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SAMBODHI

Developing M&E Framework for SAPCCs

Standard Operating Procedure

Preface

In the face of mounting global challenges, climate change stands as one of the most critical and immediate threats to sustainable development. Recognizing the urgency, the global community through the 2030 Agenda for Sustainable Development and the Paris Agreement has underscored the necessity of coordinated climate action, balancing development goals with climate resilience and environmental stewardship. In this context, nations have committed to reducing greenhouse gas emissions and bolstering adaptation measures, particularly in countries most vulnerable to climate-induced disasters and ecological shifts.

India, with its unique environmental and socio-economic vulnerabilities, has responded proactively by establishing the National Action Plan on Climate Change (NAPCC) and guiding states to formulate their respective SAPCCs. These state-level frameworks allow for climate action tailored to each region's unique landscape, vulnerabilities, and priorities. The Government of Uttar Pradesh (GoUP), with technical assistance from GIZ, has revised its SAPCC to integrate emerging climate priorities and align with international commitments, creating a comprehensive framework for climate adaptation and mitigation until 2030.

A robust Monitoring and Evaluation (M&E) framework is essential for tracking the progress of SAPCC interventions, ensuring accountability, and fostering adaptive management based on evidence-based insights. Despite significant advances in climate planning and strategy development, comprehensive M&E systems remain limited across India. Recognizing this gap, the GoUP has embarked on a pioneering effort to develop a targeted M&E framework under the CAFRI project. This document, prepared as a Standard Operating Procedure (SOP), provides a step-by-step guide to establishing an M&E framework for SAPCCs, using UP's SAPCC as a model that can be adapted by other states.

The SOP encapsulates guiding principles, methodological steps, and practical tools required to track the implementation of climate actions effectively. It offers insights into the criteria and processes for shortlisting indicators, ensuring that chosen metrics are meaningful, contextually relevant, and aligned with strategic climate goals. The M&E framework developed here is rooted in a multi-stakeholder, evidence-driven approach that leverages existing data systems and fosters partnerships across government departments to create an integrative and resilient structure for climate adaptation and mitigation. This M& E Framework is applicable for all the sectors and Missions. The designed framework is very dynamic in nature and crafted in a way to accommodate the required timely modulation for the specific sector, can be at state or at national level.

Foreword

The impacts of climate change are accelerating, profoundly affecting ecosystems, economies, and communities worldwide. For a country like India, where diverse regions face distinct climate challenges—from extreme heat waves and floods to prolonged droughts—there is an urgent need for robust climate adaptation and mitigation strategies at both national and regional levels. The State Action Plans on Climate Change (SAPCC) are instrumental in guiding state governments to address specific vulnerabilities while aligning with national and international climate commitments.

This Standard Operating Procedure (SOP) document has been developed as part of the collaborative efforts between the Government of Uttar Pradesh (GoUP) and GIZ under the Climate Adaptation, Resilience and Climate Finance in Rural India (CAFRI II) project. Recognizing the importance of systematically tracking climate interventions, the GoUP has taken a pioneer step in developing a structured Monitoring and Evaluation (M&E) framework for its SAPCC. Such a framework not only supports evidence-based climate action but also strengthens transparency, accountability, and continuous learning across implementation agencies.

The development of this SOP marks a pivotal milestone in Uttar Pradesh's climate action journey. It provides an operational guide that outlines the guiding principles, methodologies, and tools necessary for creating a comprehensive M&E system tailored to the SAPCC. By emphasizing the integration of multiple data sources, participatory approaches, and alignment with state and national priorities. This SOP has been developed organically over constant interaction and consultation with all the relevant stakeholders, and this SOP equips stakeholders with the resources needed to track progress and assess the effectiveness of climate initiatives.

We extend our deepest gratitude to all partners, stakeholders, and experts who contributed to this document. Their insights, commitment, and collaborative spirit have been invaluable in creating a framework that can be replicated across other states, thereby strengthening India's overall climate resilience.

It is our hope that this SOP will inspire and guide stakeholders in their pursuit of sustainable, climate-resilient development, advancing the vision of a secure, equitable, and sustainable future for all.

Context

The 2030 Agenda for Sustainable Development Goals (SDGs) and the Paris Agreement explicitly recognises climate change as one of the greatest challenges of our time and expresses deep concerns about how its deleterious impacts can undermine the ability of countries to achieve inclusive growth and development. Rising global temperatures, extreme weather events, and shifting ecosystems undermine efforts to eradicate poverty, ensure food security, and promote health and well-being (SDGs 1, 2, and 3), particularly in low and middle-income countries (LMICs). The challenge is compounded by the need to balance economic development with environmental sustainability and address the inequities that climate impacts exacerbate. The 2030 Agenda calls for urgent, coordinated action to limit global warming, build climate resilience, and transition to sustainable energy (SDGs 7, 13). SDGs connect policies for climate change adaptation with a spectrum of benefits for poverty reduction, public health improvements, and economic stability, and they call out the need for interventions focusing on these priorities, especially in LMICs that are particularly vulnerable to climate change impacts.[1]

India is the fifth most vulnerable out of 181 countries to the effects of climate change (Eckstein et al 2019)[2]. A report highlighted that 27 of the country's 36 States and UTs are extremely vulnerable to extreme hydro-meteorological disasters (such as heatwaves, droughts, floods, and cyclones) and their compounded impacts. Seven of the world's ten cities most exposed to environmental risks, including climate change, are in India[3]. The IPCC's sixth AR6 portends a bleak future for India – increased dry spells, intensification of extreme rainfall events by more than 20% and an exponential surge in heatwaves and cyclonic events. These events will have deleterious effects on natural and human systems, and poor, vulnerable communities with low adaptive capacities will be disproportionately impacted. Moreover, India's economic losses due to climate change are substantial and escalating.

India is making significant strides in transitioning to renewable energy as part of its commitment to meet the Nationally Determined Contributions (NDC) under the Paris Agreement. As of 2023, India has achieved nearly

1 Bennich, T et al (2020). "Deciphering the scientific literature on SDG interactions: a review and reading guide". Science of the Total Environment Vol 728, 138405.

2 Eckstein, D et al (2019). Global Climate Risk Index 2020. Germanwatch. Available at (https://germanwatch.org/sites/germanwatch.org/files/20-2-01e%20Global%20Climate%20Risk%20Index%202020_10.pdf)

3 Environmental Risk Outlook (2021). Verisk Maplecroft. Available at (https://www.sipotra.it/wp-content/uploads/2021/07/Environmental-Risk-Outlook-2021.pdf)

173 GW of installed renewable energy capacity, which includes solar, wind, biomass, and small hydro power[4]. Solar energy, in particular, has seen remarkable growth, with the installed capacity reaching approximately 70 GW, up from just 2.6 GW in 2014. This progress aligns with India's target of achieving 450 GW of renewable energy capacity by 2030. Additionally, India has pledged to reduce the emissions intensity of its GDP by 33-35% by 2030 from 2005 levels. India is also focusing on green hydrogen and electric mobility to further accelerate the transition, aiming to generate 5 million tons of green hydrogen annually by 2030. These efforts are crucial for India to not only meet its NDC targets but also to lead the global shift towards sustainable energy.

India, a signatory of the Paris Agreement, launched its National Action Plan on Climate Change (NAPCC) in 2008. In 2009, the central government instructed states and Union Territories to create State Action Plans on Climate Change (SAPCC) to address local vulnerabilities and priorities while aligning with the NAPCC. The SAPCCs reflect a decentralized approach to addressing climate change by tailoring strategies to each state's unique environmental, economic and social conditions. They aim to address state-specific climate challenges and opportunities, enhance resilience to climate impacts, and promote sustainable development. Most states have prepared their SAPCCs aligning with the National Action Plan on Climate Change (NAPCC). The Ministry of Environment, Forest, and Climate Change (MoEFCC) recommended revising SAPCCs in 2018 to address new international commitments like the Paris Agreement and state priorities. Till date, 33 states and UTs have prepared their SAPCC.

The Government of Uttar Pradesh (GoUP), with support from GIZ under the Climate Adaptation, Resilience and Climate Finance in Rural India (CAFRI II) project, has revised its SAPCC in 2020.

A critical piece of the successful implementation of any SAPCC is a Monitoring and Evaluation (M&E) framework that will track the activities required to meet the various intended targets.
Although there are many climate change adaptation interventions to address the current and projected impacts across the globe, yet evidence on their effectiveness remains limited, highlighting the need for appropriate ecological indicators to measure progress of climate change adaptation for the natural environment. Some countries have prepared their own Monitoring and Evaluation (M&E) Framework like the Tracking Adaptation and Measuring Development (TAMD) framework in Cambodia, UNDP's framework for the Least Developed Countries (LDCs), National level M&E framework in Nepal and Climate change adaptation monitoring and assessment tool (AMAT) to name a few. In India too, we currently do not have any M&E framework for tracking our SAPCC targets. However, the GoUP understood the urgency of the situation and has developed a M&E system under the CAFRI project.

This Standard Operating Procedure (SOP) document will envisage the step-by-step understanding of the creation of the M&E framework for the UP SAPCC. It will reflect on the guiding principles, certain assumptions and the detailed steps that have been followed during the preparation of the M&E framework. This document will act as a primer to help any practitioner create a M&E framework for SAPCC. We use the UP SAPCC as an example in this document, but it can be replicated for other states as well.

The developed M&E Framework has some limitations due to the approach adopted. This approach is based only on existing government schemes, and programmes. It is acknowledged that there is a lack of clarity on the timeline and continuity of identified schemes and programmes. Some schemes might end earlier, get subsumed or renamed into some other scheme. Hence, the Framework needs to be adaptive and accommodate this dynamic nature of the schemes.

4 Ministry of New and Renewable Energy (MNRE). (2023). Year-end review 2023: Renewable energy sector. Ministry of New and Renewable Energy, Government of India. Retrieved from https://mnre.gov.in/

Need for M&E

Monitoring is the routine tracking and reporting of priority information about a program / project, its inputs and intended outputs, outcomes and impacts. It helps in program management, risk management, compliance and verification and accountability and transparency.

Evaluation is the rigorous, scientifically based collection of information about program/intervention activities, characteristics, and outcomes that determine the merit or worth of the program/intervention. Evaluation studies provide credible information for use in improving programs/interventions, identifying lessons learned, and informing decisions about future resource allocation (UNAIDs & MERG, n.d.). Evaluation helps us to review our performance, make informed decisions, learn from experience and support accountability and learning.

It is very important to understand the logic of a program, what it intends to do, how it is supposed to work and the impacts of this program. A program follows a sequence of events listed in the figure below.

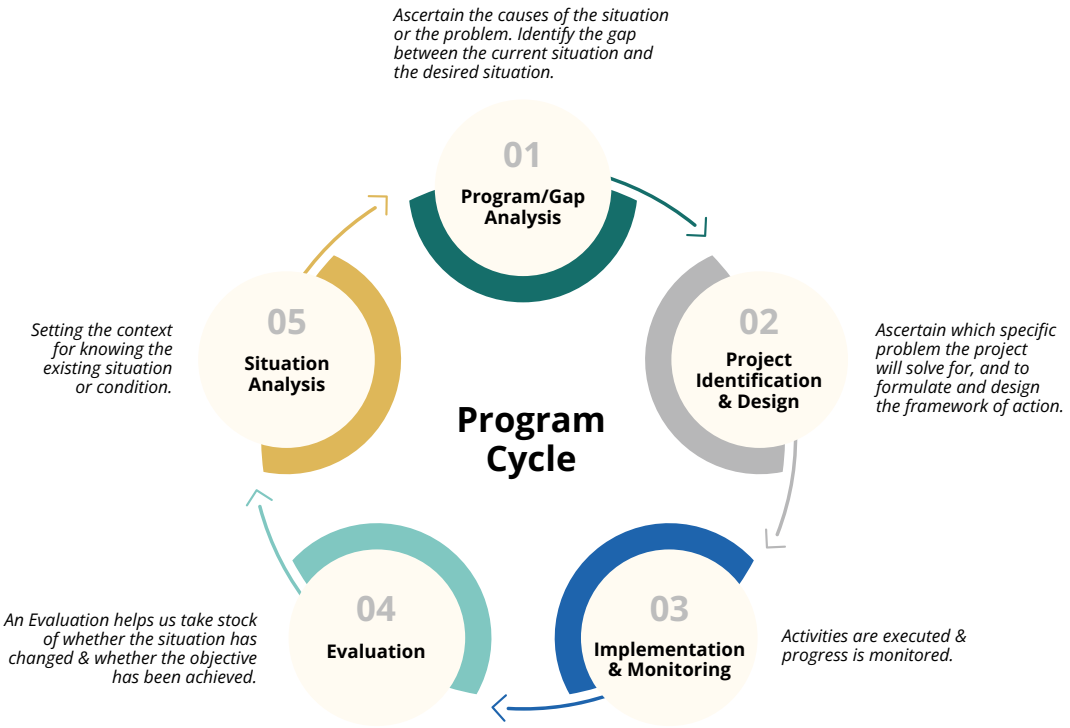
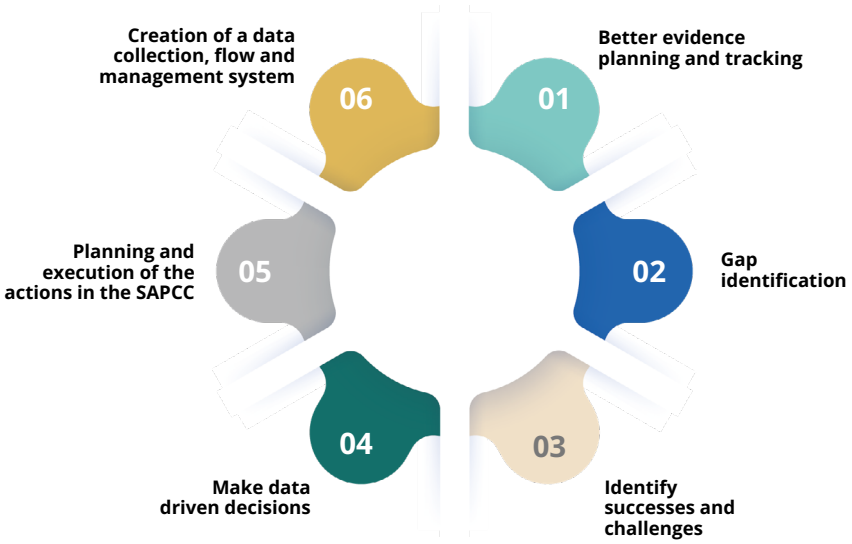


Figure 1: Components in a program cycle

Different M&E methods and tools fit into the program cycle like Needs Assessment, Outcome Evaluation, Impact Evaluation, Evaluability and Formative Assessment, Process Evaluation, Concurrent Monitoring and Embedded Evaluation to name a few. Moreover, these systems include a range of methods and tools, such as performance indicators, data collection protocols, and evaluation frameworks. It can also provide ongoing feedback on program performance, identify areas for improvement, and support evidence-based decision making.

The M&E systems play a big role in understanding the entirety of any program as it involves systematic collection and analysis of data to track the implementation and impact of policies and programs.

With regard to the need for an M&E framework for tracking the activities and targets mentioned in the state SAPCCs, a M&E system is essential to ensure that climate change action plans are effective and achieve their intended goals. UP SAPCC felt the need to develop a M&E framework to meet the following criteria.



We have used Results and Monitoring Framework (RF) as a tool to understand the different levels or chains of results expected from the different action points present in UP SAPCC. A RF shows the longer-term objectives (often referred to as “outcomes” or “impact”) and the intermediate outcomes and outputs that lead to those desired longer-term objectives and clarifies the expected time horizon to see changes in those outcomes. This helps in determining if the targets present in the UP SAPCC are on course to achieve their aims. The results specified typically comprise the longer-term objectives (often referred to as “outcomes” or “impact”) and the intermediate outcomes and outputs that precede, and lead to, those desired longer-term objectives.

According to the definitions developed by OECD DAC, outputs are referred to as the products, capital goods and services which result from a development intervention; may also include changes resulting from the intervention which are relevant to the achievement of outcomes. Outcomes are the likely or achieved short-term and medium-term effects of an intervention’s outputs. Impacts are positive and negative, primary and secondary long-term effects produced by a development intervention, directly or indirectly, intended or unintended.

Structure of UP SAPCC 2.0

The first UP SAPCC focused on developing mitigation and adaptation strategies aligned with NAPCC missions, such as Sustainable Agriculture, Solar Energy, Enhanced Energy Efficiency, Green UP, Jal, and Sustainable Urban Habitat. The revised UP SAPCC (2020) adopts a broader approach, incorporating past developments and extending policies to 2030. It introduces new missions like Disaster Management and Health, combines Solar and Energy Efficiency into the Enhanced Energy Efficiency and Green Energy Mission, and expands the Sustainable Habitat Mission to include rural areas. Each mission has specific strategies, action points, and designated actions (implementation, research, capacity building, policy) targeting adaptation or mitigation.

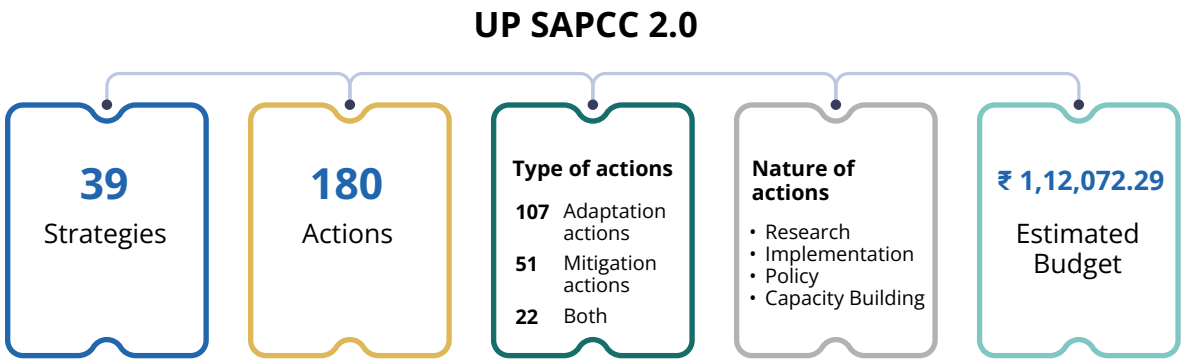


Figure 2: UP SAPCC at a glance

The structure of a typical mission (Example - Sustainable Agriculture Mission) is presented below in Table 1.

Table 1: Snapshot of a strategy under Sustainable Agriculture Mission

S. No.	Actions	Nature of Action	Type of Action	Target	Target (2021-2025)	Target (2026-2030)	Estimated Financial Requirement (in INR Cr)	Relevant Central and State Schemes	Nodal and Implementing Agency	SDG and NDC Linkages
Generate and disseminate precise weather forecasts to all farmers based on high resolution network of weather observation stations and ensure last mile delivery of agro-met services										
1.1	Establish a network of Agro-Automatic Weather Stations (AWSs) at a finer resolution of 10km x 10km grid. Integrated the ones installed by IMD under its Gramin Krishi Mausam Sewa (about 200 to be installed across India	Implementation	Adaptation	2433 AWSs across UP	Tender, procure and install all AWS	Continue maintenance	50.0 (Installation & maintenance)	Gramin Krishi Mausam Sewa	NA: Agriculture Department IA: Agriculture Universities, IMD	NDC 06 SDG 2,8,13

Each action point has an overall implementation target for 2030 and provides a break-up target for the period 2021-2025 and 2026-2030. Different states might have different SAPCC structures, but the methodology of the M&E Framework developed is robust enough to account for any structure and format.

Methodology for developing M&E Framework

Guiding principles followed towards developing a M&E Framework

The M&E Framework was developed from an extensive review of various relevant state and national documents aligning with climate change. In the case of UP, the documents were UP District Environment Management Plan (DEMP), UP SDG Vision 2030, NAPCC and NITI Aayog SDG Index .

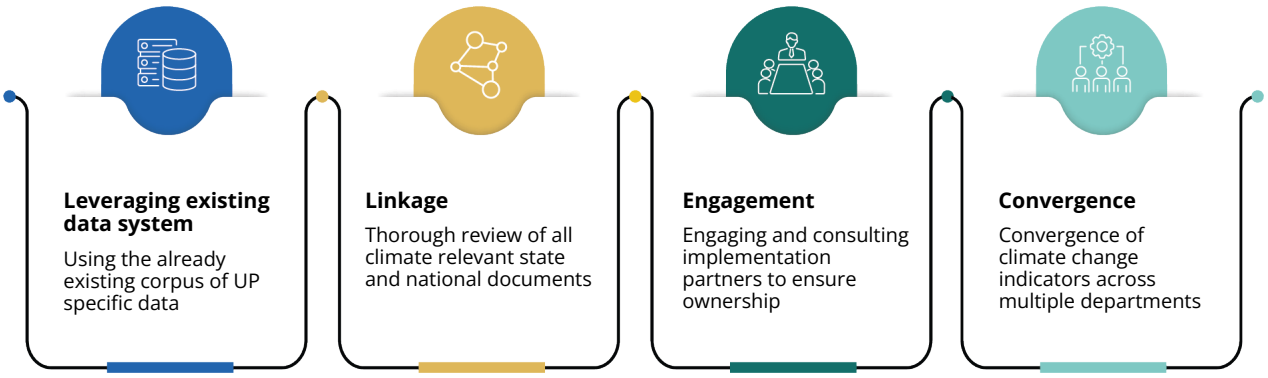


Figure 3: Guiding principles for developing the M&E framework

The methodology to develop the M&E Framework or UP SAPCC 2.0 comprised of the following four steps:

Step 01

Creating a comprehensive list of indicators

a. Review of relevant documents (UP SAPCC, UP DEMP, UP SDG Vision 2030, NITI Aayog SDG Index, MoSPI Documents)
b. Convergence of Action Points/Strategies with SAPCC Vulnerability
c. Indicators, Priority Areas in DEMP, SDG Targets, NITI Aayog SDG Indicators
d. Mapping Schemes/Programmes to Action Points/Strategies
e. Aggregation of indicators at Action Point, Strategy and Mission level (remove redundancies)

Step 02

Shortlisting of indicators

Criteria for shortlisting

a. Shortlist intermediate and outcome indicators
b. Identify indicators 'relevant to strategy'
c. Identify indicators that provide a 'holistic perspective'

Step 03

Consultation with line departments

(Multistakeholder approach in a participatory approach)

Validate the following:

a. Data availability
b. Relevance to strategy
c. Data source
d. Holistic perspective

Step 04

Reviewing and Finalising Mission level indicators

Criteria for finalizing

a. Data availability
b. Relevance to strategy
c. Mapping to more than one strategy
d. Holistic perspective

Figure 4:Methodology for developing the M&E Framework for UP SAPCC 2.0

Step 1

Creating a comprehensive list of indicators

The overall process adopted in creating a comprehensive list of indicators for the M&E Framework is presented below.

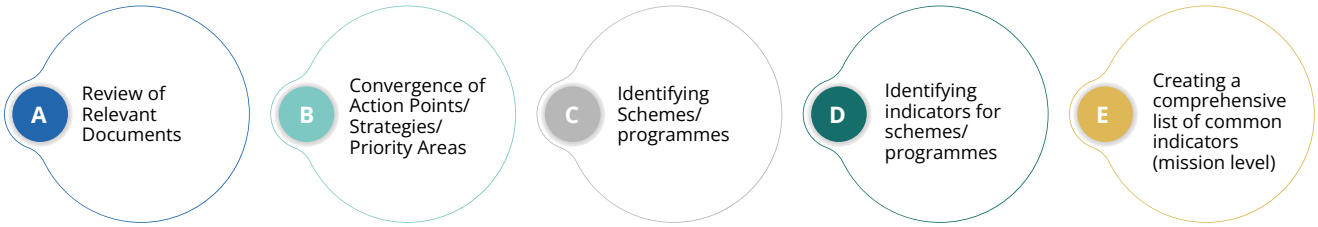


Figure 5: Process for identifying a comprehensive list of indicators for the M&E Framework

A: Review of relevant documents

All national and state level documents were extensively studied to understand the relevance, feasibility and limitations of these documents with respect to the state SAPCC. Each of the documents were mapped to UP SAPCC to glean important information/indicators.

UP DEMP	**UP SDG VISION 2030**	**NITI Aayog SDG Index**	**SDG Goals: Progress Report 2021 UP**	**Statistical yearbook 2018**

Figure 6: Documents reviewed to develop the M&E framework

01 UP DEMP

The National Green Tribunal (NGT) issued several pan-India directions relating to environment management, which are required to be executed at the district level, covering all cities, towns and villages. To implement the directions issued by the NGT, the UP-Pollution Control Board (UP PCB) developed the UP DEMP. There are different plans under the DEMP, each with several action points, timelines for fulfilling those action points and the department responsible for the action. Sambodhi mapped the relevant UP DEMP action points with the UP SAPCC action points. The structure of UP DEMP (Example - Solid Waste Management Plan) is presented in Table 2.

Table 2: Action points in the Pollution Control and Resource Management Plan (on Solid Waste Management) of the UP DEMP

1.1.2 Action Plan for Solid Waste Management			
S. No.	Action Points	Timelines	Department/Agencies
1	Door-to-door collection of municipal solid waste as per MSW Rules-2016. Segregation at the source of solid waste Regular pest control system	Regular activity	Nagar Nigam/ Development Authorities
2	Collection, Segregation, Transport and Disposal of Solid Waste in city	Regular activity	Nagar Nigam/ Development Authorities

02 UP SDG Vision 2030

The UP SDG Vision 2030 contains specific targets for each SDG and corresponding strategies and action plan/ activities to achieve the set targets. Sambodhi mapped the relevant targets with the UP SAPCC action points. The structure of UP SDG Vision 2030 (Example - Target 6) is presented in Table.

Table 3: Sample SDG target and activity from UP SDG Vision 2030

Target 6.1: By 2030, achieve universal and equitable access to safe and affordable drinking water for all	
Suggested activities	How?
All households in GP to have 24 X 7 access to safe and adequate drinking water Ensure the availability of safe drinking water in school and Anganwadi centres	• Panchayat, together with VHSNC members, can map all the water points in the village along with access of households to each water point • Pradhan can take the lead and call Jal Nigam Jal Sansthan, assistant engineer placed at the block-level, to conduct water quality testing of all the drinking water sources in the village. Panchayat can mark the safe sources so that people can use safe water for drinking and quality affected water for other purposes • Organise campaigns or create awareness during panchayat meetings regarding the safety of water sources, procure IEC materials from block office and display it in prominent places of the panchayat, school, PDS shop etc. • If the village has piped water supply, panchayat, ward-wise, can mobilise the community members to get a connection and ensure that it reaches each and every household irrespective of their social status, caste or religion • Ward wise, members can take up the responsibility of ensuring timely collection of water user charges so that everybody can have uninterrupted water supply • Organise cleanliness drives in the panchayat, together with all the members/water users to make the vicinity of water sources clean • If any new scheme comes to the village, the panchayat can prepare a priority list of the area which needs to be served first (based on the situational analysis). School and Anganwadi centres should always be the first priority • Keep the contact details of person in-charge of hand pump, mechanic, public in each ward and school so that people can contact as per their requirement

03 NITI Aayog SDG Index

The NITI Aayog SDG Index is a national-level index developed to identify indicators that best capture the essence of the SDG goals. Each SDG also contains a comprehensive list of indicators list. The relevant SDG goals that mapped with the UP SAPCC action points were identified, and then the relevant indicators from that goal that mapped with those relevant action points were considered.

S. No.	Area	Forest + Tree Cover as a percentage of total geographical area	Percentage of area covered under afforestation schemes to the total	Forest cover as a percentage of total geographical area	Tree cover as a percentage of total geographical area	Percentage of degraded land over total land	Number of cases under Wildlife Protection Act (1972)	Percentage increase in area of desertification
1	Target	33	2.74			5.46	0	0
2	India	24.56	0.51	21.67	2.89	27.77	15	1.98
3	Uttar Pradesh	9.2	0.21	6.15	3.05	11	19	-16.69

04 SDG Goals Progress Report 2021 UP

The SDGs National Indicator Framework (NIF) Progress Report (2021) highlights the progress made so far in the journey of SDGs monitoring/achievement at national level and identifies the gaps. It also reports against all the 17 SDGs. The relevant indicators that mapped with the SAPCC action points were considered. Each indicator also has the source and periodicity mentioned. A snapshot of Goal 7 is present in Figure 7.

Goal 7: Ensure access to affordable, reliable, sustainable and modern energy for all

Number of Indicators in NIF (Original)	Number of Indicators in NIF (Revised)	Values available at National level	State Value is available
5	5	5	1

SL	NATIONAL INDICATOR	VALUE OF THE INDICATOR		
			INDIA	UTTAR PRADESH
Target 7.1: By 2030, ensure universal access to affordable, reliable and modern energy services				
1	7.1.1: Percentage of households electrified *Source: Ministry of Power / Periodicity: Annual*	**Year**	**Value**	
		2019-20	99.77	98.56
		2021-22	100.00	100.00
2	7.1.2: Percentage of household using clean cooking fuel *Source: Ministry of Petroleum and Natural Gas / Periodicity: Annual*	**Year**	**Value**	
		2015-16	62.83	NA
		2016-17	74.16	NA
		2017-18	82.49	NA
		2018-19	97.95	NA
		2019-20	97.94	NA
		2020-21	98.1	NA
		2021-22	99.35	NA
Target 7.2: By 2030, increase substantially the share of renewable energy in the global energy mix				
1	7.2.1: Renewable energy share in the total installed electricity generation *Source: Ministry of New and Renewable Energy / Periodicity: Annual*	**Year**	**Value**	
		2015-16	25.50	NA
		2016-17	27.28	NA
		2017-18	29.1	NA
		2018-19	29.26	NA
		2019-20	30.77	NA
		2020-21	31.64	NA

Figure 7:SDG Goals: Progress Report 2021 Uttar Pradesh

05 Statistical Yearbook 2018

This document contains various indicators for each sector. For example – Under "Horticulture", it contains data on the following indicators:

- Export of Horticulture Produce in India
- Area and Production of Plantations – State wise

- Area and Production of Vegetables
- Area and Production of Fruits
- Area, Production and Productivity of various kinds of spices
- Area and Production of Flowers – State wise
- Area and Production of Various Horticulture Crops – State wise
- Area and Production of Various Horticulture Crops – All India
- Area and Production Estimates of Horticulture Crops – Summary

The relevant indicators that mapped with SAPCC action points were considered.

05 Statistical Yearbook 2018

This document contains various indicators for each sector. For example – Under "Horticulture", it contains data on the following indicators:

- Export of Horticulture Produce in India
- Area and Production of Plantations – State wise
- Area and Production of Vegetables
- Area and Production of Fruits
- Area, Production and Productivity of various kinds of spices
- Area and Production of Flowers – State wise
- Area and Production of Various Horticulture Crops – State wise
- Area and Production of Various Horticulture Crops – All India
- Area and Production Estimates of Horticulture Crops – Summary

The relevant indicators that mapped with SAPCC action points were considered.

B: Convergence of Action Points/Strategies/Priority Areas

Once the documents were thoroughly reviewed, convergence of these documents with the UP SAPCC was identified. In UP SAPCC, each mission has several strategies, which are further broken down into implementable action points. While mapping the UP SAPCC with the relevant documents, convergence was located at the action point level and not at the strategy level. In other words, each action plant under each mission was mapped with the information from the relevant documents.

01 Mapping with UP DEMP

Relevant DEMP action points were mapped with the UP SAPCC action points. For example, The Pollution Control and Resource Management Plan has action points for several sub-domains such as Waste Management, Water Quality Management, Air Quality Management and Other Management. These action points are mapped with the SAPCC action points. Table 5 shows an action point under the Sustainable Habitat Mission in SAPCC mapped with the action point present in Climate Change Mitigation & Adaptation Plan.

Table 5: Mapping of UP SAPCC (Sustainable Habitat Mission) with the UP DEMP

Sustainable Habitat Mission	
SAPCC Action Point	DEMP: Climate Change Mitigation & Adaptation Plan
4.1 - Management of solid waste through * Setting up of Waste processing facilities * Creating value chains for waste recycling and reuse (Waste to energy and any other) * Supporting entrepreneurs for city waste collection and reuse * Setting up of sanitary landfill * Bioremediation/capping of old landfills (legacy waste)	• Waste Management – Solid Waste Management • Development of leachate collection and treatment centre at • Municipal Solid Waste treatment facility Development of • Buffer Zones to control odour.

02 Mapping with UP SDG Vision 2030

UP SDG Vision 2030 has different targets corresponding to each SDG and each target in turn has several proposed activities/measures. Sambodhi team mapped the relevant SDG targets and corresponding activities/ measures with relevant UP SAPCC 2.0 action points across all eight missions, wherever applicable.

Table 6 provides an example from Green UP Mission to show the mapping of UP SAPCC action points with UP SDG Vision 2030 document.

Table 6: Mapping of UP SAPCC 2.0 with UP SDG Vision 2030

GREEN UP MISSION		
SAPCC Action Point	UP SDG Vision 2030 targets	UP SDG Vision 2030 activities
1.1 - Enhance quality of Open Forest cover and ecosystem services in UP. A total of 4081 sq.km area to be restored	Target 15.2: By 2020, promote the implementation of sustainable management of all types of forests, halt deforestation, restore degraded forests and substantially increase afforestation and reforestation globally	Promotion of agroforestry by targeting planting of 1 crore saplings every year across the state under the National Agriculture Mission.

03 Mapping with NITI Aayog SDG Index 2020-21

The NITI Aayog SDG Index Dashboard provides state scores and tracks the performance of each state concerning the 17 Sustainable Development Goals (SDGs). This Index also includes a detailed list of indicators for each goal. For each under the UP SAPCC, relevant NITI Aayog SDG Index indicators have been identified and mapped to the SAPCC action points where applicable. Specifically, for the Green UP Mission, seven index indicators have been aligned with the SAPCC action points.

- Percentage of area covered under afforestation schemes to the total geographical area
- Forest cover as a percentage of total geographical area
- Tree cover as a percentage of total geographical area
- Percentage of degraded land over total land area
- Number of cases under Wildlife Protection Act (1972)
- Percentage increase in area of desertification
- Percentage of LPG + PNG connections against number of households

The same mapping process has been followed for all the remaining seven missions.

04 Mapping with Vulnerability indicators of the UP SAPCC 2.0

The impact of climate change is primarily influenced by three factors: hazard, exposure, and vulnerability. Among these, governments and development agencies can mitigate climate change by focusing on reducing vulnerability. Consequently, the UP SAPCC includes a chapter titled “Climate Vulnerability Assessment,” which outlines vulnerability indicators for each of the eight missions. Across the seven SAPCC sectors, nine indices were created—one for each sector, with the habitat sector further divided into two indices: the Urban Development Vulnerability Index (UDVI) and the Rural Development Vulnerability Index (RDVI). Additionally, a composite vulnerability index was developed, incorporating one indicator from each of the seven sectors. Sambodhi has identified convergence and mapped all relevant indicators accordingly.

C: Identifying Schemes/Programmes

When compiling a comprehensive list of indicators for the M&E Framework, existing state and national level schemes and programs were thoroughly examined, as they already have established monitoring mechanisms. The process began with secondary research to identify all available schemes, programs, and dashboards

relevant to each Mission. A compendium was then created for each Mission, listing all publicly available indicators associated with those specific schemes. Next, the SAPCC action points for each Mission were mapped to the relevant schemes, programs, and dashboards. A brief description of each scheme or program was included in the mapping sheet, along with temporal and spatial details, such as the applicable time period and cities. Indicators from these schemes that aligned with the action points were added to the compendium as 'Action Point level indicators.' The numbers in brackets next to each indicator correspond to the respective scheme, program, or dashboard from which the indicator is derived.

Additionally, the 'Action Point level indicators' include indicators from relevant MoSPI reports, UP SAPCC vulnerability indicators, and NITI Aayog SDG Index indicators. The mapping process is followed for all the eight missions of the UP SAPCC. However, there are some action points which could not be mapped to any scheme.

Table 7 provides a snapshot of the mapping process.

Table 7: Snapshot of the Scheme Mapping Spreadsheet

No.	UP SAPCC Action Point	Relevant project/scheme/ dashboard	Schemes description	Action point level indicators
Strategy 1: Generate and disseminate precise weather forecasts to all farmers based on high resolution network of weather observation stations and ensure last mile delivery of agro-met services				
	Establish a network of Agro-Automatic Weather Stations (AWSs) at a finer resolution of 10kmx10km grid. Integrate the ones installed by IMD under its Gramin Krishi Mausam Sewa (about 2433 to be installed across India)	1. Gramin Krishi Mausam Sewa 2. Statistical Year book, 2018, Rural and Urban Development (MoSPI)	1. To issue crop and location specific weather based agro advisories for the benefit of farming community on every Tuesday and Friday and occurrence of extreme weather. Timeline: 2015-ongoing	1. To issue crop and location specific weather based agro advisories for the benefit of farming community on every Tuesday and Friday and occurrence of extreme weather. Timeline: 2015-ongoing

D: Indicators identified for schemes/programmes

Indicators from various schemes were mapped at the action point level. However, within a single strategy, some schemes were mapped to multiple action points, and certain schemes appeared across different strategies. To avoid redundancy, indicators from each scheme were included only once. The Action Point level indicators for each strategy were then compiled and labeled as 'Strategy Level Indicators.'

For the Sustainable Agriculture Mission, three indicators were identified from the Gramin Krishi Mausam Sewa Scheme: the number of District Agro-Meteorology Units (DAMUs) established, the accuracy of dissemination of district and sub-district Agromet Advisories, and the number of farmers receiving district agro-met advisories. These indicators were initially mapped to three action points (1.1, 1.2, and 3.2) across two strategies. However, to eliminate redundancy, these indicators were listed only once in the comprehensive list of indicators, rather than being repeated for each strategy.

E. Comprehensive list of common indicators (mission level)

The indicators that appeared across different strategies and originated from the same schemes were consolidated into a 'Comprehensive List of Common Indicators.' This list includes each indicator from the schemes only once, with all repetitions removed.

Step 2

Shortlisting indicators

After compiling a comprehensive list of indicators for each of the eight missions, the M&E Framework approach focused on selecting key indicators to monitor the progress of each mission. Certain parameters were established to filter out the most relevant indicators for each mission. This shortlisting process was conducted through a participatory approach, involving discussions with relevant implementing partners.

Figure 8: Process for Shortlisting M&E Indicators at mission Level

Let us take the example of **Sustainable Agriculture Mission** to explain the process.

1. Sustainable Agriculture Mission has a total of 128 indicators in the Comprehensive list of common indicators obtained from various schemes/programmes /dashboards.
2. All the indicators in the comprehensive list are classified as output, intermediate outcome, and outcome based on the following criteria:
   a. The indicators were categorised as short-term, medium-term, or long-term, based on the timeline that an indicator might show change.
   b. Context that the strategy provides: The indicator will be defined as short-term, medium-term or long-term based on the context that the strategy and target that the UP SAPCC provides to the action point.

   The comprehensive list of indicators for Sustainable Agriculture Mission were cut down to 30 indicators by including only intermediate and outcome indicators.

3. Relevance to SAPCC Strategy: This is a binary parameter. Previously, all mapping was conducted at the action point level. To shortlist mission-relevant indicators, the focus shifts
4. to the strategies of the SAPCC missions. A score of "1" is assigned if an indicator is relevant to a particular strategy within the mission, and a score of "0" is given if the indicator is not relevant to any strategy.
5. Holistic perspective: This is also a binary parameter. Indicators that offer an overview of the mission and whose positive progress signifies the successful fulfillment of the strategy—and thus the health of the natural resource—are considered as providing a 'Holistic Perspective.' Conversely, negative trends would highlight gaps in achieving the strategy. The holistic perspective is assessed alongside the relevance to the strategy.

A score of "1" is noted if the indicator is able to capture the holistic perspective of the strategy it is mapped to. These indicators can be holistic independently or a combination of indicators can give a holistic perspective of the particular strategy. For instance, area under drip irrigation does not provide a holistic perspective and is noted as '0' individually. However, when combined with area under sprinkler irrigation, together both indicators will provide a holistic perspective on **'Area under Micro Irrigation practices'**.

Table 8 illustrates the shortlisting approach (template) applied to the Sustainable Agriculture Mission:

Table 8: Shortlisting Approach - Sustainable Agriculture Mission

No.	Indicators (30)	Mapping to Strategy	Relevance to SAPCC Strategy	Holistic Perspective (1/0)	Data source
	Agro-weather services				
1	No. of District Agro-Meteorology Units established (DAMUs)	1,3	1	1	Gramin Krishi Mausam Sewa
2	Access to information and technology	1	1	1	UP-SAPCC

For example – Consider the indicator **"No. of District Agro-Meteorology Units established (DAMUs)"**

- It is mapping to Strategy 1 and Strategy 3. Strategy 1 states "Generate and disseminate precise weather forecasts to all farmers based on high resolution network of weather observation stations and ensure last mile delivery of agro-met services". Strategy 3 states "Mainstream climate smart adaptation in agriculture production, consumption and livelihoods, develop and implement contingency plans at village level in UP".
- This indicator is relevant for both the strategies and thus a score of 1 is given against it.
- This indicator alone is not able to provide a holistic perspective of the strategies it is mapped to. However, "No. of District Agro-Meteorology Units established (DAMUs)" in combination with the indicator "No. of Agro-Automatic Weather Stations established" can provide a holistic perspective and thus a score of 1 is given to these pair of indicators.
- The data source has been added which is Gramin Mausam Krishi Sewa.

The same process has been followed for the remaining missions.

Step 3

Consultation with line departments

A key component of the updated UP SAPCC is the establishment and implementation of a robust M&E system to enhance the planning, management, monitoring, and evaluation of activities across the eight SAPCC missions. This M&E system will monitor the progress of implementation efforts, support the achievement of the intended adaptation and mitigation goals, and identify areas needing more targeted intervention.

A consultative workshop was spearheaded by the Department of Environment, Forest and Climate Change (DoEFCC), GoUP. The objective of the consultation was to garner inputs and insights from the various line departments to craft a relevant, practical and effective M&E framework and to highlight solutions to strengthen institutional mechanisms for implementation of the framework.

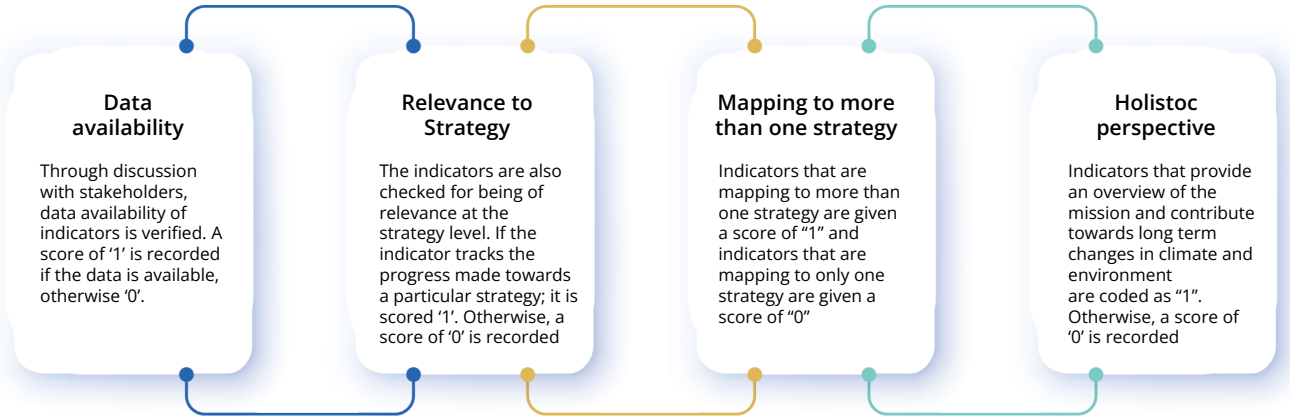
Indicators from all the eight missions, prior to deliberation, were classified with respect to different strategies. In order to obtain perspectives on each indicator, the following categories were populated during the discussion with line departments:

- Strategies mapped
- Data source of indicator
- Score card comprises of a ranking criterion used for shortlisting the indicators
- Periodicity
- Responsibility
- Notes on additional data sources

Several suggestions to buttress the M&E system were provided. Feasibility of the existing data architecture to provide periodic data was also discussed along with the way forward, in making this M&E framework robust and implementable.

Scorecard for shortlisting the indicators

A score card was developed to shortlist mission level indicators. The scorecard contained some ranking criteria defined in Figure 9:



Scoring criteria: Indicators will be scored individually on the above four parameters. The summation of all 4 scores will be recorded as: 0 – 1 = Low priority; 2 = Medium priority; 3 – 4 = High priority

Figure 9: Scorecard for shortlisting indicators for the M&E Framework

Periodicity

The periodicity of data collection for each indicator was mentioned. Data could be collected at annual, biannual, quarterly, monthly or at real time frequency.

Responsibility

During the consultation, the line departments suggested the name of the department responsible for collecting data pertaining to each indicator.

Additional data sources

During the consultative process, line departments also suggested additional schemes pertaining to the indicators.

Let us take the example of **Sustainable Agriculture Mission** to explain the process.

This Mission has five strategies (See Figure 10):

Figure 10: Strategies under Sustainable Agriculture Mission

Considering Strategy 1: Generate and disseminate precise weather forecasts to all farmers based on high resolution network of weather observation stations and ensure last mile delivery of agro-met services.

Four indicators were shortlisted for this strategy and were deliberated with relevant line departments.

1. No. of Agro-automatic weather stations established
2. Access to information and technology
3. No. of farmers accessing the knowledge-based decision support system
4. Disaster preparedness score as per Disaster Resilience Index

Step 1: *Each of these indicators were mapped to different data sources as discussed in the previous sections.*

Step 2: *The scores for each of the above-mentioned indicators were calculated using the score card mentioned below.*

No.	Indicators	Mapping to more than one Strategy	Data availability	Relevance to strategy	Holistic perspective	Total score	Rank	Percentage increase in area of desertification
1	No. of Agro-automatic weather stations established	1	1	1	0	3	High	0
2	Access to information and technology	0	0	1	0	1	Low	1.98
3	No. of farmers accessing the knowledge-based decision support system	0	1	1	1	3	High	-16.69
4	Disaster preparedness score as per Disaster Resilience Index	0	1	1	1	3	High	-16.69

Therefore, in consultation with the line departments, three indicators for the strategy were ranked as "High" and one indicator was ranked as "Low". Table 16 presents the shortlisted indicators for Strategy 1 of Sustainable Habitat Mission along with the department responsible for collating data and the periodicity at which data can be collected.

Step 3: *The periodicity and the responsible authority of all the indicators were validated with the line departments.*

Table 9: Shortlisted indicators for Strategy 1 - Sustainable Agriculture

No.	Indicators	Responsibility	Periodicity
1	No. of Agro-automatic weather stations established	IMD, Department of Agriculture	Annual
2	Access to information and technology	Urban Development Department	Monthly
3	No. of farmers accessing the knowledge based decision support system	IMD, Department of Agriculture, Relief Commissioner	Bi-weekly
4	Disaster preparedness score as per Disaster Resilience Index	Revenue Dept., UPSDMA, Municipal Corporation	Seasonal

The same process has been followed for the remaining missions.

Step 4

Reviewing and Finalising Mission level indicators

After consulting with the line departments, the feedback received was integrated, revealing that certain indicators across all missions required further attention. To address these gaps and finalize the mission-level indicators, additional one-on-one consultations with relevant government departments were conducted. For example, the team held meetings with officials from the Department of Health and Family Welfare, UP Technical Support Unit (TSU), Bankers Institute of Rural Development (BIRD), and UP Biodiversity Board. Following these individual discussions, the following strategy was adopted:

a. Indicators for which data was not getting collected or collated and/or was not relevant to the strategy or mission, were removed from the list. For instance, water productivity from Jal Mission, and malnutrition and anaemia related indicators in Health Mission.
b. Line department officials suggested rephrasing some indicators for which data was being collected from existing data systems. For instance, in Jal Mission, the ground water restoration indicator was changed to two separate indicators: annual ground water extraction and annual ground water restoration.
c. Some suggestions were made to add new SMART indicators for which data was available, which could be a better parameter to monitor progress towards 2030 targets. Strategic Knowledge Mission had mostly new indicators which seemed more relevant to monitor progress across the Mission. For instance, number of research studies conducted that are aligned to climate action plan at state level and number of district knowledge centres established.

After post-discussion assessment of the indicators and a thorough clean-up of the M&E Frameworks for all missions, the indicators were applied to the score card system (explained earlier) and tested against the following criteria:

- Data Availability
- Relevance to Strategy
- Mapping to more than one strategy
- Holistic perspective

Indicators that received a total score of ‘3’ or ‘4’ across the four criteria mentioned above were classified as ‘High’ priority. Those with a total score of ‘2’ were ranked as ‘Medium’ priority, and indicators with a score of ‘0’ or ‘1’ were classified as ‘Low’ priority. Indicators categorized as ‘High’ priority were included in the final list of mission-level indicators. However, in some missions, the team also considered ‘Medium’ priority indicators due to a scarcity of ‘High’ priority indicators mapped to the strategies.

Published by

Directorate of Environment (DoE) and UP Climate Change Authority
Department of Environment, Forest & Climate Change
Government of Uttar Pradesh

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With technical support from

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Developing M&E Framework for SAPCCs

Standard Operating Procedure

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