, and sanitizing landfills. The government's Waste Management Policy consists of key strategies, including reducing, reusing, and recycling. In line with these strategies, the government has invested in sending 19.9 megawatts of waste to an energy power plant that can process 242,000 tons of unsorted municipal solid waste per year.¹⁷ In the 2020 budget proposal, the government announced its intention to ban all single-use plastic beginning on January 1, 2021. In turn, this effort will create potential investment opportunities for both public and private sector enterprises to produce alternatives to single-use plastics.

Moreover, in 2021, the government allocated SL Rs 3,000 million to local government authorities to manage waste and proposed an integrated urban investment plan incorporating waste management: "This national program is an integrated investment effort to enhance the investments relating to private sector industries, including in service delivery, forest density, and waste management" (2021 budget speech, 34).

In 2019 the government invested SL Rs 7,600 million to establish a solid waste management plant for the city of Colombo.

¹⁷ See <https://wteinternational.com/investments/ready-to-finance-projects/242000-ton-per-year-msw-to-electricity-plant-in-sri-lanka/>.

4.3.3. Organic farming and sustainable agriculture

By submitting its NDC, Sri Lanka pledged to support sustainable agricultural practices, including food security, organic farming, the use of environmentally friendly technologies (green energy) and compost fertilizer, and the recycling of waste and water. Extending the government commitment to climate change priorities, the 2021 budget¹⁸ included several proposals relating to sustainable agriculture, including the development of organic crop cultivation zones using organic and high-quality mixed fertilizer (2021 budget speech, 20).

The government has invested a considerable amount of money with a view to encouraging sustainable agricultural practices. The budget proposal for 2021 allocated SL Rs 1,500 million “to provide capital grants of Rs 150,000 to Rs 10,000 small- and medium-scale commercial agro entrepreneurs, with agricultural wells to install solar power–operated water pumps in order to increase production capacities by harnessing new technology including drip irrigation.”

Moreover, to empower local farmers, the government has imposed import restrictions on agricultural products that can be produced locally. ADB has provided US\$453 million to enhance the productivity of rural irrigation systems and upgrade the livelihoods of farming communities. Extending this initiative, SL Rs 1,000 million were allocated to rehabilitate small and medium tanks and reservoirs in rural areas in 11 districts. In 2019 the government also allocated SL Rs 450 million to build a modern climate-controlled agricultural warehouse facility. Upon completion, the facility is expected to minimize postharvest losses. Additionally, SL Rs 250 million were allocated to modernization projects, including agriculture technology and demonstration parks. Further in 2018, SL Rs 3,000 million were invested in a weather index insurance scheme to protect vulnerable farmers from the effects of climate change and cover damage to their crops.

4.3.4. Water management

The water sector in Sri Lanka is managed largely by the government. In line with the NDC, under the national Water for All Program, the government is committed to providing people with access to safe, clean drinking water and sanitation. The proposed 2021 budget allocates SL Rs 1 trillion to invest in more than 1,000 community water projects and 176 other major water projects during 2021–24. In doing so, the government aims to increase the daily water supply to 4.4 million cubic meters, providing an additional 3.5 million families with pipe-borne drinking water. At present, only 54 percent of the population consumes pipe-borne drinking water. In 2017 the Board of Investment recognized water supply and sanitation as a key investment priority. Recent budgets have proposed significant investment opportunities in wastewater management and sanitary facilities. The 2021 budget allocates SL Rs 200 million to prevent the illegal disposal of sewage and to regulate illegal sand-mining activities.

¹⁸ See <https://www.treasury.gov.lk/budget>.

4.3.5. Sustainable transport

Transforming Sri Lanka's transport sector into a sustainable transport system remains a major challenge. Transport accounts for more than 50 percent of the country's total emissions (UNDP 2017). While the number of electric vehicles is increasing every year, public sector transport continues to depend on imported petroleum. The government provides incentives for the purchase of hybrid gas and electric vehicles, although limited public financing has undermined the enforcement of sustainable transport solutions. The Sri Lanka Energy Sector Development Plan for a Knowledge-based Economy 2015–2025 aims to reduce the use of imported petroleum in the transport sector by 5 percent by 2020 and to introduce alternative modes of transport (Ministry of Power and Energy, Sri Lanka 2015).

Several mega investment projects are in the pipeline to electrify both the rail and road transport systems. For instance, the government initiated a light rail transit system with financial support from Japan International Cooperation Agency.¹⁹ Following the approval of PPP investments in the government's emissions testing, further steps have been taken to upgrade emissions standards in order to comply with Euro III for diesel vehicles and Euro IV for gas vehicles. By 2014, 56 percent of cars sold in the country were hybrid or electric vehicles. Extending the PPP initiatives, in the next 10 years, the government is planning to introduce 100 electric buses on the Galle Road in Colombo Metropolitan Area (UNDP 2017). A UNDP study on sustainable transport proposes alternative public investment opportunities in the transport sector. The total cost of building an electric bus rapid transit system is expected to be around US\$104 million, of which US\$30 million will be funded by international climate change agencies, US\$73 million by the private sector, and the rest by government. The government also has invested in nationwide highways and expressways to minimize traveling costs, greenhouse gas emissions, and traffic. In the 2021 budget, SL Rs 20,000 million and SL Rs 7,000 million were allocated, respectively, to add an additional 50,000 kilometers to the road network and construct 10,000 bridges in rural areas.

4.3.6. Sustainable construction

The public sector in Sri Lanka has launched several initiatives to promote investment in sustainable construction and green buildings. Recent budgetary provisions have proposed proactive investment opportunities to source sustainable materials, such as recycling materials, and reduce climate change impact. For instance, the 2021 budget proposes mechanisms for promoting environmentally friendly sources and allows a 10-year tax holiday for investments in recycling sites.

In line with the government's forecast of a 30 percent rise in urbanization by 2050, public investments in sustainable construction have been prioritized. In support of growing urban settlements, the government allocated SL Rs 1,000 million in 2019 to build eco-friendly public parks.

¹⁹ See <https://www.clr.lk/>.

4.3.7. Disaster management

The government enacted the Disaster Management Act 2015 with the aim of establishing a national council for disaster management and a disaster management center, appointing a technical advisory committee, preparing a disaster management plan, declaring national disasters, facilitating compensation for disaster victims, and facilitating other regulatory, financial, and institutional arrangements.²⁰ After the 2004 tsunami, the government took several steps to strengthen its disaster management policies and practices, with significant public investment.

In 2019 the government invested SL Rs 10,900 million to prevent flooding in the Colombo Water Basin, Beira Lake Linear Park, Beddagana Park, and the Weras Ganga. Moreover, the government allocated SL Rs 2,000 million to rehabilitate existing houses and other infrastructure facilities as well as to introduce disaster-resilient houses. Additionally, SL Rs 20 billion were allocated to the Disaster Management Contingency Fund to support victims (both individual and corporate) affected by droughts and floods and to invest in appropriate mitigation projects. The Natural Disaster Insurance Scheme, established in 2016, gave the government a proactive means of responding to natural disasters. By 2019, the annual premium of the insurance scheme rose to SL Rs 1.5 billion.

Currently, the Sri Lankan government does not have an appropriate system in place to identify climate financing, due to the lack of clarity about what constitutes climate financing (Centre for Environment and Development 2017). This lack of clarity has been a major issue in evaluating financing for climate investment projects in the country; historical evidence of climate financing is therefore scarce. Accordingly, there is a need to develop a national climate finance and investment framework, including public, private, and international investments and stakeholders. While the Sri Lankan government has set strong climate change strategies and targets that clearly outline its adaptation and mitigation goals and policies, implementation appears to be relatively weak (Centre for Environment and Development 2017). The proposed framework should outline how national spending on climate change is linked to local priorities and should offer mechanisms to empower local authorities (financially) in setting and executing local priorities.

5. Findings from the field study

5.1. Case findings: India

5.1.1. Climate change policies in Kerala

The Ministry of Environment, Forests, and Climate Change supervises climate change-related action in India, setting priorities for both the national and state levels following the NDC. In line with the NAPCC, all states are required to implement an SAPCC. In turn, the SAPCCs are disseminated to local authorities for integration with community and livelihood strategies through

²⁰ See http://www.dmc.gov.lk/index.php?option=com_content&view=article&id=28&Itemid=188&lang=en.

a Local Action Plan on Climate Change (LAPCC). At the subnational level, the SAPCC provides a framework for climate change adaptation and mitigation interventions. Localized planning is aimed at addressing vulnerabilities at the state level. Furthermore, several sectors vulnerable to climate change, including mines, agriculture, and land use, are enlisted, and their inclusion in state government policies is emphasized.

In August 2014 Kerala prepared its SAPCC outlining 128 actions, grouped under 10 sectors.²¹ The Kerala SAPCC was drafted by the Directorate of Environment and Climate Change (DoECC), with relevant departments, agencies, and institutes providing inputs. Institutions such as the Centre for Earth Science Studies, Centre for Water Resource Development and Management, Kerala Forest Research Institute, National Transportation Planning and Research Centre, and Institute of Climate Change Studies work under the broader leadership of the Kerala State Council for Science, Technology, and Environment.²²

The Kerala SAPCC identifies specific vulnerabilities of the state and planned responses, primarily through expert consultations (Kerala Department of Environment and Climate Change 2014). The key initiatives with heavy local government involvement are (1) waste minimization and treatment of municipal waste, with Kerala Suchita Mission providing technical backup to local self-government institutions; (2) a sensitizing program on climate change challenges for panchayat members, delivered by Kerala Institute of Local Administration (KILA) with the support of UNDP; and (3) programs to restore wetlands and a river action plan to identify vulnerabilities and design interventions for the conservation of water resources. The SAPCC was intended to be integrated into the state-level planning process (Directorate of Environment and Climate Change, Kerala 2014). Table 3 presents the proposed budget under the Kerala SAPCC (2014–20).

Table 3: Proposed budget under the State Action Plan on Climate Change (SAPCC) in Kerala, India, FY 2014/15 to FY2019/20

Indian rupees (crores, with 1 crore = 10 million)

Sector	Numbers of key priority activities	Annual plan (FY 2014/15)	Next five years (FY 2014/15 to FY 2019/20)
Agriculture	25	24.30	126.5
Animal husbandry	7	7.85	33.50
Fisheries and coastal ecosystem	16	78.79	417.2
Forest and biodiversity	22	22.48	114.75
Water resource	17	22.15	106.20
Health	10	21.15	86
Energy	9	12.60	65.5
Urban front and transport	15	125.21	197.75
Tourism	6	5	23
Total	127	319.53	1,170.4

Source: Directorate of Environment and Climate Change, Kerala 2014, 143.

²¹ Kerala has the highest literacy rate in India and is noted for its achievements in education, health, gender equality, social justice, and law and order (see <https://kerala.gov.in/about-kerala>).

²² See <https://kscste.kerala.gov.in/>.

The strategies proposed by the Kerala DoECC include a wide range of developmental and research projects. However, strategies suggested in the plan are not supported by scientifically backed, state-level predictions of climate impact. The budgeting appears to have been prepared based on rough estimates rather than clear calculations. Disaster risk reduction is not addressed. The plan also notes the weak institutional capacity of states to respond effectively to climate change (Directorate of Environment and Climate Change, Kerala 2014). In many ways, the state lacks a comprehensive adaptation strategy that aligns human development with climate change response efforts.

Coordination among levels of government (central, state, and local) is an important element of implementation, but there is no evidence of clear coordination mechanisms. Interview participants noted this lack of coordination. For example, a panchayat member said,

There is no coordination between various departments of the government. The irrigation department may implement a project of their own, and they never consult with panchayats for its implementation (IN20).

Government agencies, departments, and panchayats follow their own approaches to planning and implementing climate change-related initiatives. An academic who works for the government, added,

We have a policy and a program, but the largest difficulty is that we don't have a coordinated action plan (IN11).

Interview participants emphasized the need for coordination in the protection and conservation of ecosystems. For example, the director and founder of the State Council said,

There has to be some effort for coordination at the district level itself and also between departments. That has to happen (IN10).

However, government officers often have different views about forging wider coordination with stakeholders, other agencies, and stakeholders. A participant from the Ministry of Environment and Climate Change (MoECC) stated,

The department that is in nodal responsibility of climate change is the Directorate of Environment and Climate Change. There is a state-level steering committee for climate change to take decisions regarding climate issues. In line with this, the Directorate of Environment and Climate Change has constituted a climate change cell. The major reason for constituting such a cell was to have a state-level coordination point with other departments (IN19).

Several participants mentioned climate change initiatives undertaken by the state. For instance,

The Haritha Keralam²³ Mission has been introduced as part of the Nava Kerala Mission. Several other programs have been launched for environmental protection and the restoration of rivers, canals, and ponds (IN15).

²³ Haritha Keralam is an umbrella mission integrating waste management, organic farming, and water resources management (see <https://kerala.gov.in/harithakeralam>).

However, a retired chair of the State Finance Commission questioned the implementation of these initiatives:

Enforcement of environmental laws ... is not very strict.

For these projects and initiatives to succeed, community participation is needed in addition to the involvement of government, civil society, and public-private partnerships.

Although the Kerala SAPCC provides a formal plan for climate action in the state, many projects have mixed objectives, and their contributions to climate change are not explicit. State governments are expected to mobilize their own resources for funding SAPCC activities. In Kerala these sources include the state budget, with the support of international and national climate funds.

In 2017 the DoECC launched a study on a possible framework for financing the Kerala SAPCC, finding that the state budget could be designed and used to finance climate action. In the budget for FY 2015/16, 22 percent of total plan expenditures of Rs 215.7 billion and 3 percent of total nonplan expenditures of Rs 737.5 billion had some relevance to climate change.

5.1.2. Climate change policies in local government

In the mid-1990s, in alignment with India's 73rd and 74th constitutional amendments, Kerala implemented decentralization reforms and started devolving funds, functions, and functionaries to local self-governments. KILA facilitates and accelerates the state's socioeconomic development by strengthening local self-government institutions and training elected representatives on issues related to climate change. In October 2017, KILA, along with the DoECC and the Kerala State Biodiversity Board, launched a capacity development program for panchayat representatives. The program focused on four districts—Alappuzha, Idukki, Palakkad, and Wayanad—that are prone to climate change impacts, specifically land-use changes, sea-level rise, and heat waves. KILA's capacity development programs helped panchayat officials to assess their specific cases in an informed manner and to prepare long-term plans.

The carbon-neutral Meenangadi Panchayat Project took a "bottom-up" approach to implementing low-carbon development projects. This experiment showed the significant role that local governments can play in low-emission development and climate resilience. However, local governments continue to play a small role in strategic climate-resilient planning, largely because a lack of available expertise weakens their decision-making capabilities.

A climate change expert at the Kerala Sastra Sahitya Parishad explained the interrelationship between the national, state, and local governments and how the country's climate change policies are linked to the global agenda, such as the Paris Agreement and the UNFCCC:

The national-level policies are formulated by combining the international and national discussions and conferences. The different inputs obtained from all these conferences will affect national-level policy making so that it has a global context. The national-level inputs influence the state policies, and state-level policies influence local policies. But in the field, we give priority to local policy (IN02).

Compared with national practices, some states, including Kerala and Orissa, are actively engaging in climate change practices. Yet local authorities often do not have a clear understanding of the possible outcomes as set out in the SAPCC. Local-level authorities need to have clear targets and priorities in line with the SAPCC and NAPCC. A senior adviser to the Sixth Kerala State Finance Commission commented,

In Kerala, we have prepared the state action plan, which has put together all the regular activities of the departments without understanding the consequences. Because basically they thought some funding was coming, they put everything together. But then they decided to revise the plan; this process still has not been completed. That is one side of it at the state level. On the other side, most of the departments in the last few years have started to incorporate climate change into their regular process of planning. Although the state action plan is still not final or functional, at least I can see that many departments have started to look at things from the point of view of regular activities and also to look at them from a climate change point of view (IN01).

State governments are required to formulate their climate change plans in compliance with the NAPCC. Many states have done so in the last few years, embedding the priorities, strategies, and targets as set out in the national plan. A key requirement for state governments concerns formulating detailed sectoral and departmental climate change plans covering an extended period of time, up to 2030. However, as with many other policy agendas, implementing the climate change plans as set out in the NAPCC and SAPCC has been difficult. According to a senior public officer, it is unusual to see even a reference to the climate in any of the agricultural policies and acts in Kerala:

They speak about smart agriculture, but they have never mentioned it anywhere in the government orders or acts about climate change. Now there is an inclination to look at climate change as a relevant factor, but it is not enough (IN01).

Formulating an integrated approach is important, as is putting in place mechanisms to facilitate professional, technical, and scientific inputs to departments and local governments. Such mechanisms are crucial for evaluating climate change–related plans and strategies at the state level and ensuring their applicability in state departments. Plans and policies can be improved and made more context-specific based on such evaluations. A participant remarked,

The actual implementation of preferred activities or interventions to mitigate climate change needs much more improvement (IN04).

Moreover, the extent to which state governments themselves have identified climate change–related issues is unclear. For instance, there are growing concerns over the lack of proactive measures to minimize air pollution. Much of the impact depends on political leadership. According to a senior adviser to the Kerala State Finance Commission,

If you look at Meenagadi Panchayath, they undertook a lot of mitigation measures, and many panchayats have taken mitigation up also ... It depends on the leadership, and it is too early to say whether it is high or low priority, but at least we have started; there is a long way to go. At the state level, climate change is not a priority. Some changes have happened, but not beyond a certain level. We have added the

two words “climate change” in many things. The government has started an institute for climate change, and that is also not functional (IN01).

Even if the state and local governments have well-written and well-established plans and policies to address climate change, in the absence of proper priorities, the allocation of funding is an issue, which, in turn, can affect the implementation of planned projects or activities. According to a panchayat member,

Panchayats go for priorities. It is very difficult to resolve all the issues or suggestions, as we do not have enough resources for that (IN20).

Sharing experience about a climate change working group initiative within local bodies, one participant expressed concerns about effectiveness (IN02). Working groups at the local level are advisory; they can only suggest potential projects. However, locals do not have the power to question the authorities—for example, they cannot question why an important project is not included in the annual plan. As a result, the working groups are not taken seriously and only function to fulfill government orders. Local governments’ initiative and commitment are the key drivers for implementing climate adaptation and mitigation strategies in a local context. According to a senior public officer,

It only needs the initiation from the local body side. If the local body has a good governing system and a pool of experts or socially conscious citizens, it can implement ... I am not saying that all the local bodies in Kerala are inefficient. Many local bodies take this issue seriously and work on it. They can be taken as models. They may not be 100 percent right; only after implementing plans in the field can they identify their success rate. Otherwise, it is only a hypothetical model (IN02).

State departments, however, vary in their capacity to execute adaptation and mitigation strategies. The extent to which these strategies are implemented depends on departments and their climate change strategies. States with strategies have well-developed proposals for resource management and budget allocation and are equipped with technical expertise. A participant commented,

I feel there is a gap in the capacity of the departments to articulate the issues of climate change and to materialize a project mode or mission mode, prepare various proposals, and collect more funds and also to have technical expertise, inputs, to implement such activities (IN04).

Most participants said that climate change as a single issue does not get enough attention at the local level. When it comes to disaster management, many local authorities have addressed most of the set objectives. However, funding for long-term climate change strategies and plans has been substantially undermined in most cases. A longer-term vision and awareness of climate change are lacking. A senior advisor commented,

The schemes need to have a long-term vision. Normally, government has a very small cushion for thinking along that line, especially in the case of this Indian federal system. In the case of state governments, expenditure responsibility is much more than income responsibility. So, they will always be at the receiving end (IN03).

5.1.3. Integration of climate change into national and local government budgets

While the national budget allocates a considerable amount of money for climate-related projects, such allocations are not used exclusively for climate change-related activities. According to a senior adviser,

There is no such fraction or anything. So, there is nothing like a separate fund for climate change. Unless you do a study, you don't know how much goes to address the impact of climate change. Nobody has done such studies ... The climate change data cell is not even functioning. For every government, climate change is the lowest priority because there are no direct funds related to climate change (IN01).

However, a few state departments have started incorporating climate change in their policy documents and allocated budget. Some important sectors have been identified based on their vulnerability to climate change, and several adaptation and mitigation activities have been proposed. For instance,

For the past two years many of the districts have started to incorporate a chapter for climate change and to allocate budgets as part of the district planning committee. We identified six to seven important sectors or departments, including agriculture, to incorporate some adaptation and mitigation-based activities (IN05).

Few participants were aware of the extent to which climate-resilient plans and climate change mitigation expenses are incorporated in the government's budget. However, a senior public officer distinguished between a budget for climate and a budget for disaster management. Climate change budgets should be well planned to identify vulnerable groups, whereas disaster budgets allocate funds after the disaster has occurred. Participants said that local government authorities have not taken any meaningful steps to integrate climate change into budgets:

The local bodies are not serious about the climate change-based budget preparation. It's our common problem, that's what we speak, but not what we do ... I don't think that giving a certain amount to state governments can solve the problem of how the funding will be divided among local governments. Disaster management comes under the revenue department. It comes under the bureaucratic hierarchy of village officer to district collector. When we face water scarcity, the tehsildar is the accountable person, and the problem will be solved by village officers. But a climate change-based budget is not so simple. They need to prepare a climate change budget early to identify the vulnerable groups (IN02).

Several participants raised concerns about available funding and support in climate-related initiatives. For example, a panchayat member commented on local self-government institutions,

The local self-government institutions do not have support from state departments on climate change as well as disaster management (IN20).

Limited funding and budget allocations have led to challenges in sustaining many climate-related initiatives undertaken by the state government. According to an officer who works for the Department of Aquatic Biology and Fisheries,

There is insufficient allocation for climate change in the current budget. We have a climate research institute, but no funds have been set aside to keep it running. If you want to do something about climate change, you'll need money for data collection and document preparation, which isn't available (IN11).

However, views were divided even among government officers. For instance, an MoECC officer said,

I have been part of climate-related projects since 2015; based on my experience during this period, I understand that the local self-governments are now aware of climate change to a good extent. They are motivated to do certain activities in this regard ... In the state budget there is a massive allocation for local self-governments (IN19).

While the national and central governments prepare budgets according to the overall needs of the country or state, each district or community has unique needs. A senior public officer commented that the allocation of funds to local government depends on the particular project and context:

To minimize the impact of flood, what are the strategies we need to implement? We can make new bundles, renovate rivers, undertake scientific management of dams, etc. These works are actually a part of climate change mitigation, but there will be a limit to these activities, according to the available resources; these works can't be divided equally. Most of the dams in Kerala are situated in Idukki, so they need funds according to the necessity (IN02).

As most of the central and state government funds are allocated to local governments for specific projects, the allocated funds should be integrated within the local agenda accordingly. Any shortfall between allocated funds and project budgets needs to be met using the local governments' own funds. A senior climate expert explained how local government authorities approach the convergence funding system through additional funding sources, such as corporate social responsibility (CSR) funds, green taxes, and fines:

The local bodies will get funds from central and state governments, so they are not ready to tap their other available resources. Most of the panchayat and municipalities are now also seeing tax collecting as a shameful activity. But the government works mostly based on the revenue it gets from taxes. The local bodies have no provision to collect donations, but they can use the sponsoring system or CSR funds to do activities. Taxes and fines are some of the resources available for the local body. There is no need to collect any separate fund for addressing climate change; the local body can use the general or its own funds for this purpose (IN02).

Participants also felt that there should be no restrictions on local, state, or national government budgets related to climate change or disaster emergencies. If special conditions arise, local authorities should ask for additional funding from the state:

By considering the special conditions, we need additional funds, and we can ask for them. No local bodies in Kerala have ever asked for them. If we do not ask, how will we get the funding? Funding can't be a problem in this case. That's why I am repeating: don't put any restrictions or percentage rate on disaster-related funds (IN02).

Although local budgets have not properly planned for climate change priorities so far, participants were optimistic about the future of local governments' contribution to climate change priorities:

I don't think the state-level budget and all has been adequately dealt with, but if we look at it from the other side, internally there have been some changes in the thinking process and all. The Planning Board has started thinking about climate change, and that process will bring changes in the future. We have a long way to go. And also, the Disaster Management Plan, which the state government started preparing a year ago, is also a good attempt that makes people think about climate change (IN01).

In many states, multilateral agencies like the UNDP have been involved with the SAPCC and its implementation. Donors or international organizations need to support research and development so that the findings can be used to convince government policy makers.

5.1.4. Integrating climate change investment priorities into livelihood strategies: A case of floods in Kerala

5.1.4.1. Impact of climate change on livelihood strategies

Kerala is one of the most severely flood-affected multihazard-prone states in India and “a climate change hotspot relative to the rest of India” (Le, Leow, and Seiderer 2020, 287).²⁴ Frequent flooding in some parts of Kerala is affecting the lives and livelihoods of many local inhabitants. For instance, a local resident and panchayat member described the impact of flooding in his locality:

I live in the upper Kuttanad region. Here we have a perception that once a year we will have a flood in our region, and we have been prepared for this situation over many years. If rainfall continues for two days, the houses will be filled with water (IN20).

Many residents have been victims of flooding. One resident described how flooding changed her life and livelihood:

I was here during the 2018 flood, and I was also engaged in the rescue operations. At the same time, the area around my house was flooded, and I had to move to a rehabilitation center. I had to stay at the rehabilitation center for about two weeks (IN17).

²⁴ Also see <https://www.maplecroft.com/risk-advisory/climate-change-and-environment/>.

Particularly since the 2018 flood, many locals are aware that floods are increasing in frequency and that this change could be the result of climate change. According to one participant,

It is only since the flood of 2018 and 2019 that people comprehensively started thinking about the impacts of climate change (IN15).

Locals' thinking and behavior with regard to climate change has, to some extent, changed due to these recurring floods. However, these changes in perception tend to become weaker over time. As one participant noted,

After the flood, you all came with the "Room for River," "Living with Water," all these beautiful slogans. But ultimately, we only repaired roads and buildings, we didn't go for those kinds of things. We didn't protect the environment. We didn't protect the Western Ghats ... After the crisis, especially after the 2018 flood, I thought the area would become a watershed, but really nobody has understood the implications of having people go back to life as usual (IN09).

Extreme events, such as randomly changing patterns of monsoon rainfall, recurrent floods, increased cyclonic storms, landslides, high temperatures, and heavy windspeed are the main causes of flooding in Kerala. A senior public officer of the Kerala Sastra Sahitya Parishad explained the impact of changing weather patterns as follows:

If we get the usual three-month monsoon rain within one month, that area can't accommodate the rainwater, and it will lead to flooding. We already experienced this change in rain pattern for the past two years. But we didn't experience it in the previous year, so we can't predict what is going to happen in 2021. One thing we are sure of is that the chance or probability of extreme climatic events in Kerala is high. In 2016–17 we faced severe drought, but we didn't take it as seriously as the 2018 flood. Unlike flood, drought is not so visible; it progresses slowly, and we can only identify it in its severe stage (IN02).

Public officers are generally aware of the fact that climate change is connected to the livelihoods of citizens and can have a disproportional impact on vulnerable groups and communities. According to one participant,

These climate change issues have affected vulnerable people like fishermen. Fish resources are declining due to climate change, which will affect their livelihood. So these issues should be addressed in plans (IN07).

Erratic rains and subsequent flooding are affecting agricultural livelihoods. Kerala exports around 550 crores of coconuts across the world, providing employment to millions of its residents, mainly the poor. One participant noted,

Kerala is still a coconut economy. This is a vast employer, especially of poor people, uneducated people. But even the main agriculture experts in Kerala are not bothered by the impacts of climate change. What would happen if the temperature rises? Another thing we are doing is with women farmers who are engaged in paddy cultivation. This is heavily dependent upon water content. So, if the water level rises, weeds increase heavily, and it is very difficult to plant. The same is true for

the process of rice transplantation. This process needs adequate water for two weeks. We have almost given up because the rain is so erratic. If we have to do it twice, the loss is extremely high (IN06).

Kerala State's western border stretches nearly 600 kilometers along the Arabian Sea shoreline, and population density in coastal areas is high. As a result, the fishing community is especially vulnerable to climate change. The government cannot protect these vulnerable communities because of infrastructure issues associated with transportation and energy. As a senior project officer of the Kerala State Disaster Management Authority explained,

The density of population on the coast is higher than 2,000 plus per square kilometer, compared to the average population density in the state of 860. The state as such is highly densely populated, compared to the national average. We have around 10 million fisherfolk, including their families and members. Population wise the coastline is one particular area where the impact of climate change is really being seen in the form of cyclonic storms and high wave hazards. The fishing community is hugely affected, considering the number of people (IN04).

No one had expected the scale of flooding experienced in 2018:

In 2018, no one expected that the rains would bring those severe floods. But suddenly, there was a consistent downpour. We do not really know what the climate change impact will be next year (IN04).

Another participant added,

In the last floods, two districts have lost a good percentage of their topsoil—in both Idukki and Wayanad. The problems related to this will come only later (IN06).

Several participants also suggested that climate practices need to focus on longer-term impacts and resilience. According to the founder of the State Council,

Presently we are evaluating damages based on that year's damage. This approach needs to change because, of course, the damage that happens this year is not only this year. The impact is actually felt in cumulative form later. We are not acknowledging that. These systems have to become more resilient, and we have to do an analysis and projection on that basis. Data might be important for people working in policy—not for lay people—but changes in policy based on data have to be made (IN10).

Community and government not only should focus on the aftermath of flooding or a disaster but also should behave proactively to mitigate the impacts of climate change. One local resident shared her view:

One thing I felt was that a lot of funds are being provided when a flood occurs, but not enough attention is paid to what needs to be done before that (IN17).

An urban planning researcher added,

I personally believe that every project in every local self-government institution should have an environmental component because, at the moment, the state is highly promoting the gender component and, similarly, each and every part of the environment should be part of the project. The environment should not be separate like a pillar. It should not be addressed as a separate or polarized pillar (IN15).

5.1.4.2. Livelihood strategies and climate investment priorities

Most participants agreed that the impact of climate change is often greatest on fisheries, farmers, and other vulnerable and marginalized groups. A government officer from the Department of Aquatic Biology and Fisheries told us,

Vulnerability can be viewed from two perspectives. The influence on their livelihood is one thing, and the impact on their survival is another. People who make their income from fishing as well as those who live near the shoreline are both affected. Climate change is one of several factors that contribute to coastal inundation, which poses a serious hazard to those who live in the area. Inland fisheries are no longer protected by mangroves, which were once a natural barrier to the land, which, in turn, will increase the possibility for a sea attack. Their resource availability has also been jeopardized. For example, sardine production, which is a major part of the fisheries, has declined by 35 to 40 percent. When the sea surface temperature rises, the sardines migrate north to a colder climate, which has an impact on the availability of resources. This has an impact on fishes' reproductive cycle, migration patterns, and distribution patterns. All these factors together affect the livelihood of people in the shoreline area (IN11).

In addition, frequent hurricanes and depressions in the sea have made fishing increasingly challenging.

Local authorities in Kerala have initiated several plans prioritizing climate change impacts. However, participants questioned whether these investment priorities align with the community's livelihood strategies:

There is no dispute in the fact that infrastructure development is essential for the society, but the plans should be based on climate resilience and sustainability (IN07).

Several participants stated that future local government projects should focus on community-level livelihood strategies instead of focusing exclusively on carbon-neutral programs. More specifically, the government should consider public investments that have benefits not just for the economy but also for the wider society. According to a senior state adviser,

When it comes to climate change, the only thing that the government gives importance to is the carbon-neutral programs that were done in Meenagadi and all, but climate change is not just about carbon-neutral activities; it has to go beyond that. For example, if you take sea-level rise, it affects the income of the fishing community as the production of fish declines. It affects the social life as well as the economic life. Also, the agriculture sector—for example, the Palakkad

region, which is near the Western Ghats—is facing serious drought issues. If proper mitigation measures are not taken, after a few more years, it will be very difficult to have adequate water for irrigation as well as drinking in some areas (IN01).

Several routine government commitments, such as forestry and energy, focus on an important aspect of climate change. However, sectors such as water and health care need urgent government investment in order to meet community needs. A senior state adviser commented on the progress made in these areas:

In the case of Kerala, the forest area has increased in the last few years. Whether this has been done from the climate change perspective and all is not clear, but at least they have the determination to increase the area of forest, which definitely helps with climate change. That is actually the routine work they are doing. The energy sector is also doing it. Water resources and health are the main sectors that need attention. Water will be the first thing because without water, survival will be difficult. Agriculture also depends on water. All sectors—water, agriculture, health, forest, etc.—are interconnected. Energy in my view is not the first priority. It only comes later. Transport is least because it is emissions related (IN01).

While funding is an essential element in addressing climate change issues, it should not be the only one. An integrated, inclusive investment approach should be adopted in addressing climate change issues. A senior adviser commented,

In my opinion, funding is not the issue. How do we address climate change in our day-to-day activities—whether it is the individual or the government or the private or the public sector—how do we consider that? For example, construction of houses: we should strongly insist on the policy to have a rainwater harvesting unit. These are all simple policy decisions. Even if we look at the state budget, we can analyze how much of the state budget is affecting adaptation and mitigation. If we start looking at it and taking actions, it's not the money that matters; it's how we approach climate change (IN03).

While the state has been the major source of climate funding, participants also mentioned the possibility of using other funds that have their own allocation and distribution mechanisms. A participant remarked,

We need to utilize mostly state funding, following the guidance provided. If we need additional funds, we can use the National Climate Adaptation Fund and the Green Fund. Usually, they instruct us to use a plan fund, and local bodies have their own funding system (IN05).

Of the key areas relevant to climate change, agriculture has drawn particular attention in Kerala. According to a senior public officer, more focus should be given to community and environmentally friendly cultivation methods, rather than to commercially driven farming such as sugarcane:

Sugarcane has a high-water footprint; it will affect other sectors. Also, planting more area to sugarcane cultivation means that we need to replace other crops like paddy with sugarcane. That may adversely affect food security. There are many

cross-linked confusions like this. It will be beneficial to the industries related to sugarcane if ethanol production and its value increase. But for society as a whole, sugarcane production will not be profitable (IN02).

Participants shared numerous examples in different sectors, including water, fisheries, forestry, and energy, of the manner in which the state and local governments have initiated investment projects related to livelihood strategies. In many instances, such projects have been launched to provide employment opportunities for locals. For instance,

Haritha Keralam²⁵ activities with the support of local people and an employment guarantee scheme have been effective in addressing climate change (IN07).

However, participants were not certain whether these projects had been specifically planned with the aim of mitigating climate change impacts. As a senior public officer explained,

There are some plans, but I'm not sure whether they have been implemented effectively. Actually, these livelihood strategies should be long term. Very short-term plans cannot be sustained. Even with the promotion of Haritha Keralam, there are missions, but in the mission mode, one problem is that, for the time being, the mission mode will work. But after that, without enough support, it won't be sustained. Even in the case of livelihood strategies, if people cannot make their livelihood out of an intervention, they will be forced to stop it. There needs to be more forward integration (IN03).

Views were expressed about the need to communicate with locals about the importance of climate-resilient farming and animal husbandry. A participant described how a win-win result can be achieved by integrating climate change with the livelihood of farmers and laborers:

Paddy cultivation contributes a lot to the ecosystem and to livelihoods. After we started massive plantation, we have been able to plant in short windows, which has reduced the chance for pest attack. This has been a major success: the problem was seen as a water scarcity issue, from which we identified paddy as a solution, which further led to a win-win solution, through livelihood support for the farmers and laborers as well (IN06).

While several state governments have taken proactive measures to promote sustainability, such as providing subsidies for solar power investments, concerns were raised about the affordability of these projects for middle- and lower-class households. Only a small share of people can afford and are interested in shifting to these mitigation measures. Several participants appreciated that KILA has initiated adaptation measures under the LAPCC. In order to localize the NAPCC and SAPCC, participants emphasized the importance of promoting awareness campaigns and education programs:

In the case of Kerala, four or five years back, people used to think that climate change would never affect Kerala. But Ockhi and then the floods have made the people start thinking. We should seriously make people think through campaigns because many of these things are specific to the local area. Citizen education is

²⁵ See <https://kerala.gov.in/harithakeralam>.

very much required for people to start thinking ... So, awareness building is very much required. The role of local government is very important in citizen education, and the state government should take the lead in strategies that address these issues (IN01).

In the last few years, several NGOs have facilitated campaigns to mitigate the impacts of climate change. Although these efforts have promoted awareness, the educational aspects of climate change are relatively underdeveloped. Climate change is yet to be introduced as an issue of social significance and incorporated in the education curriculum:

We have to help the children to be sensitized around climate change. They should be aware of what they can be doing, what they should not be doing ... We should teach them about climate change from an early age ... so that they are aware of this issue once they grow up (IN04).

5.1.4.3. Community perception of and involvement with climate investment priorities

Public officers who are involved in prioritizing climate investments recognize the importance of community participation and listening to local voices. A bottom-up approach, driven by active community involvement, would benefit both policy makers and beneficiaries, as community acceptance is key to inclusive sustainable development. Participants emphasized that if people in the locality do not feel any attachment or involvement in policy decision-making, the community will be reluctant to obey the policies and practices. While the top-down approach and information sharing are beneficial to policy making, people need to have the capability to form their own mitigation and adaptation plans, which requires passing the information on to them. A senior public officer in Kerala elaborated,

Among all policies or strategies, only the local community can decide which one is better for the locality, so we need to give that knowledge to them and let them choose. Different communities face different problems. If the water level rises in a lowland area, people can migrate to a highland area (IN02).

Irrespective of government efforts to support livelihoods, the community seems to believe that “climate change is a government problem” and “the government is responsible for managing it.” In particular, some communities living in deprived areas are likely to perceive disaster-related compensation schemes as sources of income:

Now people are thinking that if we face agriculture loss, the government is accountable for it; they need to give compensation. It's our mind-set. It's not inappropriate to think like that, but we are only focusing on it. There is a book that says, “Everybody likes a disaster.” There are also people who like to utilize this as an opportunity. But it's all a societal expense. So, it is better to avoid the disaster. Rather than focusing on compensation, we can try to develop new methods to avoid the disaster (IN02).

As a mitigation strategy, the government transfers funds for floods directly to those affected. Usually, flood funds are distributed directly to communities as planned:

In the case of mitigation, funds are mainly reaching the targeted communities because most of the funds are direct benefit transfers. There may be some issues like corruption or something like that, but those are very localized issues. Otherwise, those kinds of funds are going directly to the beneficiaries. In the case of funds allocated for general interventions, statistics of reaching the target community cannot be obtained, because long-term outcome analysis is required for that (IN03).

Local governments also can promote other mechanisms to generate resources and execute mitigation strategies, such as corporate social responsibility:

One portion of the taxes could be used for climate change mitigation and adaptation activities, because the revenue is also generated from that particular combination. The second way of doing it is through some CSR (IN04).

Lack of political will can also be a major impediment to achieving climate change priorities. Although public officials may incorporate instructions from scientific experts into national or international strategies, these strategies are often not coherent with the activities being carried out, due to the pressure to generate revenue:

There should be the political will. That is the only way to bring about all the changes, but I don't think we have that political will among our leaders, irrespective of party. So, what is happening right now is very organic, and there is no proper structure to channel it properly. There are a lot of conflicting examples: on one side, you give permission to quarrying, which has a negative effect on the environment. On the other side, you say that you are protecting the environment. You can't do both. So, a lot of strong decisions have to be made at the policy level. That is not easy for any political party to do because it is all about revenue generation (IN01).

It is important to sensitize the political leadership to the importance of pursuing green and sustainable development and to empower communities to put pressure on local politicians, interest groups, and NGOs to prioritize climate change investment:

The community should push the political leaders, the people's representatives, to allocate sufficient funds with respect not only to building infrastructure and various other businesses, but also to considering risk-informed planning in their community and to address the climate change issue (IN04).

5.1.5. Summary of findings: India field study

India's national government has set clear priorities for addressing climate change as set out in the NDC. In line with the NAPCC, all states are required to have an SAPCC. However, integrating SAPCCs through the LAPCC has not proceeded as intended. In particular, local government authorities have continued to prioritize disaster management and disaster risk reduction instead of long-term climate change agendas.

Due to the sociocultural and geographic diversity of individual states (for example, Kerala), local government authorities have paid more attention to local priorities than to national priorities. Climate change policies and strategies are therefore misaligned at the central and local levels. Political will can be a key driver in prioritizing and aligning the NAPCC and the SAPCC within local government authorities.

While the national budget allocates a considerable portion for climate change–related activities, there is no clear evidence of the percentage or actual amount spent on mitigation of and adaptation to climate change impacts. In addition to budgetary allocations from the national government and contributions from donor agencies, state and local governments are likely to seek additional funding from local sources, such as CSR activities, local taxes, and fines. However, according to participants, local authorities do not spend national allocations efficiently or effectively.

Finally, local government authorities are likely to prioritize disaster recovery and relief instead of broader climate change policies and practices. Disaster management practices in Kerala have been improving significantly, and local authorities have taken steps to empower the community and strengthen livelihood strategies. However, an overcommitment to disaster management has largely undermined the importance and awareness of long-term climate change impacts.

5.2. Case findings: Nepal

5.2.1. Integration of climate change–related policies at the local level

The constitution of Nepal guarantees the fundamental right of citizens to live in a clean and healthy environment. This right is elaborated on and enshrined in the Climate Change Policy 2019 (replacing the previous policy developed in 2011), which aims to achieve the “socioeconomic prosperity of the nation by building a climate-resilient society” (Ministry of Forests and Environment, Nepal 2019, 6). The policy outlines seven objectives and various sectoral policies, strategies, working policies, and frameworks. Nepal also has prepared a National Adaptation Program of Action in 2010, developed a budget code in 2013, signed the Paris Agreement in 2015, and developed numerous environment-related plans, policies, rules, regulations, strategies, frameworks, and acts. The first NDC was submitted in 2016, followed by a revision in December 2020. The country also prepared a Local Adaptation Plan for Action for implementation at the local level. The country is in the process of developing its National Adaptation Plan, which is expected to be introduced in 2021, with the aim of reducing the country’s vulnerability to climate change by enhancing resilience and, most important, by integrating climate change policies, plans, strategies, and frameworks in all sectors of government. Nepal is especially vulnerable to the impacts of climate change; to address these impacts, the government has developed a range of policies, plans, and programs. However, the extent to which these well-developed policies, plans, and strategies have been integrated at the state, province,²⁶ and local levels is questionable.

²⁶ State and province are used interchangeably in the report.

To gain insight into this issue, interviews were conducted with relevant officials, climate change experts, consultants, politicians, policy makers, and other stakeholders who have been involved directly or indirectly with such initiatives in Nepal. One participant who has been advising the government—in particular, the Ministry of Forests and Environment²⁷—on climate change-related policies and plans and who has played an active role in formulating the NDC and mainstreaming the climate change development plans and budget, commented,

We have everything in hand in terms of policies. Even the sectoral ministries are now integrating climate change into their policy. In terms of policy framework and integration, the federal level is quite advanced, but local governments are fairly new; the real integration at all 753 levels (local government bodies) needs to happen. I think overall the national framework will guide them in taking actions. All the policies at the federal²⁸ (central) level are approved and need to be rolled out for the actual implementation on the ground. We are waiting for the next few years for its implementation (NP06).

Another participant stated,

We have a LAPA framework based on climate change policy that aims to internalize adaptation action at the local level (NP18).

A senior official in the Ministry of Forests and Environment, who is also responsible for climate change initiatives, said that the integration of such policies into action continues to be a challenge and much work needs to be done to implement central-level policies and programs at the local level:

To be honest, climate policies are not rolled out effectively to the local level, especially to the vulnerable and marginalized communities. This effort will require massive resources and support for capacity building (NP17).

A regional adviser on climate change argued that, although the issues of climate change are not unknown at the local level, local governments deliberately exclude climate change from their list of priorities:

There is huge recognition that climate change has to be the priority for local government, but other priorities such as infrastructure development are the primary objectives, and there are other social development issues they want to focus on. They still don't know that climate change has to be at the center of both those aspects of development (NP05).

A high-level committee member of the National Association of Rural Municipality in Nepal (NARMIN)²⁹ agreed that local governments have yet to prioritize climate change:

²⁷ The ministry's Climate Change Management Division is the focal point for the climate change agenda in Nepal and the UNFCCC.

²⁸ Federal and central governments are used interchangeably in this report.

²⁹ NARMIN is an umbrella organization of 460 rural municipalities in Nepal. See https://narmin.org.np/?page_id=1140.

Local government is more focused on infrastructure development. Climate change is not a priority yet, but it needs to be prioritized in their planning and budgeting process (NP16).

A senior government official noted that climate change–related rules, regulations, and acts are under way at the provincial level to help local and state levels to prioritize climate change (NP17).

Local governments tend to give priority to socioeconomic progress, infrastructure development, and economic growth. They have limited awareness that the impacts of climate change may threaten the development initiatives to which they have allocated a large portion of their budgets. To address this lack of awareness, a vulnerability and risk assessment was undertaken as part of the NAP formulation process. A participant who had worked for 17 years in the Ministry of Environment and also served as head of the Climate Change Management Division (CCMD) stated,

Preliminary information clearly indicates the vulnerability of people, ecosystems, and people's livelihoods to the adverse impacts of climate change (NP04).

A government adviser suggested,

The Ministry of Forests and Environment has a division called CCMD dealing with the whole climate agenda that is the focal point of UNFCCC. For the provinces, there are climate change sections to look at a number of tasks. Even in the local government, there is an environment advisory committee for budgetary and planning, but their capacity needs to be enhanced (NP06).

A senior adviser identified several barriers preventing the effective integration of climate change in local agendas:

Over the years, there has been recognition that climate change has to be an issue that the government tackles, but there are a few barriers ... This could be because of lack of awareness. Although there are other barriers, if you want to integrate climate change into local government priorities, the human resources, and technical resources are not able to do that even if they would like to (NP05).

Some participants suggested that awareness about the impact of climate change can be created in several ways, such as by involving civil society, development partners, and the media. Most participants also cited the need for appropriate training, development, and awareness campaigns at the local level. For example, a senior adviser said,

The focus should be on the implementation part: capacity development, training, and awareness programs at the state-province and local level (NP17).

However, human resources who are dedicated to climate change and environmental concerns are needed, especially at the provincial and local levels. The focus needs to be on enabling implementation capacity:

We have policies and frameworks in place, but we also need to enhance the capacity of the province and local government. That is one route we need to take: all the

policies and frameworks need to be rolled out so that they know what they need to do. That's one line of things that need to be done. Policies are not barriers now because we have everything except NAP, which is coming in a few months (NP06).

In addition, as a senior official explained,

Instead of being engaged in publicity, there is also a need to focus on work (kaam) (NP17).

Others indicated a lack of political support:

Climate change might be raised in the parliament once or twice but is not discussed extensively in the way that it requires (NP05).

In addition, capacity building is important for effective implementation:

Ongoing capacity building: the local government needs to take this concern very seriously, undertake local effort, and work on the LAPA scheme. Let's not only focus on the LAPA scheme supported by development partners but also allocate our own resources so that we take local climate action and demonstrate that this is something that we are addressing, we know the risks, and we know the impacts, and we are delivering in terms of sectoral concerns that have been there for some time in terms of climate change problems. This is where capacity building and action need to be reflected in local government budgets and plans in alignment with our national framework. They need to go hand in hand. Implementation is the major thing that needs to be done by the government (NP06).

Finally, a senior government official emphasized the importance of climate finance:

The main challenge remains accessing the required climate finance. The aim of the government is to seek international financial support and also their expertise to roll out national-level policies to the state, province, and local levels (NP17).

5.2.2. Climate change–related funding, investment, and accountability at the local level

The government has introduced a climate change financing framework to integrate climate change–related national policies and strategies into the budgeting process. The CCFF is a tool for channeling 80 percent of the Climate Fund to the local level, as indicated in the 2019 Climate Change Policy. Many participants raised doubts about the extent to which this goal has been achieved. For example, a senior government adviser stated,

According to the Climate Change Policy, 80 percent of funding should be channeled to the local level, but as of now, we do not know the exact figure, so we are going to unpack this by conducting some studies (NP17).

Apart from the CCFF, the government also introduced a climate change expenditure tracking system (a budget code) following a review held in 2012–13 (Ministry of Finance, Nepal 2017; National Planning Commission, Nepal 2012). According to a government adviser,

Nepal is one of the pioneering countries to set out the climate budget coding in 2011. Approximately 29–30 percent of the national budget is climate relevant. Having said that, there is a priority set by every line ministry, but the local government is not currently in the picture. National allocation is good (NP06).

All of these climate finance–related initiatives (CCFF and budget code) have improved the effectiveness of PFM (Ministry of Finance, Nepal 2017). The government’s spending on climate change has been increasing, as shown in table 2. However, some participants questioned the effectiveness of the CCFF for ensuring that the allocated climate funding reaches communities, especially vulnerable and marginalized communities, and contributes to their livelihoods. According to one participant,

Climate-related expenditure is still very low. The picture will be clear if we look at the local government allocation. If we go down to the local level, only around 5 percent of the total budget is supposed to be integrated in the environment, forestry, and climate-related issues inclusive of disasters (NP05).

There are no provisions mandating that local governments allocate a particular budget for climate change. As a result, identifying and segregating the percentage of the budget to be allocated to climate change–related investments and activities are challenging. This difficulty has raised doubts about the extent to which local governments are complying with policies and strategies introduced at the central level as well as about the extent to which the poor and vulnerable benefit from climate budget and finance. One participant commented,

Some improvements might be needed in terms of climate finance targeting the poor and vulnerable and the most affected groups (NP06).

At the same time, a few participants mentioned the efforts being undertaken to integrate policies and strategies at the local level. According to a participant from the Ministry of Forests and Environment,

Currently, we—the Ministry of Forests and Environment, Ministry of Finance, and National Planning Commission jointly—are preparing a Climate Finance Strategic Roadmap that will guide federal, provincial, and local governments for effective implementation. We are also preparing a long-term strategy that will guide us in mitigation approaches so as to achieve net-zero emissions by 2050 (NP18).

While some participants said that international donors can help the country to obtain access to climate finance, others said that more private sector investment is needed. However, the continuation of donor funding requires assurance that the intended targets and results will be achieved. Failure to meet targets and poor performance at local levels have prompted many donors to cancel their climate change funding. One participant commented,

Donors like the US Agency for International Development, the United Kingdom, and the German government are very active development partners supporting

climate action in Nepal through various means (bilateral or through international multicountry projects), although some of the Nordic donors have left (NP06).

The private sector can play a role in mitigating and adapting to climate change. For example, some participants highlighted the need to set up investment-friendly climate policies to attract private investment, while others supported setting up public-private partnerships. However, there was general consensus that attracting private investment in areas such as agriculture, energy, transport, waste, and insurance will be difficult unless the government can create investment opportunities and provide assurance of the potential benefits. For example, according to a senior officer from the Ministry of Forests and Environment,

The Ministry of Finance is developing strategies to attract the private sector in this area, as there are a number of opportunities for them (NP17).

Commenting on the role of the private sector and PPP, another senior officer added,

A lot of work can be done in clean energy generation from the PPP model. Private sectors can also be engaged in developing private forests (NP18).

Moreover, investment in climate change could be embedded within the broader framework of corporate social responsibility:

Corporations can spend on climate change adaptation and mitigation as their corporate social responsibility (NP18).

Participants agreed that substantial work is required to draw the attention of the private sector to climate change investment. First and foremost, the government needs to identify the areas where investment is sought. A regional adviser for climate change indicated possible investment areas for the private sector:

There are banking institutions thinking and promoting green investment. We need to identify the needs and areas where private sectors can make an investment, what is the required policy environment for the private sectors to make an investment (NP05).

Provisions exist for innovative financing and for promoting green bonds and impact investments, but the private sector is yet to recognize that such provisions exist or to tap into climate change investment opportunities. According to a government adviser,

The private sector has lots of potential. Look at the policy: the provision for innovative financing through them is articulated in the form of green bonds or impact investing. There are a number of provisions the policy has articulated but not tapped into yet to the level that they can really play and contribute a lot. For example, in the Philippines, private sectors are actually dedicated to and create projects that have clear benefits for climate and business also (NP06).

Other participants were more concerned about promoting good practices than about relying on government initiatives. The concept of corporate social responsibility has gradually been taking hold within big business and corporations in Nepal. Some corporations have allocated a certain

portion of their profit for philanthropy and CSR activities. Although climate change is relatively new for corporations, several best CSR practices are evident in this area. A government adviser presented one example:

Private sectors who are a part of this mitigation action are already undertaking initiatives—for example, Yeti airlines declared itself to be carbon neutral some time back. This initiative is to be applauded (NP05).

Given the nature of climate change investment, immediate benefits may be difficult to achieve, and additional measures and assurance of returns are paramount to draw private sector interest:

As climate change interventions will not provide immediate “benefits” and the government might be unwilling to spend the limited financial resources in such activities, revenue generation will be difficult unless “proven benefits” are realized (NP04).

5.2.3. Impact of climate change on livelihood resources and strategies: The case of Koshi River and zone

The Koshi River is the largest river in eastern Nepal, and the Koshi region is vulnerable to flooding every year, causing the loss of fertile land, cattle, properties, and homes. In some instances, impacts have been severe, with hundreds of people killed, hundreds either missing or injured, and tens of thousands becoming homeless and displaced.

An officer of a local NGO shared his experience of torrential rainfalls and unexpected flooding that not only damaged crops (*dhan kheti*) but also caused the loss of hundreds of hectares of fertile land in areas like Tilathi and Hanumannagar (Kankalni),³⁰ affecting the livelihoods of poor and vulnerable community members. An executive director of a local NGO indicated that climate change has caused massive unemployment and displacement in the region and that migration has become increasingly necessary, adding,

The threat is still present there (NP10).

A local resident who has witnessed many floods agreed:

The 2008 flooding created a massive economic loss, as many local residents lost their land and cattle and became unemployed and even homeless. This flood had a huge impact on peoples’ livelihood, which forced many people to search for employment abroad (NP 12).

National and international media reports, government reports, as well as the findings of previous research studies support these claims. In August 2008, the Koshi dam in Sunsari District collapsed after breaching the eastern embankment, leading to large-scale flooding that affected nearly 65,000 people and eight village development committees. Four village development communities were submerged for an extended period of time (Ministry of Home Affairs, Nepal 2009). Almost 700 hectares of fertile land became uncultivable, and some of the most severely affected communities

³⁰ These areas are close to the Koshi River.

remain desert-like (Kafle, Khanal, and Dahal 2017). The 2008 Koshi flood affected not only Nepal but also the neighboring state of Bihar, India, where nearly 400 people died and millions were displaced (Haviland 2009). A regional adviser for climate change admitted,

Climate change is already threatening the livelihood and income security of people on the ground (NP05).

A participant who had served as head of the CCMD emphasized the importance of paying attention to agriculture and water resources as part of mitigating the consequences of climate change. These two sectors are seen as closely connected to livelihood improvement:

Much attention is needed in agriculture and water resource sectors, in helping these sectors to adapt and develop resilience to the adverse effects of climate change ... There is a greater realization of the need to link climate change programs with livelihood improvement of climate vulnerable communities and ecosystems (NP04).

Many participants said that climate change adaptation projects at the local level should begin to focus on livelihood ethics and practices. Furthermore, the intended impact of the interventions on the livelihoods of people and communities needs to be more explicit. For example, some donor-sponsored projects have begun to cultivate climate-resilient rice (*dhan*):

Climate change vulnerability and adaptation programs and projects must look at the livelihood dimensions of people and the community into which they want to intervene. These programs and projects should focus on five types of capital—human, finance, social, natural, and physical—which the Department for International Development has been using for several years and lots of development agencies have also been practicing. They try to see climate vulnerability from the livelihood dimension but are unaware of how to prioritize livelihoods while developing interventions (NP04).

A government advisor commented,

In terms of government investment, there has not been a thorough study of the impacts of climate change finance on the poor and vulnerable. A study conducted by the Ministry of Agriculture looked at case studies of what have been the impacts of their investment on poor and vulnerable farmers. I think it shows very positive impacts in terms of income generation, jobs, and productivity (NP06).

Further studies clearly are needed to identify the needs of the poor and vulnerable and the support they require to maintain their livelihoods. Although most government policies, plans, and strategies are intended to involve livelihood strategies and some donor organizations have supported these government initiatives, many participants highlighted the need for effective implementation. According to a local NGO officer, although community projects and disaster management teams are working in the Koshi region, the efficiency of the government has dwindled:

There is little or no link between the government's flood-related plan, policies, projects, and effective implementation of such initiatives (NP14).

Some government projects and programs have been developed on an ad hoc basis, lacking expert advice and community voices. According to a local government adviser,

The government should encourage people's participation so that the local community will feel a sense of ownership of climate change-related projects implemented in the region in the future (NP10).

Instead, there appears to be little community participation. Acharya (2021) suggests that community participation is often symbolic. A participant from the Ministry of Forests and Environment agreed,

Local governments are the main actors for implementing climate change adaptation and mitigation actions. Local Adaptation Plans of Action (LAPA) should be prepared and implemented at all local levels ... A lot of adaptation and resilience building is being implemented at the local level, benefiting local communities (NP18).

A lead person in the government's climate change initiatives in the Ministry of Forests and Environment suggested that the 2019 LAPA framework could be useful for implementing climate change-related initiatives at the local level. However, other participants noted a gap between central, state, and local governments' plans, policies, and projects. According to a local NGO officer,

There is no process for evaluating the effective implementation of such flood-related projects. Most of the works appear to be superficial. ... The government's flood-related projects are not aimed at the local community, and therefore, they hardly reach the grassroots level (NP14).

With regard to flood relief and financial and other government support, a local resident commented,

There has been no financial support from the government in the last five years, although a few support services are available, such as a disaster management team. The local government has not shown any interest in them (NP12).

Instead, NGOs have become the main player in terms of providing immediate relief for the poor and vulnerable (elderly, disabled, pregnant women, children, and the sick). Most participants appreciated the role played by the NGOs. Some participants suggested that NGOs are helping local flood-affected residents by providing training and development programs to enhance their entrepreneurial or business skills, which they can use to start a small business or exploit other self-employment or income-generating opportunities. The government's limited engagement with the victims was heavily criticized. A local resident told us,

The government of Nepal has no interest in protecting the people or village and has not taken any responsibility to protect the flood-risk area (NP01).

In particular, participants talked of corruption and lack of transparency and accountability:

The only trend that is increasing is the extent or level of corruption (NP 12).

A government adviser suggested,

The civil society has a role to play in terms of understanding whether the allocated budget has been reaching the poor or not. The parliament can ask government whether they have allocated funds according to the vulnerability of climate. The media has a role to play in terms of whether their climate priority is well addressed (NP06).

According to Nepal’s Climate Change Policy 2019, 80 percent of climate funding should be allocated to the local level. However, there is little, if any, solid evidence in this regard, even from top-level government officials, climate change experts, advisers, or consultants. The majority of informants agreed that very little has been allocated in reality. Estimating actual allocation remains a challenge, however, due to the absence of an accounting system for identifying and measuring climate-related expenditure. This absence is not just an issue in Nepal. According to the International Institute for Environment and Development, “Less than 10 percent of funding committed under international climate funds to help developing countries ... is directed at the local level” (IIED n.d.).

To address this issue, a government adviser recommended unpacking this 80 percent allocation so as to offer more clarity:

Some improvements need to be done in terms of targeting climate finance for the poor and vulnerable and the most affected groups (NP06).

Photo 1: Koshi Barrage, Nepal



Source: Sanjiv Khanal

Regarding the government’s role in controlling flooding, most participants—in particular, flood victims, local residents, and NGO officials of the Koshi region—indicated that the main issue concerns the operation of the Koshi barrage. The barrage was built by India and is operated by the Indian government, but it is located in Nepal. This situation is in accordance with the Koshi Treaty signed by both Nepal and India in 1954 to manage the river and control flooding (Khadka 2019).

Operation of the barrage remains political and controversial, requiring the urgent attention of local and national government officials, diplomats, and politicians.

5.2.4. Summary of findings: Nepal field study

Nepal is one of the most vulnerable countries in the world to the impacts of climate change, including impacts on agriculture, biodiversity, ecosystems, and livelihoods. To address such impacts, the country has introduced many climate change–related policies, plans, strategies, and frameworks. However, this rich array of policies and programs appears to be poorly integrated at the provincial and local levels.

Based on the primary data collected from interviews with a range of stakeholders, climate change–related policies and programs should be rolled out at the local level. However, implementation is challenging: climate change is not being prioritized by local governments in their budget and planning; climate-related rules and regulations are still being formulated at the provincial level; awareness about climate risk is weak; human resources and technical expertise are lacking at the local level; and lack of political support and access to climate funds remain problematic.

The Climate Change Policy indicates that 80 percent of climate funding should be allocated to the local level. However, such funds do not appear to be reaching the grassroots level, especially vulnerable and marginalized populations. To address this issue and to improve PFM effectiveness, the government introduced a CCFF and a budget code, but they are not being implemented effectively and do not reach the local level; moreover, the amount allocated may be much lower than indicated. According to a senior official, the Ministry of Forests and Environment, the Ministry of Finance, and the National Planning Commission are preparing a climate finance strategic road map to guide provincial and local governments in the effective implementation of the climate change agenda, priorities, and budgeting, so this situation may improve.

However, access to finance remains a challenge for the government. The country relies on international donors, but private sector investment is also needed, with some participants proposing PPP as an alternative. The potential for private sector involvement and investment is huge in areas such as agriculture, waste, energy, transport, forest, and insurance, but massive groundwork is needed to formulate private sector–friendly policies, plans, and frameworks to facilitate such investments.

In the Koshi region, people’s livelihoods are being adversely affected by floods, including loss of land, cattle, homes, and property, creating unemployment and displacing people. In 2008 the Koshi flood affected 65,000 people, hundreds of hectares of land became uncultivable, and some villages remained under water for an extended period of time. The effect of the flood was not limited to Nepal: neighboring Bihar State in India was also affected, with nearly 400 people killed and millions displaced.

According to local residents, flood victims, NGO representatives, and other local stakeholders, the financial and other support of the central government was wholly inadequate. At the same time, local and international NGOs are the main players in the region, providing ongoing support to the flood-affected local community, including not only immediate relief, but also capacity building to

develop entrepreneurial and business skills that can be used to start a small business or find other income-generating work. Some participants pointed out that the government's flood-related projects are being introduced without community consultation and participation, while others focused on issues of transparency, accountability, and corruption. In terms of the government's role in controlling the floods, most participants complained about the lack of initiatives to address the long-term impacts as well as the controversial operation of the Koshi barrage, which requires the urgent attention of local and national government officials, diplomats, and politicians.

5.3. Case findings: Sri Lanka

5.3.1. Prioritizing national climate change policies at the local level

As set out in the country's NDC, the Sri Lankan government has officially agreed and committed to the Paris Agreement and the UNFCCC. In turn, various national policies and regulations have been enacted to support the setting of goals. A member of the Sri Lankan parliament reiterated the government's commitment to achieve the SDGs:

The United Nations–approved sustainable development policy has been passed as a law in the Sri Lankan parliament where it has been agreed to accordingly. And also, we have agreed policy wise to our sustainable development strategy to comply with the UN-approved sustainable development policy (SL05).

The Sri Lankan government is still revising its NDC and has not yet submitted it to the United Nations. As a result, the extent to which the NDC goals have been achieved and what the upcoming amendments will be are not clear. The Department of Census and Statistics predicts that Sri Lanka is likely to make progress on around 40 out of 240 indicators. If Sri Lanka is to achieve its objectives, the government needs to act urgently to localize the SDGs and to share resources among local authorities, taking into account the complex institutional structure at the local level. According to a senior government officer,

The Census and Statistics Department is developing an indicator framework, and they have come up with only 40 indicators out of 240 because of lack of data. So, Sri Lanka is capable of handling only 40 out of 240 indicators ... We can add in the local context and also the need to share resources, although we have different institutions and different mechanisms (SL08).

Several stakeholders who have contributed to the forthcoming NDC revisions from different perspectives informed us about their proposals. According to a senior United Nations project leader, Sri Lanka has proposed including climate migration in the revised NDC, and the panel has agreed to consider the suggestion. Further, two members of a leading climate change think tank confirmed that gender-responsive climate change budgeting actions have also been incorporated in the revised NDC:

We did have some conversations about gender-responsive actions. There's going to be an NDC on it. I was part of the initial core group conversation, but after that

I haven't heard anything ... I think the tourism sector is looking at this, and it was discussed during the first round of NDCs and now, I think, also with the review happening. The climate risk assessment is a very technical thing, and there is not a lot of relevant expertise in the country. One more thing is the need to integrate it into finance (SL06).

While the national government has developed various climate change policies and regulations, several participants noted a clear gap in the implementation of national policies at the local, community, and livelihood levels. In turn, lack of communication is a major obstacle in prioritizing national policies at the local level. A senior public officer commented,

Having a policy will give you the legal background to work for climate change with the government stakeholder and everyone. But parallel to that, these policies should be known by the people as well. I mean, they are on the books, and people are somewhere, and there is no link between them. So, there should be a way for people to get to know what these are and how these things will benefit them (SL12).

In addition to communication issues, the practical implementation of national policies at the local level is a major concern. While policies are very scientific and well formulated, the issue is how to convert them into actions. As a senior disaster expert commented,

Those regulations, strategies, and tools are really good if they are implemented correctly. The issue is that they are not being implemented effectively and, therefore, those procedures are not addressing the issue of climate change (SL03).

However, in some sectors, such as in public health, funding is not lacking; rather, there is little awareness of what needs to be prioritized. Drawing an example from climate resilience in the health care sector, a senior technical expert discussed how their commitment has enabled the sector to get the attention it deserves:

The health sector is lucky. But what is lacking is, I think, awareness and the priority that needs to be given to climate change. We will be able to invest in the sector either through broader funding or through funding from the World Health Organization or from the Asian Development Bank or from other sources; funding is not an issue. We continue to build new buildings, but the challenge we have now is advocating to make them more resilient. It's not lack of funding but rather a lack of awareness and prioritizing, among and within the sector, for incorporating safety and climate resilience into our plans (SL02).

Most participants agreed that local governments are prioritizing natural disasters caused by climate change. Local authorities are well aware of disaster management procedures, practices, and financing mechanisms. Yet, as proposed in the NDCs, integration and implementation of national climate change policies within local government have been largely ignored.

5.3.2. Integrating climate change into national and local government budgets

The government focuses predominantly on disaster management and relief operations. Similarly, the national budget prioritizes activities related to disaster management; it does not address the long-term impacts of climate change. A senior public officer from the Department of National Budget confirmed that, at present, Sri Lanka does not have a specific climate change budget:

When considering our budget, there is an expenditure-based budget and there are sector budgets, like defense and agriculture. Some part of the climate sector will be covered in those sectors. However, we are not preparing a separate budget for the climate (SL01).

Although climate change policies and plans are well established and agreed at both national and international levels, the national budget is less likely to consider climate change in particular. In response to a question about whether the Budget Department considers climate change policies, a senior public officer said,

No, when we are talking about climate changes, we are assuming that there will be a drought or flood in the future. But actually, there are some provisions for the disaster sector, like provisions for flood relief, drought relief, and food allocations for flood victims. For damage to large-scale infrastructure damage like a bridge that has collapsed due to floods, line ministries are expected to do what is needed (SL01).

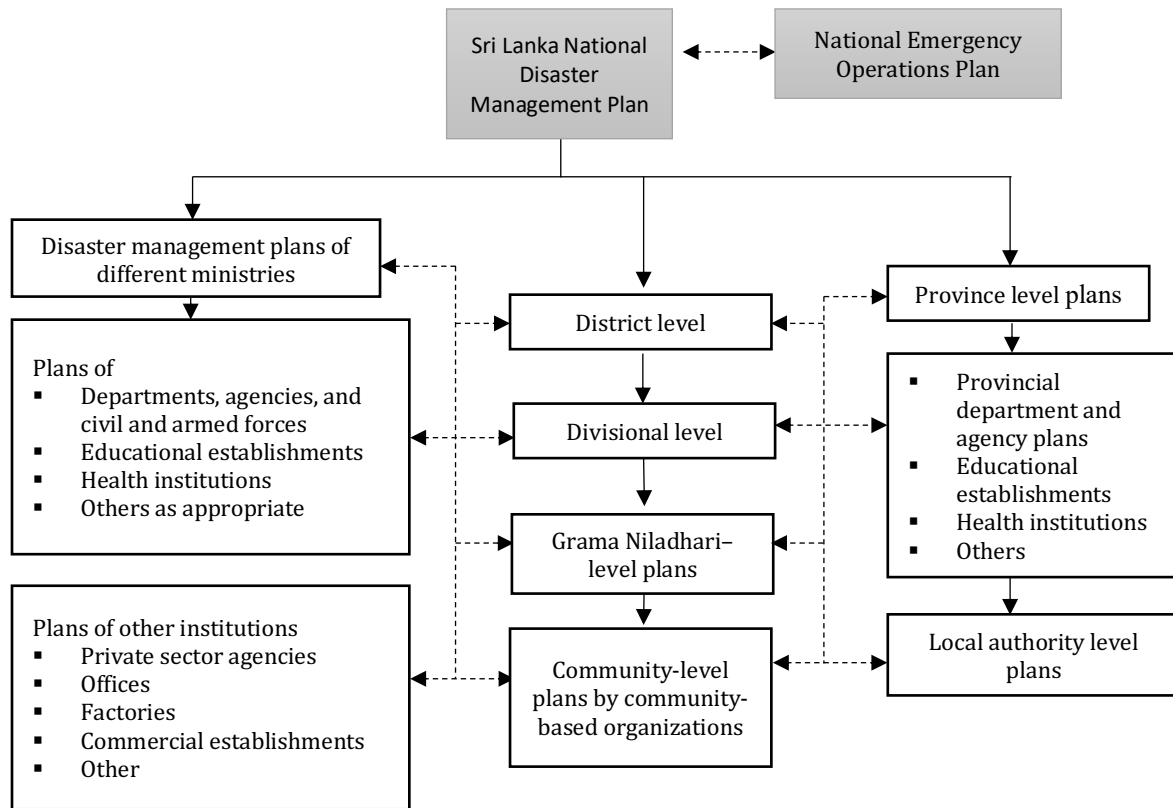
In Sri Lanka the Climate Change Secretariat is responsible for planning and developing climate change policies and practices. The Climate Change Secretariat is established under the Ministry of Mahaweli Development and Environment, and the budgetary allocation is only part of the line ministry's allocations. As a result, national budgetary allocations support primarily the operational activities of the Climate Change Secretariat, instead of contributing to the broader climate change policies as proposed in the NDC. Most climate change-related projects under the Climate Change Secretariat are therefore funded by international donor agencies such as the World Bank, the ADB, and UNDP:

The Climate Change Secretariat has a budget line. But it's more of a coordinating entity for the activities of line ministries. The activities have to be under those ministries. I don't think they tag activities as being for climate change, but by projects and activities that they submit, but some components are related to climate change (SL06).

The national government does not allocate a specific percentage for climate change. Nevertheless, funds are allocated to line ministries that deal with different aspects of climate change. Specific allocations are made to the Disaster Management Centre, under the State Ministry of Defense, which has regional offices throughout the country. Figure 2 depicts the conformity of disaster management plans at all levels (district, divisional secretariats, and village levels) and in all sectors of Sri Lanka. According to a senior officer in the Budget Department,

When we are preparing a budget for disaster management, we are not considering climate change.

Figure 2: Disaster management plans in Sri Lanka



Several public officers said that, as with a disaster emergency response fund, the government should take immediate action to allocate a specific percentage of the budget to climate change:

Just like a disaster emergency response fund, there should be a mechanism to allocate funds to climate change-related projects; rather than giving them the cash, there should be a long-term mitigation and adaptation mechanism and funds for that (SL12).

Even when allocating funds to the Disaster Management Centre, the Climate Change Secretariat, or any other government institution, the Budget Department considers the foreign funds received by the External Resource Department and lowers the annual budgetary allocations after reconciling them with the foreign-funded projects. A senior disaster management expert explained how national-level budgetary allocations are distributed to local levels and what the alternative approaches are when funding in response to a natural disaster is inadequate:

Initially, the District Secretariat will provide funds for the basic needs of those who have been affected for three days and only at the District Secretariat level. After three days, the government will provide the funds for their requirements. Meanwhile, we contact NGOs and other organizations, and we will get assistance

from NGOs as well. As an example, we prepare a Monsoon Awareness Plan, and if there is a crisis situation during the monsoon season, we work according to that plan. Before the monsoon starts, we conduct a coordinator meeting with the relevant authority, especially government organizations and NGOs. In the coordination meeting we discuss the matters and deploy the funds accordingly (SL03).

Participants emphasized the urgency of integrating a climate change budget into the national budget. According to a member of parliament, Sri Lanka is lagging behind the achievement of climate change targets due to its failure to allocate a specific percentage of the annual budget; the Budget Department should consider this allocation to be essential and should pass it down to the local and council budgets accordingly:

One reason is that a budget allocation has not been created for climate change. Globally, if we take the trend, a percentage of the annual budget is usually allocated and separated for climate change. And this percentage is increased annually. However, in reality, in Sri Lanka there is no allocation specifically to address climate change in the budget ... I strongly believe that a percentage should be included in the annual budget that is allocated specifically for climate change. And that is our opinion. If this happens in the central government, it will be a model for the provincial council budgets as well as for local council budgets. Hence, it is a responsibility of the Budget Department to consider and make an allocation for climate change in the annual budget (SL05).

A senior officer from the Budget Department said that it is unrealistic to predict such allocations, given the country's severe economic downturn:

It would be more effective if there were a climate budget. But the problem is that we don't have the economic capacity to allocate such a budget for climate change. We are looking for the day-to-day expenses, and we don't like to hold such amounts. I think it would be good if there were a budget, but we cannot do it practically yet. In the next year, there would be less allocated for climate change (SL01).

Due to its severe financial difficulties and excessive government debts, Sri Lanka has not yet implemented a nationally accredited climate budgeting system. In the absence of such a system, a limited budget is allocated for emergency and disaster risk reduction operations to assist communities during adverse climate threats but not necessarily to address climate risk.

5.3.3. Integrating climate change investment priorities into livelihood strategies: Floods in Western Province

5.3.3.1. Impact of climate change on livelihood strategies

While Sri Lanka makes a minimal contribution to global warming, the country is especially vulnerable to climate change, including flash floods, landslides, high temperatures, droughts,

changing rainfall patterns, and sea-level rise. The adverse impact of climate change is influencing every aspect of society. Table 4 shows the impact of climate-related disasters in Sri Lanka.

Table 4: The impact of natural disasters on livelihoods in Sri Lanka, 2015–17

Impact	2015	2016	2017
Deaths and disappearances	123	263	509
Injured	69	70	348
Affected population	535,744	1,533,144	3,386,466
Houses (completely destroyed)	685	952	2,679
Houses (partly destroyed)	6,438	7,279	46,903

Source: Disaster Management Centre 2017.

Floods cause the most hazardous disasters in Sri Lanka. Table 5 depicts the damage to livelihoods caused by floods over three years.

Table 5: The impact of floods on livelihoods in Sri Lanka, 2015–17

Impact	2015	2016	2017
Deaths and disappearances	16	26	210
Injured	18	22	124
Affected population	237,616	448,833	676,809
Affected families	6,1347	110,596	174,186
Houses (completely destroyed)	423	385	1,411
Houses (partly destroyed)	5,112	2,549	11,946

Source: Disaster Management Centre 2017.

The impacts of flooding in Western Province have both man-made and natural causes. Western Province is located in southwestern Sri Lanka (see the map in appendix C). Covering a land area of 3,684 square kilometers, the province is surrounded by the Laccadive Sea to the west and Northwestern Province to the north, Sabaragamuwa Province to the east, and Southern Province to the south. Western Province consists of three districts (Colombo, Gampaha, Kaluthara), including the administrative and commercial capital of Sri Lanka. As the most urbanized province in the country, Western Province is extremely vulnerable to recurrent flooding due to higher and heavier average rainfall, coupled with an increase of informal infrastructure and rapid growth of the urban economy.

The Kelani River has been the main source of flooding in Western Province for several years. The 2016 flood was one of the most severe hydrological hazards faced by people living in the Kelani River basin. The Kelani River crosses Colombo and Gampaha Districts in Western Province. A senior public officer shared the findings of a study on Kelani River floods, conducted by the Department of Irrigation:

The river that has caused a lot of flooding is the Kelani River. We understood that 20 years ago. The level of flooding caused by the Kelani River was compared to the massive floods during 2006 until 2017, and the levels were very high. The main objective of this project was to create a flood protection dam from Hanwella to Kaduwela because this flooding is coming from the Kelani River. There is an obvious threat to the community in Colombo because of this flooding. I think this is an example of increase in climate change in Sri Lanka (SL16).

In addition to floods caused by changes in rainfall patterns, human activities have also exacerbated floods beyond the river basin areas, including illegal sand mining, lowland reclamation, and informal settlements in the river basin. According to a disaster management expert,

The main reason for flooding is blockages of waterways. Natural waterways are blocked because of human activities. I think river depth has decreased because of soil erosion. Human activities such as sand mining cause flooding even when rainfall is low. Riverbank erosion has also been a factor (SL02).

5.3.3.2. Impact of floods on community livelihoods

Recurrent flooding is severely affecting every aspect of livelihoods. Participants shared their personal experiences, including the death of family members, loss of livelihood, internal displacement, and damage to properties. A flood victim from Pugoda, Colombo, lost his entire family, his business, and his livelihood due to the flood in 2016:

In 2016 the flood directly affected me. My pregnant wife and my mother-in-law, both of them died due to the floods. I attempted suicide several times... For more than two years, I did not work anywhere. At that time, I became alcoholic. This is not the world I wanted. Now I am living in Piliyandala area because of what happened at that time. That area is facing flooding at least once a year or some period of the year. The flood comes from the Kelani River. At that time, I had two cars and seven bicycles, and I rented out those seven bicycles to embassies. I had a good income, and I bought that property on my own. At that time, I had everything, but now I have nothing. I am sorry to say that I had to sell up, and I use the money for alcohol instead (SL20).

The flood victims also told us about the welfare and relief benefits they received from the government. In the 2016 flood, if a person died, family members were eligible to receive SL Rs 100,000. However, the amount varied depending on contextual factors, such as political connections:

A person only received SL Rs 100,000. But they did not give or propose anything for damaged houses or other properties damaged. I got SL Rs 200,000 for my wife and mother-in-law. I gave that money to the temple (SL20).

A businessman who also experienced severe flooding shared his experience of internal displacement and economic loss:

During the flooded period, my shop was closed for around 10 days, and we were submerged in around 3 to 3.5 feet of water. We were upstairs for several days without electricity. All our belongings were already submerged, and we couldn't carry them to a safer place. Then we went to Dehiwala and stayed there for three days and then moved to Mabola ... First, I got SL Rs 5,000, and the next time, I got SL Rs 10,000, and that's not enough. However, some other people helped us, and we managed somehow (SL21).

Several flood victims spoke of how recent public investments led to natural disasters and endangered community livelihoods. In particular, unplanned construction and long-term investments affected both the community and individuals. A flood victim explained how the recently constructed southern highway is threatening livelihoods:

I am living in Maturajawela mass land in Kelaniya. When it comes to the southern monsoon, my place is vulnerable. Through development of the southern highway, the rainwater has no place to run other than to inundate our houses. Basically, every year this monsoon has the same impact on our lives. The government demarcated some areas to absorb the water through a motor pump back to the sea. Even though I live in an elevated area, people around me encounter various issues like starvation, and due to lack of shelter, people live on railroads as well (SL04).

Public officers mentioned irregularities associated with the climate investment funds distributed to communities. There are also growing concerns about whether allocated funds are being used for the relevant purposes. According to a senior government officer,

I have an experience in which the victims of floods were provided with funds to rebuild their houses. After giving them the first installment, the Divisional Secretariat Office rejected other installments, saying that funds had not been allocated yet. The people protested against these actions (SL17).

Another senior public officer confirmed that government estimates are substantially lower than the damage caused by disasters:

Most of the time, if the house is severely damaged, they get funds to rebuild it according to the government estimation. It is not enough to rebuild their houses as they were before. It is the practical scenario. There is a quantity that can be given, and there are limits. The amount that is destroyed and the value they get will never be the same (SL01).

5.3.3.3. Livelihood strategies and climate investment priorities

In response to increasing impacts from climate change, the government has initiated and completed some important projects, focusing primarily on waste, water, air pollution, and floods. While several projects have met community objectives, doubts have been cast on the effectiveness of other projects. A flood victim described the initiatives taken to control the floods in the Kalutara area:

In Kalutara, these days the government does one thing, which is that they filter the estuary, and, because of that, the flood level is lower. Sometimes in the usual month of rain, which is March, we don't get any rain. So, then the water levels of the river fall. At that time, sea water comes into the river, and it is a huge problem. That time the government again filtered the estuary. They have implemented water projects like this in the Horana area in the Kalu River, but the government doesn't have an exact solution for this (SL22).

An employee working for the Colombo Municipal Council also shared a success story of how a newly established waste management power plant delivered its intended benefits:

Earlier we faced a lot of difficulties when we disposed garbage. We discharged garbage into the environment, and sometimes we separated the decaying garbage to make compost. Now we don't have to do that. We directly put the garbage into the plant, and they make electricity. They are using that electricity to run their machines at that plant ... It is built by China, but the Colombo Municipal Council is mainly maintaining it. It is a solution for households' garbage problem as well as the town's garbage problem (SL18).

However, for flood victims, community demands and government climate investment priorities seem somewhat contradictory. In particular, many flood victims have established informal activities near the riverbanks. Other informal settlements have also been established, with the support of political patronage. A senior disaster management officer commented that the government should take appropriate actions to invest in a new housing scheme to resettle informal communities living close to the Kelani riverbank:

Communities residing along the riverbank have gotten used to this situation, and government should take an appropriate action, because they are settling very close to the riverbank. The government should initiate a new housing scheme for these people; otherwise, they will get used to this situation (SL03).

Several livelihood support officers and flood victims emphasized the importance of connecting resettlements to the environment and culture of the community. Resettlements driven by climate change socially affect the community's employment, culture, and environment. Participants raised the need for a policy framework for housing development and a resettlement action plan. A flood victim suggested that any new housing scheme should be established as close to the river as possible.

The government should provide a solution to the people who are living near the river dam. Those houses need to be built in the same area. That is the main thing they have to do to protect the people's lives. The livelihood of these people is centered around this area. They are not ready to leave their jobs. Some people are laborers, and they cannot go outside Western Province and cannot make money because their living and everything is in the Colombo area (SL21).

The community also questioned the effectiveness and efficiency of some of the investments that had already been made. A flood victim told us that the tsunami alarm system was the only disaster prevention mechanism that was functioning:

The Sri Lankan government has some departments to address the damages arising due to climate change or any other disaster. But they will come after the event. They only have tsunami alarms, and there is no way to inform the people prior to a disaster occurring. People will call 119 or 118 or NAVY that a flood is coming. Until that point, the authorities have no idea (SL20).

While the government has invested a considerable amount of money to support agriculture, a livelihood support expert commented that climate investment projects focusing on flooding and

agriculture do not have a clear master plan. As a result, stand-alone projects initiated by stakeholders are less likely to deliver the intended outcomes. The government should develop a master plan by consulting diverse stakeholder groups that are involved in climate change initiatives, and, importantly, should consider beneficiaries' views proactively. Similarly, once a new project is started, it should be continued until its completion, instead of allowing different stakeholder groups to launch similar projects. An agriculture livelihood officer told us,

Farmers are living in the most affected areas of drought and flood. If they know about mitigation, it's good. In government projects, I don't see a proper plan to direct the water into lagoons. These are stand-alone projects. There is no master plan on flood issues. When projects are delivered by NGOs or the private sector or anyone else, they should have a master plan (SL10).

Climate investment projects should focus on modern technological best practices and innovations to maximize limited resources. Several government projects have resulted in unintended consequences, raising serious concerns over whether the intention to address real climate issues is genuine. A livelihood officer commented,

What I can say is, the government can have technologies to use the land wisely without cutting the jungle and to increase farmers' knowledge of how to use fertilizers. Farmers use whatever is marketed on television. Knowledge about tree cultivation needs to be prioritized, as does the use of water, and these kinds of plans should come from the government. New farming methods should be introduced like in other countries. Sri Lanka is totally backward in these practices. We can introduce these methods, and in doing so, we can mitigate climate issues (SL10).

Human encroachments on natural resources such as Ramsar wetlands, beaches, and secured forests are increasing, creating an urgent need for government to invest in protecting these natural resources. Participants expressed their concern that government failures or delays will undermine climate change mitigation efforts. A senior government adviser on public transport offered the following suggestion:

Ramsar wetland protection is one of the most important things that should be addressed by the higher-level authorities; moreover, the government should declare these precious natural places to be protected, which is the only way to safeguard those lands. In a country, there should be development, but the development should not destroy nature; such development should be prohibited (SL04).

Several public sector banks and financial institutions have initiated lending facilities to support businesses that invest in climate change-related projects. Under the Central Bank's Sustainable Financial Initiative, the government has enacted several regulatory and policy frameworks, encouraging public sector financial institutions to support climate investment business priorities. A sustainability manager of a leading public sector bank commented on these initiatives:

My organization understands climate change, and my organization has a role to play in helping the country to mitigate climate change. Most of our business strategies take climate change into consideration ... For instance, Colombo had a huge flood recently. Through the bank, the government provided subsidies, funds,

and some relief for flood mitigation even for low-income people. We also support agriculture investments, with part of the funding coming from the government. We support both mitigation and adaptation (SL09).

5.3.3.4. Community perceptions and involvement in climate investment priorities

Due to lack of awareness, poor implementation mechanisms, and regulatory ambiguities, the community perceives climate investment initiatives as short-term survival tactics, instead of long-term sustainable strategies. For instance, even for a small flood, most urban communities ask for survival and relief packages from the government. A senior public welfare officer explained how quickly community demands are made for food and financial relief:

They actually now expect relief even when water levels only rise slightly. They immediately call the Urban Council commissioner saying, "Please help us" and "We need lunch and dinner." They know that the Urban Council or Secretariat will meet their request, and now they are used to it. Last week there was a slight water-level rise, so they called the commissioner at 4.00 p.m. and said that they were facing a flood situation and that they needed our help and needed to be provided with a meal. There were almost 200 families, totaling 500 members (SL03).

Changing community attitudes toward climate investment priorities has been challenging. Lack of awareness and traditional livelihood practices tend to prevent communities from recognizing the gravity of climate change impacts and, in turn, mean that communities are unlikely to support climate investment projects and practices. A livelihood project manager shared his experience:

We tried a few activities to help farmers to increase their yield and to be good farmers, but they do not have the right attitude to learning or understand what we are trying to tell them; they try to go with the knowledge they have. Only 5 percent were interested; others did not listen and did not get the knowledge. The government, through the Agriculture Department, provided information on weather pattern changes, but the farmers didn't take in that knowledge. They went with their instinctive knowledge, rainfall increased, and yield dropped, and so they suffered losses. If they had followed instructions, they could have harvested a lot of yield. They don't change the way they farm to adapt to climate changes that are happening now. Climate change is a big missing part of the livelihood project that we are working on (SL11).

Concern was expressed over the government's approach to community engagement in addressing climate change issues. The government does not ask for public opinions as to whether projects are beneficial for the community or not and does not consider community views when they initiate new projects or implement new practices. For example, a flood victim spoke about the quality of a dam to prevent floods and the government's poor response to requests for maintenance:

Actually, the project started in the flooding area. The engineers haven't investigated what is going on. I have seen with my own eyes that the dam is very damaged. So, when it rains, the dam leaks. They had no awareness of this. Sometimes I have complained to them that there is a leak, but they have not sent

anyone to look into it. Sometimes people and the NAVY have used sandbags, but this is not a long-term solution (SL20).

As a result, the community has little faith in the quality of government climate investment projects. In particular, government bureaucracy, corruption, and administrative complexities have all contributed to the negative image of government projects. One flood victim spoke of the bribery and corruption that accompany the implementation of climate investment projects:

The quality is a joke. In Sri Lanka if the government is involved, they will not do it properly. I have some experience, and I have been involved in some government projects. We have to give lot of commission to government officers. It could be a form of donation or some other way, but we have to give a commission to that person (SL20).

Climate mitigation investments and adaptation projects suffer from a lack of clear focus. According to a member of parliament, the government needs to integrate climate change urgently and proactively into development strategies:

The policy makers only consider physical development. They do not think of the social effect or the impact of it on climate change, only about rapid development methods. The present government is following a fast-track development strategy. Even though it's a good approach, they should definitely consider climate change as one component of it (SL05).

A key issue in integrating climate investment priorities into livelihood strategies and public budgeting is lack of awareness among both policy makers and the general public. Even members of parliament who make policy decisions are not necessarily knowledgeable about the causes and consequences of climate impacts:

Frankly speaking, neither the general public nor the members of parliament who make the policies have enough knowledge about climate change ... I believe a good awareness program should be developed for parliament members as well as other relevant representatives in local government. The general public should be aware of climate change, and its consequences should be conveyed through a broad awareness program that is funded as a part of budget allocations (SL05).

As a first step, the central government should involve regional governments in rolling out an awareness program that explains the long-term impacts and drivers of climate change:

I think most of them are not aware of and don't have much knowledge of climate change. I think it should start at the school level. Firstly, we should change students' attitudes and teach them to protect our environment, teach them about the bad effects of using polythene and that human well-being is also dependent on the protection of the environment. A proper awareness campaign is needed on this issue within the community. The main reason for all the issues is a lack of public awareness. This campaign should be done through the government or a United Nations agency (SL04).

Another major impediment in achieving the set objectives is a lack of consistent government policies to continue and complete initiated projects. According to a senior public officer, government and policy changes directly influence project outcomes:

We have been working on an integrated water management project for four years in Kurunegala. But suddenly, with the changes to policies and ministries in the current political situation, we are in a very challenging situation where we cannot conduct the project activities at the ground level. There should be one state policy and funding allocation in the first place, so with the dynamic situation, organizations and people won't have to face challenges like this (SL12).

5.3.4. Alternative funding and resource mechanisms to enable climate investment priorities

Due to lack of government financial resources to invest in climate projects, alternative funding and resource mechanisms have played a critical role in supporting communities in the aftermath of natural disasters. The public sees the community, voluntary groups, and NGOs as quicker and more reliable than the relief mechanisms put in place by the government. For example, religious places are well developed and can provide temporary emergency help for flood victims:

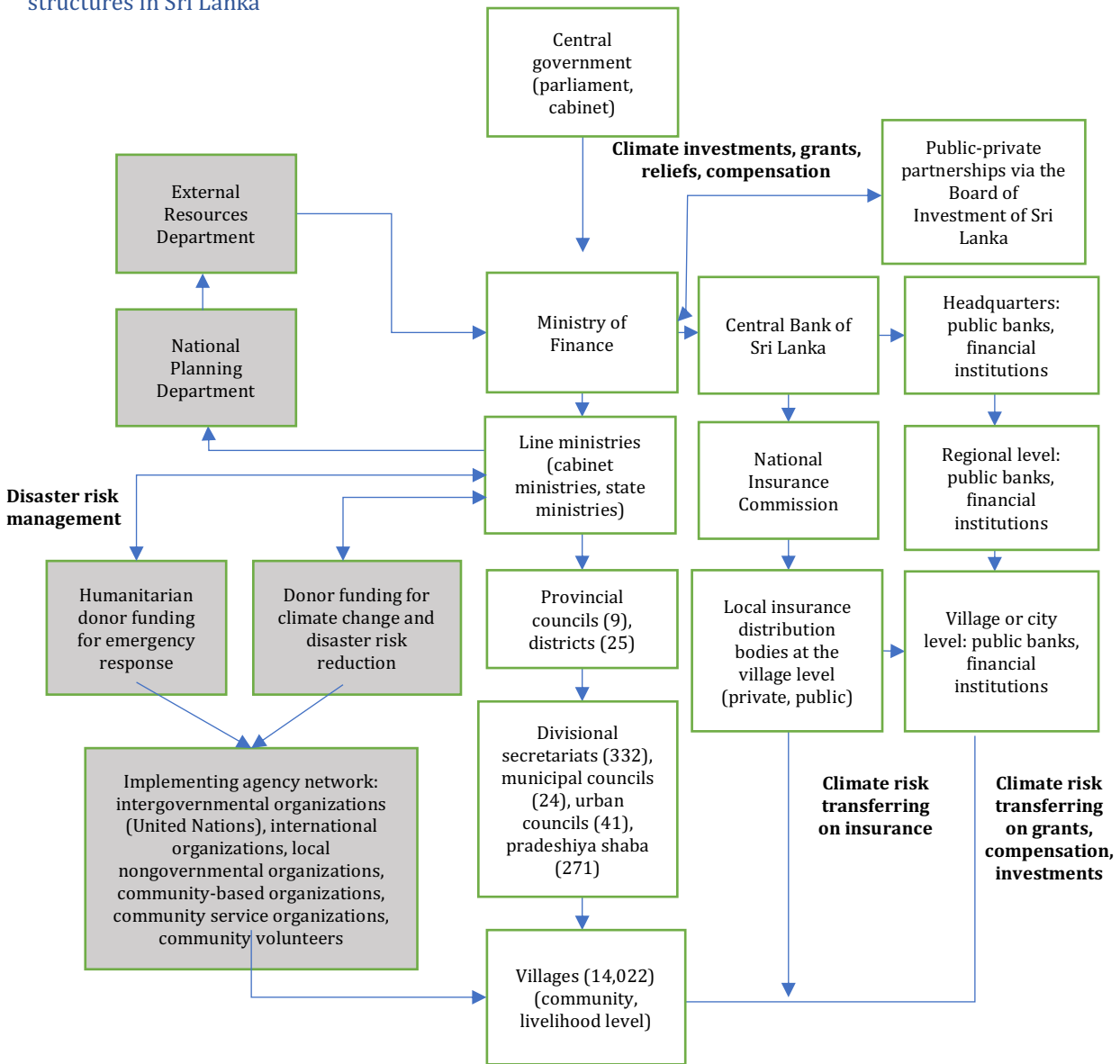
In terms of community resilience, what happens is if people get flooded or whatever the disaster, they will run to the church, kovil [Hindu temple], or to the [Buddhist] temple. That is why we named this project as Pillars of Resilience. Religious places are well built with good facilities. They are really a safe haven, even during the worst of the times, and so people go there (SL02).

While there are several sources of funding besides international and private organizations, those funds are likely to support projects with a short-term focus; climate change requires a long-term focus:

We are working with some organizations to get funds at the international level: at the local level, organizations are more into distributing relief through short-term projects. But climate change is more like a long-term disaster, so organizations and the private industrial sector are not enthusiastic about working toward it, because the results are not easily quantifiable (SL12).

Figure 3 depicts the modes of integrated climate change investment in Sri Lanka. The central government uses three channels to reach the community. First, well-established formal administrative procedures are enacted at the district, provincial, urban, municipal, or *pradeshiya shabha* levels to reach the community with regard to climate change investments and disaster recovery. Second, the government implements an insurance scheme through the central bank that is particularly effective for farmers. Third, the government uses public banks to facilitate climate investment-focused loans and livelihood support. Donor funding agencies (shown in gray) focus primarily on disaster risk management and urgent recovery support. To implement projects within the community, foreign funding is channeled through the National Planning Department and the External Resource Department.

Figure 3: Integrating climate change and livelihoods within public investment policies: Integration structures in Sri Lanka



5.3.5. Summary of findings: Sri Lanka field study

Sri Lanka has become increasingly vulnerable to the impacts of climate change. In response, the national government has enacted various policies and agreed to lead on international conventions and agreements, including the Paris Agreement.

The country has set clear policy priorities to address climate change impacts and to achieve the SDG goals. However, due to lack of reliable and integrated data sources, there is no clear evidence of the extent to which the set objectives are being achieved. As a result, efforts to set up new climate change agendas and revise the country's NDC are overly complicated.

The national budget does not allocate a specific percentage to climate change mitigation. Only line ministries and sectoral departments receive budgetary allocations with some emphasis on climate-related matters. The current practice is to allocate an emergency or disaster risk reduction fund to assist communities during adverse climate threats, but not necessarily to address climate risk. Policy makers seem to believe that the budgetary allocations made to disaster management constitute a climate change budget. However, most public investment focuses on short-term disaster recovery rather than on long-term prevention.

A substantial part of climate change-related investment projects is funded by foreign donor agencies. The Budget Department, with recommendations from the External Resource Department, considers these foreign-funded projects in the budgetary allocations for climate change-related projects. In turn, allocations for climate investments in the national budget depend on funds received by international donor agencies.

Budgetary allocations to local government authorities are committed largely for emergency relief, not long-term investment in climate priorities. The use of funds allocated to the local government is of questionable effectiveness and efficiency. Similarly, local government authorities are likely to be overly reliant on donor agencies, not national budgetary allocations.

Except in a few cases, many public investments in climate change-related projects are misaligned with the interests of the community and their livelihood strategies. Various factors contribute to this misalignment, including lack of community participation in the design and implementation of livelihood projects; political will and a culture of political patronage; lack of technical expertise; administrative bureaucracy; regulatory inconsistencies and irregularities; and lack of awareness among the general public and, it seems, politicians.

Finally, the community is not as proactive or as supportive of climate change priorities as needed. The community is likely to perceive climate investments as narrowly focused survival tactics. Lack of awareness, resistance to change, loss of livelihood, poverty, and reliance on short-term financial benefits reinforce the community's lack of support for climate change investment priorities.

6. Discussion

The first part of this study draws on a content analysis to describe climate change policies adopted by India, Nepal, and Sri Lanka, countries that are especially vulnerable to climate change. As expressed in their NDCs and NAPs, the three countries have set clear national priorities for addressing climate change that are to be achieved by 2030. Five years after the Paris Agreement, the governments have invested a considerable amount of public money in various climate change projects.

In all three countries, the central government has undertaken national initiatives. While Nepal has revised its NDC documents, indicating the country's achievements and setting new targets for 2030, the progress achieved in its earlier NDC is not clear. A key concern in India has been the difficulty of channeling national action plans into state action plans and integrating them with

community and livelihood strategies through local action plans. Sri Lanka's commitment to achieving its NDC targets is also unclear due to the limited progress made. However, all three countries have unexplored, untapped potential for climate investment. National budgetary allocations have focused on priority areas, including renewable energy, waste management, sustainable agriculture, sustainable transportation, sustainable construction, and disaster management.

Despite having set clear investment priorities in line with their NDCs and national action plans, none of the countries has explored alternative funding sources sufficiently. For example, given long-standing internal and external conflicts, Sri Lanka commits a significant portion of the budget to defense (SL Rs 440 billion), leaving insufficient resources for achieving the country's climate change targets. While defense allocations are important, the government should reflect on the critical areas for a sustainable future.

In Nepal recent studies have assessed the progress made toward achieving the targets set in its NDC 2016 document (for example, Climate Action Tracker 2020; Clean Energy Nepal 2020; Singh and Khadka 2020; Upreti 2020). While the country has placed climate change at the top of its priorities, plans, and policies, effective implementation remains problematic. For example, according to the 2018/19 economic survey, 342 participatory local adaptation plans reportedly have been prepared under the Climate Change Minimization and Adaptation Program, but the implementation of LAPA has been ineffective, and environment-friendly local governance in village development communities and municipalities has been discontinued. Accurate estimates of loss and damage caused by climate change are also lacking. The country's economywide emissions reduction target, the Climate Action Tracker, does not provide any ratings for Nepal's NDC; more clarity is needed in the upcoming NDC.³¹ Progress has been made in the forestry sector, but achievements in other areas are lagging.

All three countries have invested a considerable amount of money in renewable energy. Governments have also prioritized solid waste management, water management, sustainable agriculture, sustainable transportation, and sustainable construction. The majority of the population in these three countries depends on agriculture for survival, and sustainable agriculture should be prioritized for future public investments.

All three countries have proactively considered PPPs involving both local and international partners and have established clear PPP guidelines and policy frameworks complying with NDC and NAP priorities. In Sri Lanka, the National Agency for Public-Private Partnership was established under the Ministry of Finance to manage all PPP contracts. India and Nepal have similar arrangements. In a recent study, the IFC recommends that governments in South Asia consider the potential for private investment to address climate change challenges (IFC 2017). The report estimates potential private sector investment to address climate change of US\$3.4 trillion in six South Asian countries (US\$171.8 billion in Bangladesh, US\$42.3 billion in Bhutan, US\$3.1 trillion in India, US\$1.9 billion in Maldives, US\$46.1 billion in Nepal, and US\$18.4 billion in Sri Lanka) between 2018 to 2030. While several initiatives are under way, governments should create an environment that is conducive to channeling private sector investments to the climate change agenda.

³¹ Nepal submitted its second NDC in December 2020.

In all three countries, governments have allocated budgets for several climate change initiatives, but such investments often fall short of expectations. More specifically, the extent to which climate change investment priorities have been achieved is difficult to determine. It is also not clear whether the invested funds have been used to achieve the objectives set out in the NDCs and NAPs. As a result, the extent to which future investments realistically reflect key climate change priorities and whether such projects deliver value for money are matters of concern. Governments in these three countries should therefore establish reporting, performance evaluation, and monitoring mechanisms for climate change investment projects and activities. Climate finance and investment databases need to indicate clearly the amount of money spent or budgeted for climate change-related projects.

While NDCs and NAPs have proposed comprehensive climate change targets, priority has been given to investments with the potential to engender commercial values. In India and Sri Lanka, for instance, areas such as biodiversity and coastal conservation have received relatively little attention, and budgetary allocations for these sectors are significantly lower. Coastal conservation is critically important in Sri Lanka, and unplanned investment in coastal conservation areas has led to further environmental deterioration. In Nepal private sector investment dominates health and education but is lacking in sectors like energy, transportation, and waste management. Private investment would help the government not only to achieve its NDC targets but also to improve the quality of life of its citizens and achieve its SDGs.

Although climate change policies and strategies appear to be well developed at the central level in all three countries, our findings reveal a different picture: central policies and programs are poorly integrated into the state and local budgeting process. Policies and strategies issued at the central level emulate those prevailing in advanced Western countries. For example, Nepal has very advanced policies, plans, budget codes, and frameworks and is in the process of preparing a NAP. However, such policies and plans are poorly integrated at the provincial and local levels and rarely are given priority in the planning and budgeting process. In addition, the national budget in Nepal allocates a specific amount to climate-related activities, and the Climate Change Policy 2019 requires 80 percent of climate-related funding to be channeled to the local levels. However, an absence of adequate mechanisms for separating climate-related activities from other government activities plus the lack of appropriate accounting systems for measuring and reporting the climate budget and investment at the local and state levels have undermined initiatives undertaken at the central level.

In India local authorities in some states (Kerala in this case) have continued to prioritize disaster management and disaster risk reduction instead of long-term climate change agendas. All states in India are required to develop and implement SAPCCs in line with the national plan. However, the extent to which the plans are executed in practice varies across states, with Kerala and Orissa at the forefront of adaptation. Increasingly, state departments have started incorporating climate change into their regular planning process. However, climate change policies and strategies are misaligned at the central and local levels.

In Sri Lanka, the climate budget is handled by the Climate Change Secretariat, which works under the Ministry of Agriculture. Funds are allocated to line ministries based on their proposed climate-

related activities. Climate funding is subsumed within disaster management, and allocation is made considering both international resources and internal allocations. Disaster management centers operate in most districts and villages of the country. However, stakeholders, including politicians, are increasingly pushing for a separate climate change budget covering both prevention and preparedness activities and aligned with the national budget. The lack of a climate change budget has limited the country's attempt to achieve both SDG and NDC targets. Although Sri Lanka has set its climate change-related targets and SDG goals, in the absence of reliable and integrated data, there is no clear evidence of the extent to which these objectives are integrated at the state and local levels. Both India and Sri Lanka have established disaster management centers and other government institutions through which to channel climate funding.

With regard to the implementation of centrally developed policies, plans, and strategies, key challenges persist at the local level in all three countries. Climate change has been outlined in government plans and projects, but no mechanism has been put in place to ensure that these objectives are achieved. A proper mechanism, including a channel for disseminating policies and strategies at state and local levels, is largely absent. Even when such policies and strategies are passed on to the state and local levels, the lack of well-trained and committed bureaucrats and local leaders, along with inadequate resources, has prevented their implementation. These findings are in line with prior studies (for example, Paavola 2008), which argue that limited government capacity and resources make implementing policies and plans difficult. Policies and strategies developed at the central level often have proved to be rather technical and inapplicable, which has discouraged local governments from embedding and prioritizing national policies and strategies.

In Nepal lack of awareness about climate risks, lack of human resources and technical expertise at the local level, lack of political support, and lack of access to climate funds are some of the key issues. In India many states have yet to implement SAPCCs, despite incorporating them within their annual plan. The presence of environmental champions, supported by political leadership, are well-recognized enablers of climate change adaptation within local governments. As Pasquini et al. (2015, 60) conclude, "Access to a knowledge base, the availability of resources, political stability, and the presence of dense social networks all positively affect adaptation mainstreaming."

Limited planning has led many Indian states to allocate funding in a manner similar to their approach to disasters: planning for preparedness is absent in some cases. In many instances, priorities are different at the central level and the state or local level, and limited communication between the stakeholders widens these variations further. Support exists for setting up a climate change fund, similar to a disaster emergency fund. For instance, in Sri Lanka the health sector was incorporated into the climate resilience strategy of the central government after being lobbied by local actors. Local politicians' awareness of climate change issues also varies, which has a direct bearing on the implementation of policies and strategies in all three countries. For example, in Nepal there is a need to create awareness through civil societies, NGOs, and political parties, while in India the involvement of NGOs and state organizations has been crucial in building awareness. In particular, in Kerala the state-run training institute—KILA—has introduced several climate change-related measures and campaigns as part of awareness building, drawing the attention of both local politicians and citizens. However, creating awareness and providing resources and

technology may not be sufficient: people may need to make behavioral changes to adapt to climate-related change and vulnerability (Tian and Lemos 2018).

The lapse in local implementation has affected livelihood strategies in all three countries. Erratic rains, floods, droughts, and avalanches (mainly in Nepal) are increasingly frequent, plunging vulnerable households into absolute poverty. Western Province of Sri Lanka is extremely vulnerable to recurring flooding of the Kelani River. Limited attempts to integrate climate investment priorities have prevented the control of illegal sand mining, lowland reclamation, and informal settlements along the riverbank. Flooding has caused deaths and loss of livelihoods, triggering mass displacement. The situation is very similar in the Koshi region of Nepal. Recurring flooding, which was uncommon a decade ago, has destroyed hundreds of hectares of fertile land, affecting the livelihoods of several thousand community members and displacing hundreds of thousands of people, many of whom have been forced to migrate abroad for employment and survival. Such flooding has regional impacts, with the 2008 flood of the Koshi River stretching to the neighboring state of Bihar, India. The projects for flood control developed at the central level are driven largely by international NGOs and donors; in the absence of expert advice and local participation, these projects have been ineffective in addressing local issues.

Such projects seldom reach grassroots levels and vulnerable communities. Being excluded by both central and local governments for decades, many victims and community members rely solely on the support of NGOs. In Kerala, central, state, and local climate change investment strategies are poorly integrated, and most local governments have failed to target vulnerable communities proactively. Community-based climate change adaptation is challenging as well (Archer et al. 2014; Colenbrander, Dodman, and Mitlin 2018; Pasquini et al. 2015). To overcome these challenges, local government authorities could consider integrating the community as a key stakeholder within the wider climate change agenda, reforming institutional structures to enable community inclusion, implementing a collaborative stakeholder and governance approach, and employing participatory research efforts to strengthen community-based climate change planning. For instance, a lack of interinstitutional involvement has been a major impediment to addressing climate change in water management in India (Azhoni, Holman, and Jude 2017).

Few, if any, attempts have been made to engage with expert groups, beneficiaries, and other concerned stakeholders in developing and executing mitigating strategies in all three countries. Instead, unplanned construction, illegal settlements, and urbanization have continued. In Sri Lanka several projects and strategies have been halted either because the allocated resources have been spent or because they have been replaced by new projects, which have suffered a similar fate and remain incomplete. Limited use of technologies and concerns over the optimization of scarce resources have further undermined the efficacy of such projects. Climate change programs need to address the livelihoods of climate-vulnerable communities and ecosystems in all three countries.

Limited knowledge and awareness of climate change at local levels have further eroded the efficacy of climate policies and investment strategies in all three countries. In Kerala climate change activities focus largely on executing carbon-neutral programs to the exclusion of many other activities with wider societal benefits. Other areas that are central to climate change investment priorities, such as health and forestry, have also drawn little attention. In all three countries, locals are largely unaware that climate change is causing the recurring disasters affecting

their lives and livelihoods. They lack any forums or opportunities to learn about the consequences of climate change or to make their voices heard about climate-related projects, interventions, policies, and strategies. They do not participate in efforts to address issues that can have a lasting impact on their lives and livelihoods. Adaptation projects are therefore largely disconnected from livelihood ethics and dimensions, and local governments have drawn criticism for their failure to reach out to poor and vulnerable communities.

Government support to protect vulnerable communities from the effects of climate change and related disasters is meager, and all three countries are seeking alternative resources and funding mechanisms to fill the gap. Community groups, voluntary groups, and NGOs are increasingly involved in disaster management and efforts to address climate change, and the private sector has begun to show interest in climate change investment. This interest has created investment opportunities for private banks, triggering a rise in PPPs in areas such as waste management. Such opportunities are especially evident in Sri Lanka. Mainly in Nepal, entrepreneurial and business training and skills development programs run by NGOs have helped to improve the livelihoods of the poor and vulnerable.

Access to climate finance is needed to help provincial and local governments to prioritize climate change in their planning and budgeting processes. The extent to which climate finance is distributed to local authorities will help to minimize both procedural and distributive justice in implementing climate change policies. National governments should encourage local authorities to adapt national climate change plans through “participatory planning, budgeting, monitoring, and evaluation procedures to encourage citizen participation” (Colenbrander, Dodman, and Mitlin 2018, 902). In particular, how the national government allocates climate budgets to local authorities should be transparent, participatory, and efficient (Orindi, Elhadi, and Hesse 2017). A decentralized mechanism for distributing national climate finance would help local governments to implement public investments that prioritize livelihoods and build community resilience to climate change (Orindi, Elhadi, and Hesse 2017).

Public investment is a key driver of inclusive socioeconomic growth, building resilience against climate change and natural disasters (Schwartz et al. 2020; Xiao, D’Angelo, and Lê 2020). To minimize misperceptions at the local level, policy makers should attempt to encode climate and disaster risks into public investment decisions at all levels. More specifically, policy priorities should be in place to integrate climate-informed public investment management in the upstream stages, including in project identification, prescreening, risk analysis, appraisal, and selection (Le, Leow, and Seiderer 2020). As the three case studies reveal, country-specific, climate-informed public investment management frameworks are needed to accommodate the unique socioeconomic demands embedded in livelihood strategies. To address climate change priorities through effective public investments, governments should incorporate relevant regulatory, institutional, operational, and capacity-building reforms (Le, Leow, and Seiderer 2020). Local governments’ failure to prioritize livelihood strategies within the climate change agenda has been a major impediment to delivering the expected outcomes of public investment projects. Countries with poor infrastructure governance are highly unlikely to deliver strong output for their public investments (Schwartz et al. 2020). While emerging and developing Asian countries need continuous public investments to achieve their climate change priorities, the quality of infrastructure has fallen short (Vu, Bizimana, and Nozaki 2020). The 2020 CRPFM provides a suitable framework with which to assess the

extent to which governments have aligned public investment management with climate change priorities.

Climate-related investment projects in Nepal and Sri Lanka have been funded largely by international resources. While the importance of these projects should not be understated, their implementation has raised concerns. For example, in Sri Lanka the government relies too much on donor funding rather than on the national budget. Similarly, in Nepal the government needs to take advantage of opportunities for private sector investment rather than rely solely on international donors. Further, in Nepal and Sri Lanka many public investments in climate change-related projects are disconnected from the needs and interests of the local community or livelihood strategies. Climate change in local governments is confined largely to disaster management—rescue and relief of victims—and its impacts on the lives and livelihoods of vulnerable community members have drawn relatively little attention. This limited awareness has made central-level policies and investments largely ineffective in mitigating the consequences of climate change for vulnerable communities.

Despite the weaknesses, these countries have been attempting to incorporate best practices within their climate change strategies. As reflected in CRPFM-1, which aims to measure the alignment of budgetary allocations with climate change strategies, the three countries have taken steps to prioritize NDC targets within budgetary allocations, to integrate climate-related public investment projects and reform tax policies, and to promote concessions for climate investments. In particular, India has several policy initiatives to link national government climate policies within the policies of state governments. The CRPFM-2 aims to measure the extent to which national governments track climate-related expenditures. Nepal is a pioneer in introducing a climate change expenditure tracking system, enabling the central government to prioritize investments that support and reduce the adverse impacts of climate change. Given the particular interest in climate-related public investment management, as proposed in the CRPFM-5, all three countries have incorporated regulatory provisions that enable public investments in climate changes in several sectors. These provisions focus on both public and private sector compliance with NDCs. As proposed in the 2020 CRPFM, however, each country needs to strengthen the selection of climate-related investment projects, project appraisals, and institutional reporting. Taking these steps would help to minimize the gaps between climate change plans, policies, and budgetary allocations at both national and local levels. A summary of key findings of the study is presented in table 6.

Table 6: Summary of key findings

Key finding	India	Nepal	Sri Lanka
National climate change missions	<ul style="list-style-type: none"> • National Solar Mission • National Mission for Enhanced Energy Efficiency • National Mission on Sustainable Habitats • National Water Mission 	<ul style="list-style-type: none"> • Agriculture; food security • Water resources; energy • Public health; water, sanitation and hygiene • Urban settlement; infrastructure • Forests; biodiversity 	<ul style="list-style-type: none"> • Food security • Agriculture; livestock; fisheries • Water resources; coastal and marine sector • Health; human settlements; infrastructure

Key finding	India	Nepal	Sri Lanka
	<ul style="list-style-type: none"> • National Mission for Sustaining the Himalayan Ecosystem • National Mission for a Green India • National Mission for Sustainable Agriculture • National Mission on Strategic Knowledge on Climate Change 	<ul style="list-style-type: none"> • Climate-induced disasters • Tourism; natural and cultural heritage 	<ul style="list-style-type: none"> • Ecosystems; biodiversity • Tourism; recreation • Agriculture export; industry • Energy • Transportation
Climate investment priorities	<ul style="list-style-type: none"> • Renewable energy • Sustainable habitat • Sustainable transport • Waste management • Water management; sustainable agriculture • Disaster management 	<ul style="list-style-type: none"> • Clean energy • Forest • Environmentally sustainable transport system • Agriculture • Waste management 	<ul style="list-style-type: none"> • Renewable energy • Waste management • Organic farming; sustainable agriculture • Water management • Sustainable transport • Sustainable construction • Disaster management
Key regulatory priorities that enable public investments in climate change	<ul style="list-style-type: none"> • National Energy Conservation Act (2001) • National Electricity Policy (2005) • Integrated Energy Policy (2006) • Tariff Policy (2006) • National Policy for Farmers (2007) • National Action Plan on Climate Change (2008) • National Afforestation Program, Revised Operational Guidelines (2009) • National Policy on Biofuels (2009) • National Electricity Plan (2012, 2016) • National Mission for Electric Mobility Plan 2020 (2012) • National Agroforestry Policy (2014) • National Auto Fuel Policy; Auto Fuel Vision and Policy 2025 (2014) • National Urban Transport Policy (2014) • Notification S.O. 4259(E) creating the Apex Committee for 	<ul style="list-style-type: none"> • Hydropower Development Policy (2001) • National Transport Policy (2001) • National Water Plan (2005) • National Strategy for Disaster Risk Management in Nepal (2008) • Rural Energy Policy (2006) • Industrial Policy (2011) • Climate Change Policy 2011 • Priority Framework for Action: Climate Change Adaptation and Disaster Risk Management in Agriculture 2011–2020 (2011) • National Framework for Local Adaptation Plans for Actions (2012) • Agriculture Development Strategy 2015–2035 (2015) • Forestry Sector Strategy 2016–2025 (2016) • Renewable Energy Subsidy Policy (2016) 	<ul style="list-style-type: none"> • National Environmental Policy and Strategies (2003) • National Energy Policy and Strategies of Sri Lanka (2008) • National Climate Change Adaptation Strategy for Sri Lanka 2011 to 2016 (2010) • National Climate Change Policy of Sri Lanka (2012) • Technology Needs Assessment and Technology Action Plans for Climate Change Mitigation (2014) • National Disaster Risk Management Plan (2015) • Sri Lanka Energy Sector Development Plan for a Knowledge-based Economy 2015–2025 (2015) • National Adaptation Plan (NAP) for Climate Change Impacts in Sri Lanka 2016–2025 (2016)

Key finding	India	Nepal	Sri Lanka
Implementation of Paris Agreement (2020)		<ul style="list-style-type: none"> • Biomass Energy Strategy (2017) • National Climate Change Financing Framework (2017) • National Urban Development Strategy (2017) • National Forestry Policy (2018) • National REDD+ Strategy (2018) • Environment Protection Act (2019) • National Climate Change Policy (2019) • National Environmental Policy (2019) • Environment Protection Rules (2020) 	<ul style="list-style-type: none"> • Sustainable Development Act no. 19 of 2017 • Sustainable Sri Lanka—2030 Vision and Strategic Path (2017) • National Action Plan for Haritha Lanka Programme (2019)
Climate change priorities at the local government level	<ul style="list-style-type: none"> • Local authorities are expected to set priorities for climate change practices in line with state and national action plans on climate change • Implementation of SAPCC and NAPCC at the local level is largely misaligned • Local government authorities pay more attention to local climate change priorities than to national priorities 	<ul style="list-style-type: none"> • The Local Adaptation Plan for Action was introduced to implement adaptation programs at local levels • Climate change is not given priority by local governments in planning • Climate-related rules and regulations are being formulated at the provincial level 	<ul style="list-style-type: none"> • There are no clear policies as to how national adaptation plans should be prioritized at the local levels • Most local government projects focus on short-term disaster recovery instead of long-term climate impact prevention
Integrating climate change within national and local government budgets	<ul style="list-style-type: none"> • While the national budget allocates a considerable portion for climate change-related activities, the percentage or amount spent on mitigation and adaptation of climate change impacts is unclear • Local authorities are not efficient and effective in spending even the 	<ul style="list-style-type: none"> • The national budget allocates a specific percentage to climate change • 80 percent of climate funding should be allocated to the local level • Climate change is not given priority by local governments in their budget and planning • Introduction of the Climate Change 	<ul style="list-style-type: none"> • The national budget does not allocate a specific percentage to climate change • Only the line ministries and the sectoral departments receive budgetary allocations with some emphasis on climate-related matters • A substantial amount of money for climate change-related investment projects is

Key finding	India	Nepal	Sri Lanka
	nationally allocated budget	Financing Framework and a budget code has not generated expected outcomes	from foreign donor agencies <ul style="list-style-type: none"> Budgetary allocations for local government authorities are largely committed to emergency relief instead of long-term investments in climate priorities
Integrating climate change investment priorities into livelihood strategies	<ul style="list-style-type: none"> Local government authorities have continued to prioritize disaster management and disaster risk reduction instead of long-term climate change agendas Disaster management practices in Kerala have been improving, and local authorities have taken steps to empower the community and strengthen their livelihood strategies Continuous overcommitment to disaster management has undermined the importance and awareness of long-term climate change impacts 	<ul style="list-style-type: none"> Climate-related projects are introduced without community consultation and participation Concerns have been raised about transparency, accountability, and corruption in integrating climate investments within livelihood strategies Lack of initiatives exist to address the long-term impacts of climate change within livelihood strategies Urgent attention should be given to the Koshi barrage operational model 	<ul style="list-style-type: none"> Most public investment projects focus primarily on short-term disaster recovery instead of long-term prevention Most public investments in climate change-related projects are misaligned with the interests of the community or the local livelihood strategies

7. Recommendations

This study has outlined several issues that South Asian governments should emphasize prior to setting up future climate change policies and priorities. Central to these issues is the need to strengthen capabilities, a need that is more concerning than the availability of funds. Capacity constraints have significantly hindered the adoption of climate change mitigation measures at the local level. Capacity building is also of paramount importance to facilitate an effective cost-benefit analysis of climate change-related initiatives at both the central and local government levels. Addressing the challenges of climate change requires expanding and targeting a wide range of investments. Public investments are required not only in physical capital but also in natural capital and human, social, and knowledge capital.

In a similar vein, the need to invest in decentralized strategies across the value chain is striking, given the clear disconnect between national policies and local strategies. Otherwise, local governments may continue to view climate adaptation more as disaster relief, and citizens may continue to perceive climate change as a government problem.

In addition, governments need to strengthen outreach, knowledge, and communication on the impact of climate change. They should develop channels through which information on natural hazards flows into government planning and helps to guide the design, selection, and budgeting of investments.

Lastly, at a higher level, budgets in particular and PFM systems more generally are essential for delivering allocations. However, such allocations are only possible if (a) the fiscal space is available to do so, (b) relevant policies are elaborated, and (c) those with the power to allocate resources are interested in allocating them to climate policies. As such, emphasis should be placed on climate investments, better coordination, and the importance of participation at the grassroots level. The remainder of this section offers policy recommendations for governments in South Asia to consider.

7.1. Integrate central government climate change policies effectively within state and local authorities

All three countries have set clear climate change policies and priorities at the national level. To achieve their targets and address the impacts of climate change, these policies and priorities have to be disseminated effectively to local authorities. At present, the gap between national policies and local implementation is widening, which ultimately means that these policies will have limited impact on the ground.

For example, Nepal is pursuing advanced climate-related policies, strategies, and frameworks similar to those prevailing in developed countries at the central level. However, multilevel governance systems have complicated top-down implementation; the bureaucratic distance between the national and local levels is far, and the constraints to action are many. In India implementation is complicated even in Kerala, which is highly decentralized, has the highest literacy rate in India, and experiences extreme climate events. However, the majority of participants, including government officials, emphasized the urgent need for effective implementation of policies, strategies, and frameworks at the provincial and local levels. All achievements made at the central level of policy making have therefore been questioned. In addition, while devising implementation strategies at the local level, contextual factors and livelihood strategies should also be considered. Doing so would help to align climate change policies and priorities across all levels of government.

7.2. Change the national government policy priorities from “disaster management” to “climate investments”

All three countries have made considerable progress in managing disasters and reducing disaster risks since 2005. Specific allocations for disaster management are provided in the national budget, and, to some extent, implementation mechanisms at the local government level have improved. However, overcommitment to disaster management has substantially undermined the priority given to climate change. In some instances, climate change has been subsumed within disaster management, which has resulted in local governments focusing more on the rescue and relief of victims than on mitigating the long-term impacts of climate change. While disaster management activities are likely to be undertaken from an operational perspective, prioritizing the impacts of climate change should be undertaken from a research-based scientific perspective.

Climate investment is oriented toward the short term (disaster recovery) rather than the longer term (mitigation and prevention). Although national governments are making funding available for climate-related expenditures at the national level, albeit financed by international partners, such funding is no way near the scale required. This issue is not limited to South Asia; other countries are facing similar financial constraints in their climate change PFM reforms.

In addition, India and Sri Lanka have established separate disaster management centers and other government institutions through which to channel climate funding at different levels. These institutional mechanisms have the potential to deliver larger climate adaptation investments involving intensive cross-sectoral coordination. Indeed, they could serve as nodal agencies for broader climate adaptation and mitigation reforms. While developing institutional mechanisms, focus should be placed on modifying public investment policies to address the impact of climate change on livelihoods. Public investment decisions should consider livelihoods, for example, by requiring all projects to assess the short- and long-term impacts on livelihoods in addition to the number of jobs created.

7.3. Establish a separate climate change coordination and monitoring department at central, state, and local levels

As outlined in their NDC, all three countries have made progress in achieving targets in several sectors during the last five years. However, a national mechanism is needed for coordination and monitoring so as to ensure that climate change-related data are reliable and that progress reports are made available to the public. In particular, an integrated database is needed to link all of the sectors and levels of government. These mechanisms would help to address the need for more data and more baseline indicators to track the impact of climate change on livelihoods and jobs. These indicators would allow policy makers to link public investment decisions to climate-related vulnerabilities across sectors.

Governments should develop channels by which information on natural hazards can flow into government planning and help to guide investment design, selection, and budgeting. They also should build capacity to conduct cost-benefit analysis with climate variables at both the central and local government levels. Coordination and monitoring mechanisms should integrate different stakeholders, not least the government, external and foreign donor agencies, the private sector, research organizations, and local communities. Until such mechanisms are established, the use of in-country mechanisms and systems should be prioritized. In this regard, some lessons for coordinating information could be drawn from the establishment of the Climate Change Finance Unit at the Ministry of Finance in India, the upgrading of integrated financial management information systems to track and generate reports on climate budget allocations and expenditures in Nepal, and the establishment of the Climate Change Secretariat in Sri Lanka. The use of information should be monitored; for example, how is the climate report used in Nepal? In the Philippines, climate appropriations inform the Ministry of Finance and Planning about the country's climate response and are presented to parliament as a separate climate budget document. In Nigeria states identify climate projects in their capital budget, and the results are published in the Citizen's Budget.

A performance evaluation and communication process should be established as part of a coordination mechanism and with a view to updating and monitoring climate change-related data and reports. In addition, the voices of local communities and vulnerable groups need to be heard in the process of developing policies and setting priorities.

7.4. Commit a percentage of the national budget to a “climate change budget” and allocate it to the state and local government authorities

Climate change allocation and investment vary substantially across the three countries. While the Climate Change Policy of Nepal 2019 indicates that 80 percent of the Climate Fund should be allocated to the local level, India and Sri Lanka do not allocate a specific percentage of the national budget for climate change. As an urgent matter, these governments should consider introducing climate budgeting and allocating a specific percentage for climate change investments. Doing so requires governments to move beyond disaster response and consider the long-term consequences of climate change. To begin with, governments should separate disaster management from climate change investments. In turn, a majority (for example, around 80 percent) of the national budget should be distributed to local government authorities to help them to implement their climate change policies.

We strongly recommend that the governments set up a mechanism to ensure that the centrally allocated climate change budget reaches the grassroots level, especially vulnerable and marginalized communities. For example, while India has policies mandating the need to develop climate-responsive budgeting proposals, no clear mechanism integrates climate-responsive budgeting across agencies. This results in underresourcing, policy disconnects, and poor policy implementation, suggesting that one agency should be in charge of coordinating government

planning and response in its entirety or, preferably, that climate-responsive budgeting should be mainstreamed within the budgeting process.

7.5. Empower local authorities to source additional funds and to develop a policy framework for using the allocated funds effectively

Lack of funding of local government authorities, mainly in India and Sri Lanka, has made it difficult for them to prioritize climate change policies as set out at the national level. However, in Nepal climate change is not yet embedded in the priorities of provincial and local governments. Moreover, no clear regulatory provisions exist to allow local government authorities to source additional funds for implementing national or local climate change priorities from other means. National governments should consider enabling local governments to seek additional funding by collaborating with donor agencies and promoting measures such as PPPs and local (green) taxes.

Reviewing existing or potential incentive systems could also enhance the climate response at the subnational level. Some countries have introduced financial incentives. For instance, in the Philippines, 10 percent of resources under the Local Development Fund are earmarked for climate change, with 70 percent used for preparedness and 30 percent for response. This earmarking, together with capacity building on risk adaptation, sensitization, peer exchange, and selection of champions, has substantially improved awareness and the climate relevance of projects at the local government level.

We also urge governments to consider climate-smart spending as a policy area. In the context of tight fiscal settings, increasing debt, and limited external funding, governments will have to use domestic resources to finance climate-friendly investments within a given envelope. Decision makers will have to make informed decisions about the relevance of climate change appropriations for adaptation and mitigation. With limited resources, climate-smart solutions can offer cost-effective funding options—for example, livelihood projects. Efficiency assessments could also be carried out to identify bottlenecks in implementation and to “free up” potential resources for climate-related public investments.

7.6. Seek community participation in climate investments and enhance community awareness programs on climate change

In all three countries, community participation in planning and implementing climate investment priorities is limited. Stakeholders involved in climate change projects should consult and seek community feedback, views, and perceptions of the impact of projects on livelihood strategies. Before making any investment, the government should introduce a formal assessment mechanism to verify community acceptance. International experience shows the importance of community acceptance and involvement for the successful implementation of projects at local levels. The

Kerala experience shows how effective community leadership can enhance community awareness of climate change. However, Kerala's experience of decentralized governance is unique and may not be true in many other states in India. Awareness programs on disaster management have been relatively successful in both national and local governments. We therefore recommend that governments implement proactive climate change awareness programs, encompassing all groups in the community. Climate change should be part of the higher education curriculum in all three countries.

7.7. Set up climate auditing and performance reviews

Well-intentioned work can still fail to produce the desired results, as shown in Nepal, where national and local priorities are disconnected due to PFM deficiencies in the form of inadequate resourcing or misallocation. In a way, this disconnect is surprising given that Nepal has been tracking climate expenditure at the national level (through a budget code) since 2013 and even tags block grants to regional governments. The efforts put into tracking climate funds have not led to the channeling and targeting of resources. Climate auditing and performance reviews are needed, both centrally and locally.

7.8. Conduct further studies on climate change in South Asia

Further research is needed on climate finance and investment in South Asia, focusing on areas not covered in this study and drawing on different methodological approaches, such as mixed methods. The “content analysis” and “stakeholder interview approach” on which this study is based could be combined with other tools to engender much stronger evidence that would persuade governments to act on and introduce reforms.

Other robust tools for diagnosing PFM and other institutional deficiencies have been adapted for climate change. In particular, the CRPFM seems appropriate for an expansion of this study because it has a dimension for assessing fiscal decentralization, regardless of whether the regulatory framework clearly specifies climate change, so that local-regional policies are vertically integrated with national climate change objectives. The 2020 CRPFM provides a suitable framework for assessing the extent to which national governments align public investment management within their climate change strategies.

Other tools may also generate fresh insights into local livelihoods. For example, the premise that disaster relief does not ultimately serve long-term livelihood prospects may need further evidence, and economic analysis or data could be significant in engendering this evidence. Further research could supplement the interview data with loss and damage data, information from poverty or income surveys, and other local economic indicators as objective measures of economic status to supplement the interview data. Such information would help policy makers to track the impact of climate change on livelihoods and jobs and link public investment decisions to climate-related vulnerabilities affecting livelihoods across sectors.

The content analysis could also be extended by applying a more holistic approach to analyzing how climate change is mainstreamed in different phases of public investment management (PIM), planning tools, and the budget process. For instance, the use of planning tools and templates could help to mainstream climate change considerations in the public investment plans and budgets of central and local governments—that is, make mandatory the inclusion of climate change projects in ministries, sectors, agencies, and local governments’ public investment proposals through budget circulars and calls, the use of joint memorandums between central administration and local governments, and revised templates for public investments that capture climate-relevant projects. Climate vulnerability assessments could be used to explore the link between plans and budgets at both national and subnational levels. Such assessments could enable better project designs, screening for climate risk at the appraisal stage, or the inclusion of climate change as a selection criterion, which could offer potential areas for reform. Similarly, the scope of the study could be expanded to reflect climate action being undertaken in multiple local governments. For instance, when using Kerala to assess developments at the subnational level in India, certain caveats cannot be avoided, given that the state is an outlier on many sociocultural indicators and may not represent the country as a whole.

Our findings are derived through a thorough review of policies, strategies, and regulations. Building on this effort, we recommend further research, particularly looking at the legislative framework and regulations for PIM in these three countries. For instance, climate change legislation can be an important catalyst for mainstreaming climate change considerations in the regulatory framework of PIM. Further research could explore the extent to which climate change considerations are included in PIM regulations in South Asia and offer an example of best practice in addressing climate change. In addition, there is a need to examine the budget-making processes, PIM processes, and intergovernmental coordination and intergovernmental fiscal relations systematically and in more depth—these mechanisms are important for translating policy into action. We therefore urge further studies investigating in more depth the political economy of climate change budget making. Such studies could be useful for understanding where the specific bottlenecks to action lie and what their underlying causes are; they may also mitigate some of the tensions arising from the misalignment between climate change objectives and households’ livelihood at the local level.

Lastly, this study has raised issues and areas for South Asian governments to consider when introducing climate change policies and setting up action plans. For instance, PPPs in climate investment cover a wide area (the overall regulatory environment for any private investment), including the rights of foreign investors and intellectual property protection. Policies and regulations for specific sectors like energy or agriculture that attract or discourage investor interest could also be different across countries. All of these issues are important in designing specific PPP transactions and determining the risks and rewards for investors. Considering the many ingredients needed to increase private flows into climate projects, further research is warranted to identify the right action to address PPP barriers in South Asia.

Finally, institutional arrangements are needed to leverage a coherent whole-of-government approach for climate change and PIM. For this to happen, it is important to explore the incentives or mechanisms that can be leveraged to promote greater ownership and sense of urgency at the

local level, more communication from the center, and greater decentralization of policy decisions, interventions, and funding. In addition, the following questions could be addressed:

- Does the legal and regulatory framework adequately cover the competencies and mandates across stakeholders at different levels related to climate mitigation and adaptation?
- How can the government’s infrastructure program, informed by existing or desired livelihood policies, outcomes, and decisions, be measured?
- How can intergovernmental fiscal transfers (conditional or performance grants) be set up and used as an instrument to finance and incentivize actions? The Nepal case could be explored further in this regard.
- How are the steps of identification, prescreening, risk analysis, appraisal, and selection accomplished to ensure a climate-informed PIM that fully considers adaptation solutions in the design and cost-benefit assessment? Understanding such steps at different subnational levels would provide additional information about the challenges of mainstreaming climate change in public investments.

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Appendix A: Interview questions

1. Can you please tell me/us about your current role (in ... organization, office, ministry, government, etc.)?
2. Do you think that climate change is a real threat or problem in this country or region? Explain why or why not.
3. Are there any wider social economic or environmental consequences of climate change in your country, region, or local area?
4. Can you please elaborate on these consequences if there are any?
5. Are you aware of central government policies, plans, strategies, and regulations put in place to address the climate change impacts?

If no, move to the next question

If yes, How effective are these policies, plans, strategies, or regulations in addressing the impact of climate change in your area or region?

Can you give any example of effective implementation of such policies, plans, strategies, or regulations in your area or region, if any?

To what extent are these policies, plans, strategies, or regulations incorporated in the governments’ budget? How effective is the budget implementation process?

Can you please elaborate on the relevant mitigation strategies in place?

What wider adaptation strategies are currently in place?

How are these strategies being executed?

To what extent are these measures, plans, strategies, or regulations implemented in practice (at the ground level)?

What are the challenges or gaps in implementing these plans or strategies?

Do you think these plan and policies are ready to deal with the present or future impact of the climate change?

(If yes, how? Can you please explain it?)

6. Are any community awareness or stakeholder training programs or information campaigns related to climate change currently taking place in this country?
7. How effective are these training programs or the information campaigns? (Who is involved in facilitating these activities, trainings, campaigns—for example, the state or local government, NGOs, or any other parties)?
8. How do you evaluate the central government's initiatives to climate change issues in this country? (If satisfied or unsatisfied, why or why not?)
9. In your view, in which area or sector (for example, carbon dioxide emission, energy, transport, agriculture, water resources, forest, or any other) do you think the government is doing better and which sector needs most attention?
10. In your view, what can be done further to address these climate-related problems?
11. How are the local communities benefiting from these central government plans, strategies, and activities (if any)?
12. What do you think about the role of state or local governments in addressing the climate change issues?
13. How is climate-related decision-making made at the local or community level and who is involved in this process?
14. To what extent do you think the local governments have set priorities for climate change-related issues? (If low or high, why? Can you please explain what the reason may be?)
15. What do you think about the existing funding situation for climate change?
16. What fraction of spending is dedicated to addressing climate change-related issues? Is this adequate in your opinion?
17. What role do you think the donors or international organizations can play in addressing climate change issues? And what role are they playing at the moment?
18. What do you think about the role of the private sector (or public-private partnerships) in addressing climate change issues? Are they currently playing any role in mitigating the impacts of climate change?
19. Do you think that the central or state governments have sufficient (monetary or human) resources to deal with this problem or issue?
If no, What can be done to generate required recourse (revenues) to address the climate change impact?
If yes, How are revenues being generated and expenditures incurred? How are the action plans or climate change measures funded?
20. In your view, what could be additional sources of revenue for addressing climate change impacts?

21. To what extent do you think climate change–related taxes (for example, a carbon tax) will be effective in generating additional funding to address climate change?
22. Does the central government allocate a separate or an additional budget to address climate change issues?
23. How are the climate-related concerns (flooding) of local communities represented in the national budget?

If no, move to the next question

If yes, Can you please elaborate on the process?

How much or what percentage of the climate change budget is allocated to the state or local area?

Do you think that the present budget allocation for climate change is sufficient? Why or why not?

Are you aware of climate investment schemes or any other such schemes (for example, insurance or tax)?

Do you know whether the allocated budget or fund is reaching the target group or vulnerable communities?

Can you provide any examples to support your point(s)?

In your opinion, how transparent is the budget allocation process? Why or why not?

24. To what extent do the government’s (mitigation or adaptation) strategies assist in livelihood development of communities in your country or region?
25. How are the local communities benefiting from these central government plans, strategies, and activities for livelihood strategies (if any)?
26. In your view, what are the key constraints that the (central) government is facing in addressing climate change—for example, lack of funding or resources, wider engagement of stakeholders, or any other problem?
27. What mechanisms should be put in place to discharge climate accountability to local communities more effectively.
28. Do you have any other suggestions that you think could help the central government to address the climate change impacts?

Thank you very much!

Questions for the general public:

1. Can you please tell us about the impact of climate change in this area (for example, floods)?
2. When did the last flooding occur in this area (if any) in the last five years?
3. What do you think are the main reason(s) for continuous or increasing flooding in this area?
4. Did the flooding have any impact in your or others’ livelihood?

If no, move to the next question

If yes, Can you explain the damage?

How did or do you recover from the damage?

Did you get any relief for the damage incurred?

(**If yes, Did you get it from the government or from NGOs or other charities?)**

What are your future plans? Are you considering relocating to another area or changing your occupation if the government does not begin to address the problem soon?

Can you please tell us about the state or local government's response to that event?

In your opinion, what can be done to prevent such damage in the future?

Do you have any suggestions for the state or local government to prevent such flooding in the future?

5. Do you think the state or local governments have any plan or projects to prevent extreme events like flooding in the future?
6. If yes, could you please explain how your area or village has benefited from the government's flood control project?
7. Could you please explain how the livelihood of your area or village has been changed after implementation of the government's flood control project?
8. Do you think that the government's flood control projects and policies have addressed the community's real climate change challenges?
9. Has the government considered your (or the community's) views before implementing flood control projects?
10. How well do you think the government could have invested public money in addressing these issues?
11. How transparent is the government's relief distribution mechanism?
12. Do you have any other suggestions for the state or local governments to address these problems and support the livelihood of people living in this area or region?

Thank you very much!

Appendix B: Demographic profile of study participants

Table B.1: Demographic profile of study participants in India

ID no.	Participant profile	Affiliation or location	Gender	Date of interview	Duration of interview
IN01	Adviser	Kerala State 6th Finance Commission	Female	April 13, 2021	1:08
IN02	Senior fellow and former president	Kerala Sastra Sahitya Parishad	Male	April 13, 2021	1:23
IN03	Seni*or fellow	Centre for Socio-economic and Environmental Studies	Male	April 14, 2021	1:00
IN04	State project officer	Kerala State Disaster Management Authority	Male	April 16, 2021	1:00
IN05	Environment program manager	Department of Environment and Climate Change	Male	April 14, 2021	0:40
IN06	Adviser	Kerala State 6th Finance Commission	Male	April 13, 2021	1:15
IN07	Director and founding member	Thanal Project, Kerala State Council	Male	April 17, 2021	1:30
IN08	Member	Block panchayat, Sultan Batheri	Female	April 21, 2021	1:00
IN09	Chairperson (retired)	State Finance Commission	Male	April 20, 2021	0:35
IN10	Director and founding member	Thanal Project, Kerala State Council	Female	April 20, 2021	1:30
IN11	Senior officer	Department of Aquatic Biology and Fisheries	Male	April 21, 2021	0:45
IN12	Consultant	Waste Disposal Management	Male	April 15, 2021	0:42
IN13	Loss prevention manager and volunteer	Industry	Male	April 29, 2021	0:40
IN14	Youth coordinator	Grama panchayat	Male	April 29, 2021	0:31
IN15	Consultant and researcher	Urban Planning and Development	Female	June 8, 2021	1:41
IN16	Employee	Labor Office	Male	June 11, 2021	1:30
IN17	Employee and flood victim	Waste Management, Kuttanad	Female	June 11, 2021	0:37
IN18	Local resident	Coastal Students' Cultural Forum	Male	June 11, 2021	0:57
IN19	Project officer	Ministry of Environment and Climate Change and United Nations Development Programme	Male	June 11, 2021	1:00
IN20	Member	Block panchayat	Male	June 11, 2021	0:58

Table B.2: Demographic profile of study participants in Nepal

ID no.	Participant profile	Affiliation or location	Gender	Date of interview	Duration of interview
NP01	Local resident and flood victim	Hanuman Nagar	Male	April 8, 2021	0:20
NP02	Flood impact officer	Nongovernmental organization (NGO)	Male	April 8, 2021	0:17
NP03	Climate change expert	International organization	Male	April 7, 2021	0:46
NP04	Former head, Climate Change	Ministry of Forests and Environment (MoFE)	Male	April 2, 2021	—
NP05	Consultant	Regional adviser	Male	April 6, 2021	0:47
NP06	Senior consultant and adviser	Affiliated to international organization (previous affiliation, United Nations Development Programme)	Male	April 5, 2021	1:15
NP07	Consultant	Freelance	Male	March 25, 2021	0:40
NP08	Chairperson and academic	Water Project; university	Male	April 1, 2021	0:27
NP09	Officer	Bagmati Province	Male	March 20, 2021	0:37
NP10	Director	Local NGO	Male	March 22, 2021	0:22
NP11	Engineer	Department of Irrigation	Male	April 21, 2021	0:26
NP12	Flood victim	Hanuman Nagar	Male	April 11, 2021	0:20
NP13	Flood victim	Saptari	Male	April 11, 2021	0:10
NP14	NGO officer	Rajbiraj	Male	April 8, 2021	0:41
NP15	Watershed practitioner and expert	Freelance		April 6, 2021	1:22
NP16	Committee member	Association of Rural Municipality	Male	April 4, 2021	0:15
NP17	Senior government officer	Ministry of Forests and Environment	Female	April 12, 2021	0:35
NP18	Senior government officer	Ministry of Forests and Environment	Male	April 15, 2021	—
NP19	Senior government officer	Gandaki Province	Male	April 15, 2021	0:25
NP20	Forestry professional	National Park	Male	April 15, 2021	0:33

Note: — = time was not recorded.

Table B.3: Demographic profile of study participants in Sri Lanka

ID no.	Participant profile	Affiliation or location	Level of responsibility	Participant profile	Gender	Highest education level	Date of interview	Duration of interview
SL01	Director	Ministry of Finance	Central government	Former defense budget officer	Female	First degree	March 26, 2021	0:35
SL02	Director	Ministry of Health	Central government	Consultant physician, MBBS	Male	PhD	March 23, 2021	0:45
SL03	Director	Disaster Management Centre	Local government; policy	Wing Commander, Sri Lanka Air Force	Male	Master's	April 2 and 13, 2021	0:33
SL04	Adviser, Western Provincial Council	Local government	Local government; policy	Researcher and climate change–disaster risk specialist	Male	Master's	March 3, 2021	1:01
SL05	Member of parliament	Sri Lanka Parliament	Central government political; policy	Opposition party	Male	First degree	March 27, 2021	0:09
SL06	Managing director	Nongovernmental organization (NGO)	Policy research; NGO	Climate risk transfer, policy, law and finance	Female	Master's	March 18, 2021	1:07 ^a
SL07	Executive director	NGO	Policy research; NGO	Agriculture, climate-induced mobility, policy, finance	Male	Master's	March 18, 2021	
SL08	Senior academic	University of Moratuwa	Academia; research public sector (high-level)	Climate risk, Sustainable Development Goals, national policy	Male	PhD	March 24, 2021	0:13
SL09	Sustainability officer	Bank of Ceylon	Public banks	In charge of the headquarters	Male	Master's	April 20, 2021	0:30
SL10	Senior officer	International Organization for Migration—Sri Lanka	Project; research and policy	Migration, environment, and climate change in Sri Lanka; United Nations Humanitarian country team emergency response lead for International Organization for Migration	Female	Master's	April 14, 2021	1:12
SL11	Senior officer	International Labour Organization	Project; research and policy	Climate change projects and in humanitarian livelihood assistance	Male	Master's	April 10, 2021	0:38

ID no.	Participant profile	Affiliation or location	Level of responsibility	Participant profile	Gender	Highest education level	Date of interview	Duration of interview
SL12	Senior scientist	Research organization	Central government	Specialist in air pollution	Female	Master's	April 2, 2021	0:15
SL13	Officer	Sri Lanka Air Force	Local government	Researcher and flood victim of Kaduwela	Male	Master's	March 4, 2021	0:24
SL14	Assistant government agent	Government Agent Office	Local government	Former Western Province disaster risk management Divisional Secretariat officer	Male	First degree	March 20, 2021	0:24
SL15	Officer	Ministry of Irrigation	Climate project	Climate Resilience Improvement Project, funded by the World Bank	Male	First degree	April 2, 2021	0:20
SL16	Officer	Ministry of Irrigation	Climate project	Climate Resilience Improvement Project, funded by the World Bank	Male	Master's	March 18, x2021	0:58
SL17	Lead, Livelihood Development and Resettlement Project	Former United Nations Development Programme project	Livelihood project	Former project manager, Mahaweli (System C)	Male	First degree	March 30, 2021	0:25
SL18	Senior driver, Colombo	Municipal Council, Colombo	Local government	Responsible for Muthurajawela garbage piling	Male	General certificate of education ordinary level	March 6, 2021	0:35
SL19	Program lead	Sri Lanka Red Cross	Civil society organization; community-based organization; humanitarian	Humanitarian worker	Female	First degree	March 2 and 4, 2021	0:32
SL20	Flood victim, loss of life and damages	Pugoda, Colombo	Community; livelihood	Businessman; family loss	Male	Postgraduate diploma	March 1, 2021	0:30
SL21	Flood victim, loss of property	Wellampitiya, Colombo	Community; livelihood	Small café; hotel owner	Male	General certificate	March 2, 2021; April 11, 2021	0:25

ID no.	Participant profile	Affiliation or location	Level of responsibility	Participant profile	Gender	Highest education level	Date of interview	Duration of interview
SL22	Flood victim	Kalutara, Western Province	Community; livelihood	Sri Lanka NAVY	Male	First degree	March 2, 2021	0:23
SL23	Resettled flood victim of Kelani riverbank	Peliyagoda, Colombo	Community; livelihood	Currently relocated in Peliyagoda	Female	General certificate of education ordinary level	April 13, 2021	0:13
SL24	Youth activist on climate change	Global	Voluntary; youth climate activist	Internationally recognized	Male	Postgraduate diploma	April 1, 2021	0:08
SL25	Scientist	Ministry of Agriculture	Central government; policy; research	Research scientist, Climate Resilience Improvement Project, funded by the World Bank	Male	PhD	April 20, 2021	0:54

a. Focus group discussion.

Appendix C: Maps of the project areas

Map C.1: Kerala, India



Source: <https://www.infoandopinion.com/wp-content/uploads/2019/09/Kerala-Map-District.pdf>.

Map C.2: Koshi River, Nepal



Source: <https://www.bbc.co.uk/news/world-asia-india-48986799>.

Districts of Western province

