

WORKING PAPER

Evolving a Monitoring Framework for the KSAPCC Implementation in Water and Agriculture Sectors

September 2023

Prepared by CEE South with support of Hanns-Seidel-Stiftung India



**Hanns
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CEE

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Disclaimer

The study document has been prepared by the Centre for Environment Education (CEE) as part of the partnership with Hanns-Seidel-Stiftung India. It has attempted to represent the needs and gaps in the state of Karnataka pertaining to climate change, water, and agriculture based on qualitative surveys and key stakeholder interviews, and the same should not be construed as accurate information for the entire population for any purposes whatsoever. The authenticity of the secondary research presented and information gathered as part of the study lies with the respective agencies. Certain elements of the Karnataka State Action Plan on Climate Change (KSAPCC) concerning the agriculture and water sector are beyond the scope of this study and hence are not taken into consideration. While all care has been taken researching, compiling, editing, and reviewing this report, the accuracy of the data included cannot be guaranteed. Reproduction is authorised, provided the source is acknowledged.

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About CEE

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The Hanns Seidel Foundation, founded in 1967, is a German political foundation, working "in the Service of Democracy, Peace and Development". It has been active for more than 40 years in the field of political development cooperation and is currently taking an active part in 80 projects in 60 countries worldwide. In India, the Foundation started its work in the year 1996 and undertakes projects to support India's federal democratic structure, strengthen geopolitical relations, water governance, and improved access to justice. The projects are implemented with government and non-government partners at regional, national, and state level, aiming at increased systemic efficiency. The Foundation seeks to contribute to India's sustainable development by strengthening peace, democracy, and rule of law. More information on the work of Hanns Seidel Foundation India can be found at <https://india.hss.de/>.

List of Abbreviations

ACS	Additional Chief Secretaries
ATMA	Agricultural Technology Management Agency
BOD	Biochemical Oxygen Demand
CAG	Controller Auditor General
CAGR	Compound Annual Growth Rate
CAMPA	Compensatory Afforestation Fund Management and Planning Authority
CO₂	Carbon Dioxide
CDM	Clean Development Mechanism
CEE	Centre for Environment Education
COD	Chemical Oxygen Demand
COP	Conference of Parties
CSS	Centrally Sponsored Scheme
DPR	Detailed Project Report
EMPRI	Environmental Management & Policy Research Institute
EPI	Environment Performance Index
FPOs	Farmer Producer Organizations
GCF	Green Climate Fund
GDP	Gross Domestic Product
GEF	Global Environment Facility
GFOA	Government Finance Officers Association
GHG	Green House Gas
GW	Gigawatt
INDC	Intended Nationally Determined Contributions
INR	Indian Rupee
IPCC	Intergovernmental Panel on Climate Change
JJAS	June July August September (Monsoon)
JJM	Jal Jeevan Mission
JSA:CTR	Jal Shakti Abhiyan: Catch the Rain
km²	Square kilometre
km	Kilometre
KMEA	Karnataka Monitoring and Evaluation Authority
KSAD	Karnataka State Agriculture Department
KSAPCC	Karnataka State Action Plan on Climate Change

KSPPEC	Karnataka State Agricultural Produce Processing & Export Corporation Limited
KtCO2	Kilotonnes of Carbon Dioxide Equivalent
KUSUM	Kisan Urja Suraksha Evam Utthaan Mahabhiyan
KVK	Krishi Vigyan Kendra's
LDCF	Least Developed Countries Fund
LED	Light Emitting Diode
LULUCF	Land Use, Land-Use Change, and Forestry
m³	Cubic meter
MAM	March April May (Pre-monsoon)
MGNREGA	Mahatma Gandhi National Rural Employment Guarantee Act
MoEF&CC	Ministry of Environment, Forest & Climate Change
NABARD	National Bank for Agriculture and Rural Development
NAF	National Adaptation fund
NAFCC	National Adaptation Fund for Climate Change
NAPCC	The National Action Plan on Climate Change
NDC	Nationally Determined Contributions
NDRF	National Disaster Response Force
NFSM	National Food Security Mission
NGO	Non – Governmental Organization
NIE	National Implementing Entity
NMEO	National Mission on Edible Oils
NRDWP	National Rural Drinking Water Programme
OECD	Organization for Economic Cooperation and Development
pH	Potential Hydrogen
PM-FME	Pradhan Mantri Formalisation of Micro food processing Enterprises
PM-KISAN	Pradhan Mantri Kisan Samman Yojane
RCP	Regional Concentration Pathway
RDPR	Rural Development and Panchayat Raj
REDD-Plus	Reducing Emissions from Deforestation and Forest Degradation in Developing Countries
RH Camp	Rehabilitation Camp
RSK	Raitha Samparka Kendra's
SAPCC	State Action Plans on Climate Change
SCCF	Special Climate Change Fund

SCP	Special Component Plan
SDG	Sustainable Development Goals
SMAE	Sub Mission on Agricultural Extension
SMAM	Sub Mission on Agricultural Mechanization
SMSP	Sub Mission on Seed and Planting Material
TERI	The Energy and Resources Institute
TMC	Thousand Million Cubic (feet)
TP	Taluk Panchayat
TSP	Tribal Sub Plan
UNEP	United Nations Environment Programme
UNFCCC	The United Nations Framework Convention on Climate Change
UN	United Nations
USD	U.S.Dollar
UT	Union Territories
WRD	Water Resources Department
WMO	World Meteorological Organization
ZP	Zilla Panchayat

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Chapter 1

Climate Action for Karnataka – Glimpses

This chapter serves as the foundation for understanding the imperative of climate action, setting the stage for the subsequent chapters that delve into specific strategies, policies, and initiatives aimed at mitigating and adapting to climate change. It highlights the urgency of the issue and underscores the need for collaborative and immediate action at all levels of society.

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1. Climate Action for Karnataka: Glimpses

Climate change is one of the most pressing and complex challenges our planet is facing today. From shifting weather patterns that threaten food production, to rising sea levels that increase the risk of catastrophic flooding, the impacts of climate change are global in scope and unprecedented in scale. Its recognition by the United Nations (UN) as a potential issue dates back to 1979. This initial acknowledgment paved the way for a significant milestone -the introduction of the United Nations Framework Convention on Climate Change (UNFCCC) during the Rio Earth Summit in 1992. A turning point arrived with the release of the UN's Intergovernmental Panel on Climate Change (IPCC) Fourth Assessment Report in 2007. This report unequivocally confirmed both the warming of the climate system and the undeniable influence of human activities on climate change. Moreover, it emphasized that any delays in emission reduction efforts would severely limit our capacity to achieve lower stabilization levels and heighten the risk of more severe climate change impacts.

1.1 Climate Change, Impacts, and Projections in the Context of Karnataka

Climate variations, the ongoing process of climate change, and extreme occurrences like droughts, floods, heatwaves, frost, and hail are exerting global impacts on agriculture, and India is no exception. The phenomenon of global warming, a consequence of climate change, is substantially altering our planet's future. As far back as 1972, the Club of Rome Report officially recognized global warming as an international concern. Furthermore, the World Meteorological Organization (WMO) and the United Nations Environment Programme (UNEP) have both affirmed that carbon dioxide (CO₂) is the primary driver of climate change, owing to its significant role in global warming. The anticipated rise in temperatures, heightened mean annual and summer monsoon rainfall, and greater variability in rainfall characterized by more frequent and intense heavy rainfall events along with prolonged dry spells in the 21st century are likely to escalate the vulnerabilities faced by agriculture. The potential alterations in temperature and rainfall patterns are poised to have a significant influence on crop growth. The weather conditions experienced during a crop's growing season play a pivotal role in determining its growth, development, water utilization efficiency, and ultimately, yield (CSTEP, 2020; ICAR, 2019).



Even though Climate Change is a global phenomenon, its impacts are felt at regional and local levels, including in the Indian state of Karnataka. Karnataka, located in the southern part of India, experiences a diverse range of climate conditions due to its varied topography, which includes coastal areas, the Western Ghats, and the Deccan Plateau. The rise in temperatures resulting from global warming can have multiple effects, directly affecting crop yields and increasing the demand for irrigation due to elevated evapotranspiration rates and moisture stress. Additionally, this temperature increase can lead to greater water requirements. In more extreme instances, high temperatures can cause heat stress, posing risks to both humans and animals.

It's worth noting that a significant number of districts in Karnataka experienced the challenges of both droughts and floods from 2007 to 2018. According to data from the Disaster Management Division of the Ministry of Home Affairs, as of March 25, 2019, approximately 63 lakh hectares of cultivated land were adversely affected

by natural disasters. The Karnataka districts are particularly susceptible to two severe calamities: droughts and floods. Drought has been recorded in several districts of the state since 2001. In 2019, the Karnataka districts faced the dual wrath of droughts and floods, with 16 districts bearing the impact of both climate extremes (CSTEP, 2020).

Evaluating and gaining insights into climate change projections at localized scales is crucial for the effective planning and implementation of adaptation strategies. Climate change projections for the Short-term (2030s) and Long-term (2080s) periods were conducted which involved forecasting temperature and rainfall patterns in the context of two climate change scenarios, RCP 4.5 and RCP 8.5, with historical data assessment.

- The Temperature projections for the Short-term (2030s) and Long-term (2080s) periods show an expected increase in summer maximum temperatures ranging from 0.5°C to 1.5°C in the Short-term and 1.0°C to 2.5°C in the Long-term across Karnataka under RCP 4.5 and RCP 8.5 scenarios during the summer months (March to May (MAM)). Additionally, winter minimum temperatures are projected to rise by 0.5°C to 2.0°C in the short term and 1.0°C to 2.5°C in the long term, impacting districts in the state. These findings highlight the temperature changes anticipated due to climate change.
- The Rainfall projections for the Short-term (2030s) and Long-term (2080s) periods were conducted, focusing on the Kharif (June to September (JJAS)) season. For both time frames, rainfall is expected to increase under RCP 4.5 and RCP 8.5 scenarios. In the short term (2030s), Karnataka's districts are likely to experience a 5% to 25% increase in Kharif season rainfall. Looking ahead to the long term (2080s), a similar trend is projected with rainfall increasing by approximately 10% to 25%.

1.2 Global and National Initiatives towards Climate Change

Global initiatives towards addressing climate change have been a critical focus of governments, organizations, and individuals worldwide. These initiatives aim to mitigate the causes of climate change, adapt to its impacts, and transition to a more sustainable and low-carbon future.

The Paris Agreement, a legally binding international treaty on climate change, was adopted by 196 Parties during the UN Climate Change Conference (COP21) in Paris on December 12, 2015, and came into force on November 4, 2016. Its primary objective is to limit the global average temperature increase to well below 2°C above pre-industrial levels, with an even more ambitious target of capping it at 1.5°C. This heightened focus on 1.5°C stems from scientific warnings that exceeding this threshold would trigger more severe climate impacts like frequent droughts, heat waves, and heavy rainfall. To achieve the 1.5°C goal, greenhouse gas emissions must peak no later than 2025 and decrease by 43% by 2030. The Paris Agreement is a ground-breaking achievement in international climate efforts as it unites nations in a binding commitment to combat climate change and adapt to its consequences.

The implementation of the Paris Agreement necessitates a fundamental societal and economic transformation, guided by the latest scientific insights. The agreement operates on a five-year cycle designed to encourage nations to progressively elevate their climate actions, a process often referred to as “ratcheting up.” Starting in 2020, countries have been regularly submitting their national climate action plans, known as Nationally



Determined Contributions (NDCs). Nationally determined contributions (NDCs) are at the heart of the Paris Agreement and the achievement of its long-term goals. NDCs embody efforts by each country to reduce national emissions and adapt to the impacts of climate change. As stipulated in the Paris Agreement (Article 4, paragraph 2), every participating nation is obliged to develop, share, and continually update their NDCs, outlining the specific actions they plan to take. These actions are directed at curbing emissions and adapting to climate change effects. Furthermore, the agreement encourages Parties to implement domestic measures aimed at achieving the goals outlined in their contributions (UNFCCC, 2023).

The Paris Climate Agreement has for the first time made the enhancement of adaptive capacities and the strengthening of climate change resilience a global goal. As a result, climate change adaptation is now given the same priority as climate change mitigation. However, climate and water policy often disregard the importance of water as the medium through which climate change exerts its clearest and most direct impact on our livelihoods and numerous economic sectors (e.g. agriculture, energy, and tourism). Key climate change adaptation measures in the water sector include the retention of water by forests, wetlands, and artificial storage facilities, improved soil and water management in rain-fed agriculture, and flood protection. At the same time, other adaptation measures, such as the expansion of irrigation farming, may even reduce the availability and quality of water resources (German Development Institute, 2016).

Many countries' Intended Nationally Determined Contributions (INDCs) frequently highlight the agriculture sector as a prime area for achieving both adaptation and mitigation goals, while also yielding valuable socio-economic and environmental advantages. Some nations have outlined specific strategies to harness these potential synergies. Over 78 percent and 83 percent of developing countries explicitly mention agriculture and/or Land Use, Land-Use Change, and Forestry (LULUCF) (respectively) in their contributions to mitigation strategies. Numerous nations also recognize the potential of agricultural sectors to not only achieve adaptation and mitigation goals but also generate valuable economic, environmental, and social co-benefits in the process particularly in areas such as rural development, health, poverty alleviation, job creation, and the preservation of ecosystems and biodiversity. Notably, the agriculture sector is emphasized, more so than any other sector, as it offers a wide range of opportunities to empower women and reduce their susceptibility to the impacts of climate change (Nemesh, 2017).

In this continuation, India unveiled the National Action Plan on Climate Change (NAPCC) in June 2008 as a comprehensive strategy to tackle climate change using a multifaceted approach. Designed to address climate change via multifaceted mitigation strategies, the NAPCC outlined specific actions across critical sectors like water, energy, and agriculture through its dedicated sectoral missions. Subsequently, states in India prepared their state action plans on climate change in line with the framework provided by the central government in that regard. Post the Paris Agreement and the NDC goals and targets, states are bound to assess their climate actions based on domestic priorities under the SAPCC and link them to key metrics that ensure alignment with India's goals under the NDC (KSAPCC V2, 2021).

1.3 KSAPCC Assessment of Climate Change in Agriculture and Water Sectors

The Environmental Management & Policy Research Institute (EMPRI) and The Energy and Resources Institute (TERI) played a collaborative role in assisting the Government of Karnataka in the development of the Karnataka State Action Plan on Climate Change (KSAPCC). This comprehensive plan zeroes in on sectors crucial to the local economy and livelihoods, encompassing agriculture, water, biodiversity, health, transportation, energy, industries, urban development, and forestry. Distinguished as the first policy document of its kind, the KSAPCC assumes the responsibility of comprehensively addressing climate change within Karnataka. This plan primarily focuses on enhancing the state's resilience to climate impacts through adaptation measures. It emphasized climate-resilient practices in agriculture, efficient water resource management, and the protection and restoration of ecosystems. Additionally, Karnataka aimed to contribute significantly to India's renewable energy capacity, particularly through solar and wind power. The plan also recognized the importance of sustainable rural and urban development, biodiversity conservation, and raising awareness about climate change issues.



Within the framework of sustainable development, Karnataka's State Action Plan on Climate Change, KSAPCC Version 1 identified 31 priority areas spanning various sectors. Notable among these were initiatives within the agriculture sector, such as the restructuring of agricultural power tariffs, the establishment of a policy body to strategize cropping shifts, the promotion of dry land farming, the deterrence of theft of sprinkler pipes, and the development of markets for indigenous crops. In the realm of water resources, SAPCC emphasized the enforcement of the Karnataka Groundwater Act, the formation of a policy body to regulate groundwater usage, the introduction of groundwater cess, the provision of capital subsidies for rainwater harvesting structures, integration of water resource management into public buildings, and the revision of pricing policies for irrigation water. These priorities underscored the state's commitment to sustainable development while addressing the pressing challenges of climate change and resource management.

1.4 CEE Initiatives towards Climate Action

Past study

CEE along with Hanns Seidel Foundation, Germany is working on a study for, 'Strengthening multi-stakeholder approaches for effective implementation of Karnataka State Action Plan on Climate Change' (KSAPCC) to facilitate policy as well as implementation level efficiency of the KSAPCC within integrated water resource management and sustainable agriculture sector, along with enabling partnerships for capacity building within the climate change theme for enhanced support for climate action.



As part of this project, CEE conducted a qualitative study on the Karnataka State Action Plan on Climate Change (KSAPCC) to strengthen the efficacy of its implementation in 2021. Based on the recommendations from the study on the KSAPCC we have developed the Policy Brief with a focus on sustainable agriculture and water use efficiency which suggests a solution to strengthen the localisation of the KSAPCC during 2022 (<https://www.ceeindia.org/climate-change>).

In this continuation, CEE also completed an exercise on “Briefly study on NAPCC (two missions- water and agriculture) and the linkages between NAPCC and KSAPCC” in 2022 which aims to strengthen the efficiency of the Karnataka State Action Plan on Climate Change (KSAPCC) with a particular focus on Sustainable Agriculture and Integrated Water Resource Management Sector, by reflecting on the implementation challenges as well as policy and communication gaps - with a special focus on stakeholder engagement in 2022.

In 2023, CEE undertook a study that mainly focuses on creating a “Roadmap for engaging Non-Governmental Organisations in KSAPCC Localisation in Water and Agriculture Sectors”. This study focuses on creating a strong institutional network partnership to join the action and bring together multiple knowledge stakeholders including policymakers, service providers, scientists, academicians, professors, sectoral experts, youth, students, representatives from civil society, etc. for effective implementation of Karnataka State Action Plan on Climate Change in the state. A working paper on this was unveiled in the “State Level workshop” organised on 11 July 2023 in Bangalore. (https://www.ceeindia.org/pdf_files/HSS_CEE_2023_WP-NGO-final.pdf).

Present Study

As a part of the above study, CEE aims to prepare a working paper “KSAPCC Monitoring Framework with a focus on the implementation of two sectors water and agriculture” with the following objectives:

- **To assess the funding pattern and existing financial mechanisms for Climate Change adaptation and mitigation.**
 - Assessing climate finance within the framework of the Karnataka State Action Plan on Climate Change (KSAPCC) is of paramount importance to ensure efficient resource allocation, transparency, and accountability. By rigorously evaluating the flow of funds, their distribution across sectors, and their alignment with climate goals, the assessment process ensures that financial resources are effectively utilized for impactful climate actions. It enables decision-makers to identify gaps, prioritize high-impact projects, and make informed adjustments in resource allocation strategies. Furthermore, assessing climate finance enhances credibility, as transparent reporting and clear accountability build trust among stakeholders and partners. Ultimately, this assessment contributes to the successful implementation of KSAPCC, fostering sustainable development, resilience, and positive environmental outcomes for Karnataka.

- **To study about the effective implementation of Karnataka state action plan on climate change (KSAPCC) in water and agriculture departments.**
 - Conducting a study on the implementation of the Karnataka State Action Plan on Climate Change (KSAPCC) within the water and agriculture sectors carries substantial importance. This in-depth analysis provides a concentrated lens through which the intricate interplay between climate adaptation and mitigation strategies and these essential sectors can be comprehensively examined. By dissecting the achievements, obstacles, and key takeaways specific to this context, researchers and policymakers can glean profound insights into the nuanced process of infusing climate resilience into water management and agricultural frameworks. This study not only enriches the success of KSAPCC but also serves as a valuable blueprint for regions facing similar challenges, furnishing actionable recommendations to optimize resource allocation, amplify community engagement, and foster enduring sustainable development. In essence, this targeted exploration not only enhances the efficacy of KSAPCC but promotes sustainable development, climate resilience, and long-term environmental sustainability for Karnataka.

- **To develop a KSAPCC monitoring framework which will help to measure the performance of the state's response to climate action in the water and agriculture sectors.**
 - Developing a monitoring framework for the Karnataka State Action Plan on Climate Change (KSAPCC) to measure the state's performance in responding to climate action in the water and agriculture sectors is of paramount importance for several reasons. Firstly, Karnataka is highly dependent on agriculture for its economy and food security, and it faces increasing water scarcity due to climate change. Monitoring is essential to assess the effectiveness of climate adaptation and mitigation measures in these sectors. Secondly, it provides a structured approach to collect and analyse data, enabling evidence-based decision-making for policymakers and ensuring that resources are allocated efficiently. Thirdly, it enhances transparency and accountability by making the state's efforts and progress visible to the public and stakeholders, which is crucial for building trust and support for climate action. Overall, this monitoring framework is vital for Karnataka to address climate challenges, protect its agricultural sector, and secure a sustainable water supply for its people and ecosystems.

Study Area

Karnataka has a total geographic area of 191,791 km² and accounts for 5.83% of the total geographical area of India. It is the sixth-largest Indian state by area. The state is situated on the western edge of the Deccan Peninsular region of India. It is located approximately between 11.5° North and 18.5° North latitudes and 74° East and 78.5° East longitudes. Karnataka comprises the Deccan Plateau, the Western Ghats Mountain Range, and the Coastal Plains. The state extends to about 760 km from north to south and about 420 km from east to west. The State has seven river systems, with a catchment of 191,773 km². The state represents around 6% of the nation's surface water resources. The typical yearly yield of the waterways of Karnataka has been around 98,406 m³ (3,475 TMC). Streams flowing toward the west into the Arabian Sea convey 40% of the state's surface water and those streaming toward the east 60%. The state has 30 districts and the capital of Karnataka is Bengaluru near the southeastern border.

One of the important sectors vulnerable to climate change is the water resources sector. The main climate change impacts related to water resources are an increase in temperature, shifts in precipitation patterns and snow cover, and a likely increase in the frequency of flooding and droughts. The State of Karnataka has moderate vulnerability with respect to the water resources sector. The highest vulnerability index was seen for Bangalore Rural district (0.620) and the lowest was for Udipi district (0.31) (Hema and Pramodha, 2023).

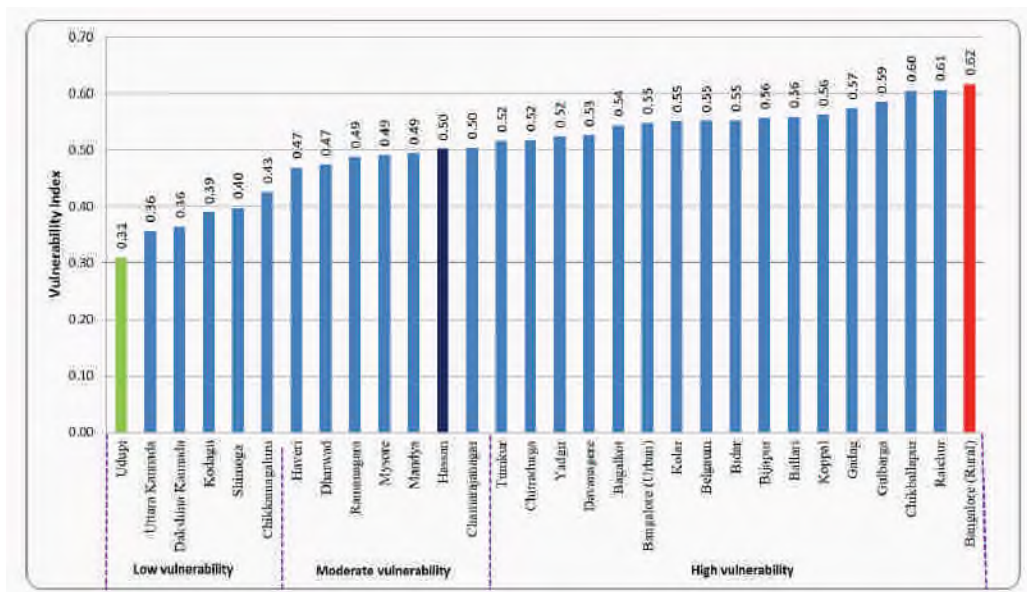


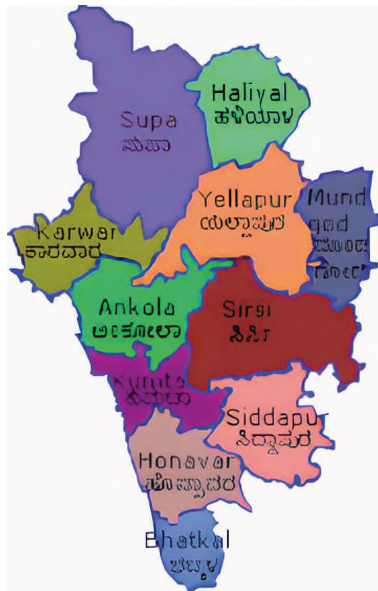
Figure 1.1, Distribution of districts on a vulnerability scale

(Source: Mapping Climate Change Vulnerability, Hema and Pramodha, 2023)

The study includes surveys of stakeholders from government line departments of Uttara Kannada and Raichur District. The Uttara Kannada, also known as North Kanara or North Canara, is a Konkan district in the Indian state of Karnataka. The city of Karwar is the administrative headquarters of the district. The main geographical feature of the district is the Western Ghats of the Sahyadri range, which runs from the south through the district. The area of the District is 10327 Sq Km. Out of 7 rivers, 5 are flowing towards the west 2 are moving towards the east and Eighty percent of the district area consists of forest land. The Raichur District is an administrative district in the Indian state of Karnataka. It is located in the northeast part of the state. The district is bounded by the Krishna River on the north and the Tungabhadra River on the south and has a very dry climate with very low humidity throughout the year, which is why it falls under the arid regions of Karnataka. The summers in the city are very hot and the temperatures usually can be seen touching the 43°C mark.

The water vulnerability Index of these districts in 2023 lies between high and low that is, Uttara Kannada is low vulnerable (0.36) and Raichur is high vulnerable (0.6). This was one of the major reasons for selecting these two districts as a study area. The major drivers of vulnerability across these two districts include average annual rainfall, surface water availability, forest area per 1000 rural population, groundwater availability, water scarcity, and per capita income (Hema and Pramodha, 2023).

Uttara Kannada District



Raichur District



Figure 1.2, Maps showing selected study area Uttara Kannada and Raichur District

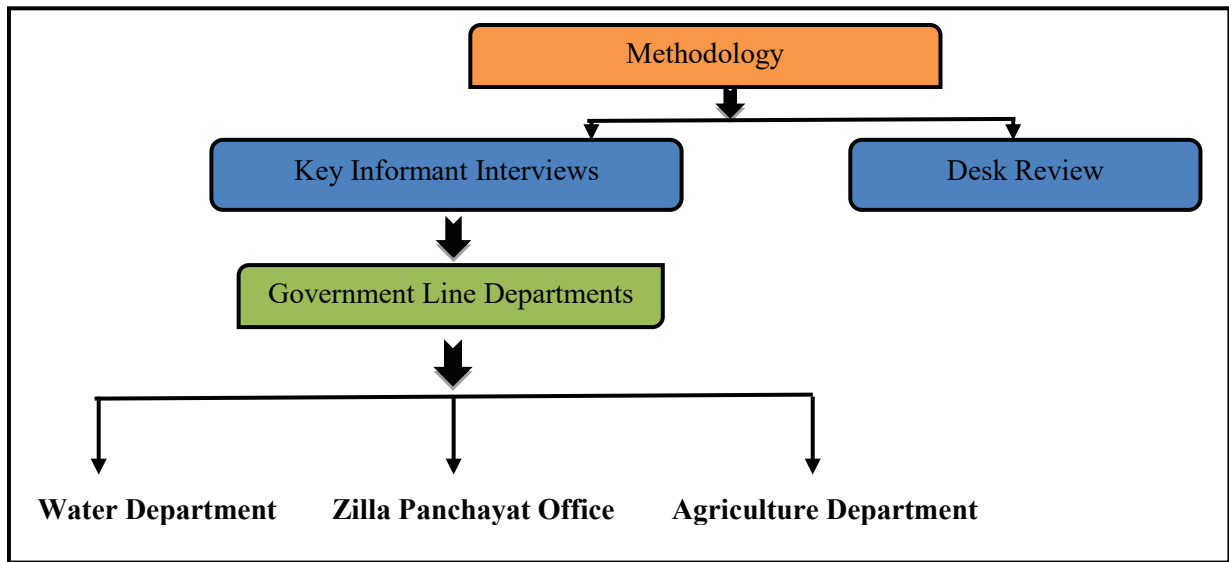
Methodology

The methodology of this study is two-fold: desk study of the public documents, majorly the KSAPCC Version 1 & 2, and on-site research with qualitative data collection in semi-structured interviews.

The secondary analysis of the KSAPCC document was done through refereeing research papers and public documents to know about the climate financing status of the state and evolving a frame for monitoring the KSAPCC for its effective implementation at the district and state levels.

The primary data collection for the research study was undertaken by capturing the views of different stakeholders through an open-ended questionnaire, (Annexure I). The questionnaire consisted of three phases of questions, the first phase focused on key research questions aimed at understanding the current gaps in policy implementation and future improvements to be considered. In the second phase, questions were focused on the respondents from each group to primarily understand their role and the risks and challenges being faced in the policy implementation and execution on the ground level. Lastly, the questionnaire centers its attention on gathering insights and input regarding recommendations for optimizing the implementation of climate action measures. The surveys were done through in-person discussions with stakeholders in both the selected districts.

During the field visits, the CEE Team had an opportunity to meet some key officials in the selected districts to seek their input. The team is grateful for the valuable time of the officials (Annexure 2) and their input. The interactions aimed to find the challenges in the State Action Plan on Climate Change and garner prospective policy recommendations for its effective implementation at the district level, covered responses from 8 Key Informant Interviews from Government Line Departments. All interviews were held from August to September 2023.



Chapter 2

Climate Financing

This chapter comprehensively analyse the scope and characteristics of climate finance within the water and agriculture sectors of the economy, with a specific emphasis on recent developments. Additionally, it closely scrutinises the distribution of climate funding for both adaptation and mitigation initiatives, with a specific focus on the contexts of Karnataka, and offers policy suggestions for budget monitoring.

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2. Climate Financing

2.1 Understanding the financing of KSAPCC

Climate finance encompasses the provision of funds from diverse sources, such as public, private, and alternative channels, intending to support efforts to mitigate and adapt to climate change. It aligns with the goals outlined in international agreements like the Convention, the Kyoto Protocol, and the Paris Agreement, which emphasize the importance of financial support from wealthier nations to those facing greater vulnerability and fewer resources. This recognition acknowledges the varying degrees of responsibility countries bear for climate change and their differing capacities to combat it and cope with its consequences.



Climate finance serves a dual purpose: it is indispensable for mitigation efforts, as substantial investments are necessary to significantly curtail emissions, and it is equally vital for adaptation, as it provides the financial means to address the adverse impacts and reduce the consequences of a changing climate.

Following the “**common but differentiated responsibility and respective capabilities**” principle established in the Convention, developed countries are obligated to provide financial resources to assist developing nations in achieving the goals of the UNFCCC. The Paris Agreement reaffirms these responsibilities for developed countries and, for the first time, encourages voluntary contributions from other Parties as well.

Developed nations should continue to take the lead in generating climate finance from a wide range of sources, financial instruments, and avenues. This includes utilizing public funds and undertaking various actions to support strategies driven by individual countries, all while considering the specific needs and priorities of developing countries. This effort to mobilize climate finance should signify a step forward from previous endeavors (UNFCCC, 2023).

In this chapter, we undertake a comprehensive analysis to thoroughly investigate the scope and characteristics of climate finance within the water and agriculture sectors of the economy, with a specific emphasis on recent developments. Additionally, we closely scrutinize the distribution of climate funding for both adaptation and mitigation initiatives, with a specific focus on the contexts of India and Karnataka.

The climate financing chapter draws its foundational framework and methodology from the United Nations Framework Convention on Climate Change (UNFCCC), particularly referencing Article 2.1(c) of the Paris Agreement which states that “**making finance flows consistent with a pathway towards low greenhouse gas emissions and climate-resilient development**”. The study conducts an analysis of climate financing from two key perspectives: Funding Source Analysis and Expenditure Analysis. To assess funding sources, data, and information are from a variety of reputable sources, including approved project documents, national development budget reports, project lists provided by development partners, information found on the Climate Funds Updated website, and project listings on the websites of relevant climate funds. For the expenditure analysis, the primary data source is National and State Budgets.

2.2 Tracing the Sources of Finance for the KSAPCC

Global Climate Finance

The United Nations Framework Convention on Climate Change (UNFCCC) established a financial mechanism to facilitate the provision of climate finance to developing country Parties, a mechanism that also extends its services to the Kyoto Protocol and the Paris Agreement. According to the Convention, the operation of this financial mechanism can be entrusted to one or more existing international entities. Since the Convention's inception in 1994, the Global Environment Facility (GEF) has functioned as an operating entity of the financial mechanism.



Furthermore, during COP 16 in 2010, Parties created the Green Climate Fund (GCF), designating it as another operating entity in 2011. The financial mechanism operates under the authority of the COP, which makes decisions concerning its policies, program priorities, and funding eligibility criteria. In addition to providing direction to the GEF and GCF, Parties have established two specialized funds: the Special Climate Change Fund (SCCF) and the Least Developed Countries Fund (LDCF), both managed by the GEF. Additionally, the Kyoto Protocol established the Adaptation Fund (AF) in 2001. The Parties reached an agreement that the operating entities of the financial mechanism, including GCF and GEF, as well as SCCF and LDCF, would also support the Paris Agreement.

The UNFCCC website includes a climate finance data portal designed to enhance comprehension of the climate finance process. It serves as a gateway to detailed information about initiatives funded in developing countries to implement climate action. This finance portal consists of three modules, each containing data and information provided by Parties and the operational bodies of the financial mechanism. It is enriched with helpful explanations, visual aids, and figures to facilitate a deeper understanding of climate finance dynamics (UNFCCC, 2023).

Top of Form

At the 15th Conference of Parties (COP15) of the UNFCCC in Copenhagen in 2009, global climate parties committed to mobilizing \$100 billion annually to support climate action in developing countries, encompassing both adaptations to climate change and emissions reduction efforts. This funding is expected to originate from wealthier nations through various channels, including bilateral, regional, and multilateral avenues, as well as private resources catalyzed by public interventions. These funds can take different forms, such as grants, loans, and even insurance (UN, 2023).



Figure 2.1, Total Climate Finance Provided and Mobilised by Developed Countries for Climate Action

(Source: OECD, 2022)

However, as of now, the \$100 billion target has not been met, and the allocation of funds has been uneven. According to the latest data from the Organization for Economic Cooperation and Development (OECD) in 2020, developed countries contributed \$83.3 billion. Only 8 percent of this total reached low-income countries, and approximately a quarter was directed to Africa, despite both categories being particularly susceptible to climate change and home to a significant portion of the global population living in poverty (OECD, 2022).

Annually, approximately USD 10 billion in climate finance is available through the UNFCCC and Kyoto Protocol, primarily via Clean Development Mechanism (CDM) projects. An additional USD 15 billion in global climate funding is sourced from entities like the World Bank and bilateral aid programs. Furthermore, an estimated USD 58 billion in global funds is directed through multilateral, bilateral, and development banks, mainly targeting adaptation, mitigation, REDD-Plus, and cross-cutting technology initiatives, provided in various forms including grants and concessional loans.

National Climate Finance

In response to the global challenge of climate change and its commitment to achieving a low-carbon economy as per the Kyoto Protocol, the Government of India introduced the National Action Plan on Climate Change (NAPCC) in 2008. This strategic plan outlines India’s approach to addressing climate change and aligns with its pursuit of sustainable development. NAPCC primarily emphasizes three key areas: energy efficiency, the adoption of clean technology, and resource efficiency.

The Hon’ble Union Finance Minister in his Interim Union Budget on 10 July 2014, announced the establishment of the National Adaptation Fund for Climate Change (NAFCC). The NAFCC got operationalised in August 2015 by the Ministry of Environment, Forest & Climate Change (MoEF&CC), Govt. of India (The Ministry of Environment, Forest and Climate Change (MoEF&CC) serves as the central agency responsible for formulating, implementing, coordinating, and overseeing climate policies in India).

The NAFCC will meet the cost of adaptation to climate change for the State and Union Territories of India that are particularly vulnerable to the adverse effects of climate change. The government has set up a budget provision of Rs.350 crores for the years 2015-16 and 2016-17, with an estimated requirement of Rs. 181.5

crores for the financial year 2017-18 for NAFCC. The projects under NAFCC prioritize the needs that build climate resilience in the areas identified under the SAPCC (State Action Plan on Climate Change) and the relevant Missions under NAPCC (National Action Plan on Climate Change).

The NAFCC Projects are focused more on climate resilient agriculture (45%) and water management (26%) compared to other sectors for bringing positive changes in the lives of 19 lakh project beneficiaries covering 25 states and 2 Union Territories (UT) with a total budget of 847.48 crore for a sanctioned 30 projects.

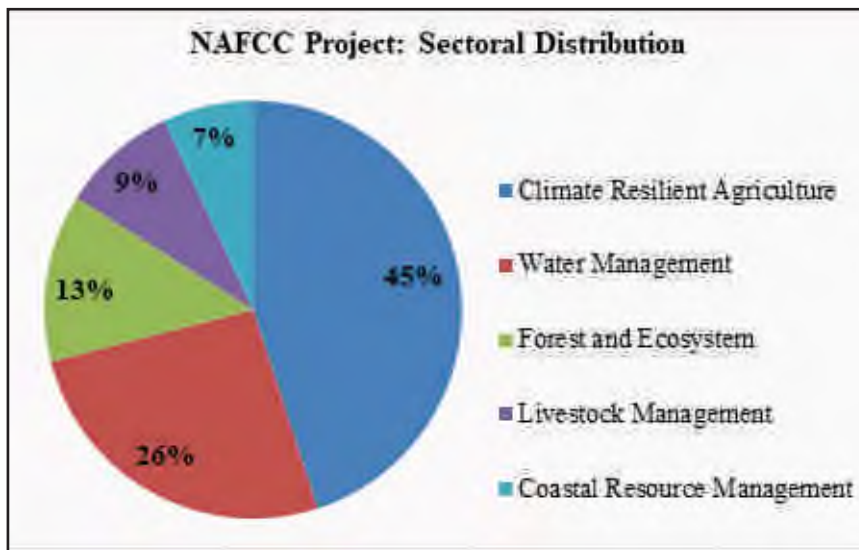


Figure 2.2, NAFCC Project: Sectoral Distribution between Sectors

(Source: NABARD, 2023)

The National Bank for Agriculture and Rural Development (NABARD) has been designated as a National Implementing Entity (NIE) for the implementation of adaptation projects under NAFCC by Govt. of India. Under this arrangement, NABARD would perform roles in facilitating the identification of project ideas/ concepts from the State Action Plan for Climate Change (SAPCC), project formulation, appraisal, sanction, disbursement of funds, monitoring & evaluation, and capacity building of stakeholders including State Governments (NABARD, 2023).

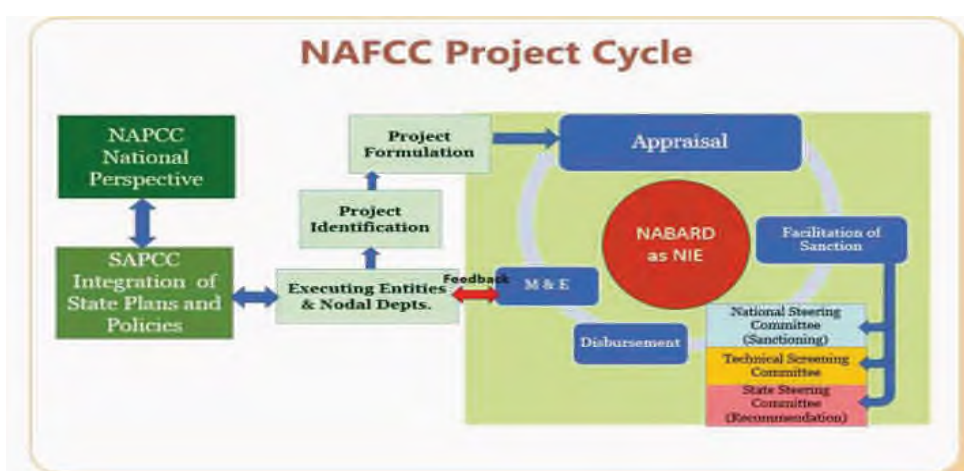


Figure 2.3, National Adaptation Fund for Climate Change, Project Cycle

(Source: NABARD, 2023)

India's efforts to meet its Nationally Determined Contributions (NDCs) as outlined in the Paris Agreement demand substantial financial resources, estimated at around INR 162.5 lakh crores (USD 2.5 trillion) from 2015 to 2030, or roughly INR 11 lakh crores (USD 170 billion) annually. In 2021, India put forth enhanced ambitions on climate action and announced the Panchamrit targets. However, the current flow of green finance in India falls significantly short of the country's requirements. In the fiscal year 2019/2020, the recorded green finance amounted to INR 309 thousand crores (approximately USD 44 billion) per annum, which is only a quarter of what India needs to accomplish its climate objectives. So to achieve these ambitious goals India has to mobilise for green finance at a much faster pace (Neha *et al.*, 2022).

Notably, the Indian government had projected a substantial budgetary requirement of Rs. 11,33,692 crore for the implementation of 29 State Action Plans on Climate Change over 5 years commencing in 2021 (Trisha, 2022).

State's Climate Finance

Climate financing in Karnataka primarily focuses on addressing climate change challenges, mitigating its impacts, and building resilience in the state. Karnataka has taken significant steps to secure funds and implement climate-related initiatives, which include both government-driven efforts and partnerships with international organizations and the private sector.

The Karnataka State Action Plan on Climate Change (KSAPCC) serves as the foundational framework for climate financing in the state. It outlines strategies and actions tailored to Karnataka's specific climate vulnerabilities and opportunities for mitigation and adaptation. The state government allocates budgetary resources to support these initiatives, including investments in renewable energy, sustainable agriculture, Water conservation, etc.

The KSAPCC version 2 estimates Rs 53,000 crore till 2030 on direct climate-related issues. Karnataka has allocated a total of Rs 800 crore for Sustainable Development Goals (SDG) 13 – Climate Action in 2019- 20 and 2020-21 (Karnataka Economic Survey Report, 2021).

2.3 Tracking of State Budget Expenditure

Addressing climate change through mitigation and adaptation relies on the State's commitment to implementing long-term policies and programs. Climate finance, encompassing both public and private sources, plays an important role in reducing climate-related vulnerabilities and promoting coping mechanisms within affected regions, sectors, and among socially vulnerable groups in the State. Funding for State Action Plans on Climate Change (SAPCCs) primarily derives from Union and State budgets, facilitated through various centrally and state-sponsored initiatives and schemes. The programs and schemes across agriculture and water departments are entirely funded through allocations from both the Central and State Governments.

State's Expenditure towards Agriculture during 2022-2023

Budget Estimates of 2022-23 (Volume - III) of Department of Agriculture (Rs. In lakhs), the amount provided was Rs. 576585.69 lakhs which includes State Sector/Zilla Panchayat (ZP)/Taluk Panchayat (TP)/Centrally Sponsored Schemes. The original budget was revised to Rs. 644918.32 lakhs. Out of the released amount of Rs. 603520.85 lakhs, the Department has incurred an expenditure of Rs. 596230.31 lakhs (KSAD, 2022).

Sl.No	Name of Schemes	Budget Estimate	Revised Estimate	Grant Release	Expenditure
1.	Commissionerate of Agriculture	14350.73	17170.30	17170.30	16709.96
2.	Secondary Agriculture Directorate	500.00	429.65	250.00	242.60
3.	Unspent Special Component Plan (SCP)/ Tribal Sub Plan (TSP) as per SCP TSP Act 2013	641.71	641.71	641.71	640.32
4.	Farmers Incentive and Support Scheme	1358.74	1408.48	1408.48	1358.13
5.	Agricultural Inputs and Quality Control	87200.00	86049.57	86040.09	85280.43
6.	Organic Farming and Millets Programme	2000.00	2480.26	2480.26	2472.05
7.	Agricultural Extension and Training	270.00	270.00	270.00	269.28
8.	New Crop Insurance Scheme	92672.56	249745.84	249745.84	249303.05
9.	Pradhan Mantri Kisan Samman Yojane (PM-KISAN)	200000.00	96810.25	96634.25	95978.32
10.	Vacant Post Provision	3960.00	2698.19	0.00	0.00
11.	NMSA-Chief Minister's Sookshma Neeravari Yojane (PMKSY)	1138.00	1138.00	569.00	534.13
12.	Chief Minister's Raitha Vidya Nidhi Yojane	20000.00	59917.68	59917.68	59911.97
13.	Agricultural Infrastructure	16547.00	17297.00	16547.00	16547.00
	A	440638.74	536056.93	531674.61	529247.24
14.	Assistance to ZP	9379.53	9399.00	9399.00	9378.22
15.	Assistance to TP	11963.43	12321.00	12321.00	11963.10
	B	21342.96	21720.00	21720.00	21341.32
16.	National Food Security Mission	16666.66	17910.87	17910.87	16638.57
17.	Sub Mission on Seed and Planting Material (SMSP)	100.00	100.00	0.00	0.00
18.	NMSA-Chief Minister's Sookshma Neeravari Yojane	30000.00	0.00	0.00	0.00
19.	Sub Mission on Agricultural Extension (SMAE)	3586.00	3586.00	2580.66	2553.82
20.	Sub Mission on Agricultural Mechanization (SMAM)	28000.00	28000.00	17247.91	17060.11
21.	National Mission on Edible Oils (NMEO)	0.00	697.79	697.79	298.66
22.	Rashtriya Krushi Vikasa Yojane	33333.33	33031.41	8701.62	7959.77
23.	Project on Management of Soil Health	8.00	190.32	188.35	0.00
24.	Pradhan Mantri Formalisation of Micro food processing enterprises (PM-FME)	2910.00	3625.00	2799.04	1130.82
	C	114603.99	87141.39	50126.24	45641.75
	TOTAL=A+B+C	576585.69	644918.32	603520.85	596230.31

Table 2.1: State's Expenditure towards Agriculture during 2022-2023 (Rs. in lakhs)

(Source: KSAD, 2022)

State's financial status under Agriculture sector for 2023-2024

Honorable Chief Minister of Karnataka Sri Siddaramaiah presented the budget for the year 2023-24 for Agriculture sector with the following points:

- Krishi Bhagya Scheme launched by our government earlier was very popular and helpful to farmers. In convergence with Mahatma Gandhi National Rural Employment Guarantee Scheme, this scheme will be launched again with an allocation of Rs. 100 crore.
- A new scheme called 'Navodyama' will be launched with an allocation of Rs.10 crore for value addition of agricultural produce and to encourage innovation in the field of agricultural marketing.
- Rs. 10 crore will be provided to encourage branding of farmers' produce on the lines of 'Nandini' to enable marketing of farmers' produce in State, National, and International markets.
- In order to strengthen Farmer Producer Organizations, 100 FPOs in backward talukas will be given financial assistance in the form of a 4% interest subsidy on loans up to Rs. 20 lakh each, availed from commercial and cooperative banks.
- Seed capital up to a maximum of 20% of the project cost not exceeding one crore rupees will be provided for the construction of godowns, cold storage, and other infrastructure to facilitate the export of produce of FPOs.
- Five crore rupees will be provided to support FPOs, Start-Ups, and micro-food processing entrepreneurs through Karnataka State Agricultural Produce Processing & Export Corporation Limited (KAPPEC) to promote the export of agricultural and horticultural produce of the State.
- In the previous tenure of our government, Krishi Yantradhare Kendra (custom hiring centres) was established to provide agricultural implements on rent. Further, to strengthen these centres it is proposed to establish 300 High Tech Harvester hubs in a phased manner and 100 hubs will be set up during 2023-24 for Rs. 50 crore (Karnataka Budget, 2023).



State's financial status under Water sector

In 2021-2022, Rs. 18702.51 crore budgets were allocated to the water resource department (Major Irrigation and Medium Irrigation) in which the department received Rs. 17702.94 crore. By the end of January 2022, the department spent Rs. 10959.27 crore for different irrigation projects on 18164 hectares of land in the state (WRD, 2021).

Sl.No	Project Name	Budget Spent (Jan 2022) (Rs.in crore)
1	Krishna Bhagya Jala Nigam Ltd	4165.44
2	Karnataka Neeravari Nigam Ltd	3904.54
3	Visvesvaraya Jala Nigam Ltd	1368.45
4	Cauvery Neeravari Nigam Ltd	1386.31
	Total	10824.74

Table 2.2: State's financial status under Water sector, 2021-2022

(Source: WRD, 2021)

Honorable Chief Minister of Karnataka Sri Siddaramaiah presented the budget for the year 2023-24 for water sector with the following points:

- It is necessary to allocate one lakh crore rupees to the Water Resources Department for schemes approved up to 01.04.2023. On account of the escalation of the cost of works and land acquisition, there is a possibility that the cost of these schemes will go up by Rs. 25,000 to Rs. 40,000 crore. Also, 1274 works at an estimated cost of Rs. 25,548 crore, have been taken up during the last six months. The average budgetary allocation for the Water Resources Department is Rs. 20,000 crore.
- In the Water Resources Department, in the current year, along with identification and action to complete ongoing projects that have been pending or moving at a slow pace, it is proposed to irrigate about 25,948 hectares by completing 10 irrigation schemes with a balance cost of Rs.940 crore.
- To find a permanent solution to drinking water scarcity in the State, 172 schemes of filling tanks by lifting water from reservoirs have been taken up. It is proposed to complete 19 tank filling projects for Rs. 770 crore through which 899 tanks in Belagavi, Davanagere, Ballari, Haveri, Gadaga, Bidar, Uttara Kannada, Vijayanagara, Koppala, Kalaburgi, and Yadagiri districts will be filled up.
- During the period of our government, administrative approval was accorded to take up the Yetthinahole project at an estimated cost of Rs. 12,912 crore. However, because the previous government has not completed the works within time, the rates have escalated and the cost of the scheme has been revised to Rs. 23,252 crore (Karnataka Budget, 2023).

2.4 Budget Requirement for the current KSAPCC Implementation

As per the information retrieved from the KSAPCC report, Agriculture as well as a few other sectors possesses substantial opportunities for implementing climate change adaptation and mitigation schemes and the budget estimated for these sectors could be increased gradually. Specifically, recognizing the forest sector's paramount role in climate change mitigation, there is a proposed 25% budget augmentation by 2025, with an additional 25% increase slated for 2030. In parallel, the Agriculture sector was targeted for a 20% annual budget growth by 2025, followed by a 25% increment by 2030, as part of climate change action efforts whereas the water sector's budget requirement was only a 5% increment by 2025 and 11% budget growth by 2030 which is depicted in Fig 2.4.

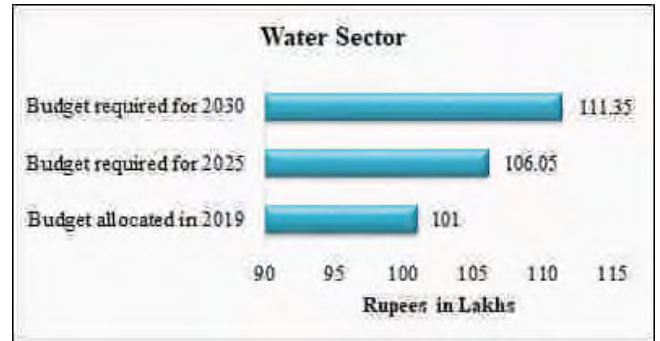
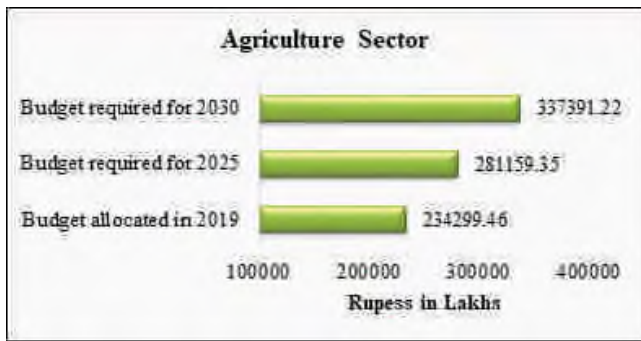


Figure 2.4, Budget requirement for climate action plan of Karnataka state for water and agriculture sector

(Source: KSAPCC V2, 2021)

According to the KSAPCC 2021 report, the primary source of climate change finance is the government, with limited engagement with private and multilateral financial alternatives within the state whereas climate financing in Karnataka is currently fragmented, relying on various central and state-level schemes and programs. There is no predetermined or guaranteed percentage of funding allocated or reserved in the state budget for mitigation and adaptation initiatives. Climate change financing in the state is primarily driven by central government funding, with limited emphasis on climate change mitigation through state-level financial resources. Moreover, the state's climate finances lack specificity, as they are not directed toward particular sectors, regions, or social groups, and fail to address the current vulnerabilities associated with climate change.

The budget requirement for mitigation action in the Agriculture sector explains the Kisan Urja Suraksha Evam Utthaan Mahabhiyan (KUSUM) subsidy scheme and the funding breakup. Utilizing the identical financing model employed in the KUSUM subsidy scheme, which involves a 60% contribution from the government, 30% from banks, and 10% from farmers (as cited in Shah, 2018), the cumulative cost of implementing solar pump-based mitigation measures for the period spanning 2021 to 2030 is projected to reach an approximate total of INR 40,010 crore. This total encompasses the combined financial commitment from both the central and state governments. Moreover, in a scenario where demand side management is fully implemented starting in 2021 without encountering any hindrances, coupled with the replacement of aging pumps (those exceeding 10 years of operation) with energy-efficient pump sets, there is a notable carbon mitigation potential estimated at up to 707 KtCO₂. Considering a unit price of INR 50,000 per pump, the aggregate cost for implementing this carbon mitigation initiative amounts to approximately INR 16,614 crore. The current state power infrastructure possesses the surplus capacity to accommodate dedicated agriculture feeders, supported by solar panels with a capacity of up to 2 GW. Our estimation suggests a substantial emissions mitigation potential of approximately 620 KtCO₂e, achieved through the connection of around 2.6 lakh energy-efficient pumps to dedicated agriculture feeders powered by 1.75 GW of solar energy.

Consequently, prioritizing this solar-feeder integration with energy-efficient pumps emerges as a key mitigation strategy for the agriculture sector. The total cost associated with implementing this mitigation initiative, inclusive of the expense for energy-efficient pumps and the augmentation of solar capacity, amounts to INR 7,242 crore. To enhance energy efficiency, additional investments are necessary. Immediate interventions that the state could prioritize include the adoption of LED lighting, implementing energy-efficiency measures within the cement industry, transitioning to energy-efficient irrigation pumps, and integrating irrigation pumps



with solar-powered dedicated feeders. These initiatives hold the potential to significantly enhance energy efficiency and reduce emissions.

The absence of a specified budget requirement for climate mitigation (river interlinking, waste water treatment, desalination rainwater harvesting, etc) within the water sector, as noted in the KSAPCC 2021 report, is a notable gap that warrants careful consideration. The significance of the water

sector in the context of climate change cannot be overstated, as it plays a pivotal role in both adaptation and mitigation efforts. Water resources are intricately linked to climate patterns, and effective management is critical to address climate-induced challenges such as droughts, floods, and altered precipitation patterns. Moreover, sustainable water practices can mitigate greenhouse gas emissions, particularly in the energy-intensive water treatment and distribution processes. As such, the omission of a dedicated budget allocation for climate mitigation in the water sector may hinder the state's comprehensive efforts to combat climate change. Therefore, it is imperative to assess and address this gap to ensure the resilience and sustainability of water resources while contributing to broader climate mitigation goals.

2.5 Importance of Budget Monitoring for KSAPCC Implementation

Monitoring the budget is an important critical aspect of ensuring that an organization or government department adheres to its financial, operational, and capital plans as outlined in the budgeting process. This oversight plays a pivotal role in upholding accountability in expenditure. Furthermore, regular and comprehensive budget monitoring empowers a government to assess the quality of service delivery, track the progress of new initiatives toward their objectives, gain insights into trends and deviations that could impact future operations, and demonstrate transparency by openly sharing the findings of this ongoing evaluation.

In the year 2000, the Government of Karnataka introduced an Evaluation Policy. According to this policy, all schemes and plans with a budget exceeding Rs. 1 crore were mandated to undergo evaluation every five years. This requirement applies to all government departments, corporations, boards, local bodies, and other entities funded by public resources. To facilitate this process, the Karnataka Monitoring and Evaluation Authority (KMEA) was established in September 2011, marking a pioneering initiative in the country. KMEA's primary role is to offer technical support and guidance to all government departments and institutions involved in evaluation efforts (KMEA, 2023).

In 2021 -2022, KMEA evaluated 21 projects with a grant of Rs 100 crores (Based on the low progress of the Sustainable Development Goals) of which a total of 6 projects are coming under the agriculture and water sector, National Food Security Mission (NFSM), Jal Jeevan Mission, Jalasiri Programme, SCP/TSP schemes in Agriculture, SCP/TSP schemes in Water Resources and Rashtriya Krishi Vikas Yojane. This authority has mainly taken up initiatives to promote quality evaluation every 5 years.

Effective budget monitoring encompasses a wide range of functions to provide a holistic view of the situation and inform necessary actions in case of significant deviations. While the initial step involves comparing budgeted figures to actual expenditures, it should expand to encompass the organization's or government department's performance in terms of service delivery and other programs and initiatives (GFOA, 2023).

To ensure this budget monitoring process is productive; governments should clearly define the components to be assessed, designate responsible parties for analysis, and establish a framework for utilizing the analysis results. Regular budget monitoring will enable government departments to promptly address any significant discrepancies, ensuring the uninterrupted delivery of programs and services. If this is executed consistently, comprehensively, and efficiently, budget monitoring yields valuable information that can guide corrective actions and operational enhancements.



Chapter 3

Implementation of KSAPCC in water and agriculture sectors

This chapter gives a comprehensive overview of how Karnataka is addressing climate change in these two sectors through case studies. It demonstrates the implementation status, implementation challenges, and ways to enhance the implementation efficacy of KSAPCC based on the case studies and inputs from government officials.

- Dr. Hema Nagaraj¹



¹ Dr. Hema Nagaraj holds a Doctorate in Environmental Science with 16 years of experience in Research and Development. She served as a Principal Scientist with EMPRI and contributed for Chapter 2- State profile in KSAPCC V2

3. Implementation of KSAPCC in Water and Agriculture sectors

3.1 Implementation status

The implementation of schemes/programs of the state action plan on climate change in water and agriculture sectors was assessed in the two districts of Karnataka namely Uttara Kannada and Raichur.

In Uttara Kannada, in terms of implementation of KSAPCC, the two centrally sponsored schemes viz., Agriculture Technology Management Agency (ATMA) and the National Food Security Mission (NFSM) are considered as most crucial. The Agriculture Technology Management Agency (2005) is a registered society responsible for technology dissemination at the district level through the Strategic Research and Extension Plan (<https://www.myscheme.gov.in/schemes/atma-scheme>). ATMA has achieved 100% success in terms of its implementation in the district with the assistance of 33% of the officers appointed under the scheme with a budget of 293.37 crores. The ATMA initiative has improved farmers' awareness of the quality of seeds. The crop shifting in field schools was implemented in the year 2022 with a budget of 293.37 crores. Under this scheme, farmers are taken on field visits both within the state and district to demonstrate the success stories of outcomes of adopting quality seeds and crop-shifting practices.

The National Food Security Mission (2007) was launched to increase the production of rice, wheat, and pulses through (i) area expansion and productivity enhancement, (ii) restoring soil fertility and productivity, (iii) Creating employment opportunities, and (iv) enhancing farm level economy (<https://pib.gov.in/PressReleasePage.aspx?PRID=1592269>). Under this scheme, 10-year-old crop varieties were introduced which covered almost 90% of the cultivable area with a financial support of 180.18 crores. The hybrid varieties of paddy and commercial crops like sugarcane have been successfully introduced under this scheme. The highest level of success is seen in ATMA scheme as the seed awareness training programs are conducted at field schools. The farmers are taken on tours at the district and state levels to demonstrate their success stories.

The MGNREGA scheme implemented in the district with the financial support of 8,679.69 crores in 2021-2022 has benefited farmers by increasing the agricultural labor wages which in turn has helped in an increase in crop productivity by 20%. Local initiatives such as the construction of 311 farm ponds and 29 check dams have helped farmers conserve water in the district. Even though they are known to be beneficial in the long run, during the rainy season the surplus water causes flooding affecting these structures and it dries up in the summer season. As one-third of workers must be women under this scheme, it's also assisting in women's empowerment, particularly the illiterates.

The initiatives related to climate action implemented in the district have been instrumental to a certain extent. The taluk has soak pits (1200 households), water recharge pits (430), check dams (4), farm ponds (311), and agro-nutrition gardens along with horticultural and sericultural farms. Farm ponds and check-dams are not sustainable in this region because the surplus water during the rainy season causes flooding in farms and the surrounding area, and it dries up in summer. The pitching work done near the seashore reduces floods.

The soak pit scheme has been highly successful since it was implemented in 1,200 households in the taluk. As the houses are scattered, more space is available around the house for the construction of the soak pits. The soak pits assist in the recharge of groundwater levels, and the extent of the water table has improved

considerably in all households. Based on the dependence on groundwater from the households, the water resources department will sanction financial assistance of a minimum Rs.14,000 subsidy to construct the soak pit.

Water conservation programs are seen to be prevalent in the district. The Mission Amrit Sarovar was implemented in the year 2022 to develop and rejuvenate 75 water bodies in each district of the country as a part of the celebration of Azadika Amrit Mahotsav. In Uttara Kannada district, 100 lakes around the area were considered for development and rejuvenation of which 97 lakes are completely developed and three lakes are yet to be rejuvenated.

The Jal Shakti Abhiyan: Catch the Rain (JSA: CTR) initiative focuses on saving and conserving rainwater with the theme “Source sustainability for drinking water” from 04 March 2023 to 30 November 2023 in the pre-monsoon and monsoon periods of 2023, covering both urban and rural areas of all the districts in the country. In the year 2023, the key focus of JSA: CTR is on ensuring source sustainability in 150 water-stressed districts of the country, identified by Jal Jeevan Mission. In the district, the stormwater is conserved through the construction of water recharge pits and check dams. The department has targeted to construction of 2,530 water recharge pits and 29 check dams. This task is expected to be completed by the end of the financial year 2023. Under the Jal Jeevan Mission, from the past 3 years 1,43,503 (50.15%) households have got surface water (tap water) connections. Departments receive adequate funding to implement programs, and they also conduct local-level programs based on district requirements.

Drinking water is a state subject and through the National Rural Drinking Water Programme (NRDWP), the Ministry of Jal Shakti provides technical & financial assistance to the states. The NRDWP is a Centrally Sponsored Scheme (CSS) aimed at improving the coverage of adequate and safe drinking water for the rural population of the country. Under the NRDWP scheme, Multi Village Drinking Water Programmes have been implemented in the district which has been quite successful.

The Gokarna Multi-Village Water Supply System has been implemented in 12 taluks and Jal Jeevan Mission in 1, 43,503 (50.15%) households for the past 3 years. The Gokarna and 21 Multi-Village Water Supply scheme has been one of the most successful programs. The scheme has been commissioned across 12 taluks in its first phase with a budget of 21 crores, helping 40,000 people or 8500 families. Under the scheme, many villages will be clubbed into one drinking water supply project where the nearest water source will be identified, treated, and supplied to the group of villages. The Jal Jeevan Mission has extended tap water connections to every household in the district. These two programmes have several benefits. The utilization of funds from the department budget allocation has decreased and it's no longer dependent on other grants or schemes. The open wells in the village no longer have salt water in them. The issue of water availability and resource sustainability has been overcome considerably. The department has submitted new project proposals on water conservation and the Detailed Project Report (DPR) is currently being assessed. The proposals submitted are the BhatkalShiral MS Scheme (240 Crores), Karki MS Scheme, Hannavar (130 Crores), and Kumta Hegde Annapurna Scheme (130 Crores).

In Raichur district, the most crucial policy for implementation of KSAPCC in realms of climate change is the Jal Jeevan Mission (JJM). The Jal Jeevan Mission has been split into two initiatives: Multi-village scheme and the in-village scheme. A large quantity of water (bulk) will be supplied to the targeted villages under the

multi-village scheme, whereas water will be supplied through tap connections under the in-village scheme. So, the department's primary focus is on the in-village scheme. The JJM phase 1 was launched in 2021, with a target of 312 regions and 85,633 households. The first phase is towards completion with only 20 households remaining. Some communities in the irrigated areas oppose the idea since they have enough water resources and only a few villages require the JJM scheme. The JJM phase 2 (2021-22) was planned with a target of 64,323 households and phase 3 (2022-23) with a target of 1, 24,438 households. The JJM phase 4 (2022-2023), will focus on a target of 1, 01,459 households.

The RH (Rehabilitation) camp multi-village water supply scheme (Sindhaur taluk), Kavital multi-village water supply system (Manvi taluk), and Hullur multi-village water supply scheme (Sindhaur taluk) have been successfully implemented in Raichur district with a total financial support of 286.69 crores. The multi-village water supply scheme supplies filtered drinking water to the villages, and the district's water scarcity problem has decreased by 40% thereby providing a solution to the problem of water scarcity. Under the National Food Security Mission, less than 10-year-old variety seeds of paddy, wheat, and pulses are used for crop cultivation. The department has received 9.62 crores of financial support to carry out the programme of which 9.39 crores has been spent to date.



The department has been executing several water conservation and agriculture programmes under the MGNREGA scheme for the past 3 to 4 years which have been successful. Certain local-level programmes based on district requirements have also been initiated. In the first phase, the department established 20-30 'River Water Harvesting Systems' in 100 locations around the district between 2020 and 2021 to reduce water scarcity. In 2022, the Amrit Sarovar program was successfully implemented in 91 lakes in the district in 18 months. The scheme has helped to overcome the issue of water crisis in rural areas and has supported livelihoods by using sarovar water for irrigation. The Gomala Land Development programme was executed in several farmlands and government lands in 2022 with a total budget of 600 crores, with 300 crores spent on its implementation. The department is constructing trenches in farmlands to keep the soil moist. Presently, 15000 trenches have been constructed in various locations covering 12,000 hectares of land throughout the district.

Many water conservation efforts such as farm ponds, water recharge structures, check dams, lake rejuvenation programs, reviving old wells and borewells, and construction of new water tanks, have been implemented to alleviate the impacts of drought. The department has planted 2,200 saplings under the "KotiVruskshaAbhiyana" scheme with the financial assistance of 3.5 lakhs from the MGNREGA scheme which makes the Raichur district greener. As Raichur is one of the major drought-prone districts in Karnataka, the department is attempting to address water scarcity issues through these programmes. However, these schemes assist farmers throughout the summer season mostly in the dry regions, to cultivate crops and generate a small amount of revenue.

In 2014-15, Krishi Yanthradhara Centres of the Agricultural Department provided modern farm equipment to the farmers, such as Hi-tech Harvesters (300). The programme budget for the year 2023 is Rs.50 crore (100 Hi-tech harvesters at a cost of Rs.50 lakhs each). Farmers benefit from hi-tech and innovative farm machinery which are available at low cost, allowing them to resume agricultural activities. Farmers receive subsidies to purchase seeds, fertilisers, and pesticides at a low cost from the Raitha Samparka Kendras through the seed programme. In 2023, an additional subsidy of Rs.10,000 is being provided under the new scheme 'Bhoo Siri' for Kisan Credit Card holders, to assist around 50 lakh farmers in the state. The scheme would help farmers to purchase seeds, fertilisers, insecticides, and other farm inputs. The Raithasiri scheme was launched in 2023, where farmers receive an incentive of Rs.10,000 per hectare to boost the area expansion, production, and productivity of crops. Farmers are cultivating sajjje crops (Bajra) in 45,000 hectares of agricultural land and 50% of sowing has been completed. However, due to a lack of market access and demand, farmers are showing little interest in growing the sajjje crop.

The Krishi Bhagya scheme was implemented in 2014 with a financial assistance of 968.37 crores. The scheme is exclusively for the dry-land farmers who rely on the annual rainfall for their farming. As a part of this scheme, Raichur has constructed 2,273 farm ponds which exceeded the target of 2000 since the inception of the scheme with an expenditure of 891.16 crores. Farmers are demanding farm ponds in greater numbers, but the scheme is currently closed. In 2023, with a new scheme called "Jalanidhi" water conservation works will be taken up by building farm ponds on farmer's lands. Under this scheme, the department will encourage all farmers to construct farm ponds on their land by converging with the MGNREGA scheme.

The micro irrigation plan was implemented in 2006 and it has helped in the reduction of labour cost. There is less water consumption due to the use of drip and sprinkler irrigation methods. The department was given a budget of 9.32 crores to implement the scheme in 2022, of which 7.82 crores has been spent. A total of 4,638 hectares of agricultural land are covered under the scheme.

3.2 Implementation challenges

In Uttara Kannada, there have been several challenges in the implementation of the action points on climate change in Karnataka. The primary objective of the establishment of Raitha Samparka Kendra's (RSK) (2000-01) under the Raitha Mitra Yojana is to provide technical and weather-information on crop selection, crop production, and crop protection-related know-how and market information to farmers and to provide facilities such as seed and soil testing (Raghuprasad et.al., 2012). Despite the RSKs being established in all hobli's of the district, there is a lack of agricultural officers in thirty-five RSKs. Hence, the lack of manpower resources is one of the major barriers to implementation of the state-specific climate actions in the district.

In the state Agriculture department, there is an 80% shortage of officers. The department has thirty-five sanctioned positions for agricultural officers and fifty-five for assistant agricultural officers but only 29% and 67% are currently appointed and working in those positions respectively. This shows that there is an immediate need to fill the remaining positions to ensure the effective implementation of programs/schemes. Alongside this, the lack of human resources such as assistant engineers and junior engineers has caused constraints in the implementation of works. The total number of sanctioned positions was 48 of which 11 are functional. The department has no budgetary restrictions due to the implementation of the Jal Jeevan Mission.

Under the MGNREGA scheme, the budget allocation is in the ratio of 60:40, with 60% spent on wages and 40% spent on materials, which makes managing the scheme difficult because machinery is required for some works and the funds allocated may not be sufficient and the work gets delayed. A total of 84,573 agricultural laborers are working under the MGNREGA scheme. Labor shortage due to market demand is another issue of concern. As the district is close to cities such as Goa and Mumbai, labourers migrate in search of highly-paid wages in these cities creating a shortage of 40% workforce. Moreover, the work assignment is for 100 days and this makes the labourers look for an alternative mode of employment, given the uncertainty of finding a new job in a short duration. This directly affects the field-based implementation of schemes/programs.

The availability of water is another major challenge, due to uneven rainfall in the district. The flash floods in coastal regions during the rainy season cause an increase in salinity in drinking water sources like open wells and borewells. The agricultural lands are to a limited extent in the coastal regions because a majority of the area is covered by forest and sea and the soil is more saline.

In Karwar, the availability of agricultural land is limited as the majority of the area is covered by forest and sea. Due to this, they have difficulty implementing agricultural-related projects. The soil is known to be more saline. In this context, the department has taken measures and suggested farmers sow salt-resistant paddy varieties like Kagga and Halaga, which can give up to 40 percent yield. Another issue in the district is the availability of water. Natural calamities like landslides damage the pipeline networks due to which there is a loss of water during its supply. In Karwar, the groundwater is available at four inches but the water level fluctuates over some time due to irregular and insufficient rainfall. Saltwater intrusion causes severe salinity of water in the surrounding aquifers. As 60% of the houses in the district are scattered, the department is experiencing difficulties in laying the pipeline connections. Hence, certain financial challenges are encountered under the Jal Jeevan Mission. Operation and maintenance of the water conservation units like community overhead tanks and water supply valves also pose challenges (Motor repair, damage, oiling, and greasing).

With respect to the water supply schemes/programs, the challenge is quite varied. Seventy percent of the households in Karwar taluk (40,330 total houses) are scattered, and the department is facing issues in drawing pipeline connections for water supply along with budgetary constraints. Though the extent of the area is huge, since the population is vastly distributed, there is limited funding allocated for this region. The department is managing the budget with the 2.0 crores allocated for maintenance activities of the taluk panchayat.

Allocation of area for implementation of a scheme/program is another issue of concern. A portion of the territory is under the jurisdiction of the Forest Department (1,17,877.67 hectares comprising 71.75% of the geographical area) and hence cannot be accessed for program implementation. Under the MGNREGA scheme, the department is required to finish 260 permitted activities before commissioning any additional work, so the department is implementing a water conservation program using funds available at the taluk.

In Raichur district, the challenges observed are similar to the ones in Uttara Kannada. Acute shortage of staff in the department is one of the main constraints in the implementation of water-related climate actions. The department's sanctioned positions are three engineers and one assistant executive engineer who are assigned 50 regions but after the implementation of Jal Jeevan Mission (JJM) the regions have been expanded to 250 in each taluk and the department still manages with the existing staff strength. As a result, programme monitoring and implementation have become extremely difficult. Even the number of sanctioned assistant

executive engineer positions (09) have remained vacant with only one official currently working for the entire district. This calls for expansion in the number of sanctioned positions following the number of regions and the amount of grants allocated to the district.

The major responsibility of the water resources department is to supply water to the communities via pipeline connections, but these networks are damaged during road construction and electrical works (BSNL and Reliance network). The repairs are unattended for a long time resulting in leakage of water. This demonstrates the lack of coordination between the concerned departments.

The department installs overhead tanks in gram panchayats to supply water to villages, which are operated and maintained by watermen. As per the department protocol, the overhead tanks should be filled twice a day and supply water to villages, but the watermen fill the tank only once a day which is not sufficient to cater to the needs of the people thereby causing water scarcity concerns in the villages. Therefore, we need to hire skilled watermen (ITI certification) in all gram panchayats.

The department has compulsion in terms of adhering to its mandate and therefore is unable to focus on state-specific climate actions. To quote an example, under the MGNREGA scheme, the department has the mandate to complete 260 approved activities (Construction of flood/diversion channels for the community, construction of irrigation channels, open wells for the community, wasteland line plantation of farm forestry trees for individuals and construction of farm ponds) before undertaking any additional work. As it's a centrally sponsored programme, the budget is provided based on the district's target activities, making it extremely difficult to implement any additional local-level activities.

Convincing officials for new initiatives at the gram panchayat level is another issue of concern. Most people would prefer to use the traditional water resource methods (wells, canals, borewells), making it difficult to implement new programmes in the district. The budget under the MGNREGA scheme is in the ratio of 60:40, with a higher portion given to wages and a lower portion given to materials. However, laborers sometimes refuse to take up difficult work where mechanical devices are required, but due to a lack of funds the department would struggle to complete the work on time and this will cause delays in delivering the task.

The lack of agricultural and assistant agricultural officers in Raitha Samparka Kendras is a major challenge for implementation. The department has 63 and 85 sanctioned positions of agricultural and assistant agricultural officers but only 40 and 22 officers are currently working in the RSK centres respectively. There are 37 Raitha Samparka Kendras in the Raichur district, but they do not have a sufficient number of officials working at the hobli level. Thus, there is no progress in the effective implementation of state-specific climate actions.

The restricted and delayed sanction of the budget is also impacting the implementation. In the year 2022, the department received 40.50 lakh budget, of which 38.26 lakhs was spent on various departmental and scheme costs. However, this amount received was insufficient. The funds for 2023 are awaited. Migration of labourers to the nearby villages/cities for higher wages is the most serious issue leading to labour shortage by 60% of the total agricultural laborers (3,28,491) in the district.

3.3 Enhancing implementation efficacy of KSAPCC

In Uttara Kannada, as per the opinion of the officials, the following could be adopted for the successful implementation of the action plan in the district:

- The action plan should focus on the gram panchayat level for effective implementation as it is easier to execute actions at the village level than at the district level
- To decrease crop damage, one needs to adopt effective communication strategies at the farmer level that include alert messages regularly about changes in weather patterns
- The state programmes should be implemented at the gram panchayat level. Schemes such as crop insurance, Krishi Bhagya, and Bhoochetana are examples of initiatives that have been adopted and successfully implemented at the gram panchayat level.

An effective monitoring framework should consist of the following:

- The baseline assessments should identify and rectify district-level gaps by involving all local Stakeholders
- Farmers are to be provided with resources and facilities such as chemical sprayers and advanced equipment at an affordable cost
- Annually, 15-20 crop-wise training sessions are to be conducted for farmers for 1-3 days with about 30 participants in each program. More training programs need to be conducted regularly on crop shifting, climate-smart agriculture, and aspects of seed awareness.

To come up with a comprehensive and efficient monitoring framework, a department/committee exclusively for climate change at the district level should be established which could routinely monitor the ongoing programs/schemes. The cooperation between the departments should be strengthened for effective monitoring and evaluation of the action plans. Trained and experienced personnel subject experts and skilled professionals should be assigned the task of implementing programs. The personnel should be provided with scientific training and workshops/seminars to enhance their knowledge of tracking the implementation status of programs and mapping of natural resources

them enhance their competencies. Despite the department staff being trained on technical aspects, they lack the necessary knowledge on climate change-related issues and hence are unable to understand the implications of impacts of climate change on the environment. Therefore, enhancing the expertise of the department officials should be of utmost priority. Field trips to the agricultural sites would help demonstrate the practical difficulties encountered by farmers.

The policy framework should be planned systematically, with information gathered from local gram panchayats who are aware of the water resources in the district. Based on their knowledge, the district-specific action plans should be designed for the effective implementation of programs/schemes. The department should periodically coordinate with the local stakeholders through workshops and training programs on climate action plans. The monitoring framework should be established methodically based on district requirements



and then brought to the gram panchayat level for successful implementation. For systematic monitoring and evaluation of the action plan, the agriculture department should prepare and circulate the calendar of activities to be implemented on the field regularly to all officials.

The schemes/programs on climate action should provide certain subsidies to farmers (monetary benefits) to generate revenue and sustain their livelihoods. To quote an example, the government provides subsidies for the installation of solar panels. Accordingly, if they provide subsidies to implement rainwater harvesting at the household level, this will help to recharge the groundwater, and the issue of drought in the summer months may be reduced to a certain extent.

The operation and maintenance of the water conservation units should be evaluated regularly to improve their efficiency and workshops on advanced water-saving techniques could help in water conservation by farmers. For efficient execution of the programs, the district water and sanitation committee should assign responsibilities to all the committee members.

In the case of Raichur district, a separate monitoring and evaluation department/cell at the gram panchayat level should be established to consistently monitor the status of programmes. Each gram panchayat has a village water and sanitation committee. Their main responsibility is to monitor the water and sanitation issues in the villages monthly and report to their department. This ensures that there is greater accountability in terms of systematic monitoring and evaluation for the successful execution of climate actions. Both the central and state governments have created the best policy frameworks, but the implementation should begin at the gram panchayat level for successful execution. The gram panchayat officials are continuously monitoring all departmental programmes and resolving issues as they arise.

In the context of establishing a comprehensive and efficient monitoring framework, under the Jal Jeevan Mission, department officials have participated in four capacity-building training programs in a year. Three to four training programs are scheduled annually with a maximum of thirty participants in each session. The baseline water quality assessments are carried out using water quality testing kits in the water testing laboratories in all gram panchayats. The water quality parameters tested are pH, COD, and BOD. The water quality is tested on a daily, weekly, and monthly basis before supplying water to the villages.

Department officials frequently conduct baseline assessments and receive training programs. However, they intend to be trained extensively which would help them to improve their area of expertise. The department intends to conduct regular awareness programmes in all gram panchayats because villagers show little interest in new programs mainly related to crop shifting. The policy framework should focus at the gram panchayat level. To date, all policies have been comprehensive, with a concentration on state-level implementation. Thus, strategies at the district and taluk levels should be developed for the successful implementation of climate actions in Karnataka. In Raichur, the department is developing district and taluk-level action plans based on the district climate trends and planning activities accordingly. If the department receives the calendar of events ahead of time, officials will be able to monitor the action plans regularly.

The Assistant Officers at the taluk level organise regular farmer training programmes on crop productivity, soil health, fertility management, and agroforestry at the Krishi Vigyan Kendras (KVK) in all gram panchayats of

the district. In a year, 10-15 training programs are conducted to farmers season-wise for up to 30 participants. At the department level, bi-monthly training programs are conducted for staff on issues of crop management and modern technologies in agriculture. The KVK officials also organize field trips to farmers to demonstrate the success stories.

3.4 Importance of Output Monitoring for KSAPCC Implementation

The Monitoring and Evaluation (M&E) process plays a crucial role in augmenting the success of climate change mitigation and adaptation activities through evidence-based assessment and efficient project management. Monitoring a project is the process of closely observing the entire project management life cycle and ensuring project activities are on the right track. Evaluation of the executed projects is critical in aiding decision-makers to come up with practical solutions in addressing management problems or any barriers periodically. M&E is additionally needed to understand how the allocated funds are being utilized and to plan the disbursement of remaining funds effectively. The evidence-based evaluations of past experiences and ongoing programs help to evaluate the performance of an intervention, identify measures that can improve project quality, and thereby, aid in making the intervention more cost-effective.

The perceptions of the officials in the two districts of Karnataka namely, Uttara Kannada and Raichur focused on aspects of the implementation status of KSAPCC, its challenges in the water and agriculture sectors, and policy recommendations for enhancing the implementation efficacy of KSAPCC. The major challenges encountered while implementing the KSAPCC can be categorized into two types: Administration-related and climate/environment-related challenges. Under the administration-related challenges, lack and shortage of manpower resources, unskilled staff, migration of labourers in search of highly paid wages to neighbouring cities, non-availability of area for implementation of a scheme/program, the compulsion for departmental staff to adhere to their mandate, restricted and delayed sanction of budget are seen to be quite prevalent. Among the climate/environment-related challenges, scarcity of water due to uneven rainfall in the districts, non-availability of agricultural land in coastal regions, natural calamities, saltwater intrusion, and increased salinity of water are issues of concern.

The schemes/programs implemented in Uttara Kannada and Raichur districts have been extremely successful except for a few. The schemes such as ATMA, MGNREGA, and Jal Jeevan Mission have demonstrated a high level of success due to several confounding factors such as conceptualization, planning, execution, monitoring, and evaluation which have been in their entirety. An effective monitoring framework has been the key to all successfully implemented schemes/programs. Contrary to this, a few schemes have demonstrated low success owing to the lack of a monitoring framework in place.

In order to bring about monitoring in a unified manner, the agriculture and the water resources departments need to set up a monitoring and coordination committee at the state level and a steering committee for the formulation of effective implementation plans for climate change-related schemes/programs. To periodically monitor the progress of schemes/programs, a separate technical cell has to be set up. These committees have to finalize the strategies and action plans in close consultation with the concerned departments. Additionally, a working group can be formed to facilitate transparency, coordination, communication, and learning. The working group must focus strongly on the Monitoring, Reporting, and Evaluation process.

The M&E framework should reflect the decentralized nature of the scheme/program and the process for assessing progress should be participatory. Multiple stakeholders should be engaged from different sectors and administrative groups, involving inter-departmental coordination, to prepare a plan for measuring the results of the monitoring framework, evaluating achievements, and learning from experience. The process will help build local capacity to reflect, analyze, propose solutions, and act. It will encompass social audit and quality control, monitoring how the interventions undertaken are progressing, and capturing how climate-resilient activities are enhancing the profitability of systems managed by scheme/program beneficiaries. Therefore, a well-conceptualized and planned monitoring and evaluation framework is the need of the hour for the effective implementation of climate actions. An immense threat is awaited in the absence of implementation of a comprehensive framework which might lead to failure of a scheme/program.

In order to facilitate the effective implementation of KSAPCC, certain recommendations could be considered. The recruitment of a sufficient number of staff and proper allocation at the departmental, district, and taluk levels would be helpful for the effective implementation of climate actions. Alongside, there needs to be an improvement in the technical skills of the staff. The daily wages of the labourers should be enhanced and have to ensure the retention of skilled labourers from migration to neighbouring towns/cities.

Organization of extensive capacity-building training programs for the departmental staff, and labourers on implementation aspects of climate action focusing on monitoring and evaluation should be given utmost priority. There needs to be the incorporation of climate actions in the departmental mandate and should ensure the periodical release of a budget without delays for the programs/schemes. Proper identification/allocation of areas/regions for the implementation of programs is essential.

Further, organization of disaster-preparedness programs for effective management at times of natural calamities, usage of modern technology for issues such as salt-water intrusion and cultivation in saline regions, construction of climate hazard resistant pipeline systems for efficient water supply and implementation of water conservation and agriculture-related programs are among the noted points for consideration.

Chapter 4

Evolving a Frame for Monitoring Actions

This chapter presents the overview of the existing monitoring frame, governance, and institutional structure, the blueprint of the frame for Evolving and monitoring Actions, and also emphasising the importance of the Monitoring Framework for KSAPCC implementation.

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4. Evolving a Frame for Monitoring Actions

“Monitoring of implementation of the KSAPCC needs to be done regularly and thus an effective framework in this regard needs to be adopted”.

This is one of the major recommendations, emerging out of the CEE’s study of two areas of the Karnataka State Action Plan on Climate Change (KSAPCC) - water and agriculture - to suggest ways to promote their implementation efficiency. This chapter attempts to outline such a frame. At the outset, a brief account of the background of the KSAPCC is given. A description of the existing Monitoring and Evaluation Strategies in the Agriculture and Water Sectors, their limitations and shortcomings, follow. Finally, drawing from the KSAPCC, a Monitoring and Evaluation Strategy would be proposed.

4.1 Genesis of KSAPCC

UNFCCC: The United Nations Framework Convention on Climate Change (1992), ushered in a Legal Frame for action, for the Community of Nations, to deal with the Climate Crisis and secure Climate Justice. The Points of Action, stipulated under it, included:

- (i) Mitigation of the serious and adverse impacts of Climate Change on environmental health and the lives of the people;
- (ii) Reduction of the global temperature to less than that of 1990; adaptation to the change in the Climatic conditions
- (iii) a group of industrialised Countries to undertake the obligation of cleaning up the atmosphere from the historic emissions (- for which they are the prime cause- clearing the “ecological debt”), that have resulted in Climate Change and by investing in developing Climate Friendly technologies and mechanisms and applying in their respective systems, besides enabling the developing Countries in that regard (- by making available and transferring such technologies, mechanisms and building the latter’s capacity in making use of those very skill sets, technologies, goods, and services) and ensure, securing and realising Climate Stability and Climate Justice.

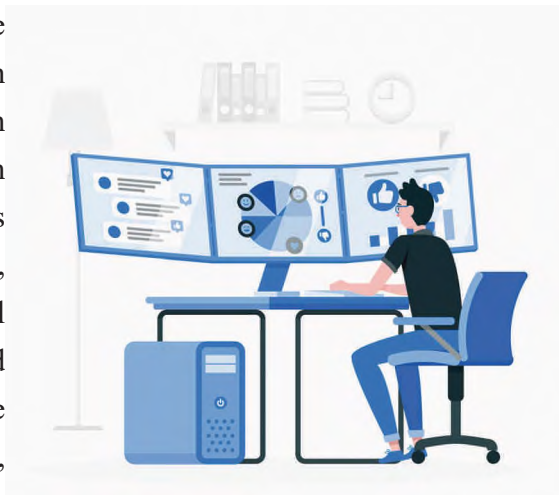
These constitute the core content and the driving spirit behind the Action Plans and their implementation, at the international, national, and local levels, even to this day.

The Kyoto Protocol 1997, to UNFCCC, evolved a mechanism for implementation of the obligation of the States. It floundered for about a decade and worked for just about 5 years. Before it could gain more traction, it fell through in 2012, as it could not get endorsement for its continuation by the Parties to the Convention.

In 2015, through the Paris Agreement, the Climate arrangement took a different turn, by which the Parties undertook obligations voluntarily, setting their roadmaps for reaching the Revised Targets, while remaining committed to the basic Action Points and Objects, spelled out under UNFCCC. Under the Paris Agreement, the Parties decided to hold the increase in global average temperature to well below 2°C above the pre-industrial levels; increase the ability to adapt to the adverse impacts of climate change, and lower greenhouse gas (GHG) emissions, while promoting climate resilient development. Intervention areas proposed by countries included renewable energy, water management, agriculture, forestry, waste management, and public transport. Every member Country, began in earnest to revise and implement their respective National Action Plans on Climate Change, thereafter.

The setting of Sustainable Development Goals (SDGs), by the United Nations in 2015, to be realised by 2030, included, taking expedient action to combat climate change and its impacts. As a result, every country was urged to lay greater emphasis on cross-sectoral planning among priority sectors like, agriculture, health, forestry, land-use planning, water resources, energy, education, etc., for accelerating actions to reach the goals set.

NAPCC: India developed its own National Action Plan on Climate Change (NAPCC) and secured the approbation of the Parliament, in 2008. With the NAPCC as the guiding star, every State in India was required to prepare its own respective Action Plans, in about a year. The National Plan laid emphasis on appropriate long-term mitigation strategies for promoting sustainable development and growth with climate “co-benefits”. It had a clear set of actions in each of the key sectors of governance concerning natural resources (- land, water, forests, biodiversity, etc.), energy, agriculture, infrastructure development, and industry. Through its sectoral missions, it provided a detailed road map for achieving the desired objectives. The NAPCC was to be implemented by each of the states through State Action Plans on Climate Change (SAPCC), approved and facilitated by the central government.



Karnataka State Action Plan on Climate Change (KSAPCC), 2015: Karnataka, like quite a few other States, evolved its own Action Plan, by 2015. It provided Karnataka’s first comprehensive assessment of sectors that could be significantly impacted by climate change, highlighted various challenges, and provided, action points to be implemented by various sectors in the state. International developments (Paris Agreement, 2015 and SDGs, 2015), required a few modifications in the National plans and Priorities, and the Plans and Actions of States were required to be accordingly re-worked.

Alongside this development, India has taken the leadership in stitching a Global Solar Alliance among Nations, the working of which would significantly contribute to the achievement of the goals of the Climate Change Arrangement. With the industrialised and the Developed world demonstrating greater reluctance in owning up to responsibility for historic emissions and not very enthusiastic in conforming to the spirit of Climate Justice and Equity under the UNFCCC, the much-needed support, cooperation, technical and economic assistance for the Developing world has become a chimera. Under the circumstances, by developing Green Technological options; evolving clear strategies for systematic reduction in the reliance on Fossil fuels, and laying greater emphasis and investments in Renewable Energy Options, over time, for our Environmentally benign Economic Development, India has emerged as the shining example and Global Leader for the Developing World, in their march towards achieving the goals of the Paris Agreement. This has informed, guided, and steered further development of the National and State Climate Action Plans, in a very significant way.

Taking note of all these developments, the Ministry of Environment, Forest & Climate Change (MoEF&CC) formulated and circulated a common framework for revision of SAPCC in 2019, clearly outlining 10 principles. The revised SAPCC required, envisaging inclusive and climate-resilient low-carbon development, through a clear plan backed by the latest knowledge, science, models, finance, and institutional mechanisms.

KSAPCC, 2021: The revision exercise, necessitated by the reasons stated above, was used as an opportunity for evaluation and quantification of the benefits of adaptation and mitigation strategies planned and implemented under KSAPCC, 2015. Spread over 9 chapters, the first 7 chapters traversing through different sectors, unveil Action Points for mitigation, adaptation, and capacity enhancement in the concerned, in the attainment of the goals. While the 9th chapter is devoted to Monitoring Actions, Chapter 8 contains details of the Structural Frame for overseeing Actions under the Plan. The following is a brief account of the existing frame and its weaknesses, followed by a new Frame, as proposed for monitoring actions that will not suffer the said shortcomings and conform to the Guiding Principles, in that regard, laid down by the Central Govt. References are made to the sectors of Agriculture and Water, at appropriate places, for focus and by way of illustration.

4.2 Existing Frame

Climate Action requires a robust mechanism that combines the synergies of all the sectors of governance. As one of the Principles governing State Action Plans, under NAPCCC, in the revised form, postulates that the institutional mechanism should, ensure stakeholder engagement, ensure inclusiveness along with mechanisms for capacity building, monitoring, and evaluation, with clear indicators for reporting. The existing system does not accommodate this as it suffers from several shortcomings. A clear focus on the Goals and the strategies to reach them is missing. Each sector operates in silos. Leave alone coordinated functioning, there is little acknowledgment or recognition of activities in other sectors. Integration is a must to bring forth collective climate action. There is a need for greater clarity of vision for further deepening the de-centralised governance system. Districts and cities are still largely neglected areas for climate action. Capacity building needs a greater focus. Building institutions and structures are crucial components of capacity building.

Water and Agriculture Governance and Monitoring Frames are, for instance, nothing short of organised Chaos. The water sector alone, dealing with issues concerning, upkeep, maintenance, conservation, augmentation, deluge, re-charge, re-use, etc., has over two dozen departments, Para-Statals, and line agencies managing the resource. Local Self Govt. institutions, too, have a role in its management. They all have oversight over a host of activities that include, irrigating farmlands, drinking water supply, groundwater, conserving and securing tanks, lakes, etc. The system does not operate in a coordinated way, and suffers from, a high degree of compartmentalization, in organisation and functioning, overlapping and conflicting jurisdictions, and a lack of transparency and accountability. It is a mosaic and a confusing kaleidoscope of management and its monitoring, of something that is fast depleting!

Like Water, Agriculture is another sector that requires greater focus and better management. Host of authorities dealing with agriculture, horticulture, silviculture, Pisciculture, Animal Husbandry, etc., cut across a host of sectors, operating in silos and contributing to the mess of bad governance.

These two Sectors are, indeed, representative of all the sectors of human activity. They all share such common weaknesses that make it next to impossible the realisation of the objectives of SAPCC. The problems can be clustered under a few heads and summed up, as below:

(a) **Coordination Deficit:** The Sectors in charge of the Missions are operating in silos. This is a real bane of governance. The absence of coordination, in the working, both within each unit in a Sector and among different

sectors has often resulted in repetitions, overlaps, and even conflicts. There is thus the need for creating an enabling environment for bringing in harmony, unity of purpose, exchange of information, and cooperation, besides integration in functioning among all the players.

(b) Information Gap: Authentic, reliable, usable, updated information, about possible adverse impacts of climate change and the measures taken/contemplated, for mitigation, adaptation, etc., either absent or available in bits and pieces in an unorganised manner, to be of some utility and value. The need remains for evolving a mechanism and facility for the generation, collection, collation, consolidation, and dissemination of the required information and its integration into the existing system of governance.

(c) Inability to Develop Resilience and Enhance Competence and Capacity: As stated elsewhere, there is a conspicuous absence of a clearly focused and professionally equipped arrangement that can address, ameliorate and effectively respond to the cataclysmic impacts of climate change. This is in addition to absence of the either the focus or the wherewithal in the existing system to prepare and enhance the capacity of communities of people, who get directly affected by the phenomenon. There is an imperative need for the internalisation of this important component of Climate Action and as an aspect of the lives of communities of people, especially the most vulnerable ones among them, to the adverse impact of Climate Change, within the existing system. Further, tying up with Academic and Research Institutions and collaborating with them to build and enhance the capacity of both Communities and institutions of enforcement, have hardly been integrated into such endeavours.

(d) Absence of Policy Oversight and an Institutional Arrangement: Nothing exists at the institutional level to provide the overarch of guidance in the working or monitoring performance, besides lending a helping hand, in every conceivable way, to support, strengthen, and ensure the sectoral units reach the targets set for them. The need exists for having a Steering Body, at the apex level, to guide, aid, enable, enhance capacity, monitor performance, and effect corrections, to put governance on its rails to conform to the mandates.

(e) Bureaucratic Flab and Drain on Resources: Every new initiative, as a rule, has resulted in the creation of a new bureaucracy. This has added to the flab in the existing administration, resulting in a lot of wastage in creating infrastructure, a large number of personnel, allocation of huge amounts of money to meet the demands of salaries, allowances, and costs of administration and time creating a huge dent in meager resources of the State. Such exercises, on balance, have resulted in disproportionate investments, costing more than securing benefits, as the Controller Auditor General (CAG) has, time and again, reported and recommended exploring alternatives. Yet another Principle in the National Plan lays emphasis on the economy with efficiency when it insists that the resources required for implementation should be leveraged from the existing budget of the State govt. and that there should be a convergence of all the relevant schemes and Programmes. This is a glaring omission, in every sector.

4.3 New Frame: Its Design, Content, Structure and Functions

Two other specific aspects, in addition to alignment with the Principles and addressing the gaps in the existing frame, require attention and accommodation in the Frame. They are:

1. 'Institutional mechanism' or 'Institutional arrangement' for monitoring the implementation of SAPCC should necessarily be government-centric and be driven by Government functionaries. However, the nature and magnitude of the problems arising due to changing climate encompass every aspect of human life and its endeavours. Hence, it should be Government-centric, adaptation, and mitigation actions that internalise every conceivable human intervention impacting the environment, gathering mass and momentum, over time, to become a mass movement, in which every segment of society and each individual participates with full commitment, preparation, and preparedness.

2. Internalising Popular Participation, both as collaborators and responsible owners of the enterprise, is a must, in this frame. Their involvement with a full understanding of the issues involved will remove many misunderstandings and misgivings, leading to cooperation and support, at various levels of Society and Government.

Blue-Print of the frame for Evolving & Monitoring Actions

It is a FUNCTION-DRIVEN Model. The inspiration comes from the one evolved by Prof. Daniel Esty, (- the principal architect of the Bi-annual Global Environment Performance Index-EPI, which rates the Environment Performance of Nations) The advantage of such an arrangement, over the Institutional Model is that it relieves the system from investing a lot of time, resources and energy in the creation of infrastructure and the paraphernalia to go with it. Instead, it would be focussed on the tasks and identification of existing institutions to carry them into effect. This is quite a unique strategy, that brings into play, scientific accuracy, transparency, and greater accountability. It is inclusive and a recipe for the realization of the goals of the Action Plan!

It is a three-tier mechanism, with the following features:

(i) It is a unique ensemble of top two tiers performing the function of a commander, facilitator, enabler, overseer, coordinator, educator, capacity-builder, and research support, and the third tier is spread over the departments, sections, and functionaries of the State, across sectors, working closely with people, performing the function of implementers.

(ii) It synchronises the working of different agencies of the State, and para-statal and engages the civil society groups in achieving the goal of climate resilience, environmentally benign and just legal order.

(iii) It neither replaces existing structures of governance nor creates a new administrative setup, but does a little bit of tweaking, to ensure greater focus, in planning, content, and delivery, among all the concerned to the tasks.

(iv) It seeks to transform the governmental institutions into a more responsive and responsible, well-oiled machinery promoting environmentally sustainable development by ensuring stabilisation of climatic conditions, equities growth, and a society that is equipped with and resilient to cataclysmic changes in climatic conditions, and

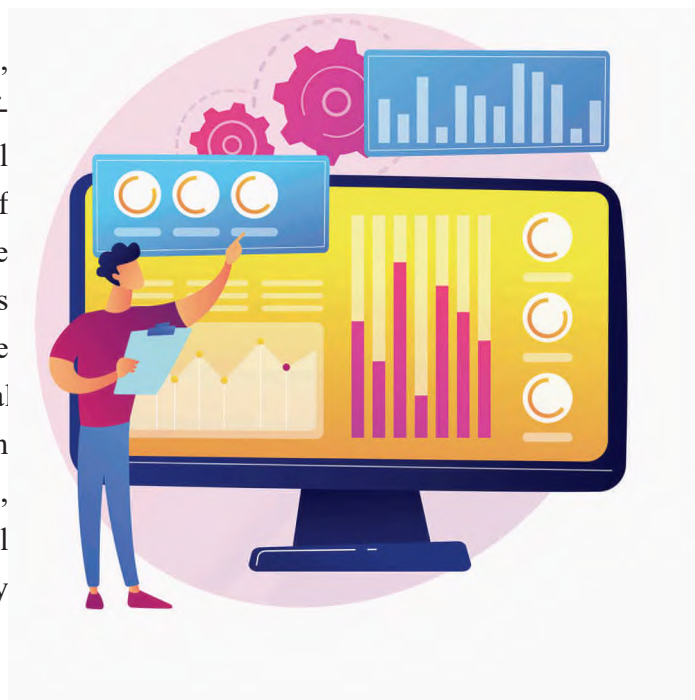
(v) It seeks to ingrain the idea of "shared commons" among the communities of people and the State and enable them to perform their assigned roles, in achieving the goal.

The following are the details of the composition, functions, roles, and responsibilities, at each level:

I. Top-Tier: Steering Committee

This is the brain trust and the primary driver of the entire Climate Action Plan. It steers and guides all the concerned institutional arrangements and activities. It sets the vision, mission, and direction for action and compliance.

1. **Composition:** A Thirteen -member body, comprising, 7 representatives from the government (-Chief-Secretary/Development Commissioner and Additional Chief Secretary, as the Chairman; 6 Additional Chief Secretaries, - instead of Principal Secretaries, the composition should have, Addl. Chief Secretaries (ACS) -and wherever ACS post does not exist, it can be Principal Secretaries); five expert and other non-official members (- drawn from among the following: those with expertise in: Climatology/Sustainable Technologies, etc., Ecology, Natural Resources, Environmental Sciences, Environmental Economics, Law; Civil Society Organisations and Industry) and a Member Secretary (- it may be, the Director General of EMPRI).



2. Functions:

Policy-making: frame policies and issue guidelines;

Decision-making: making budgetary allocations; making policy choices about introduction/employment/initiation/continuation of a particular course of action/strategy/plan of action/device/technology etc.

Approve Action Plans- by perusing those submitted by the concerned sectors,

Reviews, revises and refines them- may commission consultants to carry out an assessment and prepare an action plan and takes a call on approvals following which the obligation of implementation rests with the concerned and compliance by those engaged in related activities

Administrative Directions & Instructions for compliance: Issues instructions and directions for implementation and Compliance

Quasi-Judicial Functions: Grievance Redressal and appellate Decision-making powers; takes decisions as to infliction of penal sanctions, civil law remedies, fixing administrative accountability and liability (for administrative lapses/over-reach/poor implementation, etc., or non-compliance/evasion by those respondents having such an obligation).

It would also have two additional functions to perform, namely, Coordination with Govt of India and aligning Climate Change actions with Sustainable Development Goals (SDGs).

The Steering Committee shall meet, at least four times a year, to deliberate over and take decisions on all aspects listed in its functions.

II. Middle Tier: Coordination and Monitoring Bureau/Committee

The cacophony that exists in the compartmentalized functioning, with each department operating in silos, is sought to be overcome with this arrangement at the middle level so as to bring in the much-desired alignment and coordination in the working of different agencies of the State.

1. **Composition:** A 17 Member Body -9 nos. drawn from government, with the senior-most Principal Secretary as its Chairman and eight Principal Secretaries from among, Revenue Administration; Urban Development, Rural Development, and Panchayat Raj; Water Resources; Agriculture (- including Horticulture and Animal Husbandry, Environment and Forests (- including Wildlife, Biodiversity); Industry, Science, Technology (-including Information Technology) and Energy; 3 nos. from Autonomous institutions (- from among, the Transport Commissioner, Chairman Pollution Control Board, Chairman, Biodiversity Board, Urban Development Authority, Rural Development Authority, Urban Water Supply Authority, etc.,; one Planning and Development Expert; an expert from among the following fields of Environment, Ecology, Sustainable Development, Environment-friendly Industrial Applications/Service Sector; one from Civil Society Organisations, a Management Guru and the Director of EMPRI-as the Member Secretary).

2. **Functions:** This, indeed, is the Executive Body that gives oversight, guidance, and assistance, besides monitoring compliance. The following are its primary functions:

- (a) Coordination: irons out points of conflict, overlaps and handles jurisdictional questions;
- (b) Facilitates cooperation and collaboration: among different agencies of State to ensure Climate Change mitigation, adaptation, and resilience, in each of the Sectors of governance
- (c) Promotes civil society and communitarian participation and partnership with the concerned departments and administrative units
- (d) Capacity- enhancement- in the understanding and skills of application of proposed and strategic plans of activities and implementation by organising and conducting Training Programmes, at periodic intervals and by providing the much-needed technical assistance and support
- (e) Monitoring: provides the oversight and carries out functions of vigilance over the execution, implementation, and working of the Plans and programmes of action, by the concerned departments and compliance by those who have the obligation of conforming to the regulations and periodic reporting about the progress made by them
- (f) Receives complaints and attempts to resolve potential conflicts by adopting alternate dispute resolution mechanisms; this is the first level of addressing grievances, resolving conflicts, and evolving consensus;
- (g) Enables the concerned departments and agencies to be equipped with the information base, its retrieval, use, and application;
- (h) Carries out networking activity with research institutions, service providers, experts, and consultants and acts as a conduit between the State agencies and the above-mentioned ones;

(i) Receives action plans for different sectors, from the working groups, constituted for the purpose by it, peruses the same, and submits it, with its notes and comments, to the Steering Committee for taking appropriate decisions.

In carrying out these many humongous tasks by this Body, Three Working Groups are envisaged- (a) Working Group A (- Adaptation) - Functions: Development of programmes for adaptation; Development of policies for promoting adaptation programs; Approval of projects for adaptation; Organizing monitoring of adaptation actions, etc. (b) Working GroupM (- Mitigation). Functions: Development of programmes for mitigation of climate change; Development of policies for promoting mitigation programs or practices; Approval of projects for mitigation; Organizing monitoring of mitigation actions, etc. and (c) Working Group T & E (Training & Extension) – These working Groups would carry out their activities under the aegis of EMPRI, with secretarial and logistic assistance by it and one of its officers to act as the Member Secretary of each of the Working Groups. Their composition, on behalf of the Coordination and Monitoring Committee, would be determined by EMPRI. These officers from EMPRI may brief the working groups about the thought process and understanding that has gone into making SAPCC so that the working groups do not deviate from the central theme of SAPCC.

The three working groups would require a lot of institutional support in ‘Advance forecast and early warning of extreme events’ and its communication to departments and farmers. A lot of research at the global level is going on in this regard. In addition, new research input is coming on mitigation and adaptation strategies. In order to take advantage of all such research and also to strengthen and upgrade their research capabilities, every leading research institution in the state viz. the agricultural universities, Indian Institute of Science, Engineering and Medical universities, etc., should be encouraged to establish a multi-disciplinary cell in their Institution. These cells should identify and collate the emerging information at the global level and tailor it to Indian and State requirements. They should also initiate research to fill the gaps and take up demand-driven research besides encouraging fundamental research according to their wisdom. The outcome of their efforts should feed on the activities of the Working Groups.

III.Third Tier: Sectoral Units

This is the Unit that ensures the implementation of the approved Action-Plans, by the related Sectors. A Cell that functions directly under the Head of the Organisation is constituted in each of the concerned dept./ ministry/ entity (- like, Revenue Administration; Urban Development, Rural Development and Panchayat Raj; Water Resources; Agriculture (- including Horticulture and Animal Husbandry, Environment and Forests (- including Wildlife, Biodiversity-); Industry, Science, Technology (-including Information Technology and Energy; Transport; Pollution Control; Biodiversity; Planning and Development -), etc., that would constantly ensure policy-decisions are carried into effect and periodically report to the Coordination Bureau about the status of implementation and compliance.

This is the Unit within the Sector that would collect from each section, their proposed Plans of Action, consolidate them and submit, as the proposed Action-Plan of the concerned sector, to the Steering Body for its consideration. It shall act as the repository of everything concerning Climate Policy and action and make the same available to the higher level of governance, whenever required.

While this is an in-house mechanism to address Climate-related issues in every sectoral unit, its composition shall primarily have a small team drawn from among the personnel, working directly under the Head of the Unit/ Sector. It shall also have the provision for co-option of a Civil Society/Community Representative, as one of the members of the Cell.

The third tier should be at the department level. Every department should have a Climate Change Cell which is headed by the Head of Department himself or a Senior Officer of the department nominated by the head of Department. Besides collecting data and preparation of action plans for their respective departments, they should also analyse the extent to which their various regular activities and programmes affect the climate change issues directly or indirectly. They may also keep on finding ways and means to reduce any short or long-term adverse impact of their programme on climate. If the adverse impacts cannot be mitigated within their departmental programme itself, they may have to find other means to offset the same.

The Formulation of the annual action plan for Climate change should begin one year in advance and the whole year should be devoted to the collection of data, processing the same, and arriving at programmes. The departments should also look for agencies for implementation and fixing a system for monitoring, evaluation, and mid-term course correction during the implementation of the programme. The programmes which are likely to run for more than a year should also be properly reviewed and milestones for the year should be fixed.

District level implementation:

Many or rather most of the programmes are implemented at the district level. Hence, a proper arrangement in every department in the district with a coordination committee at the district level needs to be put in place. It may have the following features:

- (i) The Head of the Department and departmental climate change cell, in consultation with their District Level officer should arrive at the annual programme for the district. They should also fix quarterly milestones and subject the same to a review at appropriate intervals.
- (ii) The annual programme with quarterly milestones for each department, should also be communicated to the Deputy Commissioner of each district who should discuss the matter as one of the subjects in the District Coordination Committee meetings and resolve any issue which requires inter-departmental coordination or needs support from the district administration. The cross-sectoral programmes may also be discussed in this meeting and necessary instructions can be issued to the District Level Officers and their subordinates.
- (iii) Every year a workshop should be organized, at the beginning of the year, inviting representatives of people, at various levels and are briefed about the climate change issues and proposed measures to combat them. Their views should also be heard and incorporated to the extent feasible.
- (iv) The involvement of the Panchayats is very much necessary for the implementation of certain measures like optimum use of fertilizers, prevention of unnecessary burning of organic matter, excessive use of irrigation, prevention of open-air defecation, etc. Therefore, a massive training cum sensitization program need to be undertaken for each village panchayat regarding the long and short-term consequences of the possible changes in climatic condition and how communities can gear up to take the challenge. The third Tier of Governance would have the responsibility to coordinate with the District Administration, over all these aspects.

Institutional Arrangements for Research, Education, and Training: Since, the entire Action Plan and its implementation, is essentially based on Science, Technology, and evidence of climate change impacts on different aspects of natural resources and activities in relation to them and would raise questions concerning rights, entitlements, equity, and management requiring a lot of academic and research inputs, there is a need for collaboration with Academic and Research Institutions, in different sectors of Climate Action. EMPRI should be entrusted with the responsibility of forging Partnerships, in all the required aspects, with identified Academic and Research Institutions of renown, in strengthening the Research and Capacity-enhancement base.

4.4 Monitoring Mechanism for KSAPCC

Monitoring visualized here is a dynamic concept. It involves, checking and vigilance over actions at every level and within each level, impacts of working of each unit, cumulative impacts; verification of the same with those of actions already taken, and the approximation of current actions to the goals set to be realised within a given point of time span; reporting about actions taken following monitoring (- about commissions and omissions by the State functionaries; compliances and non-compliances by the ones under an obligation to conform to the norm set) by the Monitoring Entity. Finally, decision-making is expected to be informed by and logically based on reports of monitoring bodies and reports that are obtained from other sources, by the top tier of governance. Individual and communitarian involvement both at the Policy and Decision-Making Level and Monitoring Level, through their representatives, is put in place, here. Provision is also made, in this structure, for the space and its expansion for actual physical Communitarian engagement, at the third tier of governance and in each sector- both as monitors (- reporting, vigilance, etc.,) and actual players, to either lend a hand to the establishment or carry out exercises, by themselves, with State agency support, especially, when their time-tested traditions are given scope to come into play.

It is a typical belief, nurtured in the traditions of the colonial system, that new ideas and initiatives require new institutions of enforcement. This is an approach that breaks that myth by blending into the existing system, the new ideas, as the guiding stars for governance. This is about instilling, in each of the existing functionaries, a sense of duty and responsibility in carrying out their assigned roles and functions, the requirement of paying focused attention to their actions to realise the goals of Climate Justice. As such, it is to be viewed not as introducing a host of activities, requiring recruitment of new “karmacharis” and their supervisors. It should be considered as no more than a mere natural extension of their functions, to enable them to actualise the desired results.

“Monitoring”, in a sense, is an exercise in, (i) removing impermeability and opaqueness, in the approach, attitude, and work, of the functionaries, obsessed with the issue of “jurisdictional limits”, that had hindered coordination and cooperation- the frame is to enable them, in the system, both horizontally and vertically, to share information and points of action, for better performance and (ii) requiring, at each level and layer of governance, preparation of a checklist,- of their activities, do’s and don’ts, with regard to them- and carry into effect those that lead to the desired results, while subjecting them to constant scrutiny of self-appraisal and oversight of the superior functionaries.

It is a dynamic process that keeps improving and improvising upon the previous effort, incrementally, through self-observation and appraisal, reporting. Decision-making, actioning, reviewing and reforming, host of activities. Within the system, it is an internal exercise of a Performance audit that borrows a leaf from the work of the Comptroller and Auditor General and owns it up as an internally regularised activity.

The advantage of such an endeavour is that instead of “creating new structures”, it may examine alternatives, economise, pruning the administration, cut off overlaps in functions, and reduce and even eliminate unnecessary costs and expenditures. Added to this, widen the scope for communitarian engagement, not just in joining hands with administration, but even carrying things out by themselves, with the State functionaries facilitating the same.

Take for instance, the issue of desiltation of Water Tanks and Water Bodies (- an issue that cuts across the sectors of Agriculture and Water Resource Management:- A quick review of the plans, programmes, and measures reveals, huge sums of money spent on, “desilting operations”, in water bodies. Official records and CAG Reports reveal how huge sums of money were spent and several personnel engaged in carrying out the works, with several institutions- panchayats, autonomous bodies, etc., chipping in that were either repetition, overlaps in, or continuing something that was already in place as part of the regular functions of the erstwhile functionaries, with minimum positive results. Contrast this with something that was part of the tradition, in most of the villages in Karnataka, “Kere Habba” (- Festival of the Lake). Post-harvests, the farming community, would engage in ” shramadan” (-voluntary service), leading to a host of benefits, that would satisfy, perhaps, every aspect of the objectives of the Climate Action Plan!- the desilting of water tanks, restoration of the capacity of the water body and water augmentation in it, besides, fertilizing the farms- at no expense to the State! The community had a sense of “ownership” of the Common Property. By mainstreaming, the traditional wisdom and practice, as the alternative, following the informed decision-making, based on the findings of the dynamic monitoring exercise, the State, would have the satisfaction of performing its function as a Public Trustee, as well!!

As can be discerned, there is no new establishment created in this visualisation of the Frame for Monitoring. It is essentially a structureless structure that taps the talent, expertise, skills, and experiences available within and outside the govt. and galvanises and guides each one into action, in a focused way. This is analogous to putting in place a system for action, like preparing and equipping the Consumer to action, through the clarion call given under the rubric, MISSION FOR “LiFE”- Life Style for Environment, in the latest Conference of Parties to the Climate Change Convention. The latter is a call for change in the “mindset” from the market-driven consumer preferences, while what is being evolved here, is an attempt to change the mindset from, a “fund-driven”, “ institutions creating” approach, to focus and translate every action and decision to realising the goals of UNFCCC and the Sustainable Development Goals, through the function-driven approach.

The hope and expectation is to think and act differently from the colonial approach to institutional arrangements and its perpetuation. It is a lesson learned that its continuation has made it impossible to realise the goals of UNFCCC, at any level, in the foreseeable future. It is an expectation that this model presents a bottom-up approach, recognises and internalises time-honored homespun wisdom, is task-centric, inclusive, and inexpensive, and leaves no one behind!

Chapter 5

Proposed Monitoring Framework for the effective implementation of KSAPCC – Water and Agriculture sectors

- Ms. Rejini Simpson¹, Ms. Kavya R²



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5. Proposed Monitoring Framework for the effective implementation of KSAPCC – Water and Agriculture Sectors

Climate financing in Karnataka is currently fragmented, relying on various central and state-level schemes and programs. There is no predetermined or guaranteed percentage of funding allocated or reserved in the state budget for mitigation and adaptation initiatives. Monitoring the outlay is an important critical aspect of ensuring that an organization or government department adheres to its financial, operational, and capital plans as outlined in the budgeting process.

Administrative, environmental, and climate-related challenges are encountered while implementing the KSAPCC at the district level. Schemes such as ATMA, MGNREGA, and Jal Jeevan Mission have demonstrated a high level of success due to several confounding factors including Monitoring. A primary study revealed that an effective monitoring framework has been the key to all successfully implemented schemes/programs. Contrary to this, a few schemes have demonstrated low success owing to the lack of a monitoring framework in place. The Water and Agriculture sectors are, indeed, representative of all the sectors of human activity. An effective monitoring framework has been the key to all successfully implemented schemes/programs. Contrary to this, a few schemes have demonstrated low success owing to the lack of a monitoring framework in place.

This Working Paper proposes developing a unified KSAPCC Monitoring Dashboard as a G2G e-governance initiative by the Government of Karnataka. The prerequisite for such an integrated information system is the inter-departmental coordination in furnishing the real-time data to visualize concurrent progress in outlay spending, outputs, and outcomes. Such a dashboard will cater to the report needs of various stakeholders. Reports can be generated for policymakers and decision-makers, implementing agencies and institutions, and line departments from state, and district to Panchayat levels for effective decision-making to improve and correct the course of a project.

KSAPCC Monitoring Dashboard

Outlay
progress

Output
progress

Outcome
progress

Citizen Feedback Loop

Customized
Reports

Interaction of civil society members, academia, and people at large with such a web-based interface will enhance transparency in the function of government, increase effectiveness in policy implementation, and generate policy debates. Monitoring should be put into practice through a multistakeholder approach. It should reflect a whole-of-society effort. There should be a space on the dashboard for receiving feedback from the people.

Establishing a monitoring cell in each of the government departments to constantly provide the data for updating the dashboard is required. For data analytics, an expert organization of the state or center can be roped in. Customized reports can be produced as per the stakeholders.

It should not just end at outlays and outputs but go beyond them. Monitoring at the outcome level is critical to knowing the impact of the project implementation on the target groups. Framing proper indicators holds the key to the successful monitoring of the outcomes. The KSAPCC is being implemented through a multitude of schemes, often in a sectoral manner, by various departments. In such a situation, outcome reporting becomes a challenge. To ease the process of the outcome reporting, the indicators to measure outcomes of the KSAPCC implementation must be aligned with the indicators of Sustainable Development Goals (SDGs). E.g., one or more schemes can be brought under one indicator of the SDGs. Such reporting will help in underlining the contribution of a subnational climate policy towards the national and international climate goals.

The above-proposed monitoring framework for two sectors (water and agriculture) can be extended to all the sectors in due course, to comprehensively monitor the progress of the KSAPCC.

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Annexures

Annexure – 1

Questionnaire

1. In your opinion, what are the most pressing climate change-related threats or issues (three points each) in water/agriculture sector that Karnataka should prioritize?
2. The State action plan on climate change in Karnataka was prepared in 2011. What specific limitations does Karnataka confront in effectively executing state-specific climate actions?
3. What policies do you consider to be the most crucial for the implementation of KSAPCC in the realms of climate change, water management, and agriculture? Alternatively, how would you assess the current level of implementation of different schemes and policies within the water and agriculture sectors?
4. What according to you are the most prominent challenges in the implementation of State climate action, especially in the context of water and agriculture?
5. Which policy or program implemented in the water/agriculture sector within the past five years has demonstrated the highest level of success?
6. What is your perspective on the importance of systematic monitoring and evaluation for successful execution of the climate change action plan within the water and agriculture sectors in Karnataka?
7. What are the essential components and prerequisites that contribute to the establishment of a comprehensive and efficient monitoring framework within the context of climate action initiatives? How does baseline assessment, stakeholder engagement, regular assessments, capacity building play an important role in the monitoring framework?
8. What approaches, steps, measures, or communication strategies could be employed to enhance the policy framework and ensure successful implementation of the Karnataka action plan?

Annexure – 2

Respondent details

Respondent	Designation	Department	District	Email address
Mr. Honnappa Gowda	Joint Director of Agriculture	Karnataka State Department of Agriculture	Uttara Kannada	jdaukkarwar@gmail.com
Mr. Nagaraj Naik	Assistant District Program Coordinator, MGNREGA	Zilla Panchayat Office	Uttara Kannada	adpc.kwr@gmail.com
Mr. Iswar Kumar Kandoo, IAS	Chief Executive Officer	Zilla Panchayat Office	Uttara Kannada	ceo_zp_kwr@nic.in
Dr. Balappanavar Anand Kumar, K.A.S	Executive Officer	Taluk Panchayat Office	Uttara Kannada	eotpkwr@gmail.com
Mr. Prakash, K.A.S	Executive Engineer	Rural Drinking Water and Sanitation Division	Uttara Kannada	prakashrm37@gmail.com
Mr. Venkatesh	Assistant Engineer	Rural Drinking Water and Sanitation Division	Raichur	eerdwsd.rcr@gmail.com
Mr. Prakash V, KGS (S.S)	Project Director	Zilla Panchayat Office	Raichur	pddrdaraichur@gmail.com
Ms. Sudha A Madalageri	Assistant Director of Agriculture	Karnataka State Department of Agriculture	Raichur	jdaraichur@rediffmail.com

Annexure – 3

Glimpses from the Survey



Mr. Honnappa Gowda, Joint Director of Agriculture, emphasized the need to incorporate climate-smart agricultural methods in Uttara Kannada, Karnataka, to address climate change effects on crop yields and promote sustainable farming practices.



Mr. Iswar Kumar Kandoo, IAS, the Chief Executive Officer of the Zilla Panchayat Office discussed about climate-adaptive farming and water management strategies and stressed upon the urgent requirement for sustainable approaches to address climate-related challenges in Uttara Kannada, Karnataka.



Mr. Prakash V, KGS (S.S), Project Director at the Zilla Panchayat Office emphasized the urgency of addressing climate challenges by taking proactive climate action and exploring sustainable solutions in Raichur, Karnataka.



