MAINSTREAMING CLIMATE BUDGETING IN THE STATE OF TELANGANA

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SELF-DECLARATION

This is to certify that the thesis submitted by me titled **"Mainstreaming climate budgeting in the State of Telangana"** is my original work and has not previously formed the basis for the award of any Degree, Diploma, Associateship, or Fellowship to this or any other University.

- **Rawson Anthony Gonsalves**

CERTIFICATE OF THE SUPERVISOR

This is to certify that the thesis titled **"Mainstreaming climate budgeting in the state of Telangana"** is original work undertaken by **Rawson Anthony Gonsalves** under my supervision and guidance as part of his Master's degree in this Institute. The thesis may be sent for evaluation.

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ABSTRACT

The paper endeavors to explore the notion of climate budgeting as a policy instrument for directing financial resources toward climate change mitigation and adaptation. Despite the recent upsurge in green and climate financing, its impact has reached a plateau, necessitating the identification, evaluation, and application of policy tools to standardize and channel such financing. Climate budgeting is one such tool that is progressively being adopted by governments worldwide to incorporate climate change considerations into budgeting and spending decisions. The primary aim of this paper is to achieve a comprehensive understanding of the evolution of green and climate budgeting, explore its techniques, obstacles, procedures, and instruments, identify effective practices, and formulate recommendations to promote the integration of climate budgeting into the mainstream. The study recognizes the potential of climate budgeting to channel financial resources toward climate change mitigation and adaptation. However, it acknowledges the challenges associated with it, including issues around data collection and monitoring, uncertainty, political hurdles, limited funding, lack of standardization, and complexity. The ultimate objective is to establish climate budgeting as a policy tool by means of recommendation to facilitate climate finance outflows to mitigate and adapt to the consequences of climate change in the state of Telangana as a case.

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DEDICATION

I dedicate this to the cornerstones of the Kautilya School of Public Policy

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TABLE OF CONTENTS

1 List of Tables

2 List of Figures

3 List of Boxes

4 Abbreviations

BIOFIN	Biodiversity Finance Initiative
CAGR	Compound Annual Growth Rate
CBD	Convention on Biological Diversity
CBT	Climate Budget Tagging
CCBII	Climate Change Budget Integration Index
CCET	Climate Change Expenditure Tagging
CCFF	Climate Change Financing Framework
CCFLA	Cities Climate Finance Leadership Alliance
CCIA	Climate Change Impact Appraisal
CCPER	Climate Change Public Expenditures and Institutional Review
CCRS	Climate Change Relevance Share
CCSS	Climate Change Sensitivity Share
CEEW	Council on Energy, Environment and Water
COP	Conference of the Parties
CPEIR	Climate Public Expenditures and Institutional Review
DEA	Department of Economic Affairs
DFI	Development Financial Institutions
EPTRI	Environment Protection Training and Research Institute
EU	European Union
GBF	Global Biodiversity Framework
GBRF	The Green Budgeting Reference Framework
GHG	Global Greenhouse Gases
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit
GoI	Government of India
HOD	Head of Department
IFMIS	Integrated Financial Management Information System
IMF	International Monetary Fund
INR	Indian Rupee
KPIs	Key Performance Indicators
LDC	Least Developed Countries
MDBs	Multilateral Development Banks
MoEFCC	Ministry of Environment, Forest and Climate Change
MoF	Ministry of Finance
NCCHPP	National Collaborating Centre for Healthy Public Policy
NIPFP	National Institute of Public Finance and Policy
NOAA	National Oceanic and Atmospheric Administration
OECD	Organization for Economic Cooperation and Development
PAGE	Partnership for Action on Green Economy
PEFA	Public Expenditure and Financial Accountability
PFM	Public Financial Management
PSU	Public Sector Undertaking
SAPCC	State Action Plan on Climate Change
SAPFIN	State Action Plan Financing Framework

SEBI	Securities and Exchange Board of India
SIDS	Small Island Developing States
SPOCs	Single Points Of Contact
TSCCC	Telangana State Climate Change Center
TSPCB	Telangana State Pollution Control Board
UK	United Kingdom
UNDP	United Nations Development Program
UNDP-RBAP	United Nations Development Programme - Regional Bureau for Asia and the Pacific
UNEP	United Nations Environment Programme
UNFCCC	United Nations Framework Convention on Climate Change
USD	United States Dollar
WRI	World Resources Institute

5 INTRODUCTION

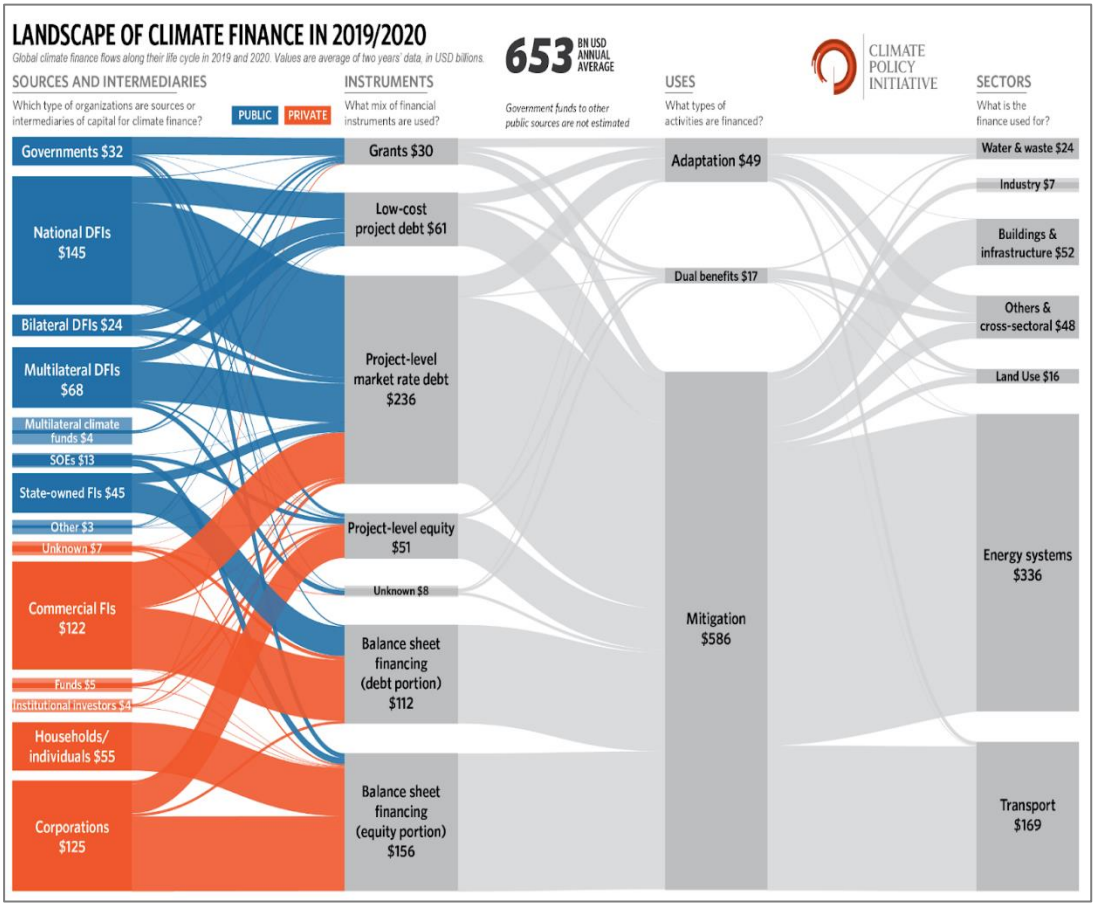
"The simplest definition of a budget is "telling your money where to go."— Tsh Oxenreider

Climate finance is referred to as the investment in and (or) financing of policies, activities, and projects that are primarily focused on mitigating and (or) adapting to climate change impacts. Such policies, activities, and projects are targeted at reducing GHG (Global Greenhouse Gases) emissions, rising sea levels, erratic weather events, and rising temperatures. These can be sourced from a myriad of institutions like governments, the private sector, DFI (Development Financial Institutions), and Multilateral Institutions, to name a few. The aim is to ensure adequate funds are at the disposal to address the impacts of climate change, to support the transition to a low-carbon, and to build a climate-resilient global economy (UNFCCC Standing Committee on Finance, 2014).

As per Climate Policy Initiative, over the last decade, green/climate finance, both from public and private sources, has increased drastically, almost doubling between the period 2011 to 2020. Nevertheless, having stated so, such financing has to increase by more than seven folds to achieve the Paris Agreement goals. At present, a total of USD 4.8 trillion has been pledged; however, despite the present pace of increase, climate financing is insufficient to restrict global warming to 1.5 degrees Celsius, and yearly finance flows of at least USD 4.3 trillion are required by 2030 (Naran et al., 2023).

Figure 1

Global landscape of climate finance in the years 2019/2020



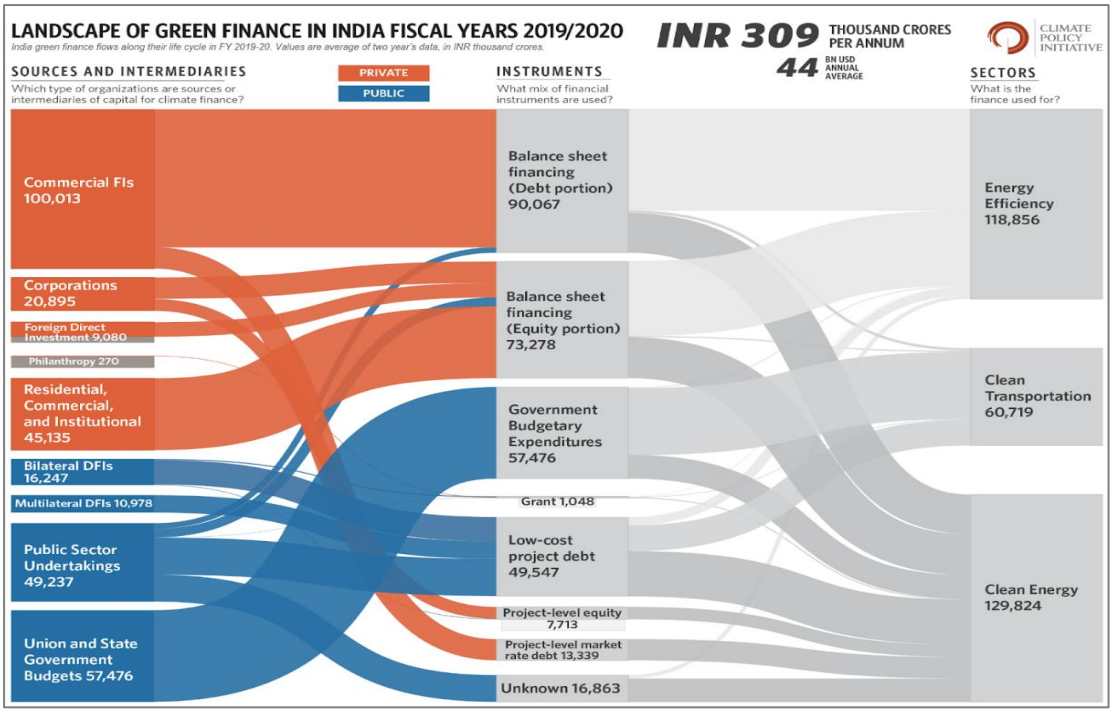
Note. The Flow of Money depicting sources, instruments, uses and sectors from *Global landscape of climate finance: A decade of data*, by Climate Policy Initiative, 2023

In India, the flow of green/climate finance is significantly inadequate compared to its present requirements. During the period 2019-2020, the tracked green/climate finance amounted to approximately INR 309 thousand crores (roughly USD 44 billion) annually, which is only a quarter of what the country needs (Khanna, Purkayastha, & Jain, 2022).

Globally, the growth of private sector investment has been inadequate in terms of speed and scale to facilitate the desired transition. Private climate finance grew at a meager rate of 4.8% (Naran et al., 2023). The public sector has been critical in directing funds, growing at 9.1% (Naran et al., 2023). In India, domestic sources accounted for the majority of financing at 83% for the fiscal year 2020, of which 59% was contributed by the private sector and 54% to 46% by government expenditure and PSUs (Public Sector Undertakings) respectively (Khanna, Purkayastha, & Jain, 2022). To avert the worst consequences of climate change, annual financial flows of at least USD 4.3 trillion would be required by 2030, advancing at a compound annual growth rate (CAGR) of 21%. However, despite the existence of USD 200 trillion in global financial markets, we are unable to channel the flow of funds because of impediments to investment, such as supply-demand factors, unattractive return on risk, availability of adequate and reliable data, uniformity and transparency among others (Naran et al., 2023; Prasad, Loukoianova, Feng, & Oman, 2022).

Figure 2

Indian landscape of green finance in the years 2019/2020



Note. The flow of money depicting sources, instruments, uses, and sectors from *Landscape of green finance in India 2022*, by Climate Policy Initiative, 2023

While green/climate finance flows have increased in recent years, their impact remains plateaued, and it is therefore becoming conspicuous that policy instruments need to be identified, evaluated, and employed to standardize and channel such financing. One such policy instrument is “Climate Budgeting.” The goal of which is to ensure that public resources are directed toward the most effective and efficient measures for mitigating and adapting to the impacts of climate change and that such expenditures are appropriately represented. For instance, a project by the Ministry of Jal Shakti to link Ken and Betwa for water security (ANI, 2023) can have climate change bearings; however, such expenditures are not represented as also being towards climate change mitigation or adaptation.

This is where “Climate Budgeting” as a policy tool/instrument can be of significance. It is being increasingly adopted by governments worldwide to better

integrate climate change considerations into their budgeting and spending decisions. For example, countries France, Ireland, and Nepal, at a national level, and even the cities of Oslo, Stockholm, Barcelona, Berlin, Montreal, Paris, and Tshwane at a local level have implemented or are developing key elements of a "climate budget" that sets targets for reducing greenhouse gas emissions, distributes responsibility and tracks progress towards those targets (c40knowledgehub). In India, Odisha was the first state to make such a public declaration, recognizing the need to identify sectoral program level/budgetary demands and integrate climate change into the state's budget (The ClimateGroup, 2021), with a few other states following suit.

The concept of a Climate Budget is a recent development and is not yet widespread. Despite this, it holds significant potential as a policy tool that can drive financial resources toward climate change mitigation and adaptation. However, there are a number of challenges associated with climate budgeting, including issues around data collection and monitoring, uncertainty, political hurdles, limited funding, a lack of standardization, and the complexity that can arise from such budgeting.

This paper endeavors to gain a comprehensive understanding of the progression of green/climate budgeting by exploring its techniques, obstacles, procedures, and instruments. Furthermore, it aims to ascertain the efficient practices, accumulates an understanding, identify intricacies, and formulate recommendations to encourage the integration of climate budgeting into the mainstream. The overarching objective is to establish climate budgeting as a policy tool to facilitate the advancement of climate finance outflows to mitigate and adapt to the implications of climate change in the state of Telangana.

The paper begins by delving into an overview of the state of Telangana and the reason for it to consider mainstreaming climate budgeting before laying down some ground rules in terms of definitions to avoid ambiguity going forward. The following section then proceeds to review the existing literature, where a detailed context is laid out by briefly examining the evolution of the concept, followed by a comprehensive overview of the pre-existing frameworks and initiatives, comprising supplementary schemes, other influencing policy instruments and tools and finally, a few examples from around the globe where the concept has been successfully implemented at the national, sub-national, and local/municipal levels. Special consideration is given to cases in India. The subsequent chapter investigates the methodology, which relies on secondary sources, along with a few unstructured interviews with pertinent stakeholders and subject matter experts. The key findings illustrate four major themes, namely political acceptability, administrative doability, procedural standards, and uniform definition, which are then followed by a thorough discussion and conclusion. The recommendations are in line with the findings, which suggest developing or adopting a taxonomy, building capacity, establishing an implementation, monitoring, and evaluation mechanism, along with a proposed "priority framework" to direct funds to highly vulnerable areas with the later section focusing on the limitations and future scope of work.

5.1 Scope of the paper

Climate budgeting is a multifaceted topic that encompasses various aspects, such as the tagging mechanism and fiscal policy. However, this paper will focus on comprehending the challenges encountered in its integration and constructing a framework that accounts for the climate risk factor.

5.2 The case of Telangana

The state of Telangana has implemented innovative and inclusive green practices that have resulted in a notable increase in forest cover, from 24 to 33 percent. One of its most significant initiatives is the Haritha Haram afforestation program, which is considered the third-largest in human history and aims to expand the state's green cover. Additionally, the state has implemented unique participatory schemes such as Palle Pragathi and Pattana Pragathi, which focus on the integrated development of villages and urban areas. Telangana has also made significant strides in solar power production and ranks high in the State Rooftop Attractiveness Index. Notably, it has launched a 100-megawatt floating solar plant in Ramagundam that produces Green Methanol. Furthermore, the state has prioritized electric mobility to minimize carbon emissions (NDTV, 2022).

The state has launched the Cool Roof Policy 2023-28, the first in the Country, which mandates cool roofing for all non-residential, institutional, and government buildings, as well as residential buildings, with the aim to reduce the urban heat island effect, lower energy consumption, and mitigate the effects of climate change (Municipal Administration and Urban Development Department, Government of Telangana, 2023)

Despite these efforts, the state is vulnerable to climate change impacts such as extreme weather events, heat waves, water scarcity, and agricultural losses. For instance, If Telangana's agriculture collapses due to heat waves, the formal seed industry could lose a significant production hub, leading to food security issues (Singh, 2023). Climate change is also affecting the monsoon weather system in Telangana, as low-pressure areas in the Bay of Bengal are becoming more intense and moving in a westerly direction (Kashyap, 2022). Given these risks, it is imperative

that the state government adopts a comprehensive approach to address climate change. This should include the adoption of climate-resilient policies, promotion of renewable energy, and integration of climate change concerns into the budgeting process.

The State Climate Action Plan furnishes a synopsis of the budgetary interventions for different sectors of the state for the years 2014-17 and 2017-22 (Table 1). The numbers for 2014-17 and 2017-22 show an increase in the budgetary allocation for most sectors. The major budgetary allocation is for Agriculture and allied activities, succeeded by Irrigation and CAD. These two sectors are pivotal for Telangana's economy, and the allocation mirrors the state's emphasis on the promotion of agriculture and irrigation infrastructure to augment agricultural productivity and enhance rural livelihoods.

Table 1

Summary of the Climate Budget Interventions by Telangana

Sl.No.	Sectors	Estimate for 2012-17 (INR Crores)	Estimate for 2017-22 (INR Crores)
1	Agriculture and allied	140575.8	169554.2
2	Irrigation and CAD	50337.47	113355.4
3	Forest and Biodiversity	552.57	1175
4	Energy	22591.26	20728.85
5	Industries (including mining)	23.6	-
6	Transportation	1082.99	1824.916
7	Health and Family welfare	114.7	114.7
8	Urban Development	1424.37	1542.85
9	Tourism	63.26	92.35
10	Panchayat Raj and Rural Development	37012.22	70598.92
11	TSPCB	23	17
12	Setting up of Climate Change Knowledge Centre at EPTRI	12.38	13.87
13	Research Studies in Climate Change	92.4	103.49
	Total	**253906.02**	**379121.546**

Note. Display the bifurcation of budget across departments for two 5 year blocks from *State Action Plan on Climate Change for Telangana State link,* by EPTRI, 2015

Furthermore, the table shows a modest increment in the budgetary allocation for Forest and Biodiversity, Energy, Transportation, Urban Development, and Tourism sectors. These sectors are crucial for sustainable development and contribute to the state's economic growth. In addition, Table 1 shows the assignment of funds for research studies in climate change and the establishment of a Climate Change Knowledge Center at EPTRI. All these interventions demonstrate the state's dedication to addressing climate change and building resilience.

Nevertheless, having stated so, it is imperative for Telangana to monitor its climate expenditures and either assign a separate budget for climate change interventions, similar to the state of Tamil Nadu or label such expenses. This measure will enable the state to effectively monitor and evaluate the impact of its climate change initiatives and policies. The establishment of a separate climate budget or tagging mechanism would guarantee the allocation of funds and resources to climate change interventions while also increasing transparency and accountability in the utilization of public finances. Furthermore, this approach will facilitate the identification of gaps or inefficiencies, if any, in the state’s climate change programs and prompt the remediation of the same. It would also enable the state access to climate financing and assistance from national and international funding agencies, including private capital, which will be crucial for the implementation of large-scale climate change programs and projects.

6 DEFINITIONS

Before we proceed with the paper, it is important to comprehend the distinction between green budgeting and climate budgeting. A good starting point would be comprehending what constitutes green financing and climate financing.

Green Finance has no universally accepted definition. As per Nicol & Park, For the purpose of defining the term "green" with a focus on climate change, countries may adopt a category for climate-relevant items, as is the case of Ireland, or categorize it into adaptation and mitigation, as seen in countries like Bangladesh, depending on the level of detailed information required. In cases where the definition of "green" encompasses environmental activities beyond climate adaptation or mitigation, such as air quality or biodiversity, national strategies guide or align the classification. For instance, in Honduras, tagging involves climate-related disaster management, which includes activities aimed at reducing the impact of environmental disasters and natural hazards. At the same time, tagging in Bangladesh and Kyrgyzstan comprises the identification of programs that contribute to biodiversity and conservation.

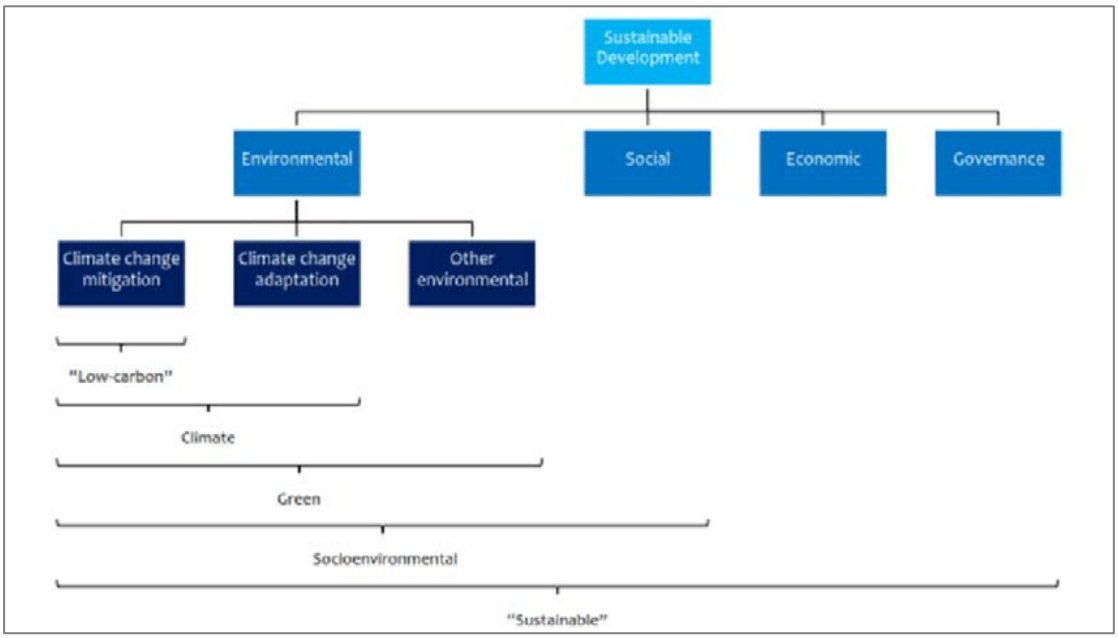
The term "green finance" in the policy context of the EU refers to financing that promotes economic growth while reducing environmental pressures and taking into account social and governance considerations. This refers to the funding of investments that bring environmental benefits, such as reducing air, water, and land pollution, decreasing greenhouse gas emissions, improving energy efficiency, and adapting to and mitigating climate change (Platform on Sustainable Finance, 2022).

The definition of climate and green finance as per the United Nations Environment Programme (UNEP) is as follows:

- **Climate finance** pertains to funding from various sources, such as public, private, and non-traditional financing, at a local, national, or transnational level, which aims to aid in mitigating and adapting to climate change by supporting appropriate actions.
- **Green finance** encompasses not only climate finance but also other ecological goals that are essential for promoting sustainability, including biodiversity and the preservation of resources.

Figure 3

Pictorial representation of the definitions



Note. Interrelationship of sustainable, green, and climate finance adapted from *Definitions and Concepts: Background Note*, by The UNEP Inquiry, 2016

Upon close examination of the definitions provided, it is deemed appropriate to state that “Green finance” encompasses “Climate finance.” Therefore, for the purposes of this paper, the nomenclature "Green" shall enclose the term "Climate" as illustrated in Figure 3 above, unless explicitly stated otherwise.

Based on the aforementioned, it is understood that Climate budgeting encompasses the process of inclusion of climate change-related hazards and advantages into governmental budgeting and financial planning. Conversely, Green budgeting pertains to the practice of incorporation of environmental and sustainability considerations into governmental budgeting and spending determinations, which may include aspects pertaining to climate. Therefore, for the purposes of this paper, the nomenclature "Green Budgeting" shall include aspects of "Climate Budgeting" unless explicitly stated otherwise.

7 LITERATURE REVIEW

7.1 The Genesis and Exodus of Green/Climate Budgeting

The Stockholm Conference

To know the genesis of green or climate budgeting, it is vital to take a step back into history and comprehend its genealogy which is believed to have begun in Stockholm at the "United Nations Conference on the Human Environment" or, as it was christened and popularly known, "The Stockholm Conference" in 1972 (United Nations, n.d.). This conference was a pivotal one for many reasons. First, it gathered policymakers, scientists, environmental experts, and representatives of 113 countries to acknowledge, formulate strategies and address the global issue of the environment. Second, it laid the foundation to advocate for policies and strategies aimed at environmental issues by creating the United Nations Environment Programme (UNEP). And third, "The Stockholm Declaration" acknowledging the crucial role of the environment in promoting human well-being and sustainable development (Down to Earth, 2022).

World Commission on Environment and Development - Brundtland Commission

This set the stone rolling for the congregation of the "World Commission on Environment and Development" (also known as the "Brundtland Commission") in 1983, which conceived the notion of "Sustainable Development" in the "1987 Brundtland Report". This report is believed to have laid down the foundation of "green budgeting," not explicitly but in spirit. Box 1 below is an excerpt of this report highlighting the need to recognize the environmental impact on fiscal policies. A salient point to note here is that "environment" is understood to entail natural

resources and their numerous aspects, including their interdependencies and interrelated processes that bolster the functional elements of societies and economies as a whole (United Nations, 1987).

Box 1 - Excerpt from the 1987 Brundtland Report highlighting the need to recognize the environmental impact on fiscal policies

"Sustainable development objectives should be incorporated in the terms of reference of those cabinet and legislative committees dealing with national economic Policy and planning as well as those dealing with key sectoral and international policies. As an extension of this, the major central economic and sectoral agencies of governments should now be made directly responsible and fully accountable for ensuring that their policies, programmes, and budgets support development that is ecologically as well as economically sustainable. Where resources and data permit, an annual report and an audit on changes in environmental quality and in the stock of the nation's environmental resource assets are needed to complement the traditional annual fiscal budget and economic development plans. These are essential to obtain an accurate picture of the true health and wealth of the national economy, and to assess progress towards sustainable development."

(Source - United Nations, 1987, Chapter 12, Paragraphs 26 and 27)

Interestingly, although this notion was introduced several decades ago, it did not garner much steam primarily because the intersection of the environment and fiscal policies was too fresh to comprehend then. It was only in recent years, in the last couple of decades, that it garnered the limelight once again, thanks to the recognition and acknowledgment that climate change has certain risks and that these

risks can have a direct and indirect effect on fiscal policies. We, therefore, now see an evolution and more exhaustive approach to viewing "environment," which is inclusive of "Climate Change," as expounded on in the definitions earlier.

Global Reporting Initiative

Although the "United Nations Framework Convention on Climate Change" (UNFCCC) was established in 1994 (UNFCCC, n.d.), what gave a certain amount of impetus since the "Brundtland Report" was the "Global Reporting Initiative," which was established in the year 1997, following the "Exxon Valdez oil spill" in the year 1989 (Box 2), creating a "Punctuated Equilibrium" (Box 3) in the policy space. The aim of the initiative was to establish an initial system of ownership and accountability to make sure that organizations follow principles of responsible environmental behavior which was later expanded to encompass aspects related to society, economy, and transparency, in other words, aspects of social, economic, and governance in its subsequent publications.

Box 2 - Exxon Valdez oil spill, 1989

"The Exxon Valdez oil spill occurred in 1989, when an oil tanker went aground in Prince William Sound, Alaska, spewing nearly 11 million gallons of crude oil into the surrounding seas. The ecological effect was catastrophic, with an estimated 250,000 seabirds, 2,800 sea otters, 300 harbour seals, 250 bald eagles, and billions of salmon and herring eggs perishing. This oil spill is significant because of its long-term environmental damage and the ensuing changes in laws and regulations aimed at preventing similar oil disasters. The disaster raised awareness of the need

for oil spill prevention and response, leading to the creation of new technology, training programmes, and regulations to govern the transportation and management of oil. The accident also led to the passage of the Oil Pollution Act of 1990, which strengthened oil spill response and preventive procedures while also increasing liability and accountability for oil spills."

(Source - NOAA, 2020)

Box 3 - Punctuated Equilibrium Theory

Punctuated equilibrium theory is a concept for comprehending change in intricate embedded systems of society, especially Public Policy. Frank Baumgartner and Bryan Jones conceived the concept in 1993, postulating that policy changes occur gradually owing to a variety of constraints, including organizational norms, vested interests, and the limited reasoning of individuals as decision-makers. Any changes in such conditions, particularly change in positions of authority or public opinion, can interrupt policy change. This results in Policy(ies) being marked by extended periods of stability, interrupted by significantly less frequent changes caused by significant changes in either society or positions of authority, i.e., the government.

(Source - NCCHPP, 2018)

"United Nations Framework Convention on Climate Change" (UNFCCC)

The period in the early 2000s did not gather much pace and was consistently stagnant. The notion of green or rather "climate budgeting" gained prominence when we witnessed a second "Punctuated Equilibrium" (Box 3) in 2010 because of the "Cancun Agreements." This agreement is of significance because it involved one of

the most comprehensive deals of assistance consented upon by governments to aid developing countries in dealing with climate change. It included financing, technology, capacity-building, and other aspects in meeting urgent demands for climate change adaptation, as well as expediting the transition to low-carbon economies that can withstand the detrimental effects of climate change. This also led to the establishment of the "Green Climate Fund" with an aim to plan and provision for long-term financing and the "Fast-start Finance" where developed countries pledged to mobilize new and incremental resources to the tune of USD 30 billion for the period of 2010-2012 through international institutions (UNFCCC, n.d.). With all such transfers of money envisaged through different instruments between institutions, both public and private, and countries, especially from developed to the most exposed and vulnerable ones like the Least Developed Countries (LDCs)[1], and Small Island Developing States (SIDS), the need for cross-cutting systems, policy instruments, and policy tools to identify, manage, track and report such expenditures related to climate change mitigation and adaptation became paramount. And this is where and why we have the entrance of "climate budgeting" as one of the policy instruments.

"Biodiversity Finance Initiative" (BIOFIN)

Taking a step back to 1992, one of the other outcomes of the "Rio de Janeiro Earth Summit," besides the conception of UNFCCC, was the conception of the "Convention on Biological Diversity (CBD)" created to promote acts that conserve biodiversity, utilize its resources responsibly, and distribute its benefits fairly and

[1] *According to the United Nations, there are currently 46 economies designated as Least Developed Countries (LDCs) 1. These countries are distributed among the following regions: Africa (33), Asia (9), Caribbean (1), and Pacific (3). Small Island Developing Countries (SIDCs).*

equitably for a sustainable future (CBD, 2022). In this Pretext, The "Biodiversity Finance Initiative" was launched by the "United Nations Development Program" (UNDP) along with the European Commission to channel finances toward achieving biodiversity goals in the year 2012. In the quest for the same, the institution has provided guidance to assist evaluation of aspects surrounding biodiversity finance, including policies, institutions, and economics, as well as identification and determination of financial requirements and developing strategies that identify and generate the necessary financial resources needed to meet a country's biodiversity objectives. This is even more important with the need for the mobilization of USD 200 billion by 2030 to achieve the goals and targets adopted in the "Kunming-Montreal Global Biodiversity Framework (GBF)" (CBD, n.d.), thereby expanding the scope of "green financing" and the complimentary aspects of identification, management, monitoring and reporting such expenditures.

Green Fiscal Policy Network

In the year 2014, we witnessed three institutions, namely the "International Monetary Fund" (IMF), the "United Nations Environment Programme" (UNEP), and the German development agency "Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ)" unite to form a network called the "Green Fiscal Policy Network." The prime objective of this network is to foster an exchange of knowledge and promote dialogue and discussions on fiscal policies with the aim of developing a sustainable economy that is "green" and inclusive of all stakeholders. It employs a set of fiscal and budgetary measures aimed at tackling environmental problems,

particularly climate change, pollution, preservation of biodiversity, and promotion of sustainable forestry, among others (Green Fiscal Policy Network, 2021).

World Bank Policy Guidance

What we also witnessed in the year 2014 is the guidance note published by the World Bank on what could perhaps be called a nudge towards mainstreaming climate budgeting. The policy guidance note sought to conduct a "Climate Change Public Expenditures and Institutional Review (CCPER)" as a means to gauge the effectiveness and efficiency of climate-related public spending. The review also addressed the potential challenges climate change could pose to budget planning and management and presented various measures that finance ministries can employ for better fiscal planning and expenditure management. It emphasizes the following three areas where improved practice can better prepare finance ministries to deal with the fiscal implications of climate change (World Bank Group, 2014).

> (i) including climate change as a long-term objective in the national budget and expenditure framework; (ii) improving financial tracking and performance accountability by spending agencies; and (iii) strengthening government financial management systems to efficiently use external climate finance (World Bank Group, 2014).

Green Budgeting - The OECD Paris collaborative

In the year 2017, during the "One Planet Sumit in Paris," the "OECD Paris Collaborative on Green Budgeting" was established. This group focused on

environmental policy and climate change initiatives, as well as green accounting principles and inclusive, sustainable growth. The primary objective was to devise innovative tools that can be employed to gauge and enhance the harmonization and integration of national revenue and expenditure norms with climate and other environmental-based objectives. The collaborative is committed to the identification of research gaps and priorities while sharing data, expertise and aiding the alignment of national and international budget policies. It endeavors to introduce a coherent narrative for research outputs while communicating results and formulating progress indicators that are reflective of global goals. Some of the salient outcomes include Green Budget Benchmarks, a Green Budgeting Toolkit, Green Budget Baseline Analysis, Cost-Benefit Analysis, and Green Fiscal sustainability reports, among others.

"The Coalition of Finance Ministers for Climate Action"

In the year 2018, representatives from 39 countries congregated in Bali, Indonesia, for the Annual World Bank Group and International Monetary Fund meeting. The congregation acknowledged the challenges of climate change and felt that efforts should be made to channelize and strengthen the same. Several of the nations present at the meeting bestowed their unwavering support for the formation of a Coalition of Finance Ministers to facilitate convergence between local and global action on climate change, increase goals, reaffirm pledges, and speed up steps to implement the Paris Agreement. In February of the next year, .i.e, 2019, an inaugural Sherpas meeting was organized in Helsinki, which brought together representatives from 19 countries and seven international institutions in order to initiate discussions

and collaboration on the objectives of the Coalition. This ultimately culminated in finance ministers from 26 nations converging to establish the "Coalition of Finance Ministers for Climate Action" on the 13th of April 2019, marking a landmark step in mainstreaming the adoption of best practices such as climate budgeting and strategies for green investment and procurement and considerations of climate risks and vulnerabilities in economic planning. Ever since its inception, the '6 Principles of Helsinki, also called "Helsinki Principles" (Box 4), have garnered the support of more than 70 finance ministers worldwide (The Coalition of Finance Ministers for Climate Action, n.d.). At the COP 25 summit held in Madrid in December 2019, the Coalition launched the "Santiago Action Plan," which outlines the strategy to collectively achieve progress on the Helsinki Principles (The Coalition of Finance Ministers for Climate Action, 2019).

Box 4 – "Helsinki Principles"

1. *"Align our policies and practices with the Paris Agreement commitments;*
2. *Share our experience and expertise with each other in order to provide mutual encouragement and promote collective understanding of policies and practices for climate action;*
3. *Work towards measures that result in effective carbon pricing;*
4. *Take climate change into account in macroeconomic Policy, fiscal planning, budgeting, public investment management, and procurement practices;*
5. *Mobilize private sources of climate finance by facilitating investments and the development of a financial sector which supports climate mitigation and adaptation;*

6. *Engage actively in the domestic preparation and Implementation of Nationally Determined Contributions (NDCs) submitted under the Paris Agreement."*

(Source - The Coalition of Finance Ministers for Climate Action, 2019)

"Glasgow COP26"

The salience of climate budgeting can be inferred from the results of the Glasgow Climate Pact, an outcome of the meeting held between 31 October to 13 November 2021, that agreed on clauses aimed at enhancing accountability through heightened transparency. Climate budgeting is indispensable in guaranteeing the provision of essential financial resources to advance climate action and improve adaptability to climate change. The Pact reasserted the commitment to furnish developing countries with 100 billion dollars annually from developed nations, necessitating a robust budgeting and financial strategizing (UNFCCC, 2021).

"Sharm El-Sheikh COP26"

Of the five takeaways from COP 27, three of them, namely – "Establishing a dedicated fund for loss and damage," "Mobilizing more financial support for developing countries," and "Making the pivot toward implementation," have a direct climate budgeting implication further solidifying its need to mainstream (UNFCCC, 2022). The allocation of funds specifically targeted towards loss and damage, as well as the effective and transparent management of the same, can be facilitated through the utilization of climate budgeting. Developing nations encounter financial

constraints when it comes to the implementation of climate action strategies. Climate budgeting becomes a viable targeted and impact-driven solution to draw finances.

7.2 Green/Climate budgeting weds Fiscal Policy.

Before we delve into the fiscal aspects of green/climate budgeting, let us understand what "Fiscal Policy" and "Green Fiscal Policy" actually mean.

7.2.1 Fiscal Policy

In short, Fiscal Policy denotes the government's utilization of its expenditure and taxation to regulate and control the economy. As per Hortan and El-Ganainy, the government uses fiscal Policy to stabilize the economy by managing aggregate. It is an essential role played by the modern State in the collection of revenues and spending of the same in accordance with the political goals set in the national decision-making processes. It involves the government deciding how much money to collect from citizens and businesses as taxes and then spending it on various public goods and services, like infrastructure development (Hortan & El-Ganainy, n.d.).

As per the World Bank, for the attainment of desired goals at the national level, governments must guarantee that specific social conditions and public goods, like healthcare, law enforcement, and education, are readily available to their citizens. However, markets may not always provide the required funding or resources for these goods, which is the reason why public action is essential, and this is where the notion of fiscal Policy comes into play because it involves government spending and taxation policies aimed at ensuring the provision of necessary public goods and services. Fiscal Policy is, therefore, crucial to address the under-provision of public goods and

negative externalities that may arise in the market system (Brahmbhatt & Canuto, 2012).

Richard Musgrave, a renowned economist who has made significant contributions to the field of public finance, posits that "Fiscal Policy" serves three primary purposes, namely- "stabilization," "resource allocation," and "distribution." In other words, Musgrave's theory suggested that all government economic activities can be broadly divided and analyzed through these three lenses. The purpose of "stabilization" is to ensure economic stability and growth, while "resource allocation" aims to distribute public goods and resources efficiently and effectively for development. And lastly, "distribution" aims to the allocation of resources, goods, and benefits within a society in an equitable and fair manner (Blanca, 2013).

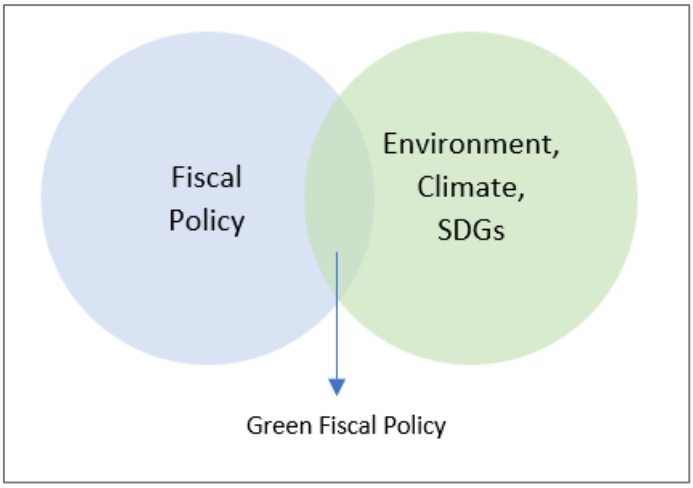
When it comes to a nation's economy, governments can either take an active or passive approach. These policymaking choices made by governments are usually heavily influenced by the role they typically play in an economy. In other words, it depends on whether they lean towards being more interventionist or laissez-faire. When governments take on a Passive role, they tend to rely on the market to provide services like healthcare and education. Consequently, the need for revenues and taxation is often reduced or less, meaning that The State plays a limited role, and public financing is minimal. On the other hand, where the market fails to provide for public goods effectively, the government often takes on a more active role, assuming responsibilities in these areas. However, this increased involvement comes at a cost which is the need for more revenue because of more significant public finance requirements.

7.2.2 Green Fiscal Policy

In the Context of Fiscal Policy that was just discussed, "Green fiscal Policy" can be referred to efforts made by governments to align their fiscal and budgetary activities with the aim of achieving sustainable development goals. In simpler words, it involves ensuring that the government's financial decisions prioritize ecological aspects along with the required economic and social aspects.

Figure 4

Diagrammatic Representation of Green Fiscal Policy



Note. Venn diagram representing the intersection of Environment, Climate, and SDGs aspects with Fiscal Policy to form Green Fiscal Policy created by the Author.

Initially, environmental policies were typically introduced through fixed guidelines without much room for flexibility or creative solutions. Most of the approaches were regulatory in nature, meaning that they relied on rules and restrictions to achieve a set of desired outcomes. Whereas fiscal instruments, i.e., economic tools that can be employed to shape the behavior of individuals and (or)

corporations towards a particular goal, in this case, promoting environmentally responsible behavior, have been utilized as incentive-based mechanisms.

Challenges, both environmental and climate-related, can be resolved by employing both regulatory and fiscal instruments. And the combination of these instruments can help policymakers in tackling multifaceted environmental issues effectively with a minimal financial burden.

It is, therefore, fair to State that the "Green Fiscal Policy" is a government approach that focuses on the promotion of sustainability while ensuring that the revenue streams are not impacted. It involves a strategic rearrangement of government expenditures and revenue in a fashion that promotes social, environmental, and financial benefits. The objective is to achieve an outcome that is not only financially desirable but also environmentally sustainable and socially responsible. With Green Fiscal Policies, governments can play a pivotal role in promoting a more sustainable economy for future generations (United Nations Environment Programme, 2020).

Table 2

Instruments of Green Fiscal Policy

Revenue-generating instruments	**Revenue-spending instruments**	**Revenue-neutral instruments**
Taxes	Subsidies	Cap-and-Trade (free permits)
Charges	Feed-in Tariffs	Revenue-neutral instruments
Fees	Tax exemptions	
Removal of subsidies	Grants	
Cap-and-Trade (auctioned permits)	Loans (below market rate)	

Transportation	Cash transfers, compensation schemes
Health and Family welfare	Public procurement

Note. List of Revenue-generating, Revenue-spending, and Revenue-neutral instruments and tools that can be employed in a Green Fiscal Policy from *Introduction to Green Fiscal Reform,* by PAGE, n.d.

Green fiscal Policy, just like traditional fiscal Policy, aims to achieve effective stabilization, distribution, and allocation. In other words, the government's approach to managing economic affairs for environmental objectives aligns with its conventional aims.

7.2.3 Green/Climate Budgeting Initiatives and Frameworks

Over time, numerous green/climate initiatives have been introduced by various entities such as institutions, groups of institutions, governments, and collaborations at different levels, including national, sub-national, and sub-sub-national levels. The implementation of important initiatives and frameworks aimed towards promoting green practices and addressing environmental and climate-related challenges through coordinated efforts have been the key focus of these initiatives across the globe. At the national level, countries have been striving to promote and implement favorable policies to protect the environment by means of marrying "Green aspects with Fiscal Policies." At the sub-national level, states have been increasingly adopting sustainable practices to reduce their environmental impact. Meanwhile, cities and municipalities have taken their own initiatives like the C40. Some of such frameworks and initiatives have been eluded in this section.

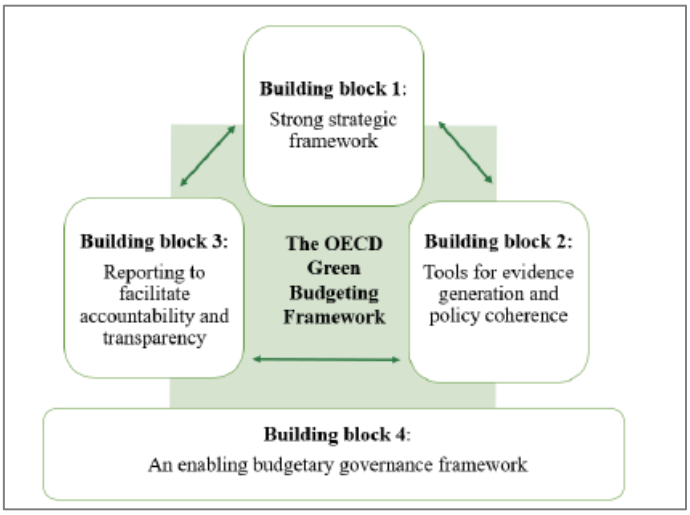
7.2.3.1 Salient Frameworks

7.2.3.1.1 OECD Framework on Green Budgeting

The Green Budgeting Framework by the Organization for Economic Cooperation and Development (OECD) was developed and introduced in the year 2017 as part of the Paris Collaborative on Green Budgeting, a platform that consists of experts from a myriad of backgrounds and disciplines who work collaboratively under the guidance of the OECD. (OECD, 2017). This framework adopts a comprehensive and strategic approach with the goal of integrating environmental and climate perspectives into the budgetary processes of the government. It has four key building blocks (Figure 6): a strong strategic framework, budgetary tools for generating evidence and achieving policy coherence, reporting for promoting transparency and accountability, and stakeholder engagement. It provides a set of budgeting tools that can assist governments in the design and implementation of environmentally sustainable policies and programs, allocate financial resources appropriately, and facilitate the transition to a low-carbon economy. The crux being incorporating green budgeting into fiscal planning is to ensure both economic growth and sustainable development are achieved in tandem (Nicol & Park, 2021).

Figure 5

The OECD Green Budgeting Framework



Note. The diagram represents the salient pillars in the OECD Green Budgeting Framework from *Green Budgeting in OECD countries* by the OECD, 2021.

Box 5 - OECD Framework

As per the "OECD Framework on Green Budgeting," the concept of green budgeting comprises four crucial elements that work together synergistically.

i- *Robust strategic framework: Strategic plans at the national level for addressing climate change or environmental issues, which outline prioritized goals and objectives to inform decisions related to taxation and spending*

ii- *Tools for evidence generation and policy coherence: Environmental impact assessments should be conducted alongside new budget measures, while ecosystem services pricing, including carbon pricing, can help achieve national environmental and climate goals by placing a value on environmental externalities through mechanisms like taxes and emissions*

trading systems. Additionally, green perspectives should be incorporated into public expenditure reviews and performance-setting processes.

iii- *<u>Promote accountability and transparency</u>: A statement on Green Budgeting that accompanies the budget, aimed at offering the Legislature and the public a comprehensive overview of how the budget aligns with environmental objectives in a given fiscal year.*

iv- *<u>Create an enabling environment</u>: The intricate web of strategic planning, budgetary measures, long-term budgetary boundaries, evidence-based budgeting procedures, and the eminent participation of both legislative.*

Additionally, the key Principles of the framework include the following:

- *Making evidence-based decisions regarding the environmental and budgetary impacts.*
- *Ensuring coherence through systematic and coordinated centralized mechanisms.*
- *Enhancing credibility by involving impartial and independent partner institutions.*
- *Ensuring transparency regarding the overall impacts of the budget on the government's international and domestic environmental commitments.*
- *Mainstreaming environmental policies by integrating them into the budget process.*
- *Ensuring fiscal sustainability to align environmental commitments with overall government priorities.*
- *Adopting a whole-of-government approach by involving ministries in environmental policymaking, especially the Ministry of Finance.*

- *Conducting a comprehensive assessment of the environmental impacts of the entire budget, including revenues and expenditures, positive and negative effects, co-benefits, and side effects of other policies.*

(Source - Nicol & Park, 2021)

An analysis by Nicol and Park reveals that Green budgeting practices exhibit unique features; for instance, in France, green budgeting implies the exhaustive labeling of expenses based on environmental goals. Conversely, in Colombia, green objectives are integrated within a more extensive agenda of high-level priorities, such as budgeting for the Sustainable Development Goals. On undertaking a comparative analysis across the 14 OECD countries that practice green budgeting, Implementation approaches to the adoption of green budgeting across the 14 OECD countries diverged significantly and were aligned with their respective national contexts. Some intended to carry out a "Climate Public Expenditures and Institutional Review (CPEIR)" to determine an appropriate method with respect to their current budget systems, while others were in the initial phases of planning and had not yet formulated a strategy. Due to various challenges, many countries have yet to incorporate green budgeting into their budgetary processes. One of the challenges is the lack of a proper methodology to assess the environmental impact of budgetary decisions. Additionally, the absence of a modern budgetary governance framework, which is essential for embedding an outcome-based approach, is another hindrance to the implementation of green budgeting. It is worth noting that green budgeting is still considered a new practice, with many countries yet to develop their capacity for it. Most OECD countries that have adopted green budgeting have plans to further develop it in the future. For instance, Ireland aims to incorporate additional

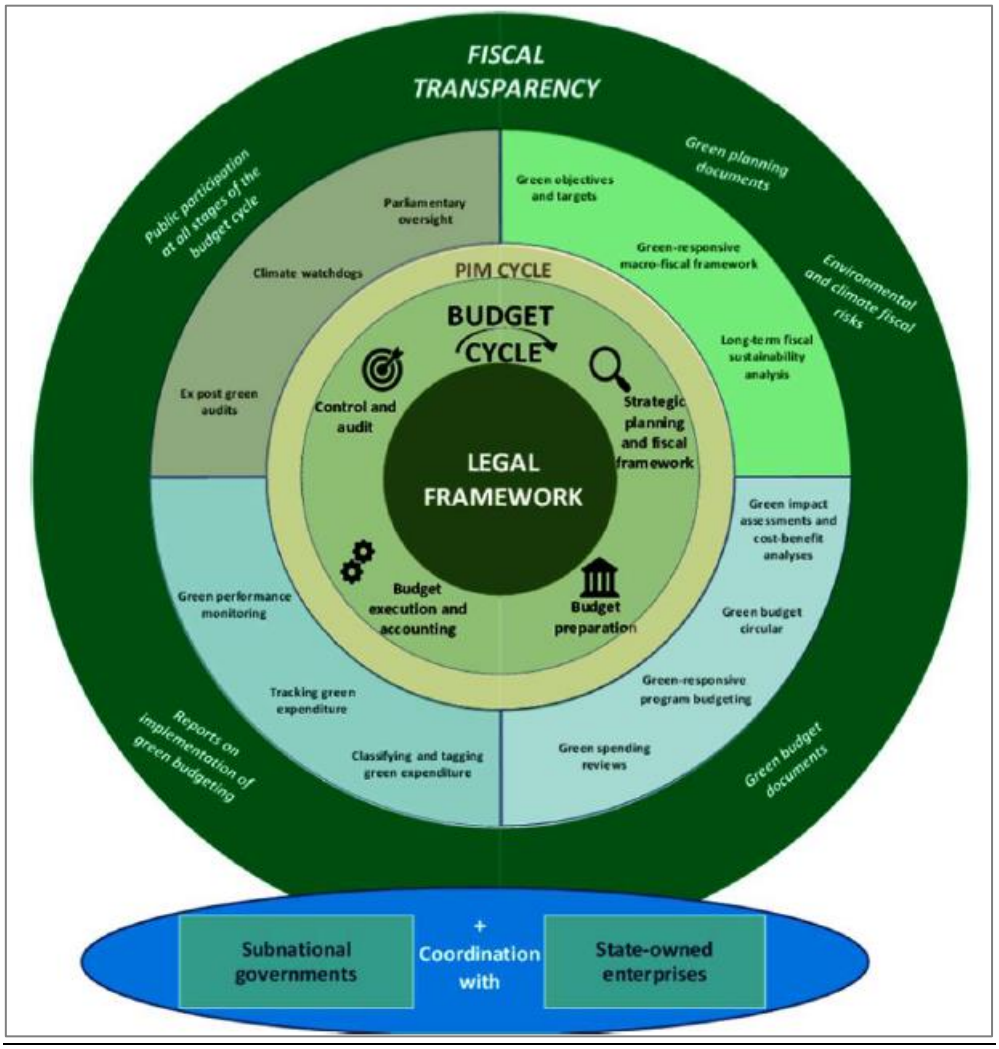
dimensions, such as tagging negative expenditures and tax expenditures. Colombia also plans to improve its green budget tagging approach to enhance accountability and transparency among parliament and the public. Moreover, the introduction of the European Green Deal will influence the development of green budgeting in many European countries in the future (European Commission, 2020).

7.2.3.1.2 IMF Green PFM Framework

The International Monetary Fund (IMF) Framework was formulated in the year 2021 to find anchorage in the pre-existing Public Financial Management (PFM) systems and budgetary decision-making tools to attain climate commitments along with other 'green' priorities. It hinges on a legal framework with four pillars (Figure 6) that focus on setting strategic and fiscal targets and policies, moving on to preparing the annual budget, which the legislative body must approve, then the execution of the finalized budget and the creation of detailed financial reports and accounts, and finally, concludes with the independent audit and oversight of the entire budget process. This process, which is cyclic in nature, endeavors the setting of fiscal policies and targets, followed by the allocation of resources and the execution of the allocated resources in congruence with the approved budget.

Figure 6

Diagrammatic representation of the IMF Framework



Note. The diagram represents the IMF's approach which hinges on a legal framework adopted from *Green PFM* by the IMF, 2021.

Delving a little into this framework, Legality or "Legal foundation" is a cornerstone in embedding climate objectives into PFM practices. This propagates Green PFM practices that ought to be legally grounded in order to achieve their objectives, without which there could be a potential ad-hoc implementation of practices. The scope, therefore, should include a myriad of significant components

that help establish a definition of key terms, outlining objectives, institutional arrangements, and specific essential requirements for the implementation of such green practices. There essentially needs to be congruence with the fiscal framework, national development plan, sub-national development plans, sectoral plans, and annual budgets while at the same time also provisioning for flexibility in unforeseen expenditures and other government support for those adversely affected by climate/environmental events. The legal framework then underpins the following four tenets.

a) Integration of green priorities into **strategic planning and fiscal frameworks,** which takes into account a medium-term horizon along with a macroeconomic outlook that integrates climate and environmental impacts and, at the same time, ensures sustainable management of debt. This includes the assessment and management of climate change-related fiscal risks and the estimated potential costs of adaptation into the fiscal strategy. It further becomes imperative to accurately calculate the costs of initiatives and schemes, establish methods for the mobilization of domestic resources, and consider all possible sources of finance in a systematic approach.

b) The subsequent phase of **budget preparation** is a salient one for the consideration and incorporation of green aspects in policies. A good starting point for the same is the "budget circular," which serves as an important guiding instrument for providing instructions to ministries before the budget preparation process. Integration of a robust climate dimension in assessments and the evaluation of the same can steer fiscal policymaking towards the achievement of more environmentally/climate-conscious goals. Tagging of climate-related expenditures during the budget preparation phase is

also a beneficial approach that can aid in the monitoring of progress made from year to year.

c) In the **execution of the budget,** it becomes critical to track and report expenditures related to climate to ensure an efficacious "Green Public Financial Management (PFM) system." This is where 'green' or 'climate' coding can be integrated to ensure the accuracy and efficiency of the financial management of all climate-related spending, including ad-hoc reporting to keep track of the actual green spending. Governments ought to also be prepared to tackle climate emergencies by enhancing the responsiveness of PFM systems by means of the utilization of risk management mechanisms, reprioritization, and cashflow management of short-term expenditures.

d) Ensuring such policies are effective calls for **Control and audit structures** with monitoring and evaluation of the budget actions on climate outputs, audit or inspection to benchmark and verify incorporation of climate focus in work programs and schemes and ultimately ensuring that climate-related expenditure and policies align with their predetermined climate goals.

The IMF's framework is a holistic one encompassing several salient aspects. However, having stated so, one ought to consider that the process of implementation of such reforms is a long-term endeavor that requires constant iteration. As such, no country has a fully integrated and comprehensive "Green Public Financial Management (PFM) system." Many nations worldwide are still in the early phases of establishing and executing Green Public Financial Management (PFM) platforms (Kim, 2022), examples of which are eluded in the next section, snapshots from around the world.

Formulation of a medium- to long-term plan that is congruent with national priorities and takes into consideration limitations in terms of capacity is of great importance as well. Furthermore, it is important for nations to carefully select strategic entry points in the budget cycle, depending on their maturity of adoption of the Public Financial Management system, in order to effectively reap the benefits of implementing Green Public Financial Management (PFM) reforms. The IMF-prescribed framework is a helping hand in mainstreaming green/climate budgeting but is not a one-size-fits-all, and therefore implementing Green PFM systems is only meaningful if the basic elements of a functional traditional PFM system, such as financial compliance and budget preparation are already in place in some form or the other.

7.2.3.1.3 UNDP's Budgeting for Climate Change

The "Budgeting for Climate Change" is a piece of guidance published by the United Nations Development Programme - Regional Bureau for Asia and the Pacific (UNDP-RBAP) by (Shah et al., 2021) in the year 2021 that offers valuable perspectives and instructions on how to employ budgeting as a tool in the fight against climate change. It takes into account the following key principles while integrating climate change into budgeting.

1- To have an integrated approach, i.e., Building on the country's existing systems, ownership, policies, and commitments.
2- To Ensure flexibility and better alignment of the reform measures with the budget cycle.

3- To define roles, responsibilities, and mechanisms for coordination that are clear and comprehensible (Shah et al., 2021).

In addition, to the above-mentioned principles, the guidance note also expounds on the method for integration of different functions and systems in a structured and planned fashion that mirrors the budget planning and approval components of the Public Financial Management (PFM) cycle. The methodology prescribes the following stages.

Stage 1 *(Strategy Setting and Macro-Fiscal Framework)*	Collaboration between government agencies and climate experts to fully integrate climate change aspects into the fiscal framework. Risks, vulnerability, loss, and damage must also be adequately assessed. Strategic budget documents that include climate change policies at the start of the budget process can provide certainty and predictability for relevant government agencies.
Stage 2 *(Budget Preparation)*	The preparation process must include adequate changes to address climate change with additional funding sources and revisitation of the existing framework and guidelines. Improving the performance information within the budget framework specifically for climate change is suggested, but it may require some behavioral and skill improvements that development partners can assist with.
Stage 3 *(Budget Approval and Accountability)*	Embedding transparency and accountability through discussions during budget hearings, negotiations, and documented processes. Strengthening organizational arrangements and independent fiscal

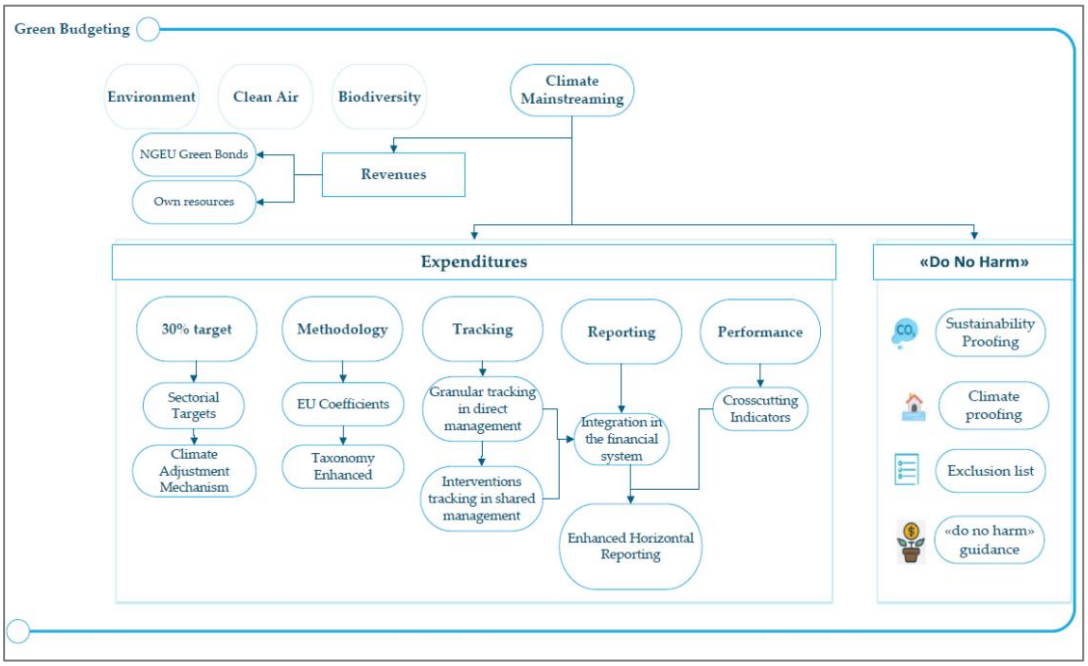
	institutions can support better fiscal policies before the Legislature, improving transparency and accountability.

7.2.3.1.4 EU Framework

The European Commission's Green Deal Communication of 2019 highlights the positive impact of using green budgeting tools. By prioritizing investment, consumption, and taxation based on green initiatives, it emphasizes that green budgeting tools can aid in the redirection of funds away from harmful subsidies and support the development of much-needed environmentally friendly projects. "Green budgeting tools," as such, can be essential policy instruments that can make a significant difference in the promotion of sustainable practices and the reduction of carbon footprint (European Commission, 2020).

Figure 7

Overview of the climate mainstreaming architecture in the EU budget



Note. The figure represents an overview of the climate mainstreaming architecture in the EU budget, seen in the wider context of green budgeting, which includes biodiversity mainstreaming and other independent green tracking methodologies from *Climate Mainstreaming Architecture in the 2021-2027 Multiannual Financial Framework* by the Council of the European Union, 2022.

The European Union, in this context, introduced "The Green Budgeting Reference Framework (GBRF)," a dual-purpose tool devised for its Member States. Firstly, it is designed to provide a basic set of master directions for countries that are in the process of initiating the implementation of green budgeting or the upgradation of their existing practices. The GBRF offers guidance for the creation of national green budgeting frameworks (GBFs). While the objective is not to enforce standardization for green budgeting practices across the European Union, it helps

serve as a point of reference or benchmark to encourage adequate levels of consistency among Member States. Secondly, the Commission could use the GBRF as a monitoring and assessment mechanism to track the process of member countries' adoption, practice, and implementation regarding green budgeting (European Union, 2022).

The framework covers several key aspects, as shown in Table 3 below, needed for effective green budgeting, including the inclusion of environmental objectives in the budget, budgetary items, and public sector organizations. It also provides a methodology to evaluate the consistency of budgetary policies with environmental objectives, clearly outlines deliverables, and establishes clear governance structures and responsibilities among stakeholders in order to establish transparency and accountability for its effectiveness. The framework outlines three levels of development that differ in ambition and comprehensiveness across the five key elements mentioned earlier. Level 1 corresponds to an "essential" green budgeting framework that includes necessary features for any country that is dedicated to implementing green budgeting practices. Level 2 corresponds to a "developed framework," while level 3 presents an "advanced" framework with a more comprehensive and sophisticated approach to green budgeting (European Union, 2022).

Table 3

Elements of the EU Green Budgeting Reference Framework

ELEMENTS		LEVEL 1 - Essential	LEVEL 2 - Developed	LEVEL 3 – Advanced
Coverage	Environmental objectives	Climate-related	Climate-related; Some other objectives Favourable items; Unfavourable items	All objectives
	Budgetary items	Favorable expenditure; Favorable revenue	Favorable items	Favorable items; Budgetary items; Unfavorable items
	General government	State (incl. social security)	State (incl. social security); Subnational governments	State (incl. social security); Subnational governments; Other (e.g. SOEs + extra-budgetary)
Methodology		Tagging methodology	Tagging methodology	Tagging methodology; Impact assessment of policies methodology
Deliverables		Identification in annual budget; Reporting on budget execution	Identification in annual budget; Reporting on budget execution; Estimates in multi-annual plans	Identification in annual budget; Reporting on budget execution; Estimates in multi-annual plans; Extra-budgetary spending reports
Governance		Ad-hoc central task force	Permanent central structure (not necessarily separated)	Permanent central structure (not necessarily separated); Green budgeting correspondents in various ministries/ agencies

Transparency & Accountability	All deliverables public; Independent expert assessment of methodology	All deliverables public; Independent expert assessment of methodology; Independent assessment of deliverables; Parliamentary discussion	All deliverables public; Independent expert assessment of methodology; Independent assessment of deliverables; Parliamentary discussion; Ex-post review

Note. The table represents key elements of the budget framework along with an overview of the three levels of development from the *EU Green Budgeting Reference Framework (GBRF)* by the European Union, 2022.

7.2.3.2 Complementary Initiatives, Policy Instruments, and Tools

7.2.3.2.1 Climate Responsive Public Financial Management Framework

The Public Expenditure and Financial Accountability (PEFA) was launched in the year 2001 by seven international development partners, which include The European Commission, the World Bank, the International Monetary Fund, and the governments of France, Norway, Switzerland, and the United Kingdom. The primary aim of this program was to standardize the evaluation of Public Financial Management (PFM) across the participating organizations and establish a reliable and consistent methodology for the assessment of the same. Since its inception, the PEFA program has become an internationally recognized standard for PFM assessments and has helped in the promotion of transparency, accountability, and efficiency in public financial management across the world (Public Expenditure and Financial Accountability program, n.d.). The Climate Responsive Public Financial Management Framework is a set of policies, practices, and tools designed by PEFA to integrate

climate-related considerations into a country's public financial management systems. It aims to introduce climate-responsive practices into a nation's policy and fiscal frameworks to address climate change. The framework promotes climate-resilient practices within a country's governance system, ensuring that strategies are in place to mitigate the adverse effects of climate change on the economy and financial sector. It encompasses budget preparation, execution, accounting, and reporting and includes indicators that cover critical areas such as climate change policy and strategy, budgeting, expenditure management, revenue management, and risk management. These indicators furnish guidance for the implementation of the framework and contribute directly to the achievement of environmental goals, making it a comprehensive approach to support sustainable development through effective public financial management systems that prioritize climate change mitigation and adaptation efforts (Public Expenditure and Financial Accountability, 2020).

7.2.3.2.2 Climate Public Expenditure and Institutional Reviews (CPEIR)

The Climate Public Expenditure and Institutional Review (CPEIR) is a tool produced by the UNDP that enables the review and assessment of public expenditures and climate change. The CPEIR explores connections between national policies on climate change, public expenditures, and institutional structures. Its ultimate goal is to help in the integration of national institutions with climate change considerations seamlessly into the country's overall development planning and budgeting process. The tool is systematically designed to ensure that salient climate change variables are not neglected in the national development decision-making processes (Bird et al., 2012).

The UNDP later released the "CPEIR Methodological Guidebook" with the primary objective of equipping governments and development partners with comprehensive instructions and resources to accomplish a CPEIR. This guidebook lays down a step-by-step approach to conducting a CPEIR, providing flexibility and adaptability to different country contexts and builds on the structure of the World Bank's Public Expenditure Reviews. It consists of three pillars: Policy Analysis, Institutional Analysis, and Climate Public Expenditure Analysis (fig xx)

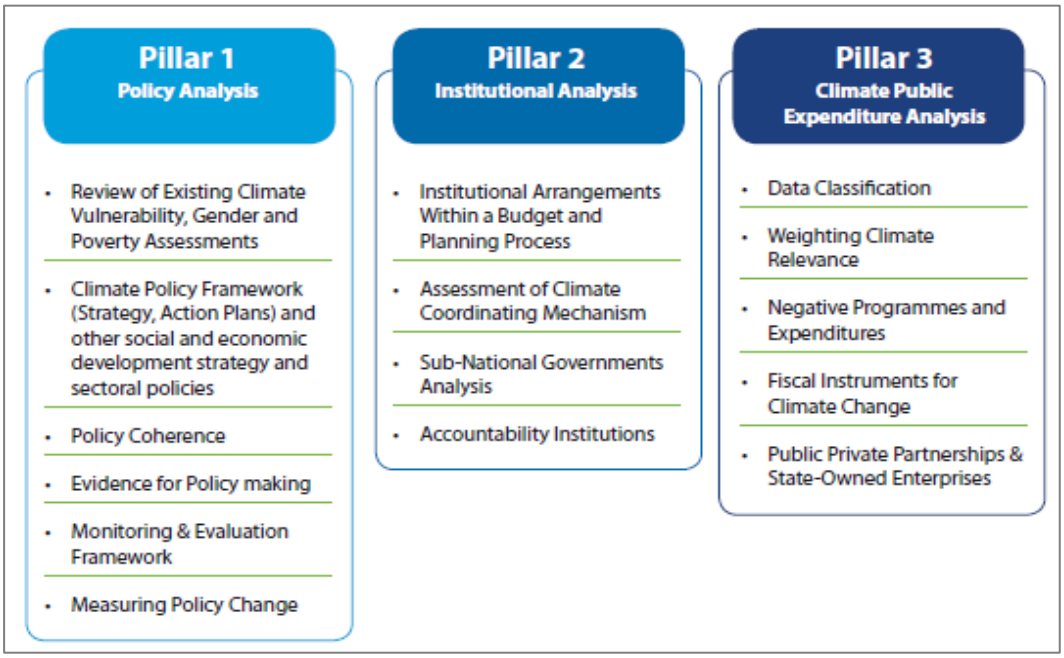
Policy Analysis evaluates the climate policy framework, including monitoring mechanisms and program implementation, to determine if policy objectives are being met.

Institutional analysis involves the evaluation of the institutions involved in formulating, implementing, and coordinating climate responses. This includes a review of budget and planning processes, engagement, and coordination with stakeholders.

Climate Public Expenditure Analysis assesses climate-related spending as a percentage of the budget and evaluates fiscal policies, including tax incentives and subsidies, as part of climate financing tools (Adelante et al., 2015).

Figure 8

CPEIR Analytical Framework



Note. The figure represents key elements of the three pillars of the CPEIR Analytical Framework from the *A methodological guidebook: Climate public expenditure and institutional review* by the UNDP, 2015

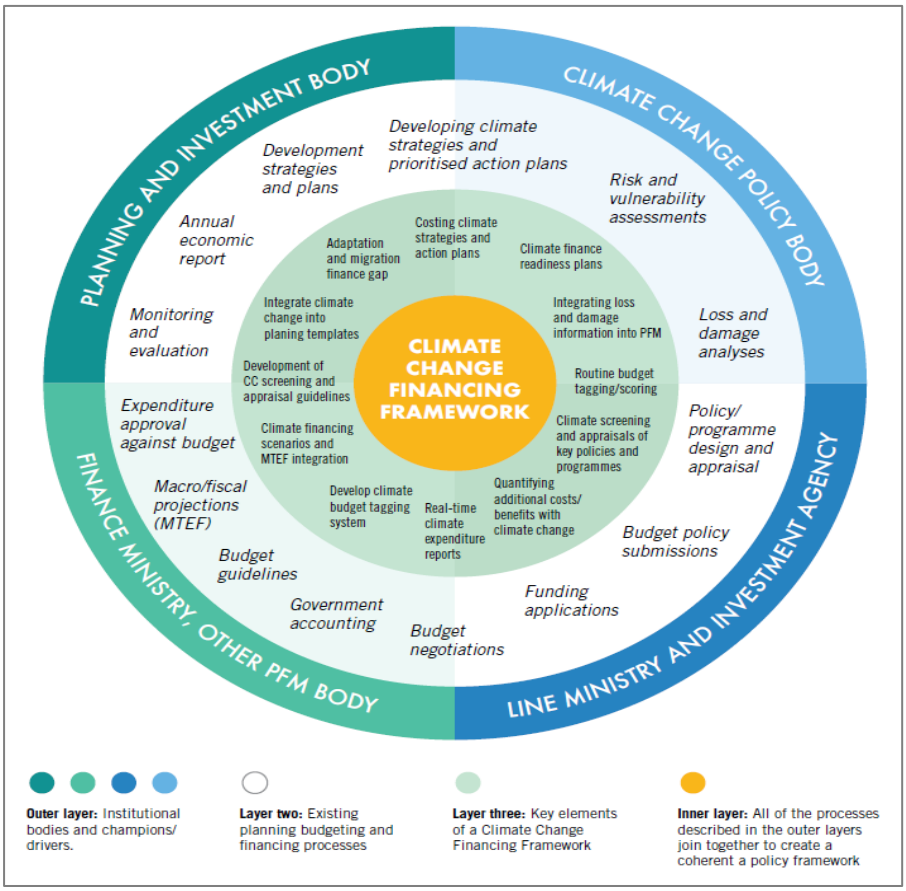
7.2.3.2.3 Climate Change Financing Framework (CCFF)

A Climate Change Financing Framework (CCFF) provides a comprehensive and methodical way to address climate change issues by establishing connections between policy structures, strategies, and budgeting (fig xx). Its main purpose is to ensure that the allocation of available funds is made in a transparent and informed manner in order to achieve its maximum utilization and effectiveness. By identification of opportunities based on legal, institutional, and process reviews of the

existing public finance management (PFM) system, CCFF offers a roadmap for the integration of climate change considerations into planning and budgeting processes. Moreover, it assists in the establishment of monitoring mechanisms that can report on climate change-related expenditures and help provide feedback to decision-makers on directing climate budgets to areas that need urgent attention, particularly those affecting the poor and vulnerable populations. Consequently, CCFF is an efficient tool for incorporating climate change into the national system by engaging stakeholders in mobilizing, managing, and targeting climate finance (Ministry of Finance Government of Nepal & Governance of Climate Change Finance to Benefit the Poor and Vulnerable, UNDP, 2017).

Figure 9

Overview of the Climate Change Financing Framework



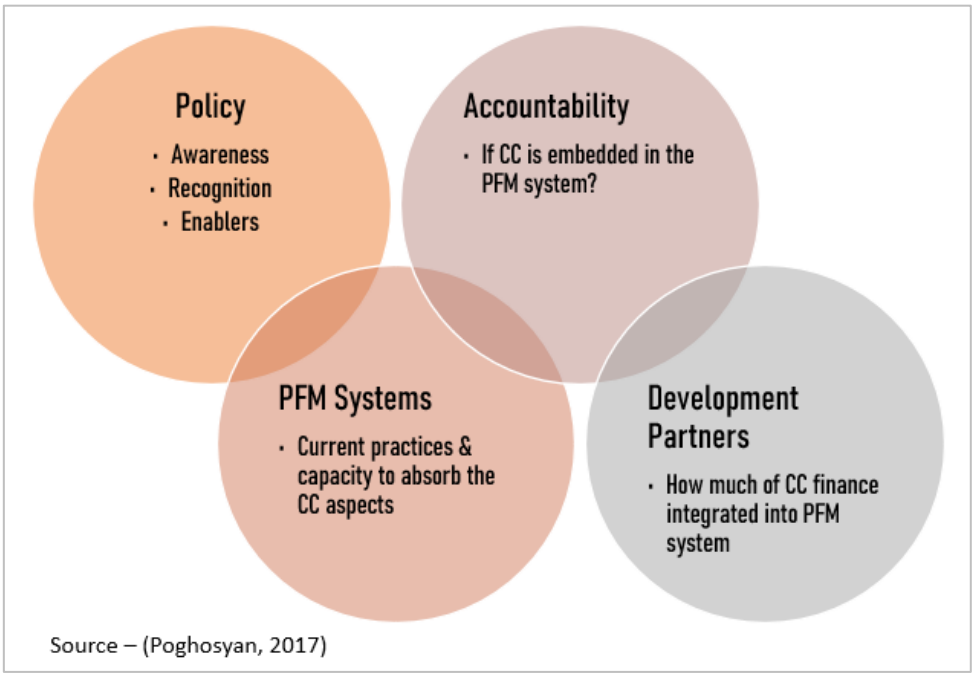
Note. The figure represents key elements of the three pillars of the Climate Change Financing Framework from the *Climate Change Financing Framework: A roadmap to systematically strengthen climate change mainstreaming into planning and budgeting* by the UNDP, 2017.

7.2.3.2.4 Climate Change Budget Integration Index (CCBII)

The Climate Change Budget Integration Index (CCBII) is a tool developed by the UNDP that quantifies how well climate change has been integrated into the public budget. It is designed to assist countries in the evaluation of their progress in the incorporation of climate change into their budgeting processes and to identify areas that require improvements. It is part of a larger initiative to encourage climate-sensitive public financial management. Along with other tools, such as the Climate Public Investment Management Assessments (Climate-PIMA), the CCBII provides a comprehensive evaluation of a country's climate finance landscape so that it can determine the most effective ways to allocate resources to mitigate the impacts of climate change. The index employs a set of indicators to assess and evaluate a range of aspects, such as the legal and institutional framework for climate finance, the allocation of climate finance across sectors, and the monitoring and reporting of climate finance expenditures (Fig xx). The intention is for it to be adaptable and flexible to suit varying contexts of countries that employ it and that which can be adjusted to reflect particular priorities and challenges faced by each country's respective government. It establishes a uniform benchmark on how well climate change has been integrated into the public budget, thereby enabling comparative analysis between countries (United Nations Development Programme, 2015; Eastern Partnership & United Nations Development Programme, 2022).

Figure 10

The Components of Climate Change Budget Integration Index



Note. The figure represents key elements of the Climate Change Budget Integration Index from *Measuring the Integration of Climate Change in PFM Systems* by the UNDP, 2015

7.2.3.2.5 Climate Budget Tagging (CBT)

Climate Budget Tagging (CBT) is a relatively new exercise that involves the identification, measurement, and monitoring of climate-specific expenditures incorporated into the budget system. It can be called a subset of "Green budget tagging," which is a comprehensive approach to labeling budget expenditures based on their environmental impact, whether it is positive or negative. In order to generate evidence and promote policy coherence, the evaluation of budgets can be done both before and after the budget formation stage, known as ex-ante and ex-post evaluation, respectively. The effectiveness of this exercise is maximized when both evaluations

are conducted. The ex-ante evaluation helps identification of potential problems and provides guidance for budget formation, while the ex-post evaluation examines the actual implementation of the budget and its outcomes. When both these evaluations are carried out, a comprehensive understanding of the budget process is known (The Organization for Economic Cooperation and Development, n.d.).

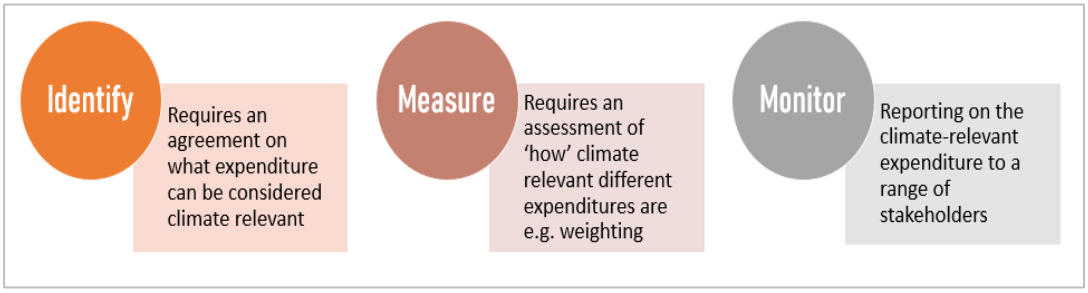
The primary objective of Climate budget tagging is to assist governments in keeping track of their climate-related expenditures and relaying the same to prospective investors. This practice strengthens accountability and transparency and allows for a more effective allocation of funds towards set climate objectives and global commitments. In addition, climate budget tagging encourages collaboration between different government agencies, disseminates ongoing efforts to tackle climate-related issues, and helps in attracting climate finance. Furthermore, it can serve as a means to motivate climate action by mandating that institutions and government agencies advance, label, and present budgets that are climate-sensitive (Bain et al., 2019).

Its introduction typically, thus far, involves three phases that require careful planning and execution. The first phase encompasses the identification of the necessity of CBT and the creation of political support to initiate the process. It requires engagement with stakeholders to raise awareness of the benefits of CBT and the development of a coalition to seek support for the proposal. The second phase encompasses the design and implementation of the CBT system. It involves the development of guidelines and procedures for tagging climate-related expenditures, knowledge sharing and training of staff, and incorporation of CBT into the planning and budgeting cycle for a successful implementation. The third and final phase includes monitoring and evaluation of the effectiveness of the CBT system. This

phase tracks and reports on climate-related expenditures assesses the impact of CBT on climate policy, and makes necessary amendments to the CBT system to ensure compliance (United Nations Development Programme, n.d.).

Figure 11

Key elements of climate-budget tagging



Note. The figure represents key elements of climate-budget tagging from *An introduction to Climate Budget Tagging (CBT)* by the UNDP, n.d.

7.2.3.2.6 Taxonomy

In the context of climate budgeting, taxonomy has a significant impact on the identification and categorization of climate-related expenditures in the budget system. "Taxonomy" is a system of classification that groups similar items together based on shared characteristics (Convention on Biological Diversity, 2010). As such, it is utilized for the identification and classification of climate-relevant expenses, as it can offer data on climate-related spending that assists in the prioritization of investments towards determined objectives and international/National/Sub-National commitments. They also facilitate transparency and accountability on the part of governments and raise awareness in terms of what is being done to combat climate challenges and risks. The European Union, for instance, has developed a classification system for

environmental protection activities, including climate change mitigation and adaptation activities. Amplifying the role of taxonomy in climate budgeting can aid in its effective use as a valuable tool for governments and policymakers to achieve climate targets and ensure a sustainable future (Sweatman & Hessenius, 2020).

7.2.3.2.7 Subnational Green/Climate Budgeting

Subnational governments play a crucial role in tackling climate change at the subnational/ local/municipal level, and the integration of environmental and climate considerations into budgeting practices is one approach to promote sustainability and resilience in local areas. With green/climate budgeting, subnational governments can channel funds towards initiatives such as the reduction of emissions, promotion of renewable energy, and implementation of climate resilience projects, to name a few. This will collaterally also result in the alignment of subnational environmental/climate priorities into national policies, leading to coordinated efforts towards climate goals. However, implementation of green/climate budgeting at the subnational level can be a complex process, as Subnational/local governments may face obstacles such as political willingness, lacking skills and resources for implementation, and potentially even obstructions from other governments. It, therefore, becomes important for subnational governments to develop a comprehensive environment and climate strategy with measurable targets and indicators that avoid transferring their limitations.

Box 6: OECD Subnational Green Budgeting Guidelines

Guideline 1: Conduct a diagnostic of local environmental and climate challenges as a prerequisite to launching a green budgeting practice.

Guideline 2: Ensure strong, high-level involvement and support from both the administrative and elected sides of government.

Guideline 3: Ensure the practice has a robust, shared scientific basis to facilitate public trust and ensure the practice can adapt to changing scientific evidence.

Guideline 4: Adopt a step-wise approach to implementing green budgeting in order to learn from previous steps and reinforce the alignment of the practice with local strategic priorities.

Guideline 5: Integrate the green budgeting practice into existing public financial management procedures and tools to help ensure the practice endures.

Guideline 6: Include revenues within the scope of the green budgeting practice to ensure the entire budget aligns with green objectives.

Source - (OECD, 2022)

Box 7: C40[2] Climate Budget main streaming at the city level

There is no single approach that will work for every city or region. Action items are drawn on the basis of Oslo as a leader in this area, along with other cities such as Stockholm, Mumbai, Barcelona, Berlin, Montréal, Paris, Tshwane, and London, who are also working on developing their own climate budgets or adapting key elements of existing ones to fit their unique governance contexts. By taking a more

[2] *C40 is a global network of nearly 100 mayors of the world's leading cities that are united in action to confront the climate crisis.*

elaborative approach, cities around the world can adopt the following action items for main streaming climate budgeting.

1- *Clearly establish roles and responsibilities for the climate budget.*
2- *Build support for climate action and ownership of climate budgeting across departments.*
3- *Utilize the city's formal processes to steer climate action.*

(Source - C40 Cities Climate Leadership Group & C40 Knowledge Hub, 2023)

7.3 Snapshots from around the world

The idea of green/climate budgeting is becoming increasingly popular around the world, as many countries and regions, i.e., nations and their Sub-national states and provinces, are adopting this approach to achieve environmental and climate-related objectives. Nevertheless, the implementation of green/climate budgeting varies significantly across different countries and regions. While some have made great strides in the integration of environmental and climate change considerations into their budgeting processes, others are still in the nascent stages of this adoption process. It is worth noting that green/climate budgeting is a relatively new concept, and as such, there may be variations in how it is implemented and incorporated into the budgeting processes.

For instance, many countries and regions around the world have come to realize the importance of taking green and climate change considerations into account during the planning and allocation of budgets, which is seen as a crucial strategic step in the fight against climate change and the achievement of their sustainability goals.

Meanwhile, in other countries, such as those with legislation or executive orders in place, green and climate budgeting has become a formalized process. By incorporating green and climate considerations into budgeting, nations/regions perhaps realize that they can more effectively address the challenges posed by climate change and ensure a more sustainable future for all. In this section, we shall delve into a few of such examples at different levels – National(Country), sub-national (States/Province), and Local (Cities/ Municipalities).

7.3.1 National (Country) Level

Nepal

The world's first climate budget was introduced in the Himalayan nation of Nepal. As part of the Climate Budgeting process, a climate relevance index was arrived at by means of calculating the total budget of its relevant activities as a percentage of the program's overall budget. This index was then employed to classify programs into three categories: highly relevant (60% or more), relevant (20-60%), or neutral (less than 20%). This method laid the foundation for a swift implementation of Climate Budget Tagging (CBT) in line ministries. However, as an unintended consequence, it created a loophole where there was a potential risk of exaggerating the actual amount of spending categorized as “highly relevant,” in actuality which prompted the UNDP and the Ministry of Finance to test a new approach that determines the relevance and weightage. This, however, did not stop the Climate Budget from being included in various reports published by the Ministry of Finance, such as the Economic Survey Report, Consolidated Financial Statements, and annual Budgets, allowing for greater transparency and accountability in the allocation of funds towards activities related to climate change. Some civil society organizations in Nepal have nevertheless expressed reservations about their dependability and

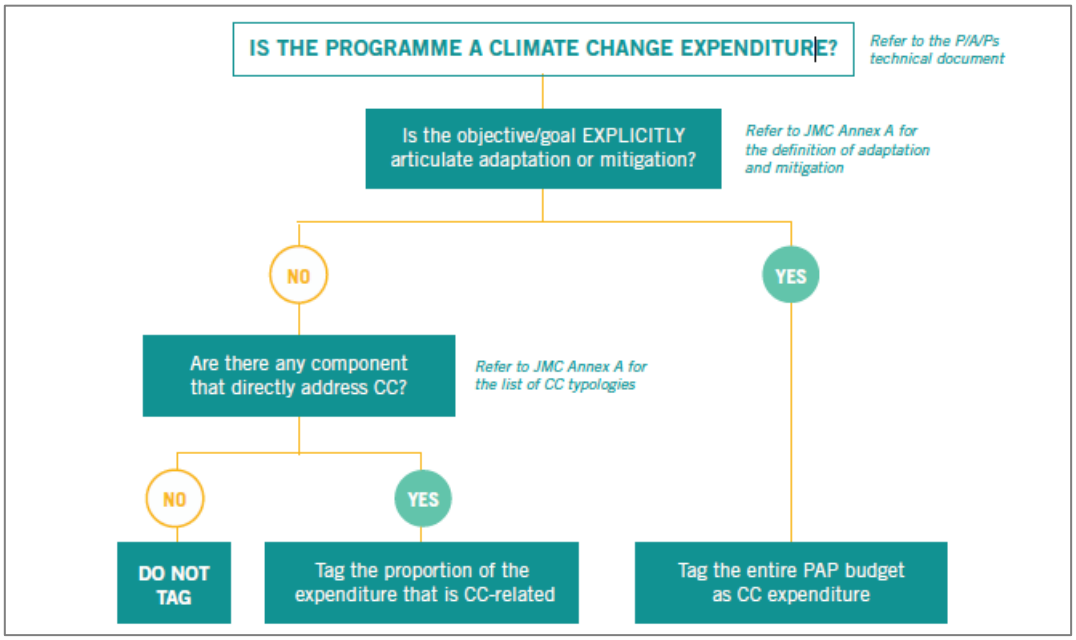
utilization of the Climate Budget tags. To summarize, the Climate Budget serves as a vital aspect of the country's financial reports, providing a clear distinction between funds allocated for climate-related activities and other expenses (UNDP's Governance of Climate Change Finance Team & International Budget Partnership, 2018).

Philippines

The Climate Change Act of 2009 and the National Climate Change Action Plan in the Philippines mandated the central government to incorporate a climate-responsive budget. This is achieved through the adoption of climate budget tagging, where climate change programs, activities, and projects are prioritized, tagged, and coded in the annual budgets of national government agencies. This ensures adequate funding and resources for the decided climate change initiatives. By tagging such initiatives and projects, the government can clearly identify expenses related to climate change and track their progress over a period of time. In 2015, subnational governments were also mandated to tag climate-related programs and projects in their annual investment programs, using a comprehensive list of climate change activities called the "Climate Change Typology" for Local Government. This typology aids Local governments in the identification of whether their planned programs or projects are related to climate change adaptation or mitigation. If a program or project includes adaptation or mitigation objectives, then the entire budget is considered a climate change expenditure. However, if only specific components of a program or project are related to climate change adaptation or mitigation, then only the budget for those specific components is considered a climate change expenditure (OECD, n.d.).

Figure 12

The Philippines climate-budget tagging process



Note. The figure represents the process of climate-budget tagging in the Philippines from *A primer on green budgeting: International, national and subnational perspectives* by the OECD, n.d.

Bangladesh

In 2014, with support from the United Nations Development Programme (UNDP), the government of Bangladesh established a Climate Fiscal Framework aimed at promoting climate-resilient development. At the onset of this initiative, climate change expenditures were initially restricted to certain ministries, but as the program progressed, all ministries across the country were included. Subsequently, measures were put in place to enhance transparency and accountability in budget allocation and expenditure reporting. Among these measures was the public availability of budget allocations and reporting on actual expenses at the end of the

fiscal year. Starting in 2018, a four-digit climate change budget code segment was added to the accounts to enable a regular analysis of government spending on climate change-related activities across the six themes and 44 programs specified in the Bangladesh Climate Change Strategic Action Plan. The government subsequently directed Ministries to include narrative reports in their Ministry Medium Term Budget Frameworks outlining the impact of their medium-term goals on the climate and the total budget allocated for climate-related expenses in the next three years. Additionally, detailed figures for climate change expenditures in the upcoming budget year are provided in an annual climate budget report (UNDP's Governance of Climate Change Finance Team & International Budget Partnership, 2018).

France

The French government released its first "Green Budget" in 2021 as an annex to its Finance Bill, which is seemingly one of the most comprehensive ones to have been produced anywhere in the world to this point. It takes into consideration the evaluation of the "green" impact of all state budget expenditures, inclusive of tax spending, and takes into account issues regarding climate change, biodiversity loss, and pollution. In 2017, France became one of the founding members of the OECD Paris Collaborative on Green Budgeting, which marked the genesis of this journey. This commitment was strengthened in 2018 when the French National Assembly and the Senate sought enhanced disclosure on the ecological consequences of policies that deal with public finances. In order to accomplish this goal, France subsequently implemented pilot programs for a number of its ministries and prepared a complete "Yellow Book" for the 2020 Budget. This document offered a comprehensive

overview of pertinent policies that are linked with France's climate objectives and outlined how they may be implemented. This document was tabled in the Parliament for the very first time in October 2019, and it contains information on the alignment of fiscal policy with environmental objectives, environmental tax income, environmental tax spending, and the economic consequences of environmental taxes on people and enterprises. Additionally, France has created a system for classifying budget expenditures according to their influence on the environment. This system takes into account not just the effects of climate change but also the effects of other environmental factors such as biodiversity, the circular economy, water quality, and air quality. The objective of this methodology is to determine how the impacts of one environmental sphere flow over into another. Furthermore, in order to solidify its commitments and guarantee supervision and continuous consultations, France has also formed the High Council for the Climate, an independent entity that provides expert guidance on public issues connected to climate change (Lelong & Wendling, 2020; OECD, 2020).

Box 8: The French approach to tagging

Expenditures are categorized based on their alignment with six key objectives: climate change mitigation and adaptation, water resource management, circular economy and risk prevention, pollution abatement, and biodiversity and sustainable land use.

Very Favourable	*Environmentally targeted expenses*
Favorable	*No explicit environmental target, but an indirect positive impact*
Favorable but controversial	*Short-term favorable effects but the presence of a long-term technology lock-in risk*

Neutral	*No significant or no information*
Unfavorable	*Environmentally harmful expenditure*

(Source - World Bank, 2021)

7.3.2 Sub-National (States/Province) Level

7.3.2.1 International Cases

Riau, Gorontalo and West Java (Indonesia)

The Indonesian Finance Ministry, in partnership with the UNDP, carried out a pilot project in 2020 to implement climate budget tagging in three provinces: Riau, Gorontalo, and West Java. The project employed the same climate budget tagging methodology that has been employed at the national government level since 2014. The subnational tagging methodology, as explained earlier, consisted of two steps, which were implemented during the budget preparation phase. The first step involved the identification of expenditure items at the output level that have an impact on climate adaptation or mitigation. The "output level" was chosen since it provided adequate information on the expenditure item for the identification of performance indicators and allocation of funds. This was a collaborative effort between a myriad of stakeholders, such as the Ministry of Finance and line ministries, with included technical input to identify and gauge an output's adaptation or mitigation impact. The second step involved the determination of the quantum of funds allocated to each output (OECD, n.d.).

7.3.2.2 Cases in India

Odisha – Climate Budgeting

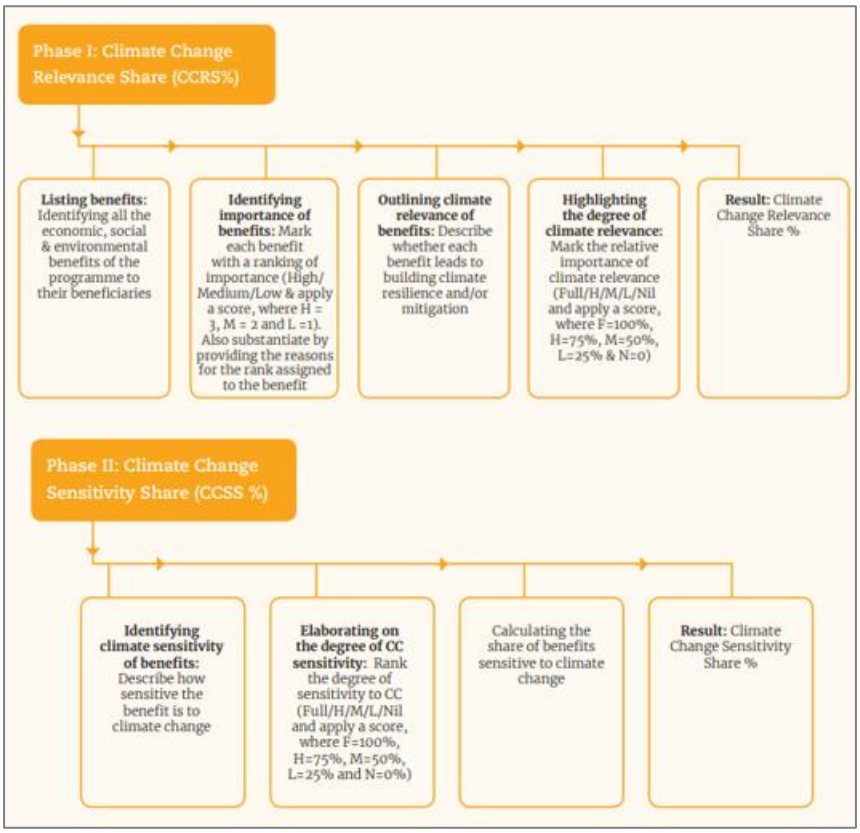
Odisha is the first State in India to recognize the significance of including climate change considerations in their budgetary planning, thereby formulating the first Climate Budget at a sub-national level. The State is located on the east coast of India and is prevalently affected by natural disasters, particularly those caused by climate change. These include tropical cyclones, floods, and water stresses, which occur almost every year. Coupled with that is the region's reliance on coastal livelihoods making its population more susceptible to the impact of extreme weather events. These challenges persist year after year, causing significant harm to the State's people and livelihoods. To address these risks, the State, as part of its action plan, developed an elaborate Climate Budgeting exercise with the aim of identification of climate-relevant spending and the assessment of the extent to which expenditure directly relates to climate change. The Climate Budgeting approach followed a phased methodology. The first phase involved conducting an analysis of the climate relevance of public expenditure within the eleven priority sectors recognized under the State Action Plan on Climate Change (SAPCC). The second phase focused on the assessment of the vulnerability of public expenditure to future climate impacts. This comprehensive exercise by the government of Odisha enabled the identification of schemes that are more resilient to climate impacts, maximizing the benefits derived from them and spotting schemes that require further attention in terms of technical or financial intervention. Additionally, the Climate Change Impact Appraisal (CCIA) study was conducted to assess the Climate Change Relevance Share (CCRS) and Climate Change Sensitivity Share (CCSS) of development projects. The CCIA analysis further helped the state government prioritize schemes/programs for climate-

related planning based on their linkage with development programs and climate change, ensuring maximum welfare benefits during budget allocations (Government of Odisha - Forest and Environment Department, 2018 & Government of Odisha - Finance Department, 2021).

The approach is distinctive given that it calculates climate change relevance and sensitivity of expenditures through a benefits-based approach. The Climate Change Relevance Share (CCRS) helps to prioritize expenditure programs for climate-related planning, while the Climate Change Sensitivity Share (CCSS) identifies areas that require climate-proofing, thereby forming a valuable matrix for decision-makers to determine follow-up action plans.

Figure 13

Odisha's Climate Change Impact Appraisal (CCIA) approach



Note. The figure represents the Climate Change Impact Appraisal (CCIA) study conducted to assess the Climate Change Relevance Share (CCRS) and Climate Change Sensitivity Share (CCSS) aspects by Odisha from *Climate Budget 2021-22* by the Government of Odisha - Finance Department, 2021.

Bihar – Green Budgeting

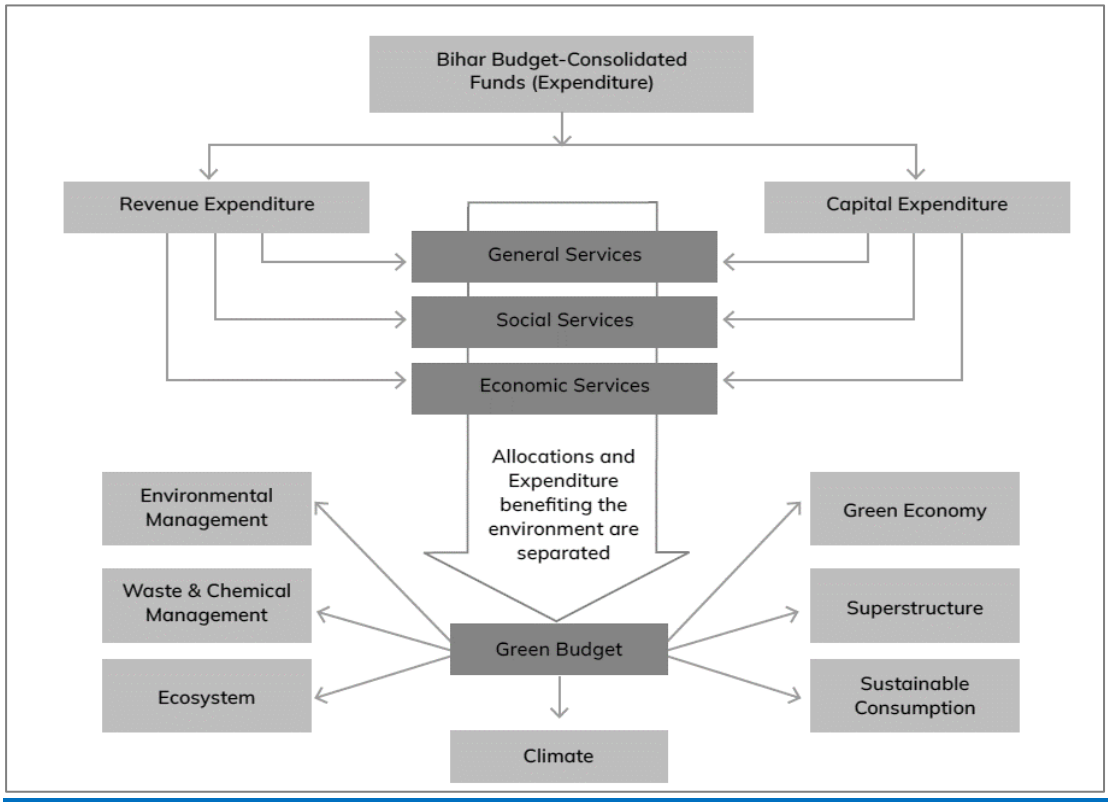
The Green Budget, also known as Harit Budget, was introduced in Bihar in the year 2020 (Singh, 2020) with the aim of assessing fiscal and economic policies through an environmental sustainability lens. The approach adopted by the State was an inspiration by Gender and Child Budget statements adopted in other states. The objectives of the Green Budget included the promotion of inter-departmental cooperation, advocacy for environmentally sustainable policies, evaluation of program outcomes, and allocation of resources towards sustainable development and environmental initiatives. As such, this budget specifically focuses on areas such as climate change, biodiversity, natural resource restoration, and pollution control. The formulation of Bihar's Green Budget involves two methods.

The first method involved the identification and review of existing policies and spending, which was undertaken in two phases. The first phase focused on the identification of schemes administered by the government, those funded by both the Union government and the state government, and undertaking a review to comprehend the extent to which these schemes are in alignment with environmental objectives, either directly or indirectly. The second phase focused on the green components of the data so obtained from various state government departments, which included a range of dialogues and discussions to examine the activities carried

out by these departments as part of the Green Budget formulation process. The second method employed a tagging and tracking method to minimize duplication and errors in expenditure-related data. This included developing plan codes and budget codes to record tracking and ensure accurate allocation of resources to map schemes and evaluate their alignment with sustainable development goals and other commitments (Government of Bihar - Finance Department, 2021 & 2022).

Figure 14

Outline of Bihar's Green Budget



Note. The figure represents the Outline of Bihar's Green Budget from *Action Plan for Green Budgeting in Bihar* by TERI, 2020.

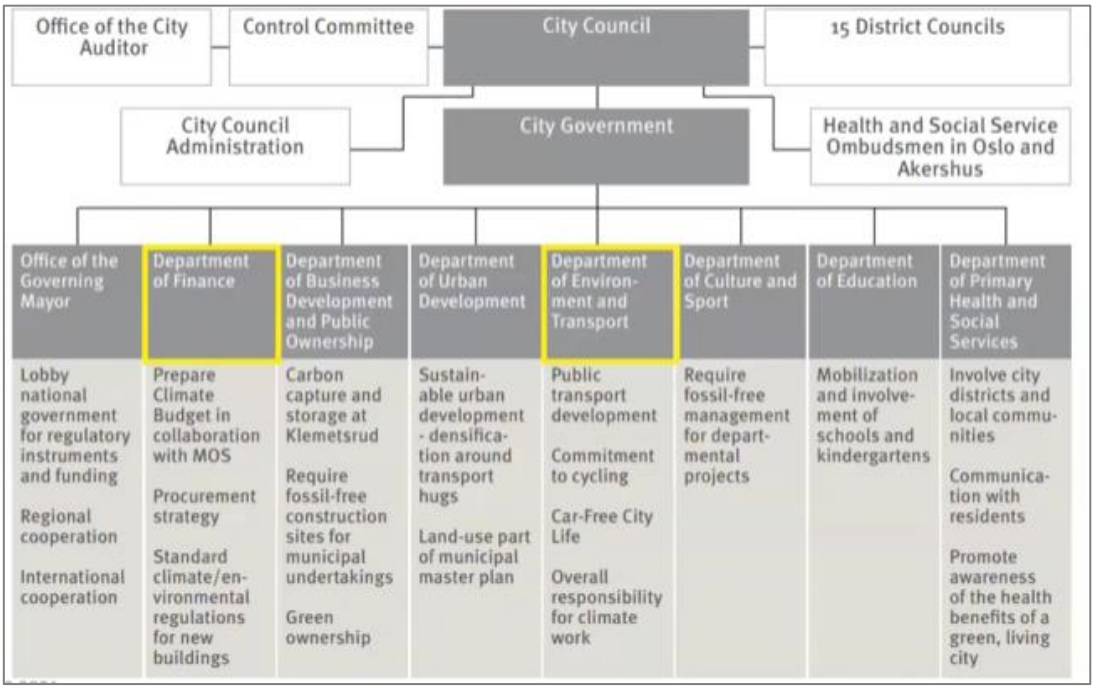
7.3.3 Local (Cities/ Municipalities) Level

Oslo (Norway)

Oslo, the capital city of Norway, is recognized for its strong dedication to environmental sustainability and ambitious climate targets. It was one of the pioneers in the implementation of climate budgeting in 2017 by integrating it into its urban planning processes. Oslo has set an ambitious goal for the reduction of its greenhouse gas emissions by 95% by 2030 compared to 2009 levels and achieving carbon neutrality by 2030 (City of Oslo et al., 2021). To achieve this, the city has integrated climate targets into its comprehensive urban development plan, guiding land use, transportation, and building regulations to align with its climate goals. The city has also made significant financial commitments to support its climate goals, allocating resources to priority areas such as public transportation, renewable energy, and energy-efficient buildings, as well as climate adaptation measures. Oslo's climate budgeting process involves active engagement with stakeholders, including citizens, businesses, and civil society organizations, through consultations, workshops, and feedback mechanisms to ensure diverse perspectives are considered in the planning and implementation of climate initiatives. The city regularly monitors and reports on its progress using key performance indicators (KPIs) and other monitoring mechanisms to assess the effectiveness of its climate initiatives, identify areas for improvement, and ensure transparency and accountability in its budgeting process (City of Oslo, 2023).

Figure 15

Orientation of Oslo's climate works



Note. The figure represents the components of the climate works of the city of Oslo from *Oslo's Climate Budget* by C40, 2023.

To summarize this chapter of the paper, Internationally, there is an increasing acknowledgment of the need to implement climate budgeting as a means to effectively tackle the challenges presented by climate change. The European Union (EU), for instance, has taken a front seat in this domain and has formulated comprehensive frameworks for climate budgeting. Nevertheless, India lacks a national strategy for climate budgeting, which poses difficulty in effectively monitoring and tracking public expenditure pertaining to climate change interventions. This lack of a uniform framework can result in coordination failures, making it burdensome to track and report on climate action. To some extent, a climate

budgetary framework can alleviate these issues by streamlining the flow of public finance and enabling the government to prioritize climate change interventions and allocate resources accordingly.

8 METHODOLOGY

The approach employed involved a combination of secondary research and unstructured interviews, thereby constituting the qualitative methodology for this paper.

For the purpose of conducting secondary research, it is necessary to engage in a thorough review of pertinent published studies, reports, and articles. The primary sources of data and information utilized for this analysis consist of periodic updates and resources from various reputable entities, such as the UNFCCC Standing Committee on Finance, The Organisation for Economic Co-operation and Development (OECD), the World Bank, The International Monetary Fund (IMF), the Climate Policy Initiative, and the European Union (EU). In addition, publicly available information from sources such as UNFCCC, C40, Cities Climate Finance Leadership Alliance (CCFLA), Oxford Policy Management, The Department of Expenditure, Ministry of Finance, GoI, Telangana State Finance Department, Telangana State Climate Change Center (TSCCC), Environment Protection Training and Research Institute [EPTRI], The National Institute of Public Finance and Policy, and other agencies that are involved in or impacted by climate finance, green finance, climate budgeting, and green budgeting was also considered (Please See Annexure C for the literature map). Once the relevant sources have been identified, a thorough evaluation and synthesis of the literature are conducted in order to identify key findings and themes.

For the purpose of conducting Unstructured interviews, the initial step involved the identification of potential interviewees who possess a considerable degree of expertise in the area of interest. Through the utilization of networking,

online sources, and reaching out to industry contacts, a list of fourteen potential interviewees was compiled. However, out of the fourteen potential individuals, five failed to respond, while one declined to participate. Details of potential interviewees, now respondents, are shown in Table 4.

Table 4

Details of respondents

Particulars	Domestic/ International	Organization	Role
Respondent 1	Domestic	Climate Bonds Initiative	Head of India
Respondent 2	Domestic	The Commonwealth	Regional Climate Finance Adviser - Indo-Pacific region
Respondent 3	Domestic	Finance Department, Government of Telangana	Officer
Respondent 4	Domestic	Environment Protection Training and Research Institute	Director and Scientist
Respondent 5	Domestic	World Resources Institute	Program Manager
Respondent 6	Domestic	National Institute of Public Finance and Policy	Assistant Professor
Respondent 7	International	Overseas Development Institute	Senior Research Fellow
Respondent 8	International	Observer Research Foundation	Distinguished Fellow

Note. Displays the types of respondents *compiled* by the Author.

Following the identification of potential interviewees, an interview guide was drafted to provide a framework of open-ended questions, which would facilitate and

direct the conversation. (Please refer to Annexure D for a comprehensive list of the aforementioned questions). These questions were specifically curated to align with the objectives of the interview while encouraging the interviewees to express their knowledge and experience without limitations. The conversations were recorded with the permission of the interviewees for some, while for others, notes were taken to capture the most pertinent aspects of the conversation. The data gathered was analyzed and synthesized to identify the key findings and themes.

Table 5

Summary of the Methodology

Objective	Method	Sources
History of Green/ climate budgeting	Secondary literature	Published studies, reports, articles, and online sources
Frameworks & complementary instruments	Secondary literature	Published studies, reports, articles, and online sources
Best practices adopted by states or countries	Secondary literature; Unstructured Interview	Published studies, reports, articles, and online sources; Respondents
Main barriers to mainstreaming	Secondary literature; Unstructured Interview	Published studies, reports, articles, and online sources; Respondents

Note. Displays the Methods and sources employed for the objective of the paper *compiled* by the Author.

9 KEY FINDINGS and DISCUSSIONS

The analysis of the adoption of climate budgeting as a policy instrument has revealed that there are several variables that can play an important role in the facilitation of its effective implementation. Post the review and analysis of the existing literature and examples of cases from across the world at various levels of its implementation, i.e., National (Country), sub-national (States/Province), and Local (Cities/ Municipalities), and inputs from the respondents, what is understood is that existing public finance systems play a crucial role in embedding this practice along with establishing governance mechanisms, institutional capacity, training and innovation all of which is backed by political support. The crux is that the following themes emerge, which will be delved into in this part of the paper.

9.1 Political Acceptability - Validation and leadership in the realms of politics and administration

Budgeting for climate change needs political backing, which entails acknowledgment that addressing climate change should be a top priority and making a commitment to provide the financial resources to do so. However, the adoption of the climate budgeting practice may be hampered if political leadership does not make addressing climate change a priority in their respective policy agendas. Both Studies and respondents concur that political leaders tend to be limited by short-term mandates and election cycles, which has the potential to impact the decisions they make on the procedures involved in budgeting. It is possible that short-term political

objectives may prioritize rapid economic advantages or political successes above long-term climate action (Energy Cities, 2019). As per a respondent,

> "The city of Mumbai or the state of Maharashtra is a good example where we witness after the change in government that the climate and environmental agenda has lost steam. On the contrary, we witness in the State of Uttar Pradesh where climate is being made an important policy priority and agenda."

This will result in insufficient focus being paid to climate budgeting and inadequate resources being allocated for the same. There are possibilities that some political leaders will be reluctant to take aggressive climate action owing to the possibility of adverse effects on the economy or society, the fear of pushback and friction from certain interest groups, or ideological disagreements (Nicol & Park, 2021). Budgeting for climate change requires an acknowledgment from the political apparatus that addressing climate change should be a top priority. However, if political leaders do not make addressing climate change a priority in their policy agenda, this can not only make it more difficult to implement climate budgeting measures but it can also make it more difficult to enact comprehensive climate policies and measures. Political buy-in is hence required in order to both meet other stakeholders and also set precedence for administrative leadership in later stages of implementation. An illustration of this may be seen in France, where the President had a role in the beginning stages of the implementation of green budget tagging (Kinniburgh, 2019).

On the India front, when we talk of political and administrative validation and leadership, we see quite a lot happening. For instance, the strategy that the Union

government took at COP 27[3], where they disclosed the long-term Net-Zero commitment and introduced the "LiFE mission" (Press Information Bureau, 2022). However, as corroborated by a few respondents, from a climate budgeting (or green budgeting) perspective, even though the Union Budget 2022 - 2023 outlays Rs.35000 crores towards green initiatives (Girotra, 2023), the Union Government has per se not adopted and implemented a mechanism for the identification and tracking of such earmarked funds. In other words, they have not explicitly adopted the practice of climate budgeting, primarily because it may not be a salient policy agenda. There may, however, be a possibility in the future that the same may be adopted by the Union Government, resulting in the State Governments following suit. Nevertheless, subnational governments have been proactive, which is why we witnessed the first climate budget adoption in the country by the State of Odisha, located on the eastern coast (The Climate Group, 2021). As confirmed by almost all respondents, this is mainly owing to governmental recognition and due to the fact that the State has been on the frontlines of experiencing the impacts of climate change, such as droughts and cyclones, all of which have had a socio-economic impact on the residents of the State, making this a significant policy priority for legislators.

9.2 Administrative doability - The ability to actively pursue and monitor expenses related to climate-related initiatives.

The introduction of climate budgeting can be a daunting task with requirements in terms of resources that can be significant for its establishment and sustenance. Various obstacles, such as insufficient technical expertise and high

[3] *COP 27 stands for the 27th session of the Conference of Parties to the United Nations Framework Convention on Climate Change (UNFCCC) that took place from 6 to 20 November 2022 in Sharm el-Sheikh, Egypt.*

turnover rates, to name a few, can significantly impact the budgeting process, primarily compliance with the tagging mechanism and quality of data, particularly when there are no adequate auditing and compliance processes in place. Basis studies conducted by organizations like the IMF, UNDP, the World Bank, and the EU, in many countries, this change and integration can only be effectively implemented after government agencies have undergone capacity-building measures. Consequently, it may be required to amend implementation plans depending on the current capacities, which can be a tedious process (UNDP's Governance of Climate Change Finance Team & International Budget Partnership, 2018; Blazey & Lelong, 2022; European Commission, 2021). As highlighted by a couple of respondents, there is often reluctance from line departments on who ought to take ownership primarily because this is a new notion. Nonetheless, it presents an opportunity for governments to bring about improvements in their policies, allocate resources more efficiently, and minimize the adverse effects of climate change through proper climate budgeting.

One of the key considerations is that training programs need to be designed according to the specific needs of each stakeholder. Due to various institutions' different roles and responsibilities, it is important to identify the relevant skillsets required by staff across all ministries and departments when designing the training programs. This will ensure bespoke training programs and workshops catering to the needs of each participating institution, leading to more effective capacity development.

Several respondents corroborated that there is often no coherence between departments. The implementation responsibility does not solely lie with the ministries of finance, and hence coordination and cooperation are necessary with other ministries and departments to gain access to subject matter expertise and resources

that will aid in the determination of priorities and pre and post-budgetary analysis. It is important to realize and take into consideration that there may be varying levels at which the budget tagging needs to be undertaken and also potential conflicting needs arising from a concurrent change in other ministries.

Furthermore, design and technology choices to be employed in the budgeting process may require the need for the development of capacities and provisioning of resources. For example, in certain countries like Bangladesh, Nepal, and Pakistan, budget tagging initiatives have begun with key ministries that require significant capacity building for decentralized approaches, while centralized approaches involve fewer entities to be trained. These countries recognized this and gradually expanded budget tagging to other line ministries over time (Shah et al., 2021). In some instances, temporary Help Desks were established to assist other ministries and institutions during the initial stages of implementation, as demonstrated in the Philippines, where the Climate Change Commission and the Department of Budget and Management established a Help Desk to provide support to line ministries (UNDP's Governance of Climate Change Finance Team & International Budget Partnership, 2018). In the case of Odisha, they realized their capacity constraints and initiated the process by prioritizing eleven departments that have a higher climate exposure (Government of Odisha - Finance Department, 2021).

9.3 Procedural standards - Lack of established budget tagging practices

The process of budget tagging is a very subjective one and, therefore, may be exposed and prone to both errors of inclusion as well as exclusion. Because of its subjective nature, there is often difficulty in undertaking a comparative analysis among countries or even intra-country, among sub-national states and provinces.

Moreover, this can open doors to potential “greenwashing” as well, and hence there is a need for clear guidance for budget tagging, along with review and validation processes and support for dealing with ambiguous budget items to improve the credibility of the system, even though it may increase capacity requirements in the short term.

Ensuring consistency and coherence of tagging is of paramount importance, and this can be achieved through robust quality assurance processes. The absence of strong quality assurance procedures in many existing budget tagging systems has led to misclassification and a higher risk of 'greenwashing' (Blazey & Lelong, 2022). A dependent factor is also the methodology being adopted. For instance, when adopting a centralized tagging approach which is led by the Ministry of Finance and (or) the Ministry of Environment and Climate Change, other ministries must be involved in the reconciliation and validation processes to ensure data quality. On the other hand, when employing a decentralized tagging approach, it's crucial to establish close collaboration with the Ministry of Finance and the Ministry of Environment and Climate Change to embed similar reconciliation procedures to ensure data quality. In some cases, ministries are required to validate and check the information generated by tagging exercises, and this leads to a lack of proper quality assurance checks in many countries. For e.g., in the Philippines, the responsibility for validating tagging lies with the line ministries, whereas in Ghana, there is no identified validation process (Ward, n.d.; World Bank, 2021). In the case of India, as highlighted by a respondent, there is no uniform methodological guidance from the union government; as a result, we observe the variance in approaches, e.g., Bihar’s green budgeting approach found its genesis from gender budgeting viz-a-viz Odisha’s approach which is based on the

Climate Change Relevance Share (CCRS) and Climate Change Sensitivity Share (CCSS).

As mentioned earlier, the capacity within ministries, including dedicated staff, technical capability, and integrated IT systems, all play an essential role in the effective implementation of green budgeting measures. Merely mandating quality assessments does not guarantee improvements, as seen in the Philippines, where ministries reduced tagged expenditures to manage the workload when required to submit quality assessments (World Bank, 2021). Perhaps a scaled approach to implementation, i.e., Starting small and then gradually expanding coverage and scope over time, can help overcome bureaucratic resistance and issues with limited capacity. For example, Ireland initially tagged expenditures with positive impacts on climate change and then gradually moved towards tagging negative expenditures as their capacity and expertise developed (World Bank, 2021).

Box 9: Philippines Climate budget tagging guidance

In the Philippines, the Climate Change Commission and the Department of Budget and Management have jointly issued a Memorandum Circular that outlines guidelines for climate budget tagging:

Step 1*: Identify the projects, activities, or programs (P/A/Ps) that have expenses related to adapting to and mitigating climate change. In order to do so, classify these expenses as Adaptation, Mitigation, Both, or None, in accordance with their respective definitions.*

***Step 2**: Identify the elements of climate change in the P/A/Ps through the use of climate change typologies. This involves comparing the activities with the provided typology in the circular and selecting the appropriate code as a result.*

***Step 3**: Provide details on the amount of climate change component that has been tagged, and provide a breakdown of the tagged amounts based on personnel services, maintenance and other operating services, financial expenses, and capital outlays.*

***Step 4**: Identify and tag in Outline Submission of Budget Proposal. Encoding the amount and identified codes to the Online Submission of Budget Proposals system. (Source - World Bank, 2021)*

9.4 Uniform definition - Absence of standardized taxonomies

As per reviews undertaken by several agencies such as the World Bank, the OECD, and the EU, what was observed is that many countries have implemented taxonomies for the categorization of activities that are relevant to climate change. These taxonomies, however, are not consistent and are either indicative or prescriptive in nature. Indicative taxonomies are those that do not have complete lists and allow for non-listed activities to be categorized if they match specific relevant definitions or policy objectives. This approach is in line with the OECD Rio marker guidelines. In contrast, prescriptive taxonomies only allow for activities listed on the taxonomy to be categorized (Ward, n.d.). Some countries have chosen to implement prescriptive lists of climate-relevant expenditures, such as Ecuador, Moldova, and the Philippines (World Bank, 2021). By categorizing activities as either indicative or

prescriptive, countries have tailored their approach to align with their policy objectives while at the same time also adhering to established guidelines.

Some have adopted the exclusionary route, where a list of activities or projects not in alignment with climate mitigation or adaptation is developed and not considered for the purposes of climate budgeting. For instance, in Colombia, activities that have disproportionately harmful impacts on the environment are excluded from climate tagging, despite them bearing the potential for reductions in emissions or adaptation benefits and include hydroelectric power facilities or projects that are large-scale, nuclear power plants, and fracking operations (World Bank, 2021). A few nations only take into consideration programs and projects that have climate change as their prime objective and treat all such expenses as related to climate. Colombia and Ireland implement this method and label all costs related to programs that prioritize climate change (World Bank, 2021). France is the sole country that tags spending such as subsidies for fossil fuels, tax expenditures for airlines and shipping, construction, etc., that have a negative environmental impact knowing the fact that this decision may add to complexities (European Commission, 2021 & World Bank, 2021). Nevertheless, in doing so, it ensures a more comprehensive coverage of environmental and climate change impacts.

Further, it is important to characterize climate-relevant activities and expenditures for the appropriate classification of budgets related to climate change. It might be a difficult task to draw a line of distinction between the goals of combating climate change and those of development. There is a possibility for development and climate change policy goals to overlap when through the implementation of activities such as agriculture or the creation of renewable power, to name a few. Usually, expenditures that are related to climate change can be distinguished from

development expenditures in one of two ways: either through objective-based methods employed by countries such as France, Cambodia, Ireland, and Kenya or policy-based methods employed by countries such as Bangladesh, Nepal, and Ecuador. Tagging procedures have been created to assist these two types of approaches. There are cases where we have the marriage of these two types of approaches to form a "Mixed- approach" employed by countries like the Philippines, Uganda, and India at a sub-national level by Odisha (World Bank, 2021). From an India perspective, several respondents corroborated that not having a taxonomy at a national level does impede several initiatives on the climate/ green front, budgeting being one of them. However, what is noteworthy is that the union government is presently engaged in the creation of a taxonomy for the country, with an anticipated completion date in the near future.

Box 10: Tagging Methodology

Objective-based *definitions distinguish climate-relevant activities on the basis of the intended impact of the activity. Most of the methodologies following this approach have applied the definitions used in the Rio markers.*

Policy-based *definitions limit climate-relevant activities to those that are specifically referenced in national climate change policy documents.*

Some countries have adopted a ***mixed approach****, and some have used indicative, prescriptive, and negative lists of climate-relevant activities to complement definitions.*

(Source - World Bank, 2021)

10 CONCLUSION, RECOMMENDATIONS, LIMITATIONS, and FUTURE SCOPE OF WORK

10.1 Conclusion

By exploring the case of Telangana, the paper posits that climate budgeting can serve as a valuable policy tool for directing financial resources toward climate change mitigation and adaptation with the potential future possibility of forecasting for loss and damage. The study acknowledges the potential of climate budgeting in channeling financial resources toward climate change mitigation and adaptation while also recognizing the challenges associated with it. Furthermore, it identifies effective practices and formulates recommendations to facilitate the integration of climate budgeting into the mainstream. It also emphasizes the need for a step-wise approach to implementing climate budgeting to glean insights from previous steps and strengthen the alignment of the practice with the State Action Plan. Upon successful integration of climate budgeting, the state can aspire to expand the scope to move towards green budgeting and, ultimately, Sustainable budgeting.

10.2 Recommendations

Basis the research conducted for this paper, the suggestions to tackle the issues of mainstreaming climate budgeting are as follows. Firstly, recommend having a taxonomy that would aid in the categorization of the various components related to climate budgeting. Secondly, building the capacities of the relevant stakeholders and departments to ensure efficient implementation. Thirdly, implementing a comprehensive monitoring and evaluation mechanism to track progress toward the identified objectives and identify opportunities for improvement. And, Lastly,

developing a priority framework that will guide decision-making and resource allocation. For each recommendation given, it is essential to create an actionable plan that describes the necessary steps, outlines the methodology to be used, identifies the individuals/stakeholders responsible for carrying out the recommended actions, and sets a deadline for their completion as illustrated in Table 5 below and delved into subsequently.

Table 5

Summary of the Recommendations

What needs to be done?	How will it be done?	Who will do it?	When will it be done?	Phase 1	Phase 2
Have a taxonomy	Benchmark against global/national approaches and Best Practices	EPTRI; Finance Department; other departments; MoEFCC (GoI); Ministry of Finance (GoI)	First 3 months	✓	-
Build Capacities	Technical assistance and training to the identified individuals and departments	EPTRI; Finance Department; other departments; MoEFCC (GoI); Ministry of Finance (GoI); Think Tanks; Educational Institutions; Subject matter Experts	First 3 to 6 months; Ongoing basis review and assessments	✓	✓
Implementing, monitoring & evaluation	Engaging all relevant stakeholders	EPTRI; Finance Department; other departments	Concurrently from the time of implementation	✓	✓
Develop a Priority Framework	Engaging all relevant stakeholders	EPTRI; Finance Department; other departments; Respective department of states who have done it or are in the process of doing it; Research Institutes	Consequent 3 to 6 months	✓	-

Phase 1 – Implementation with a few select priority departments;
Phase 2 – Expanding the Scope to other departments

10.2.1 Creating a Taxonomy – Approach and Considerations

The EU developed the “EU Taxonomy,” which is structured on the basis of six environmental goals: the reduction of greenhouse gas emissions, the adaptation of ecosystems to the effects of climate change, the transition to a circular economy, the prevention and control of pollution, the protection and restoration of biodiversity and ecosystems, and the sustainable use and protection of water and marine resources. It divides economic activities into two categories: those that contribute significantly to environmental goals and are thus referred to as "green" activities, and those that do not contribute considerably and are therefore referred to as "brown" activities. It also contains "transition" as a category for activities that are not yet fully aligned with the environmental objectives but are experiencing a considerable transition toward sustainability (European Commission, 2020). This serves as a baseline for the member states of the EU, which they use to assist in defining the elements of green or climate budgeting. In a similar fashion, the United Kingdom (UK) has developed a taxonomy framework that lays out the standards for conducting economic activities in an environmentally sustainable manner (United Kingdom Debt Management Office, 2021).

In India, as mentioned earlier, there, however, is currently no established taxonomy. But this does not mean that there are no starting points to identify and understand the various activities and projects that can be included in the climate budget tagging. One such starting point is the guidelines issued by the Securities and Exchange Board of India (SEBI) for the issuance and listing of green bonds, as well as the Sovereign Green Bonds issued by the Department of Economic Affairs. These sources provide valuable insights into the types of projects and activities that can be

included when defining climate budget tagging. By leveraging these resources, the existing working committee[4] in place constituting - EPTRI, the nodal environment, and climate change institution, along with the Finance Department, and other Line Departments, can comprehend and define the scope regarding the types of projects and activities that will aid in the allocation of resources and budget for climate-related activities and initiatives in a more efficient and effective manner. A summarized version of these guidelines is presented in Table 6 below.

Table 6

Comparative definition of what constitutes "Green" as per SEBI and DEA (MoF)

Particulars	SEBI	DEA *
Renewable and sustainable energy, including its generation and storage	✓	✓
Incentivizing the adoption of renewable energy	-	✓
Clean transportation, including mass/public transportation	✓	✓
Subsidies to adopt clean fuels like electric vehicles, including building charging infrastructure	-	✓
Climate change adaptation, including efforts to make infrastructure more resilient	✓	✓
Energy efficiency	✓	✓
Green buildings	✓	✓
Sustainable waste management, including recycling, waste to energy, efficient disposal of wastage	✓	✓
Sustainable land use, including sustainable forestry and agriculture, afforestation	✓	✓
Biodiversity conservation	✓	✓
Pollution prevention and control	✓	✓
Circular economy-adapted products, production technologies and processes, and/or eco-efficient products	✓	-

[4] The State has a existing working committee group in place for the State Action Plan on Climate Change, and other climate and environmental purposes.

Blue bonds, which comprise funds raised for sustainable water management, including clean water and water recycling, and sustainable maritime sector	✓	✓
Yellow bonds, which comprise funds raised for solar energy generation	✓	✓
Transition bonds which comprise funds raised for transitioning to a more sustainable form of operation	✓	-

* *Excluded Projects*

• Projects involving new or existing extraction, production, and distribution of fossil fuels, including improvements and upgrades; or where the core energy source is fossil-fuel based (investments/ expenditures aimed at Gas (CNG) is allowed as an 'eligible expenditure' when used in public transportation projects only)
• Nuclear power generation
• Direct waste incineration
• Alcohol, weapons, tobacco, gaming, or palm oil industries
• Renewable energy projects generating energy from biomass using feedstock originating from protected areas
• Landfill projects
• Hydropower plants larger than 25 MW

Coverage aspect in respective Definition → ✓ : Covered; ✕: excluded; "-" : no information to be determined

Note. Comparative displays of elements covered as per SEBI guidelines on Green Bonds and the Department of Economic Affairs (DEA) guidelines of Sovereign Green Bonds from *Disclosure requirements for the issuance and listing green bonds* and *Framework for Sovereign Green Bonds* compiled by the Author.

10.2.2 Building Capacities

Development of the necessary skills and knowledge and provisioning for technical aspects such as IT infrastructure, etc., for effective climate budgeting are important processes is building capacities. This involves taking certain specific steps that will aid in this process which are as follows;

- ***Identification of key stakeholders*** - Collaboration among different entities such as government agencies, civil society organizations, and private sector actors is essential for effective climate budgeting.

  For the purpose of spearheading this initiative, two institutions, EPTRI, and the Finance Department, can act as the primary drivers. EPTRI, being an established authority on Environment and Climate change, has strong relationships and is already in touch with other relevant states and central and autonomous institutions on various aspects and can leverage this experience. The Finance Department, on the other hand, is well-equipped to handle budgeting activities and other financial tasks, bringing its fiscal expertise to the table. A Committee, co-chaired by representatives from the Finance Department and EPTRI, can be established to drive the integration of climate budgeting in the State. Alternatively, the established working committee can be leveraged as a platform to do the same.

  Once these are in place, a few high-priority line ministries can be selected for the pilot and phase 1. The chosen ministry or department will have key stakeholders appointed as single points of contact (SPOCs) for the initiative and form a part of the established committee mentioned earlier. To ensure that these stakeholders are well-prepared for their roles, training programs and workshops will be conducted. This process will involve identifying the necessary skills and knowledge required for the stakeholders to perform their duties effectively.

  In order to enhance the capacity and participation of appropriate officials in the climate budgeting process, it is recommended to appoint the Head of Department (HOD) of key divisions within the Finance Department

during Phase I, which entails selecting HODs from a list provided in Annexure A. By doing so, the climate budgeting process can be facilitated, and appropriate officials can be effectively engaged.

The same process can be followed in Phase 2, where other line ministries and departments will be included in the climate budgeting initiative. The main objective of this approach is to ensure that climate budgeting is implemented efficiently in various departments and institutions in a planned, gradual manner.

- ***Develop training programs and provide technical assistance*** - Developing training programs and workshops is an essential component of building capacities for climate budgeting. Strategic partnerships with subject matter experts and institutions can enhance the quality and effectiveness of these programs. One such institution that could be considered is the National Institute of Public Finance and Policy (NIPFP) which has expertise in various aspects of budgeting, such as the economic analysis of climate change impacts, fiscal instruments for climate change mitigation and adaptation, and budgeting for climate change.

  Another potential partner for training and peer-to-peer learning on climate budgeting is the climate change and finance departments of state governments like Odisha, Kerala, Gujarat, Maharashtra, and others. These departments have hands-on experience in implementing climate change policies and can provide valuable insights into the challenges and opportunities of climate budgeting. They can also share best practices and lessons learned from their experiences in developing climate change adaptation and mitigation strategies. Departments like MoEFCC and the

Ministry of Finance are responsible for policies and public finances, respectively. Institutions such as WRI and CEEW can aid in climate budgeting with their expertise in climate change research, adaptation measures, and tools for climate risk assessment and environmental impact assessments.

It is also crucial to collaborate with international organizations and multilateral development banks (MDBs) that have extensive experience in piloting and working on such initiatives. The United Nations Development Programme (UNDP) is one such organization; the World Bank is another potential partner for training and development. The World Bank has a dedicated Climate Change Group that works on various aspects of climate change, including climate budgeting. They have developed several tools and methodologies for climate budgeting, such as the Climate Public Expenditure and Institutional Review (CPEIR) and the Climate Change Expenditure Tagging (CCET) system. These tools can help stakeholders identify, track, and report on climate-related expenditures in the budget. The ADB has experience in providing technical assistance to governments on climate change adaptation and mitigation, while the IMF has expertise in fiscal policy and management. Both organizations can provide valuable insights into how to mainstream climate budgeting into fiscal policy and budget planning.

10.2.3 Establish an implementation, monitoring & evaluation mechanism.

A significant number of Countries have included climate tags in the coding structure of their IFMIS systems [5]. Countries often begin with manual tagging, in

[5] *IFMIS, also known as Integrated Financial Management Information System, is a comprehensive and centralized platform that has been designed to enhance the efficiency of government financial management processes. The*

which information on climate tags is input on paper forms or spreadsheets. Once the design of the approach has been determined and finalized, they typically integrate climate tags into their budget information system. In the vast majority of these instances, line ministries and agencies are responsible for inputting their budget data alongside the appropriate codes. When submitting data for the budget, relevant codes are pre-tagged with climate tags by the central finance agency in both Bangladesh and Ghana. This enables the climate tags to be applied automatically (World Bank, 2021).

The state of Telangana already enjoys the benefits of having an Integrated Financial Management and Information System (IFMIS) in place. This system facilitates the effective administration of financial resources by automating financial operations such as budget preparation, accounting, and reporting. It offers a centralized place for tracking expenditures, revenues, budgets, obligations, and debt. As a result, real-time monitoring of financial transactions, accelerated decision-making, and a decreased risk of fraud and corruption are all made possible by using this system. In addition to this, it makes it much simpler to get financial information, which in turn makes it possible to make decisions that are more informed (Finance Department, Government of Telangana, n.d. & Team Youth Story, 2021).

The adoption of climate budgeting in Telangana is made considerably less challenging by the existence of an efficient IFMIS system. The existing system can enable tracking of climate financing in almost real-time and provide assurance that earmarked climate finances are appropriately distributed and utilized (Finance Department, Government of Telangana, n.d.). Furthermore, it can make the incorporation or mainstreaming of climate aspects into the process of creation of the

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primary goal of IFMIS is to provide access to secure and reliable data management, along with deep-financial analytics.

state budget less tedious and thereby enables the government to include climate concerns in overall budgetary decision-making.

The current structure of the Finance department, with established roles and responsibilities where there is a Head of Department (HoD) (as listed in Annexure A for both intra-department and inter-department functions), can facilitate the coordination of climate-related activities across different government agencies and stakeholders. This solidifies the aspect of transparency and accountability in the management of climate finance by using the IFMIS system for climate budgeting.

Climate budget tagging within the context of an Integrated Financial Management Information System (IFMIS) may prove to be a multifaceted undertaking. It is an indisputable fact that the involvement of stakeholders is crucial in the identification of intricate details within the process; however, the following can be some fundamental steps that may be adopted:

1- To commence the process, it is essential to **formulate a comprehensive set of codes** or **tags** that will be employed to identify expenditures associated with climate-related activities within the Integrated Financial Management Information System (IFMIS).
2- The IFMIS software may require **updates** for the creation of novel fields or codes in the system or adjustments to existing fields to cater to the climate budget tags.
3- It will be necessary to provide **training to staff members,** which will encompass a series of workshops and sessions designed to educate them on the application of new codes and their utilization in various types of expenditures.

4- **Initiate the process** of tagging climate-related expenditures, which would potentially require a retrospective review of past expenditures and the subsequent application of new tags, or prospectively future expenditures should be tagged promptly upon entry into the system.
5- Reports can be produced to monitor the expenditure on climate-related actions over time. Additionally, the same can be displayed on the Telangana State Finance Portal[6] by means of live statistics.

10.2.4 Adopt a "Priority Framework" to aid decision-making and funding.

As was mentioned previously in the paper, numerous approaches are used in the process of formulating and introducing the climate change variable into the budgeting process. Some use a strategy that is objective-based, taking into account the impact of climate change activities. A few others have decided to limit activities that contribute to climate change as established by their respective policies. In contrast, there are some that adopted a mixed approach.

For the state of Telangana, it is important to take into consideration two variables, namely the "socioeconomic risk aspect" and the "climate risk aspect," to help formulate a "Priority framework" that will drive decision-making and channelization of funds for mitigation and adaptation purposes. However, for the purpose of this paper, the recommendation shall be limited to the climate risk aspect.

Subsequently, the following is what needs to be done:

[6] The Telangana State Finance Portal is a website run by the Telangana State Finance Department (Website- https://finance.telangana.gov.in/FirstPage.do)

a) *Identify relevant Climate risk variables* – It is essential to take into account the climate risk factors since doing so enables an exhaustive comprehension of the impact of climate change on a given population or region. By looking into criteria like precipitation, temperatures, wildfires, floods, extreme weather events like hailstorms, etc., insights into the complex interactions and patterns of climate change can aid in the creation of an appropriate policy agenda that will guide policies and initiatives that promote mitigation and adaptation strategies.

b) Assign Weightage

A scale “0” to “1” can be used where

“0” = Low risk weightage

“0.5” = Medium risk weightage

“1” = High risk weightage

c) Assess relative significance and assign weights

Assess the importance of each variable against the district by means of undertaking risk-based or impact assessments, consultations with stakeholders, etc., and assign the high, medium, and low-risk weightages based on their relative importance. For instance, if District A has a high hailstorm risk relevance, then the weightage to be assigned will be "1". Derive the cumulative weighted climate risks to arrive at a matrix which can then be applied in the formula (as indicated in Table 7 below) (Refer to Annexure B for detailed steps of the derivation)

Table 7

Weighted Climate risk factor for districts

Districts	Climate risk variables					Cumulative Risk	Weighted Risk Factor
	Temperature	Precipitation	Droughts	Floods	Hail Storm		
District A	1	0.5	0.5	0.5	1	3.5	**0.4**
District B	0.5	0	1	0	0.5	2.0	**0.2**
District C	0	1	0.5	0.5	0	2.0	**0.2**
District D	0	0.5	1	1	0	2.5	**0.3**

Note. Weighted Climate risk factor for districts prepared by the Author.

The matrix above provides a way to assess climate risk for different districts based on various variables. The higher the cumulative risk score, the greater the climate risk for the district. The weighted risk factor provides a way to compare different districts' risks and prioritize actions based on the severity of the risk.

d) Develop a priority formula.

Taking the above into consideration, the following formula can be arrived at, which will help channelization of funds to those districts with a higher risk.

Actual budget allocation = Proposed budget allocation x **α**

Where α = Climate weightage risk factor

Illustration

Let's say that the Government has proposed a budget allocation for climate adaptation activities amounting to Rs. 1,00,000. Referring to Table 7

above, the weighted risk factor for District A is “0.4,” and the same for District B is “0.2.”

Using the proposed formula, "Actual budget allocation = Proposed budget allocation * weightage risk factor," we can calculate the actual budget allocation as:

Actual budget allocation for District A = Rs. 1,00,000 * 0.4 = Rs.40,000

Actual budget allocation for District B = Rs. 1,00,000 * 0.2 = Rs.20,000

Therefore, based on the assessment of climate risk variables for District A, the actual budget allocation for climate adaptation activities would be Rs. 40,000, and for District B, the amount would be Rs. 20,000, which would have presumably otherwise been Rs. 25,000 for both districts (Rs.1,00,000 split equally among the four districts). This amount is proportional to the district's level of risk and helps prioritize the allocation of resources to those areas that are most vulnerable to the impacts of climate change.

Now, there can be a second round of prioritization at the district level, which takes into account mitigation and adaptation activities along with the socioeconomic factors, in other words, the “socioeconomic risk aspect” and the “climate risk aspect,” to further target funding for climate action. This is something that can be worked on and derived at a future stage.

Additionally, basis a conversation with a respondent, what came to light was that in the near future, a risk cum vulnerability study from a future projections

perspective will be undertaken by the state. This will be a salient variable to have, which can form part of the formula above to help in forecasting funding needs from a Medium-term Fiscal Planning perspective which can immensely aid in factoring in the budgeting process the potential envisaged loss and damage funding requirement.

10.3 Limitations

The inability to conduct interviews with individuals who possess direct experience in mainstreaming climate budgeting in the state of Odisha represents a significant limitation of this study. These individuals could offer valuable insights into the challenges and obstacles encountered during the implementation process. By engaging with these individuals, the depth of analysis conducted in this paper could have been enhanced. Insights gained from conversations with these officials could have provided a more nuanced understanding of the political and bureaucratic factors that impacted the implementation of climate budgeting in Odisha, which could have been valuable in identifying potential barriers to implementing climate budgeting in Telangana and refining recommendations accordingly.

The research underlying this paper is based on secondary data sources and unstructured interviews. While academic papers, government reports, and policy documents provide valuable information on the subject, they may not fully capture the ground-level realities and challenges faced by policymakers and practitioners implementing climate budgeting in India. Moreover, there is a paucity of empirical data on the implementation of climate budgeting in India. The study relies on

theoretical concepts and hypothetical scenarios, and it would have been valuable to obtain more concrete data on the actual implementation of climate budgeting in India.

One significant limitation of this paper pertains to the delayed response from institutions working on mainstreaming climate budgeting. These institutions may possess valuable insights and experiences in implementing climate budgeting that could have been useful for this study. However, due to the delayed response, some of these insights were not captured in the analysis. The delay may have resulted in critical information being overlooked, potentially hindering the identification of barriers to implementing climate budgeting in Telangana.

Another limitation of the proposed "Prioritization Framework" used in this paper is that the values and weightages used in the example are hypothetical in nature and are not based on specific data, analysis, and stakeholder input. It is, therefore, essential to recognize that the values and weightages used in the example may not be entirely appropriate or applicable to the specific context of Telangana. In practice, the development of a prioritization framework for climate budgeting in Telangana would require a more rigorous and evidence-based approach involving engagement with relevant stakeholders, including government officials, civil society organizations, and experts in the field of climate change. By doing so, the values and weightages assigned would be grounded in scientific evidence and would reflect the priorities of the community and(or) the location.

10.4 Potential Areas for future exploration

Due to the paucity of time, the focus of the study was primarily directed toward understanding the prerequisites necessary for initiating operations of climate

budgeting in the state. The fiscal aspects, such as the political economy, fiscal federalism, transfers from the Centre to the State, the debt of the state and its implications, and multilateral financial flows, were not investigated in depth. However, a comprehensive study of these aspects could provide insight into not only the expenditure side of things but also the revenue side and aid in establishing a sustainable financial model for the state.

As mentioned earlier, the proposed priority framework can be further enhanced to incorporate a second layer to consider the occurrence of a subsequent phase of prioritization at the district level, which entails a comprehensive evaluation of both the mitigation and adaptation activities alongside the socioeconomic factors, thereby leading to an in-depth analysis of the "socioeconomic risk aspect" and the "climate risk aspect." This multifaceted approach can be aimed at further directing funds toward climate action in a more targeted and effective manner. It is imperative to note that this complex process can be undertaken and formulated in the upcoming stages with meticulous planning, stakeholder consultations, and execution.

The paper examines various means to facilitate the mainstreaming of climate budgeting. A more detailed comparative analysis of complementary policy tools and instruments could be explored to further enhance the effectiveness of climate budgeting.

The study aimed to initiate the process of climate budgeting at the subnational level, but thinking of it, the real climate action occurs at the city or local level. It may be worthwhile to explore the possibility of incorporating climate budgeting at the Urban Local Body level, considering not merely their administrative doability aspect

but also studying their unique position in terms of their power to levy as their source of revenue and limited delegation for expenditure.

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12 ANNEXURE

ANNEXURE A

List of salient Intra/Inter departmental Heads (in IFMIS)

S.No	SDEPT Code	Head of Department	User ID
1	AGC	AGRICULTURE AND CO-OPERATION, SECRETARIAT DEPARTMENT	AGC01
2	AGC	AGRICULTURE,HOD	AGC02
3	AGC	HORTICULTURE,HOD	AGC03
4	AGC	SERICULTURE, HOD	AGC04
5	AHF	ANIMAL HUSBANDRY, DAIRY DEVELOPMENT & FISHERIES, SECRETARIAT DEPARTMENT	AHF01
6	AHF	ANIMAL HUSBANDRY,HOD	AHF02
7	AHF	FISHERIES, HOD	AHF03
8	AMC	AGRICULTURE MARKETING & CO-OPERATION, SECRETARIAT DEPARTMENT	AMC01
9	AMC	DIRECTOR OF MARKETING, HOD	AMC02
10	AMC	REGISTRAR OF CO-OPERATIVE SOCIETIES	AMC03
11	BCW	BACKWARD CLASSES WELFARE DEPARTMENT, SECRETARIAT DEPARTMENT	BCW01
12	BCW	BACKWARD CLASSES WELFARE, HOD	BCW02
13	EFS	ENVIRONMENT, FOREST, SCIENCE&TECH, SECRETARIAT DEPARTMENT	EFS01
14	EFS	PRINCIPAL CHIEF CONSERVATOR OF FOREST, HOD	EFS02
15	EHE	HIGHER EDUCATION, SECRETARIAT DEPARTMENT	EHE01
16	EHE	TECHNICAL EDUCATION, HOD	EHE02
17	EHE	COLLEGIATE EDUCATION, HOD	EHE03
18	ENE	ENERGY,SECRETARIAT DEPARTMENT	ENE01
19	ENE	CHIEF ELECTRICAL INSPECTOR TO GOVERNMENT, HOD	ENE02
20	ESE	SECONDARY EDUCATION, SECRETARIAT DEPARTMENT	ESE01
21	ESE	SCHOOL EDUCATION,HOD	ESE02
22	ESE	ADULT EDUCATION,HOD	ESE09
23	ESE	PUBLIC LIBRARIES, H.O.D.	ESE10
24	ESE	PROJECT DIRECTOR, SAMAGRA SHIKSHA	ESE13
25	ESE	SECRETARY, TELANGANA RESIDENTIAL EDUCATIONAL INSTITUTIONS SOCIETY	ESE14
26	FCS	FOOD & CIVIL SUPPLIES, SECRETARIAT DEPARTMENT	FCS01
27	FCS	CIVIL SUPPLIES, HOD	FCS02
28	FIN	FINANCE, SECRETARIAT DEPARTMENT	FIN01
29	FIN	TREASURIES AND ACCOUNTS, HOD	FIN02
30	FIN	STATE AUDIT,HOD	FIN03
31	FIN	FINANCE, HOD	FIN07
32	FIN	DIRECTOR OF WORKS ACCOUNTS, HOD	FIN08
33	GAD	GENERAL ADMINISTRATION, SECRETARIAT DEPARTMENT	GAD01
34	HMF	HEALTH, MEDICAL & FAMILY WELFARE DEPARTMENT, SECRETARIAT DEPARTMENT	HMF01

S.No	SDEPT Code	Head of Department	User ID
35	HMF	DIRECTOR OF MEDICAL EDUCATION, HOD	HMF02
36	HMF	DIRECTOR OF PUBLIC HEALTH AND FAMILY WELFARE, HOD	HMF03
37	HMF	COMMISSIONER OF HEALTH AND FAMILY WELFARE, HOD	HMF04
38	HMF	TELANGANA VAIDYA VIDHANA PARISHAD	HMF99
39	HOM	HOME, SECRETARIAT DEPARTMENT	HOM01
40	HOM	DIRECTOR GENERAL OF STATE DISASTER RESPONSE AND FIRE SERVICES, HOD	HOM05
41	HOM	CIVIL DEFENCE ORGANISATION	HOM10
42	HOU	HOUSING DEPARTMENT, SECRETARIAT DEPARTMENT	HOU01
43	HOU	WEAKER SECTION HOUSING, HOD	HOU02
44	ICD	IRRIGATION & COMMAND AREA DEVELOPMENT, SECRETARIAT DEPARTMENT	ICD01
45	ICD	COMMISSIONER, COMMAND AREA DEVELOPMENT AUTHORITY, HOD	ICD02
46	ICD	DIRECTOR, GROUND WATER DEPARTMENT, HOD	ICD03
47	ICD	CHIEF ENGINEER, TELANGANA ENGINEERING RESEARCH LABORATORIES, HOD	ICD04
48	ICD	ENGINEER-IN-CHIEF (ADMINISTRATION), HOD	ICD05
49	ICD	ENGINEER-IN-CHIEF, MAJOR IRRIGATION, FLOOD CONTROL AND DRAINAGE, HOD	ICD06
50	ICD	ENGINEER-IN-CHIEF, MEDIUM IRRIGATION, HOD	ICD07
51	ICD	CHIEF ENGINEER, MINOR IRRIGATION, HOD	ICD08
52	ICD	CHIEF ENGINEER, NAGARJUNA SAGAR PROJECT AND AMR SLBC PROJECT HOD	ICD09
53	ICD	CHIEF ENGINEER, NEELAM SANJEEVA REDDY SAGAR SREESAILAM PROJECT, HOD	ICD11
54	ICD	ADMINISTRATOR-CUM-CHIEF ENGINEER, SREERAM SAGAR PROJECT, STAGE-I, HOD	ICD13
55	ICD	CHIEF ENGINEER, GODAVARI LIFT IRRIGATION SCHEME, WARANGAL, HOD	ICD16
56	ICD	CHIEF ENGINEER, CENTRAL DESIGN ORGANISATION, HOD	ICD17
57	ICD	CHIEF ENGINEER, INTER STATE WATER RESOURCES, HOD	ICD18
58	ICD	COMMISSIONER OF TENDERS, HOD	ICD19
59	ICD	CHIEF ENGINEER, HYDROLOGY, HOD	ICD21
60	ICD	COMMISSIONER, PLANNING AND DEVELOPMENT OF GODAVARI BASIN	ICD24
61	ICD	CHIEF ENGINEER (PROJECTS), MAHABOOBNAGAR	ICD29
62	ICD	PROJECT DIRECTOR, PPMU, WSIP	ICD30
63	ICD	CHIEF ENGINEER, FFC (SRSP) & SYP, LMD COLONY, KARIMNAGAR	ICD31
64	ICD	COMMISSIONER, RESETTLEMENT AND REHABILITATION, HOD	ICD33
65	ICD	CHIEF ENGINEER, QUALITY CONTROL WING FOR TELANGANA REGION	ICD35
66	ICD	CHIEF ENGINEER, DR. B.R. AMBEDKAR PRANAHITA PROJECT	ICD37
67	ICD	CHIEF ENGINEER, RAJIV SAGAR, INDIRA SAGAR LIFT IRRIGATION SCHEME & DUMMUGUDEM-NAGARJUNA SAGAR PROJECT TAIL POND, KHAMMAM	ICD38
68	ICD	DIRECTOR, GODAVARI BASIN	ICD42
69	ICD	CHIEF ENGINEER, PALAMURU - RANGAREDDY LIS	ICD50
70	ICD	CHIEF ENGINEER, KALESWARAM PROJECT	ICD51
71	ICD	CHIEF ENGINEER, PROJECTS, KHAMMAM	ICD52

S.No	SDEPT Code	Head of Department	User ID
72	ICD	CHIEF ENGINEER, PROJECTS, ADILABAD	ICD53
73	ICD	CHIEF ENGINEER, KANTHANAPALLI PROJECT	ICD54
74	IID	INFRASTRUCTURE AND INVESTMENT DEPARTMENT	IID01
75	LAE	LABOUR AND EMPLOYMENT, SECRETARIAT DEPARTMENT	LAE01
76	LAE	EMPLOYMENT AND TRAINING, HOD	LAE02
77	LAE	LABOUR, HOD	LAE03
78	LAE	FACTORIES, HOD	LAE05
79	MAU	MUNICIPAL ADMINISTRATION AND URBAN DEVELOPMENT, SECRETARIAT DEPARTMENT	MAU01
80	MAU	MUNICIPAL ADMINISTRATION, HOD	MAU02
81	MAU	TOWN AND COUNTRY PLANNING	MAU03
82	MAU	PUBLIC HEALTH	MAU04
83	MNW	MINORITIES WELFARE DEPARTMENT,SECRETARIAT DEPARTMENT	MNW01
84	MNW	MINORITIES COMMISSION, HOD	MNW02
85	MNW	MINORITIES WELFARE, HOD	MNW03
86	PRR	PANCHAYAT RAJ AND RURAL DEVELOPMENT, SECRETARIAT DEPARTMENT	PRR01
87	PRR	PANCHAYAT RAJ, HOD	PRR02
88	PRR	ENGINEER-IN-CHIEF (GENERAL &PANCHAYAT RAJ)	PRR03
89	PRR	RURAL DEVELOPMENT. HOD	PRR05
90	PRR	CHIEF ENGINEER, RURAL WATER SUPPLY	PRR06
91	PRR	TSIPARD	PRR07
92	REV	REVENUE DEPARTMENT, SECRETARIAT DEPARTMENT	REV01
93	REV	LAND ADMINISTRATION,HOD	REV02
94	REV	STATE TAXES,HOD	REV03
95	REV	EXCISE,HOD	REV04
96	REV	SURVEY, SETTLEMENT AND LAND RECORDS, HOD	REV05
97	REV	COMMISSIONER FOR RELIEF, HOD	REV10
98	REV	TELANGANA VAT APPELLATE TRIBUNAL, HOD	REV11
99	REV	PRESIDING OFFICER, LAND ACQUISITION, REHABILITATION AND RESETTLEMENT AUTHORITY	REV13
100	RSA	RAIN SHADOW AREAS DEVELOPMENT DEPARTMENT	RSA01
101	SOW	SCHEDULED CASTES DEVELOPMENT DEPARTMENT, SECRETARIAT DEPARTMENT	SOW01
102	SOW	SCHEDULED CASTES DEVELOPMENT DEPARTMENT, HOD	SOW02
103	SOW	SOCIAL WELFARE RESIDENTIAL EDUCATIONAL INSTITUTIONS SOCIETY	SOW05
104	TRB	TRANSPORT, ROADS AND BUILDINGS, SECRETARIAT DEPARTMENT	TRB01
105	TRB	ENGINEER-IN-CHIEF, STATE ROADS, HOD	TRB02
106	TRB	TRANSPORT COMMISSIONER, TELANGANA, HOD	TRB03
107	TRB	ENGINEER-IN-CHIEF BUILDINGS, & CRF, HOD	TRB05
108	TRB	CHIEF ENGINEER (R&B), EAP, RDC, HOD	TRB06
109	TRB	CHIEF ENGINEER, RURAL ROADS, HOD	TRB07
110	TRB	ENGINEER-IN-CHIEF (R&B, NH, ADMN., ROB/RUBs), HOD	TRB09
111	TRB	ENGINEER-IN-CHIEF (R&B) FC & HUDCO, HOD	TRB10
112	TRB	CHIEF ENGINEER (R&B) PPP, HOD	TRB11
113	TRW	TRIBAL WELFARE DEPARTMENT, SECRETARIAT DEPARTMENT	TRW01

S.No	SDEPT Code	Head of Department	User ID
114	TRW	TRIBAL WELFARE,HOD	TRW02
115	TRW	CHIEF ENGINEER, TRIBAL WELFARE, HOD	TRW03
116	TRW	TRIBAL WELFARE RESIDENTIAL EDUCATIONAL INSTITUTIONS SOCIETY	TRW04
117	WDC	DEPARTMENT FOR WOMEN, CHILDREN, DISABLED AND SENIOR CITIZENS, SECRETARIAT DEPARTMENT	WDC01
118	WDC	WOMEN DEVELOPMENT & CHILD WELFARE, HOD	WDC02
119	WDC	PERSONS WITH DISABILITIES AND SENIOR CITIZENS WELFARE, HOD	WDC03
120	WDC	JUVENILE WELFARE,HOD	WDC04

ANNEXURE B

Steps to derive the Priority Framework formula

The following step we employed to derive the Priority Framework formula

1) *Step 1: Identify relevant variables*

- *Climate risk variables*

  The following variable was taken into consideration:

  - Temperature: changes in average temperature, frequency and intensity of heat waves, and extreme cold events.
  - Precipitation: changes in average rainfall patterns frequency and intensity
  - Droughts: Changes in frequency and intensity of droughts
  - Floods: Changes in frequency and intensity of floods
  - Hail Storm: Changes in frequency and intensity of Extreme weather event (Source - Carlin & Stopp, 2022)

2) *Step 2: Assign Weightage*

   A scale "0" to "1" was used where

   "0" = Low risk weightage

   "0.5" = Medium risk weightage

   "1" = High risk weightage

3) *Assess relative significance and assign weights.*

   Assess the importance of each variable against the district by means of undertaking risk-based or impact assessments, consultations with stakeholders,

etc., and assign the high, medium, and low weightages based on their relative importance to arrive at a matrix that can then be applied in the formula.

	Climate risk variables						
Districts	**Temperature**	**Precipitation**	**Droughts**	**Floods**	**Hail Storm**	**Cumulative Risk**	**Weighted Risk Factor**
District A	**1**	**0.5**	**0.5**	**0.5**	**1**	**3.5**	**0.4**
District B	**0.5**	**0**	**1**	**0**	**0.5**	**2.0**	**0.2**
District C	**0**	**1**	**0.5**	**0.5**	**0**	**2.0**	**0.2**
District D	**0**	**0.5**	**1**	**1**	**0**	**2.5**	**0.3**

Please note *- Values and weights used are fictitious and are meant for representation only. These would need to be established scientifically using specific data, analysis, and stakeholder input for their application*

ANNEXURE C

Literature Map (Secondary research sources)

	A	B	D	E	F	G
1	Area	Status	Code	Theme	Authors	Title
31	Cities	Downloaded	RL_CB_06	Green/Climate budgeting	Centre for Environment Education; Deutsche Gesellschaft	We 4 Climate
32	Cities	Downloaded	RL_CB_07	Green/Climate budgeting	C40 Cities Climate Leadership Group, Endrava	Data and tools for climate budgeting
33	Cities	Downloaded	RL_CB_08	Green/Climate budgeting	C40 Cities Climate Leadership Group, Arup	Climate budgeting: Transforming governance to mainstream climate action
34	Cities	Downloaded	RL_CB_09	Green/Climate budgeting	City of Oslo, Hamar Municipality, Trondheim Municipality	Manual for climate budgets as a governance tool
35	Cities	Downloaded	RL_CB_10	Green/Climate budgeting	City of Oslo	Oslo's Climate Budget - Case Study
36	Ignore		RL_CB_11	Green/Climate budgeting	UNEP	Mainstreaming environment and climate for poverty reduction and sustainable developme
37	Framewor	Downloaded	RL_CB_12	Green/Climate budgeting	Asif Shah, Asad Maken, Tianyu Meng, et al.	Budgeting for climate change: a guidance note for governments to integrate climate chan
38	Definition	Downloaded	RL_CB_13	Green/Climate budgeting	European Commission	Green budgeting in the EU
39	Framewor	Downloaded	RL_CB_14	Green/Climate budgeting	European Commission	EU Green Budgeting Reference Framework
40	Budget	Downloaded	RL_CB_15	Green/Climate budgeting	European Commission	European Commission Green Budgeting Survey
41	Budget	Downloaded	RL_CB_16	Green/Climate budgeting	Directorate-General for Economic and Financial Affairs	Green Budgeting: Towards Common Principles
42	Budget	Downloaded	RL_CB_17	Green/Climate budgeting	European Commission	Climate Mainstreaming Architecture in the 2021-2027 Multiannual Financial Framework
43	Budget	Downloaded	RL_CB_18	Green/Climate budgeting	OECD	Green Budget Tagging -Introductory Guidance & Principles
44	Budget	Downloaded	RL_CB_19	Green/Climate budgeting	Scherie Nicol, Andrew Park	Green Budgeting in OECD Countries
45	Budget	Downloaded	RL_CB_20	Green/Climate budgeting	OECD	Paris Collaborative on Green Budgeting
46	Ignore	Downloaded	RL_CB_21	Green/Climate budgeting	IMF	Strengthening Infrastructure Governance for Climate-Responsive Public Investment
47	Framewor	Downloaded	RL_CB_22	Green/Climate budgeting	Fabien Gonguet ; Claude P Wendling ; Ozlem Aydin Sakrak	Climate-Sensitive Management of Public Finances—"Green PFM"
48	Budget	Downloaded	RL_CB_23	Green/Climate budgeting	Stephanie Allan, Aditya V. Bahadur, et. al.	The Role of Domestic Budgets in Financing Climate Change Adaptation
49	Budget	Downloaded	RL_CB_24	Green/Climate budgeting	OECD	A primer on green budgeting: International, national and subnational perspectives
50	Budget	Downloaded	RL_CB_25	Green/Climate budgeting	Oxford Policy Management	Climate finance: mobilising domestic budgets and external funds for adaptation
51	Fiscal	Downloaded	RL_CB_26	Green/Climate budgeting	OECD	Paris collaborative on green budgeting -Climate change and long term fiscal sustainability
52	Fiscal	Downloaded	RL_CB_27	Green/Climate budgeting	World Bank Group	Climate Change Public Expenditure and Institutional Review Sourcebook
53	Fiscal		RL_CB_28	Green/Climate budgeting	OECD	OECD green budgeting framework (Highlights)
54	Fiscal	Downloaded	RL_CB_29	Green/Climate budgeting	UNDP,UK Aid, Govt. of Nepal	Climate Change Financing Framework
71	Finance	Downloaded	RL_CF_02	Green/Climate finance	Calvet L., Gianfrate G., Uppal R.	The finance of climate change
72	Finance	Downloaded	RL_CF_03	Green/Climate finance	Ozili P.K.	Green finance research around the world: a review of literature

List of other sources referred.

	A	B	C	D	E
1		Institution	Link		
2		UNFCCC	https://unfccc.int/resources		
3		Climate Policy Initative	https://www.climatepolicyinitiative.org/		
4		OECD Database on Green Budgeting	https://qdd.oecd.org/subject.aspx?Subject=GOV_GREENBUD		
5		European Commission	https://economy-finance.ec.europa.eu/economic-and-fiscal-governance/green-budgeting-eu_en		
6		IMF - climate change staff climate notes	https://www.imf.org/en/Topics/climate-change/staff-climate-notes		
7		International Development Finance Club (IDFC)	https://www.idfc.org/green-finance-mapping/		
8		Cities Climate Finance Leadership Alliance (CCFLA)	https://citiesclimatefinance.org/publications?search=climate%20finance		
9		Oxford Policy Management	https://www.opml.co.uk/our-expertise/climate-natural-resources/climate-finance		
10		The Department of Expenditure, Ministry of Finance, GoI	https://doe.gov.in/about-department		
11		Telangana State Finance Department	https://finance.telangana.gov.in/FirstPage.do		
12		Telangana State Climate Change Center (TSCCC)	http://eptri.telangana.gov.in:8080/tsccc/about/tsccc		
13		Environment Protection Training and Research Institute [EPTRI]	http://eptri.telangana.gov.in:8080/tsccc/about/tsccc		
14		The National Institute of Public Finance and Policy	https://www.nipfp.org.in/home-page/		
17		EU4Climate	Climate finance frameworks and climate budgeting discussed under the umbrella of the EU4Climate initiative - EU4Climate		

ANNEXURE D

Unstructured Questionnaire

S. No.	Questions
1	Is there political and administrative validation and leadership in adopting green/climate budgeting? What are the issues faced, if any?
2	Do(es) the state government(s) (Sub-national level) have the capacity to pursue and track climate-related revenues and expenditures (budgeting)? What are the issues faced, if any?
3	Are there climate/ green budget tagging practices at the States (Sub-national level)? What are the issues faced, if any?
4	Does the Union government (National) provide the state government(s)(Sub-National) with either methodological, training, or financial support to promote green/ climate budgeting practices? What are the issues faced, if any?
5	Do(es) the state government(s) (Sub-national level) employ green/transition/brown taxonomies to measure environment/climate-related impacts on projects or expenditures? What are the issues faced, if any?