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A Capacity Building Assessment Matrix for Enhanced Transparency in Climate Reporting

A Comprehensive Evaluation of Indian Efforts

Report | September 2019

Sumit Prasad and Vaibhav Gupta

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The authors of this report would like to thank the Shakti Sustainable Energy Foundation (SSEF) for their support to carry out the study.

We also thank our reviewers – Elizabeth Gogoi, Oxford Policy Management India; Indrajit Bose, Third World Network; Shikha Bhasin, CEEW; and Karthik Ganesan, CEEW, for their critical comments and feedback that helped us improve the report.

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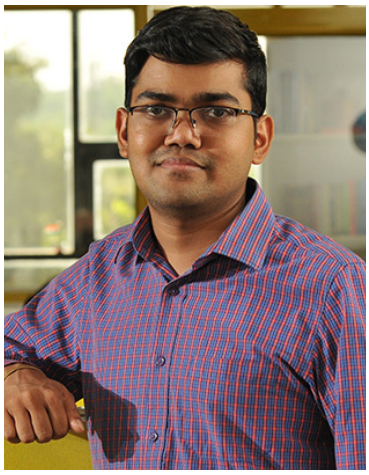
The authors



Sumit Prasad
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Sumit is a policy researcher at the Council on Energy, Environment and Water. His research revolves around climate negotiations and governance where he addresses issues related to the enhanced transparency framework under the Paris Agreement, the measuring, reporting and verification (MRV) arrangement for climate actions, and associated capacity building aspects. Sumit holds an MBA in Business Sustainability from TERI SAS, New Delhi and an undergraduate degree in Electronics and Communication from the National Institute of Engineering, Mysore.

"Transparency is central to climate negotiations. It strengthens nations' trust in the UN process and promotes ambitious climate action. This study proposes an assessment tool with the help of which developing countries can identify their capacity constraints towards adopting the enhanced transparency framework under the Paris Agreement and avail flexibilities in rational manner."

Vaibhav Gupta
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Vaibhav, earlier with CEEW, is an environmental engineer and policy specialist, who examines and analyses the industry sector via the lens of climate change, energy and resource efficiency. Principles of circular economy and industrial symbiosis are his major research interests. An objective researcher, he is proficient in developing research frameworks, data driven analytics, and project management. Some of his research accomplishments include – development of a critical minerals resource framework for India's manufacturing sector; identification of strategic industries for Make in India; compiling energy and carbon emissions' inventory of India's manufacturing sector; and critical analysis of international climate governance from the perspective of India's capacity building for enhanced transparency in climate reporting. He holds a master's degree in environmental engineering from the Indian Institute of Technology (Indian School of Mines), Dhanbad.

"Climate change is a grave concern which becomes even more complex with governance and political challenges across economies. Capacity building of the developing world is of paramount importance to exhibit transparency in progress and outcomes and is critical to demonstrate mutual trust. This study provides an objective approach towards building the monitoring and reporting capacity of developing countries and measuring and tracking their progress against existing and emerging climate actions. I firmly believe that developing countries and the UNFCCC Secretariat would be able to derive immense value out of such research."

Contents

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Figures

Abbreviations

ACB-CT	area of capacity building for climate transparency
ADB	Asian Development Bank
AF	Adaptation Fund
BEE	Bureau of Energy Efficiency
BURs	Biennial Update Reports
CBAM	Capacity Building Assessment Matrix
CBDR-RC	Common but Differentiated Responsibility and Respective Capabilities
CBIT	Capacity-building Initiative for Transparency
CDM	Clean Development Mechanism
CERs	certified emission reductions
CGE	Consultative Group of Experts
CIF	Climate Investment Funds
CMMACS	Centre for Mathematical Modelling and Computer Simulations
COP	Conference of the Parties
CSIR	Council for Scientific and Industrial Research
EESL	Energy Efficiency Services Limited
GCF	Green Climate Fund
GCOS	global climate change observing systems
GEF	Global Environment Facility
GHG	greenhouse gas
GWP	global warming potential
IAR	international assessment and review
IC	institutional capacity
ICA	international consultation and analysis
IPCC	Intergovernmental Panel on Climate Change
ISRO	Indian Space Research Organisation
ITMOs	internationally transferred mitigation outcomes
JICA	Japan International Cooperation Agency
KC	knowledge capacity
LULUCF	land use, land-use change, and forestry
M&E	monitoring and evaluation
MoEFCC	Ministry of Environment, Forest and Climate Change
MRV	measuring, reporting and verification
NAMAs	Nationally Appropriate Mitigation Actions
NAPCC	National Action Plan for Climate Change
NATCOM	National Communications
NCs	national circumstances
NCSA	National Self-capacity Assessment
NDC	nationally determined contributions
NEERI	National Environmental Engineering Research Institute
NIMS	National Inventory Management System
NIO	National Institute of Oceanography
NMSKCC	National Mission on Strategic Knowledge for Climate Change
NPL	National Physical Laboratory
PC	procedural capacity
PCCB	Paris Committee on Capacity Building
QA	quality assurance
QC	quality control
REDD+	Reducing Emissions from Deforestation and Forest Degradation
SAPCC	State Action Plans on Climate Change
SBI	Subsidiary Body of Implementation
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UNFCCC	United Nations Framework Convention on Climate Change
UNIDO	United Nations Industrial Development Organisation
USAID	United States Agency for International Development
V&A	vulnerability and adaptation
WB	World Bank

Transparency in climate action showcases how countries are transitioning to a low-carbon economy.

Executive summary

Transparency in climate actions and support is an important pillar on which climate negotiations rest. It lends credibility and legitimacy to actions and support measures, and it builds trust among developed and developing countries for carrying out further negotiations.

The existing transparency regime under the United Nations Framework Convention on Climate Change (UNFCCC) adheres to the principle of common but differentiated responsibility and respective capacity (CBDR-RC). Presently, the climate transparency obligations for developed countries are relatively more rigid in terms of the reporting requirements and review processes, as compared to the obligations recommended for developing countries (including the least developed countries and small island developing states). The obligations of the latter group have been adjusted keeping in mind the lesser individual, institutional, and systemic capacities of these countries for climate reporting.

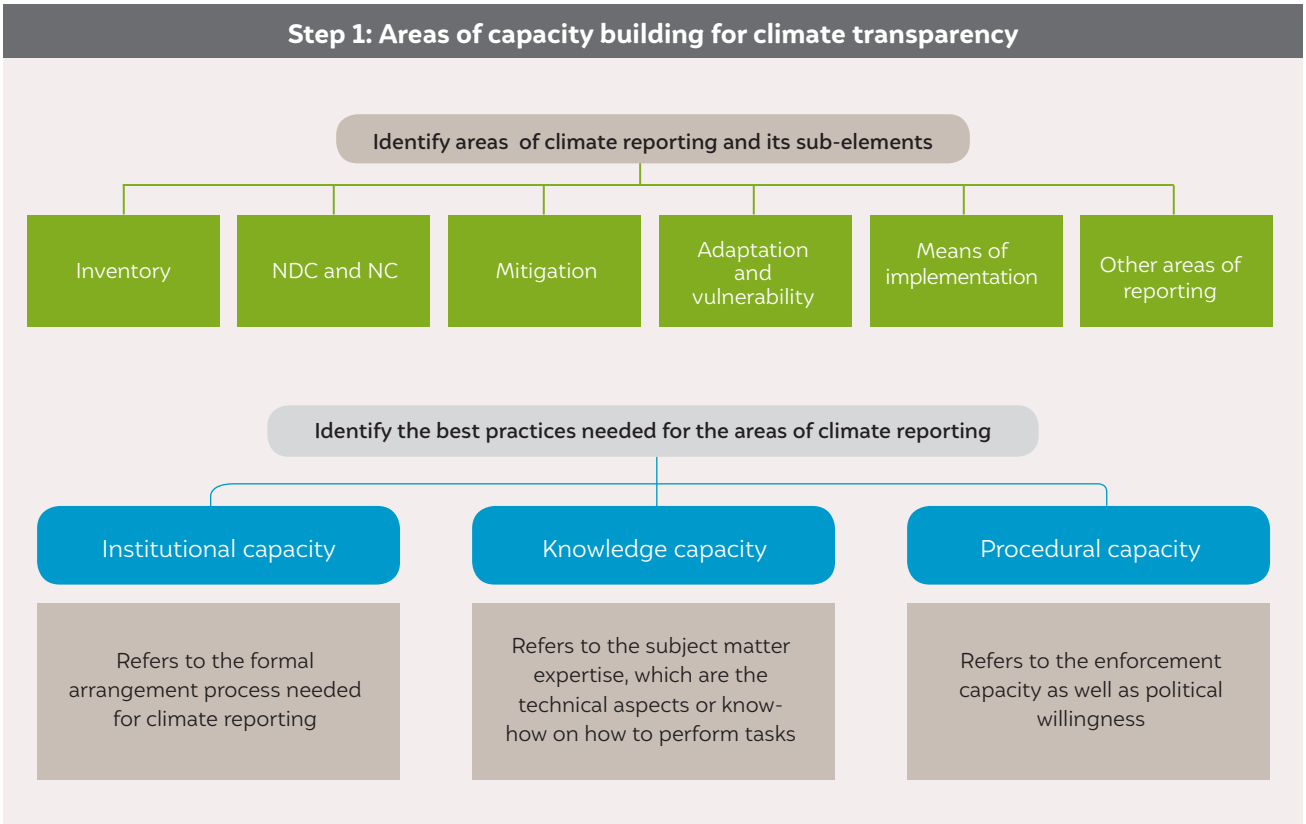
The Paris Agreement mandates a common reporting system while ensuring that developing countries receive adequate, timely, and transparent support (financial, technical, knowledge base) from developed countries. At Katowice, a majority of the member countries agreed to these common guidelines to enhance transparency. This will obligate developing countries to increase domestic capacity and transition away from temporary arrangements (ad hoc, project based, consultant-driven) in order to develop sustained reporting abilities.

Transparency lends credibility and legitimacy to mitigation and adaptation efforts, and it builds trust among developed and developing countries for further negotiations

As developing countries lack sufficient resources to ensure enhanced climate reporting transparency, they find its implementation to be difficult. In an ideal system, developed countries would deliver support in close coordination with developing countries, which in turn would prioritise needs and set realistic timelines to improve reporting processes. A global coordinated effort to enhance transparency will help in tracking progress through periodic stocktaking exercises and in establishing the flexibility requirements (as per the agreed principles) of developing countries. At present, defining capacity and ascertaining flexibility for a developing country remains a contentious process, influenced by subjective and varying perspectives in the absence of a reference point.

This study aims to bridge this gap by presenting an assessment tool – Capacity Building Assessment Matrix (CBAM) – to help quantify capacity building efforts and the gaps therein, with regards to climate transparency. The CBAM tool first defines capacity building areas for climate transparency (scope) under three broad categories: institutional, knowledge, and procedural. Further, it establishes three levels of assessment: capacity assessment, needs assessment, and support assessment to establish the baseline, shortfall, and desired resources required to achieve the targeted results.

ES 1: Block diagram of the Capacity Building Assessment Matrix (CBAM)



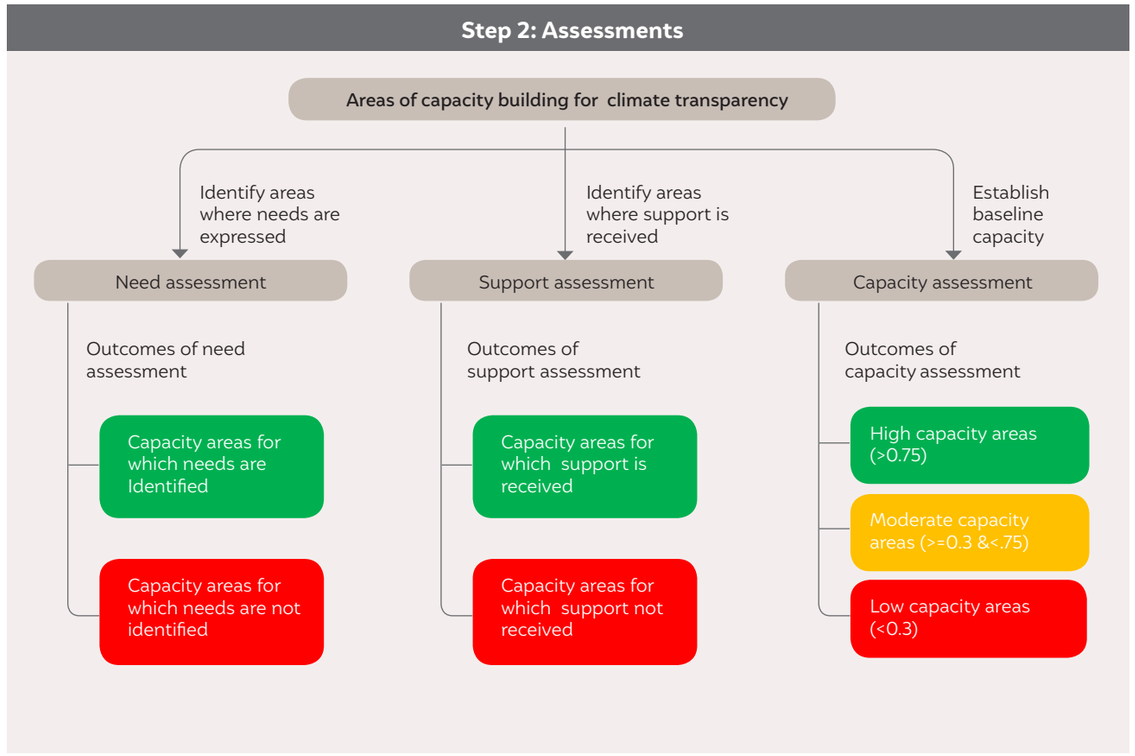
Source: Authors' formulation

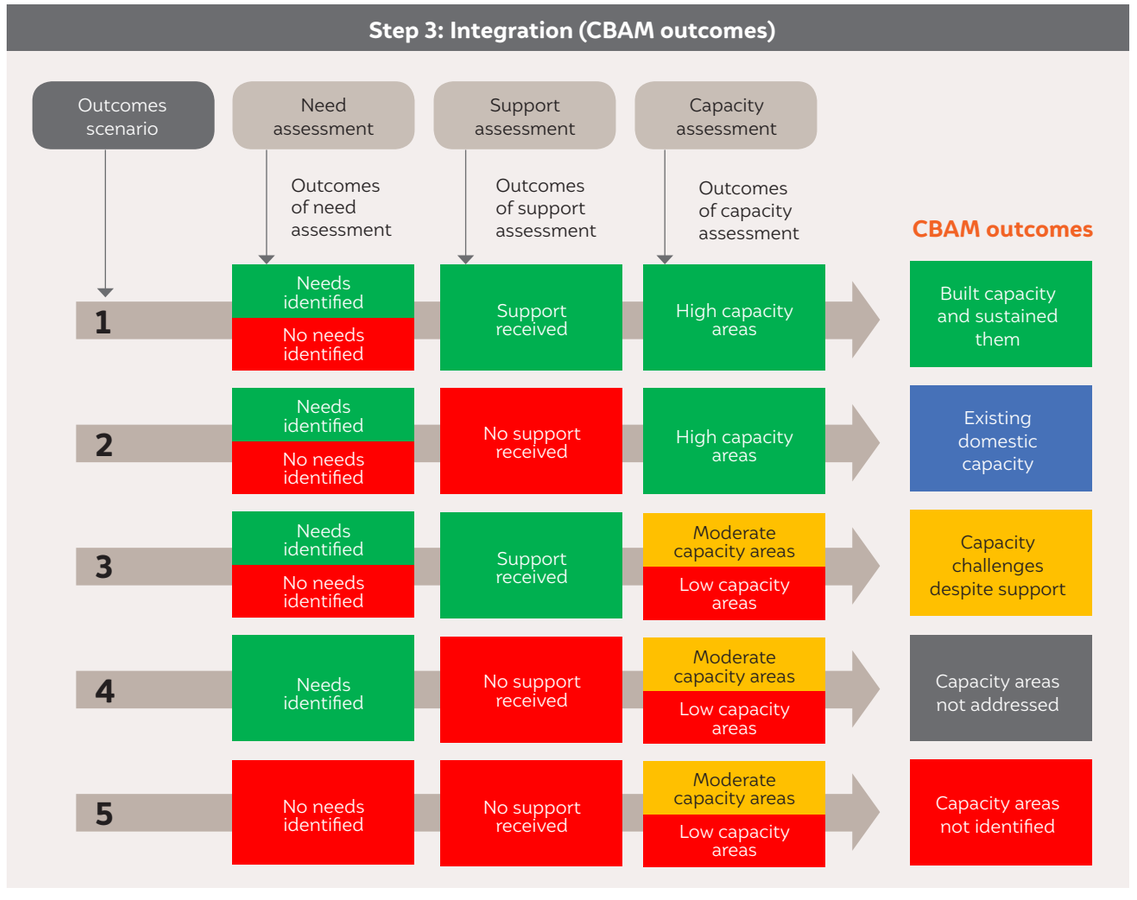
In the end, the outcomes of the three assessments are integrated to provide various insights and determine the areas for which (i) capacity already exists because of domestic resources; (ii) capacity has been built with the help of the support received; (iii) capacity challenges exist despite support being received (due to retention issues); (iv) capacity needs have not been addressed; and (v) capacity needs have not been identified. The following figure (ES 1) indicates the various dimensions, and resulting outcomes, of this tool.

The outcomes of CBAM will help establish the accountability (ownership) of the concerned parties with regards to their respective commitments. It offers a means to quantify the progress of capacity building efforts in developing countries, and to identify and address challenges optimally. Alongside capacity building efforts, retention systems can be identified and promoted to ensure the establishment of sustainable systems.

All these outcomes can serve as essential inputs for the technical review process under the enhanced transparency framework. They can also be used to determine flexibility in a rational manner, and formulate improvement plans to ensure adherence to the 'no back-sliding principle'. Further, this tool can be used by various donors to evaluate the progress made by developing countries using the support provided by them. Additionally, it can be used to explicitly identify areas where further support is required to build countries' capacities.

As a case study demonstrating the use of this tool, we have analysed India's capacity building efforts related to climate transparency based on data from India's UNFCCC submissions on climate transparency and commitments. So far, India has submitted two



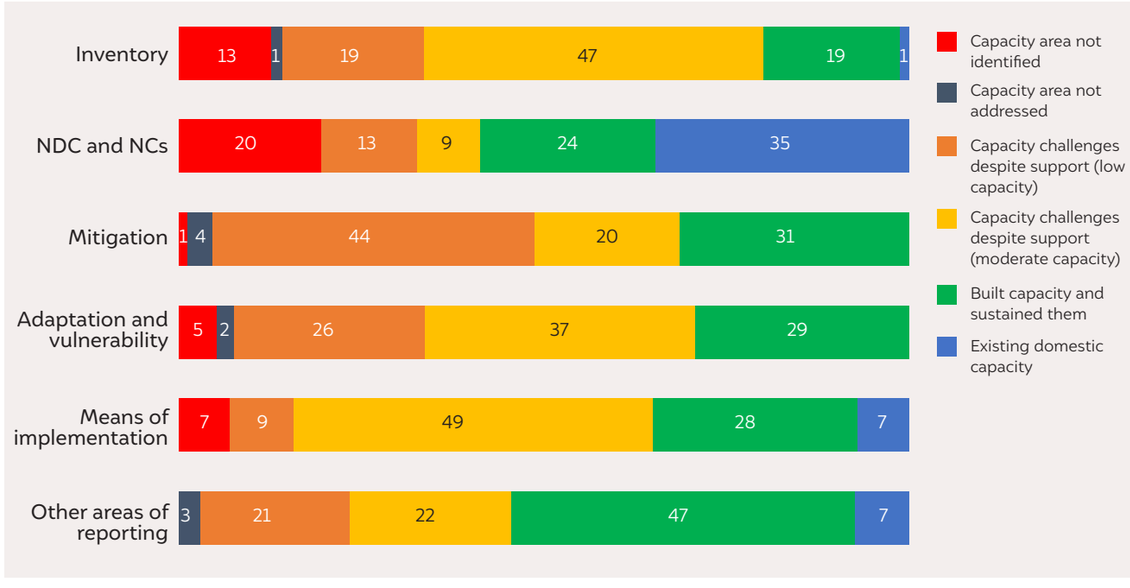


National Communications (NATCOMs) and two Biennial Update Reports (BURs), and it is in the process of preparing the third NATCOM. Preparing these communications involves engaging with a network of institutions at almost every level of governance. An indicative financial support of about USD 74.7 million has been received for strengthening institutional, knowledge, and procedural capacities for climate reporting, of which USD 42 million was allotted to preparing three NATCOMs and BURs.

It is evident from the outcomes of CBAM that India has invested considerable efforts towards enhancing its climate transparency. Across all the areas of reporting capacity building support was uniform, and most of the needs expressed in the NATCOMs and BURs focussed on enhancing inventory and adaptation reporting capabilities.

At present, for India, capacity varies across areas of reporting. Sound existing domestic capacity is visible for nationally determined contributions (NDC) and national circumstances (NC) reporting, while the capacity to adhere to mitigation reporting needs to be strengthened. Additionally, there is ample scope for improvements in inventory, adaptation, and means of implementation reporting, as the majority of capacity indicators for these areas are moderate. A summary of key findings related to India's capacity for transparency reporting is provided below.

ES 2: Block diagram of the Capacity Building Assessment Matrix (%)



Source: Authors' analysis

Image: iStock

Key findings

- A sound institutional arrangement is visible across all levels of governance. The present NATCOM Cell at MoEFCC is playing a major role in managing and coordinating the entire process. However, there is a need for enhancing inter-departmental synchronisation and coordination. The MOEFCC should play a more assertive role in terms of defining the information flow system across various other ministries and departments for enhanced climate reporting.
- Opportunities should be explored to institutionalise climate reporting through a formal legal arrangement. For inventory reporting, there is a need to formalise the roles and responsibilities of the institutions involved, and to establish legal provisions to govern data collection processes, i.e., provisions to handle confidential data, timely reporting mandates, clearly established data sharing responsibilities, and procedures to turn raw data into useful inventory data and other aspects.
- In India, the domestic measuring, reporting, and verification (MRV) capacity for mitigation actions is limited and decentralised. Efforts should be made towards strengthening the institutional capacity for the same by formulating an integrated MRV system. Whereas, in the case of adaptation actions, standard metrics (progress indicators) should be developed (defined) for the monitoring and evaluation (M&E) of the measures undertaken.
- There is little clarity regarding the capacity to retain knowledge, in terms of procedures adopted for inventory preparation, mitigation assessment (modelling exercises, scenario formulation), vulnerability and adaptation assessment, and other parameters. This may be because of the involvement of independent research institutions in this process, and the lack of any provision to ensure transfer of knowledge among these institutions. Hence, templates should be adopted, across all levels of governance, to ensure an efficient system for standardising tasks and identifying priorities for future improvement. These could also serve as a manual and a starting point for new stakeholders who become involved in the process of climate reporting.

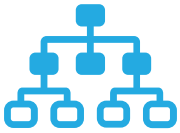
1. Introduction

Image: UNFCCC

Transparency plays a vital role in conducting climate negotiations. It primarily demonstrates the sincerity of nations towards climate actions and their willingness to take the lead in implementing the same. Consistent, comparable, and accurate climate reporting is essential for an effective stock-taking process and to track the collective progress made in achieving long-term climate goals. Most importantly, climate transparency builds trust among countries by facilitating and enhancing the visibility of their actions, thereby encouraging all countries to raise their ambitions.

Over the last decade, transparency requirements have steadily grown, especially for developing countries. At COP13, the Bali Action Plan (Decision 1/CP.13) introduced a measurable, reportable and verifiable process (popularly known as MRV) to ensure transparency in mitigation commitments or actions (UNFCCC, 2007). Developed countries (Annex I parties) were instructed to include quantified emission limits and reduction objectives into their MRV process; whereas, developing countries (Non-Annex I Parties) were advised to spell out their Nationally Appropriate Mitigation Actions (NAMAs), especially those that are internationally (external) supported through an MRV arrangement.

Subsequently, at COP 16 (Cancun, 2010), it was decided that the Biennial Update Reports (BURs) submitted by all developing countries would be subjected to international consultation and analysis (ICA). COP 17 (Durban, 2011) and COP 19 (Warsaw, 2013) took this further by adopting several decisions and guidelines regarding elements of the MRV framework; the composition, modalities, and procedures to conduct technical analysis under the ICA. As per the provisions agreed upon, developing countries may voluntarily establish domestic processes for MRV. On the other hand, at COP 20 (Lima, 2014), an international assessment and review (IAR) process was adopted to undertake technical reviews of BURs submitted by developed countries (UNFCCC, 2014).



The existing transparency obligations for developed countries and developing countries is based on the principle of common but differentiated responsibility and respective capabilities

Hence, the transparency obligations for developed countries and developing countries have different approaches (see Table 1). This is based on the principle of common but differentiated responsibility and respective capabilities (CBDR-CR), which mandates developed countries to follow a rigorous reporting obligation, while developing countries enjoy the flexibility to follow comparatively simpler reporting obligations in light of their capacities and historical contexts.

Process	Annex I Parties	Non-Annex I Parties
Reporting	**National Communications*** {every four years} **National GHG inventories*** {annually} **Biennial reports** {every two years}	**National Communications***** {every four years} **Biennial Update Reports***** {every two years}
Review	**Technical review of Biennial Reports** {every two years} **In-depth review of National Communications**** {every four years} **Annual review of national GHG inventories**** {annually} **Multilateral assessment** {every two years}	**Technical analysis of Biennial Updates** {every two years} **Facilitative sharing of views** {every two years}
Note	* Annex I Parties that are not Parties to the Kyoto Protocol submit these reports under the Convention only ** These processes are for Annex I Parties that are not Parties to the Kyoto Protocol. They have to submit these reports only under the Convention. ***Non-Annex I Parties submit national GHG inventories as a part of their NATCOMs and BURs	
Convention only	**Kyoto Protocol only**	**Both Convention and Kyoto Protocol**

Table 1:
Existing transparency arrangements established through the Cancun Agreements

Source: UNFCCC

Considering the different starting points of developing countries in terms of their capacity to adhere to transparency obligations, the Convention identified transparency as a key priority area for capacity building frameworks in developing countries (UNFCCC, 2001). Further, various financial and technological mechanisms have been established to ensure consistent support for capacity building activities. For promoting best practices in this area, a Subsidiary Body of Implementation (SBI) organises an annual in-session event named "Durban Forum on Capacity Building" (UNFCCC, 2019 (b)). The convention has also built an online, interactive, capacity building portal that gathers information on support provided to developing countries for capacity building matters (UNFCCC, 2019 (c)).

Priority areas	Capacity building activities in the period 2012–2015
Institutional capacity building, including the strengthening or establishing, as may be appropriate, of National Climate Change Secretariats or national focal points	198
Enhancement and/or creation of an enabling environment	251
National Communications	98
Greenhouse gas inventories, emissions database management, and systems for collecting, managing, and utilising activity data and emission factors	90
Assessment for implementation of mitigation options	57

Table 2:
Capacity building frameworks for developing countries

Source: Third comprehensive review of the capacity building framework, UNFCCC

Priority areas	Capacity building activities in the period 2012–2015
Clean development mechanisms	73
Vulnerability and adaptation assessment	127
Research and systematic observation, including meteorological, hydrological, and climatological services	130
Education, training, and public awareness	99
Information and networking, including the establishment of databases	211
Capacity building for the implementation of adaptation measures	88
Development and transfer of technology	85
National climate change programmes	29
Improved decision-making, including assistance for participation in international negotiations	339
Needs arising out of the implementation of Article 4, Paragraphs 8 and 9, of the Convention	109

According to the third comprehensive review of capacity building frameworks, an increase in capacity building activities was observed during the period of 2012–15 (see Table 2). The most significant increase was seen in the area of transparency (UNFCCC, 2016). But, at present, there is not much clarity on how these capacity building activities have helped developing countries. So far, only 47 Non-Annex Parties[1] (mostly developing countries) have submitted their first BUR out of 154 Non-Annex Parties (UNFCCC, 2019). A preliminary analysis (under the ICA process) of the BURs suggests that, collectively, not much progress has been achieved in establishing self-sustainable capacities within countries. Besides, a few developing countries lack institutional capacity and have asked for further support to enhance their reporting capabilities, such as strengthening MRV processes, incorporating quality assurance and quality control procedures, and undertaking uncertainty analysis. Furthermore, there are many other grey areas associated with climate reporting, such as lack of clarity in disclosures of climate finance (support received), progress on mitigation actions, and disclosure on higher tier for inventory.

Reporting obligation	Deadline for submission	Total submissions so far out of 154 Non-Annex Parties
First Biennial Update Report	December 2014	47
Second Biennial Update Report	December 2016	26
Third Biennial Update Report	December 2018	4

Table 3:
BUR timelines and submission

Source: UNFCCC

This is because of the ad hoc and timebound nature of the capacity building activities. Moreover, not much investment was channelled into permanent institutions, and countries relied heavily on external consultants for the preparation of the reporting obligations (UNFCCC, 2017). The absence of long-term and self-sustaining institutions, as well as the inadequate policy measures to support capacity retention, have affected the quality of reporting and its management.

1 As of 23 July 2019

While, developing countries are facing challenges in adhering to present transparency arrangements, at Katowice, an enhanced transparency framework has been adopted (UNFCCC, 2019 (a)). With the adoption of the enhanced transparency framework, transparency guidelines have moved from differentiating between developed and developing countries, to adopting a common reporting format for all the countries signatory to the Paris Agreement. The newer guidelines offer 'flexibilities' in reporting requirements to developing countries according to their capacity, which forms the basis of differentiation. Further, additional areas of reporting (NDCs, loss and damage) have also been added to the guidelines, and technical analysis for developing countries would now take the form of technical review process. The first Biennial Transparency Report and National Inventory Report, under the enhanced transparency framework, has to be submitted latest by 31 December 2024 (UNFCCC, 2019 (a)).

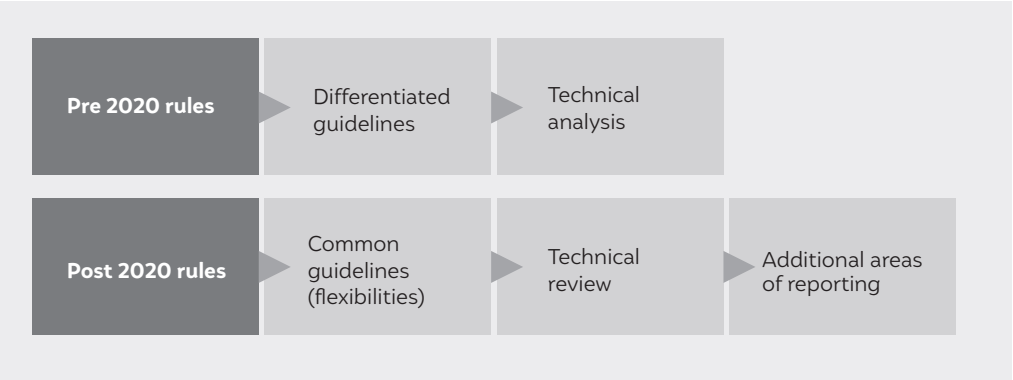
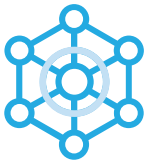


Figure 1:
Comparison of pre-2020 and post-2020 transparency guidelines

Source: Authors' analysis

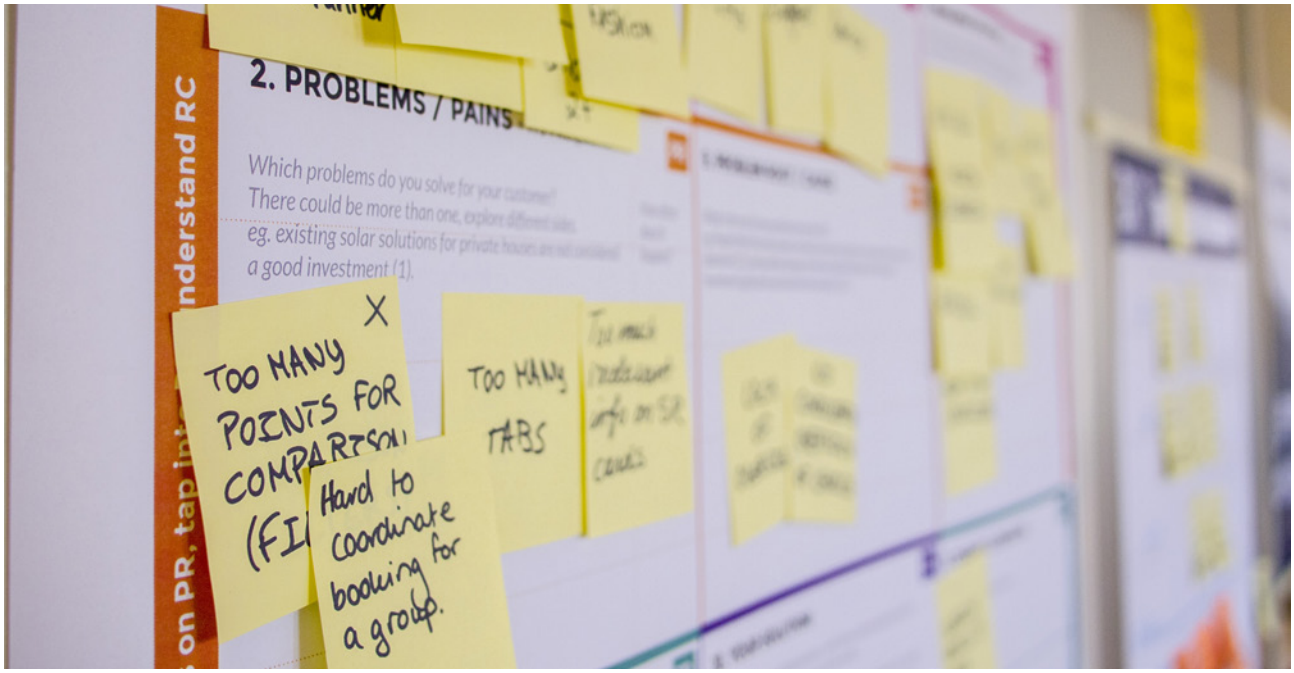
It is clear that existing domestic arrangements within developing countries would be neither appropriate nor suitable for meeting the newer reporting requirements under the Paris Agreement (UNFCCC, 2016). The question is: how would developing countries be able to evolve and adapt to the enhanced transparency regime under the Paris Agreement? The agreement has formulated the Paris Committee on Capacity Building (PCCB) that aims to address the current and emerging needs of developing countries. It has also established a Capacity-building Initiative for Transparency (CBIT) to strengthen the institutional and technical capacities of developing countries and enhance their climate transparency. But, at present, there is no comprehensive mechanism by which, developing countries can undertake need assessment, support assessment and also establish the current capacity, or track the progress on capacity development related to transparency.

The Council, through this research, aims to bridge this gap through the development and use of an assessment tool, titled the Capacity Building Assessment Matrix (CBAM), to help understand nations' capacity building efforts related to transparency. The assessment tool establishes countries' baseline capacity, and focuses on understanding the gaps and mismatches between the capacity building needs identified within national contexts, and the support received to meet them. The outcomes of the assessment tool will help countries identify their capacity constraints and will facilitate the formulation of improvement plans. The tool will also help in defining the flexibilities extended to developing countries in the transparency provisions and will support the technical review process under the enhanced transparency framework. In this research, to showcase its functioning, we have used CBAM to analyse India's capacity building efforts related to transparency.



How would developing countries be able to evolve and adapt to the enhanced transparency regime under the Paris Agreement?

2. Methodology



The methodology adopted for the formulation of the Capacity Building Assessment Matrix involved the following steps:

Step 1

Determining the capacity areas associated with climate reporting

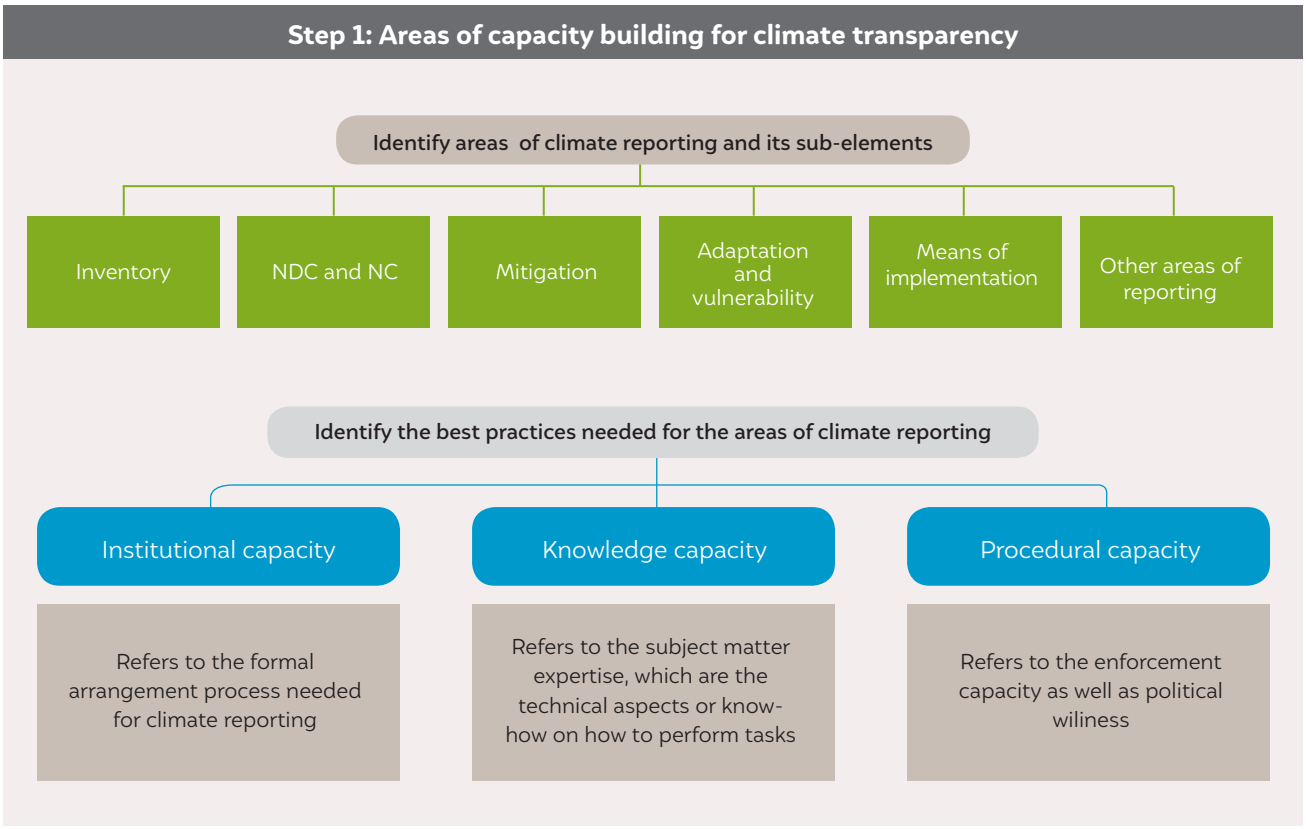
In this step, an in-depth literature review was done to identify the areas of climate reporting (scope of reporting) and the best practices (in terms of institutional, knowledge and procedural capacities) adopted by the countries to report them. This is termed as **area of capacity building for climate transparency** (ACB-CT).

Step 2

In this step, three assessment procedures are formulated, namely:

I. **Capacity assessment:** Procedure to establish the present baseline capacity and analyse the capacity areas in terms of high, moderate, and low levels.
II. **Needs assessment:** Procedure to determine the capacity areas where needs were expressed (stated) historically.
III. **Support assessment:** Procedure to determine capacity areas where support (financial as well as non-financial) was received.

Figure 2: **Block diagram of the Capacity Building Assessment Matrix (CBAM)**



Source: Authors' formulation

Step 3

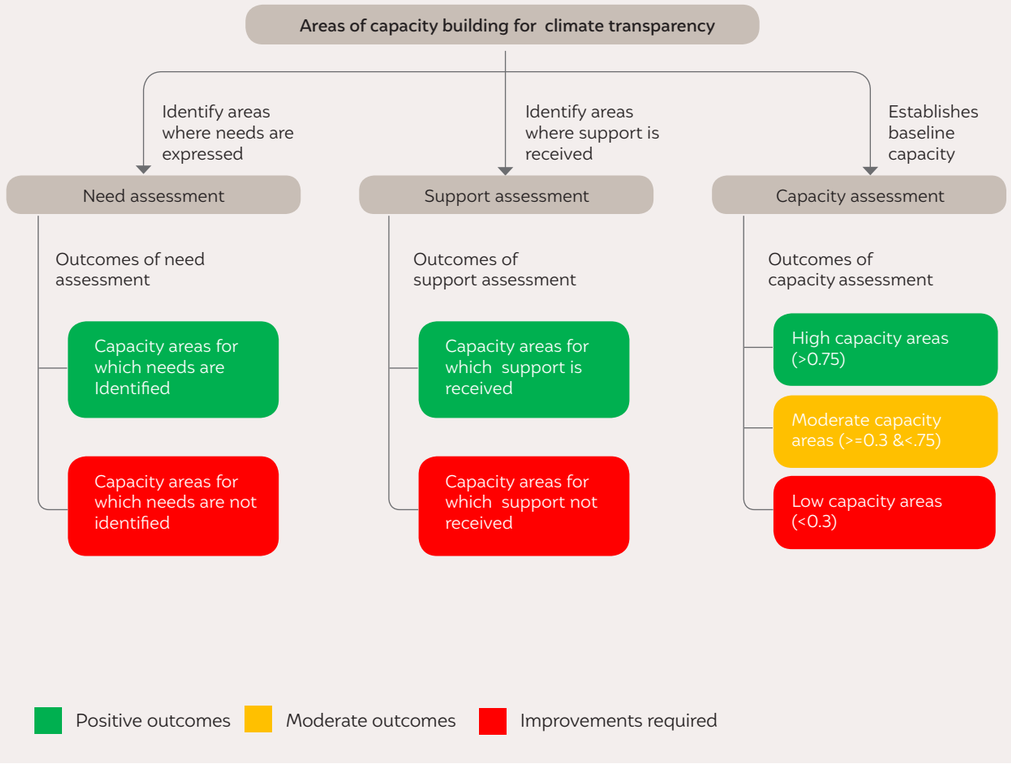
Integrating assessments

In this step, the outcomes of the three assessments are combined to determine the areas for which: (i) capacity already exists because of domestic resources, (ii) capacity has been built with the help of the support received, (iii) capacity challenges exist despite support being received (retention issues), (iv) capacity has not been addressed and (v) capacity has not been identified.

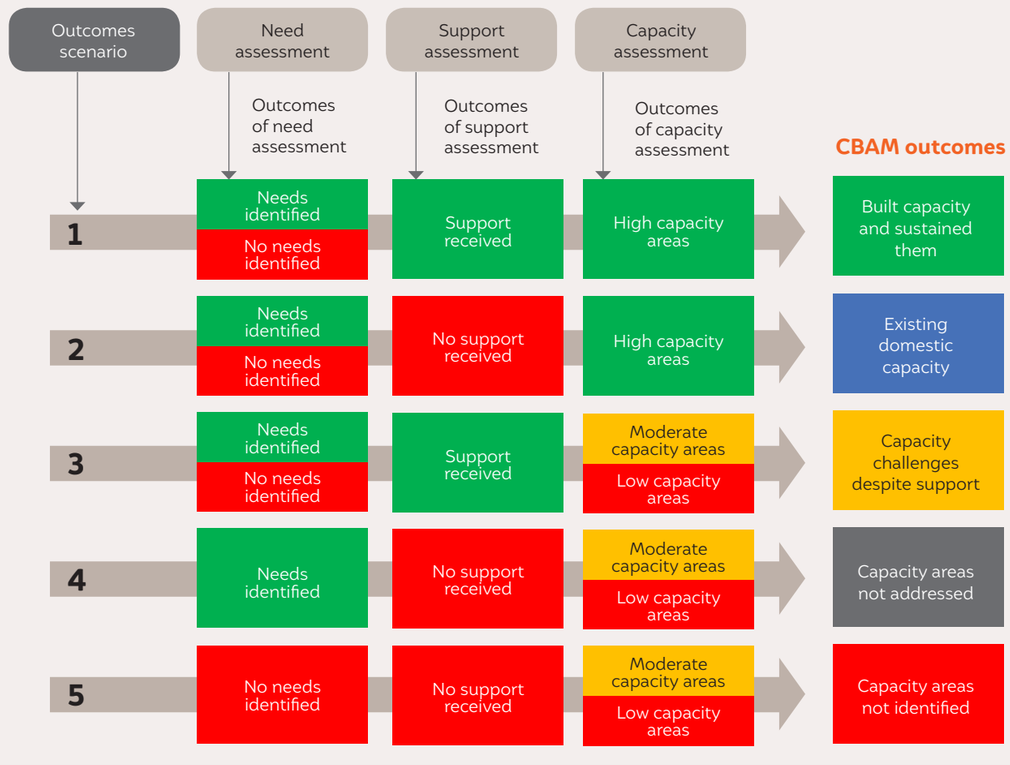
It is important to highlight that enhancing capacity building is a continuous, dynamic, process and would have a constantly moving goal post. This means that the countries' requirements will evolve alongside enhancements in reporting obligations, and as their capacity levels continue to improve over time.

The areas of capacity building for climate transparency (ACB-CT), the three assessments, and their integrated analysis jointly led to the formulation of the CBAM (see Figure 2). The evaluation of current capacity, and capacity need, and support assessment is undertaken through an excel model, where the results from each assessment are analysed together.

Step 2: Assessments



Step 3: Integration (CBAM outcomes)



Note: In the later section, each CBAM outcome follows the colour theme as assigned in this figure.

Collectively, not much progress has been achieved in establishing self-sustainable capacities within countries.

3. Literature review

In the current development regime, there is little consensus on what capacity building or capacity development means. Over the last three decade, capacity building has evolved from just being technical assistance, to becoming a means to strengthen institutions and promote good governance. As the concept of capacity building is now associated with many different processes, goals, and outcomes, the question of how effective it is remains a central concern (ECBI, 2018).

Literature and discourses, however, does offer methodologies to assess the present capacity, to identify needs, and to evaluate the effectiveness of the support received. The *UNDP Capacity Assessment Methodology User Guide* has laid out a detailed, step-by-step procedure to conduct capacity assessment. It has identified three points of entry (individual, institutional and systemic) for which core, functional, and technical issues are identified (UNDP, 2008). The Japan International Cooperation Agency, in its *Capacity Assessment Handbook*, has identified three perspectives to approach capacity (JICA, 2008). The Global Environment Facility (GEF) has its own M&E procedure to monitor project deliverables. Besides having defined midterm and terminal evaluation processes, the GEF has devised five main evaluation criteria to understand the outcomes of the project (GEF, 2017). The PARIS21 Consortium developed statistical capacity building indicators to track the progress of countries in building their statistical capacity (Laliberté, 2002). Further, USAID has also developed a structured tool for assessing institutional capacity to address climate change issues (USAID, 2016).

A quick summary of such methodologies has been presented in Table 4. Though this body of literature suggests various capacity assessment methodologies, there are challenges in adhering to them directly. This is primarily because most of these methodologies evaluate capacity needs or assess the effectiveness of the support rendered to a specific project only. Further, a few methodologies are very generic in nature, and act as guidance for capacity development from scratch. However, it was observed from these methodologies that to understand the capacity for climate transparency, it was first necessary to establish what constitutes capacity for climate transparency. Against this, a baseline capacity should be established, needs should be identified, and accordingly, support should be provided. This is necessary because, without a proper understanding of what type of capacity is needed, inappropriate measures and actions may be initiated.

First step is to establish what constitutes capacity for climate transparency. This is necessary because, without a proper understanding of what type of capacity is needed, inappropriate measures and actions may be initiated

Organisation	Handbook/Report	Key takeaways
UNDP	*Capacity Assessment Methodology User Guide*	Defined three elements of the capacity assessment framework: i. Points of entry for capacity building (systemic, institutional, individual) ii. Core issues (institutional arrangements, leadership, knowledge, and accountability) iii. Functional and technical capacities
Japan International Cooperation Agency	*Capacity Assessment Handbook*	Defined three perspectives of capacity building: i. Capabilities for handling issues ii. Capacity focused on organisations iii. The relationship between the characteristics of capacity and performance
GEF	*M&E procedure*	Defined five evaluation criteria to understand the outcome of the project: relevance; effectiveness; efficiency; results; sustainability
PARIS21 Consortium	*Statistical capacity building indicators*	Defined six capacity indicators to track progress: institutional prerequisites, integrity, methodological soundness, accuracy and reliability, serviceability, accessibility
USAID's Organizational Capacity Assessment	*GCC Institutional Capacity Assessment*	Five areas of institutional capacity are included in the assessment: governance; information, data, and analysis; planning; resources; implementation, monitoring and evaluation, and knowledge management

Table 4:
Snapshot of key aspects of various capacity assessment methodologies

Source: Authors' compilation

4. Areas of capacity building for climate transparency

The area of capacity building for climate transparency is ascertained by answering two questions:

I. What are the reporting and sub-reporting elements for climate transparency?
II. What type of capacity would be needed to adhere to these reporting provisions?

Currently, the reporting obligation applicable to developing countries are NATCOMs and BURs (see Table 1). These reporting obligations comprise hard provisions (use of shall) as well as soft provisions (use of should) that mandate countries to provide information on various aspects such as greenhouse gases inventories, mitigation actions, adaptation measures, capacity requirements, and other areas (see Table 5). Further, with the adoption of the *Paris Agreement Rulebook*, there are additional reporting obligations applicable to developing countries. These include commitments disclosures, progress made towards achieving NDCs, information on loss and damage, improvement plans, and a few other sub-elements (UNFCCC, 2019 (a)).

Areas of reporting	Key sub-reporting elements	Sectors/category
Inventory*	Institutional arrangement, sectoral overview, activity data, emissions, methodology, uncertainty, QA/QC process, key category analysis	Energy, industrial process, agriculture, land use, land-use change, and forestry (LULUCF), waste, others (memo items)
NDC and NC*	National circumstances – general and sectoral disclosures, NDC description, NDC progress and projections	Overall
Mitigation*	Mitigation assessment – procedures and outcomes, MRV, progress of actions, NAMAs, Clean Development Mechanism (CDM)	Energy, industrial process, agriculture, LULUCF, waste
Adaptation**	Adaptation frameworks, impact and vulnerability assessment – procedures and outcomes, adaptation actions, monitoring and evaluation	Water, agriculture, coastal resources, rangeland, livestock, human health, energy, forestry, biodiversity, fisheries

Table 5:
Key climate reporting areas and sub-elements

Source: Authors' compilation

Areas of reporting	Key sub-reporting elements	Sectors/category
Means of implementation (Support)**	Constraint and gaps, capacity building, finance, technology transfer	Overall (mitigation, adaptation, transparency)
Other reporting areas**	• Systematic observation – atmospheric, oceanic, and terrestrial climate observing systems • Research – climate process, socio-economic consequences, emission factor and activity data, and other relevant areas • Education, training, and public awareness – national- and state-level programmes, public access to climate information, and others	Overall

*Note: * indicates mandatory reporting and ** indicates voluntary reporting for developing countries*

In order to support developing countries in fulfilling these reporting requirements, the Convention has established the Consultative Group of Experts (CGE) (UNFCCC, 2019(d)). The CGE assists countries with technical advice and has developed various training modules across these areas of reporting (UNFCCC, 2019(e)). These training modules identify best practices in terms of the basic institutional capacity and knowledge capacity required to adhere to reporting obligations. While this institutional and knowledge capacity should jointly enhance the overall capacity to meet transparency requirements, there are other factors such as enforcement capability and political willingness that may serve as impediments on the path to attain transparency. It is important to take into account such aspects while studying a country's capacity for climate transparency. For the purpose of this study, we have taken three capacity aspects into account:

i. **Institutional capacity (IC):** refers to formal, domestic processes, such as the institutional structures, governance arrangements, and legal mandates, required for reporting on climate change- from GHG inventories to climate actions.
For example: Mandating institutions to collect relevant data, ensuring formal procedures for the MRV process, regular stakeholder engagement, provisions that ensure budgetary support to institutions.

ii. **Knowledge capacity (KC):** refers to subject matter expertise, or the technical know-how required to perform tasks.
For example: Knowledge of relevant tools and templates for reporting, expertise with respect to modelling capabilities across the sectors, awareness of the steps and procedures involved in collecting data.

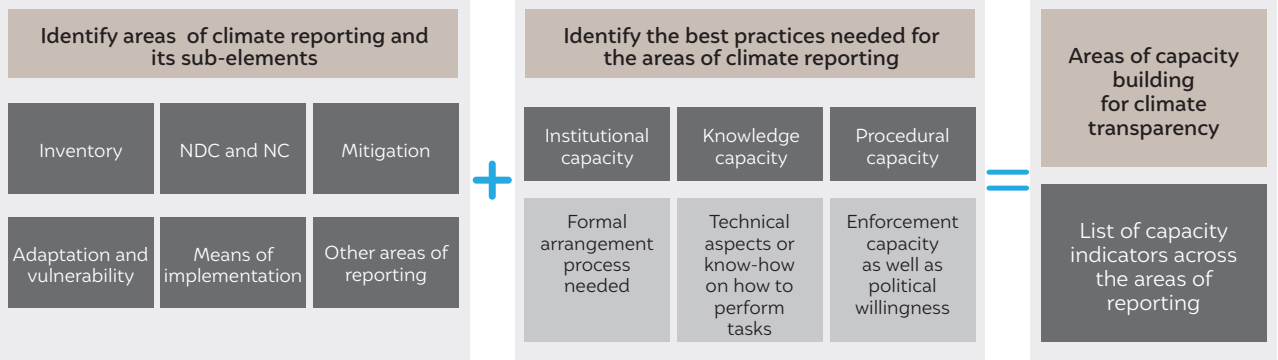
iii. **Procedural capacity (PC):** refers to enforcement capacity as well as political willingness of the government to ensure transparent reporting on climate action and support. It is judged on the basis of the country's ability to adhere to reporting obligations.
For example: Ability to adhere to higher tiers of inventory reporting, disclosure on the outcomes of the MRV process, reporting on the assumptions and methods adopted for reporting.

From the reporting obligations and training modules prepared by the CGE, the sub-elements of each capacity aspect are identified for each reporting area. Each identified element is termed as a capacity indicator, which collectively represents the areas of capacity building for climate transparency (ACB-CT). A detailed list of all the relevant capacity indicators and their sub-elements under ACB-CT has been included in the Annexures 2. These capacity indicators are not uniformly distributed, meaning that each area of reporting would have a different number of indicators. It is important to highlight that enhancing capacity building is a continuous and dynamic process and would have a constantly moving goal post. This

While institutional and knowledge capacity should jointly enhance the overall capacity to meet transparency requirements, there are other factors such as enforcement capability and political willingness that may serve as impediments on the path to attain transparency

means that countries' requirements will evolve alongside enhancements in reporting obligations, and as their capacity levels continue to improve over time.

Figure 3: Areas of capacity building for climate transparency

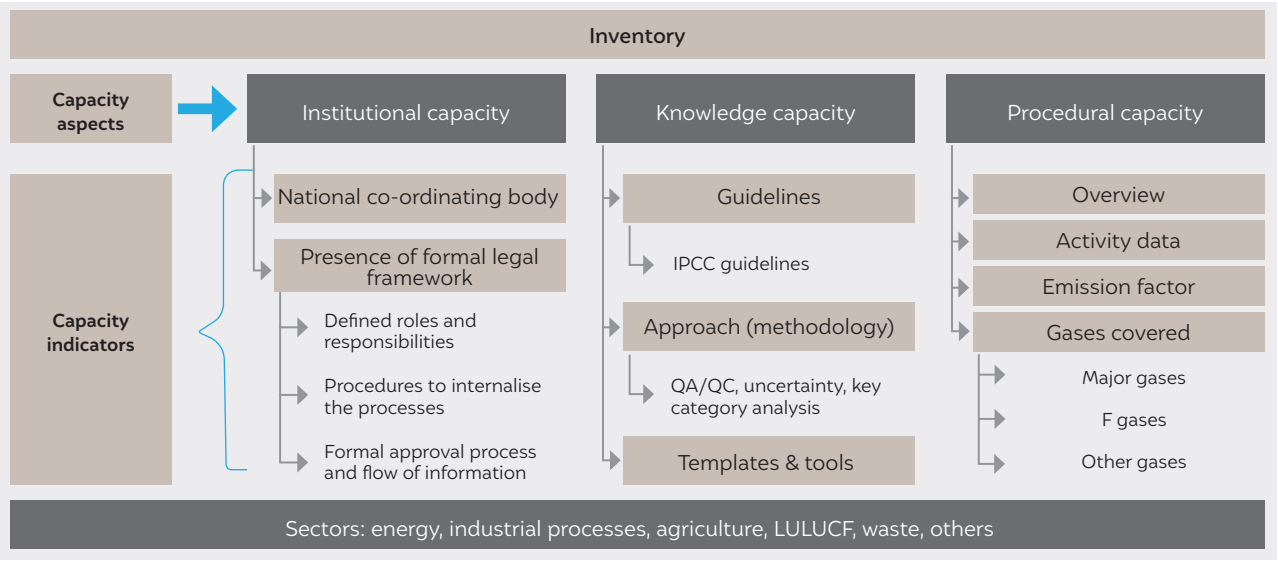


Source: Authors' formulation

4.1 Capacity indicators for inventory reporting

Inventory is the basic and most essential information required for climate transparency. For its institutional capacity aspect, the national coordinating body is identified as one of the core capacity indicators. Institution capacity also entails the presence of a formal legal arrangement which should clearly define the roles and responsibilities of the institutions involved and delineate processes to gather information and internalise reporting procedures. In case of knowledge capacity, the capacity indicator centres on the awareness and knowledge of IPCC Guidelines, quality assurance (QA) and quality control (QC) procedures, key category analysis, as well as the templates needed to report on emissions. For procedural capacity, the capacity indicators focus on overall disclosures that cover reporting on the following aspects – institutional arrangements, outcomes of QA/QC procedures, uncertainty analysis, and key category analysis. It also covers reporting on activity data, emission factors (use of tiers), and emissions of various greenhouse gases (GHGs) across sectors. The figure below highlights the main capacity indicators for the capacity aspects of inventory. A detailed list of individual indicators and sub-elements can be referred to in the Annexures 2.

Figure 4: Capacity indicators for inventory reporting



Source: Authors' formulation

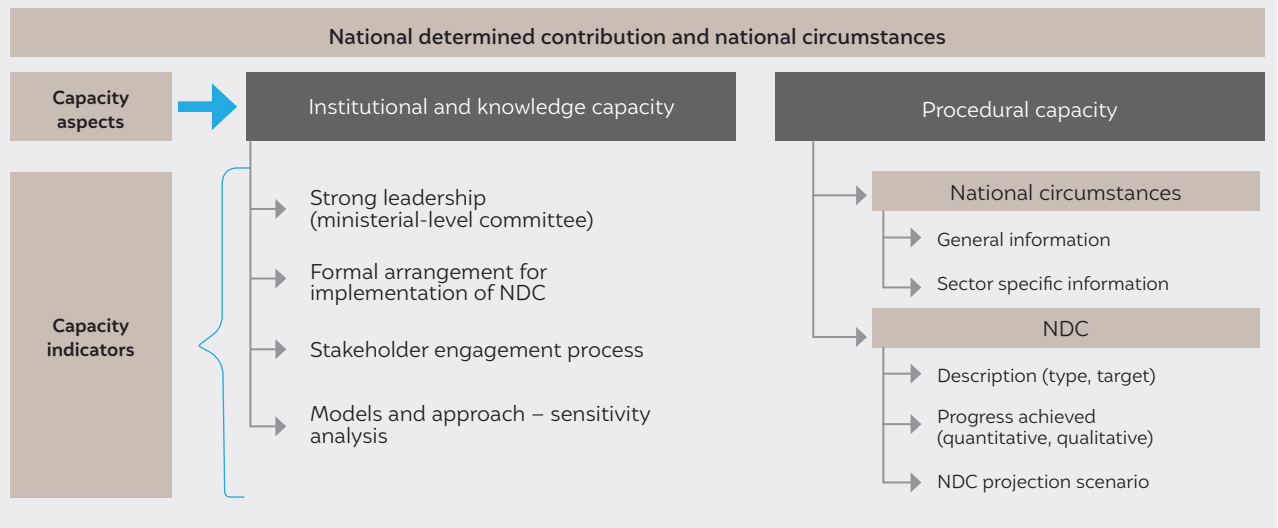
4.2 Capacity indicators for NDC and NCs reporting

While the features (commonly referred to as the design characteristics) of NDCs are still being shaped under the *Paris Agreement Rulebook*, reporting guidelines to communicate NDCs and their progress have been defined in the enhanced transparency framework. Most of the information needed for NDC reporting would overlap with other sections such as mitigation and adaptation because of the cross-cutting nature of NDCs. To ensure that there is no overlap, capacity indicators applicable to other sections are not included under the NDC. This has resulted in fewer capacity indicators across all capacity aspects of NDCs.

For institutional and knowledge capacity, the capacity indicators focus on establishing a strong political leadership for responding to climate change at the national level, maintaining essential provisions that ensure a favourable domestic environment for the implementation of NDCs, stakeholder consultation processes, and the development of models and approaches for NDCs implementation. In case of procedural capacity, capacity indicators centre on in-depth NDC disclosures which cover the following: type of NDC (absolute, intensity-based or others), clearly stated target, conditional or unconditional component. Apart from this, the capacity indicators for procedural capacity also cover disclosure on the progress (quantitative and qualitative) made towards achieving the NDC, projections of NDCs considering the various scenarios, and reporting on national circumstances (NCs).

The figure below showcases the main capacity indicators across the capacity aspects of NDC and NCs. A detailed list of individual indicators and its sub-elements can be found in the Annexures 2.

Figure 5: Capacity building indicators for NDC and NCs reporting

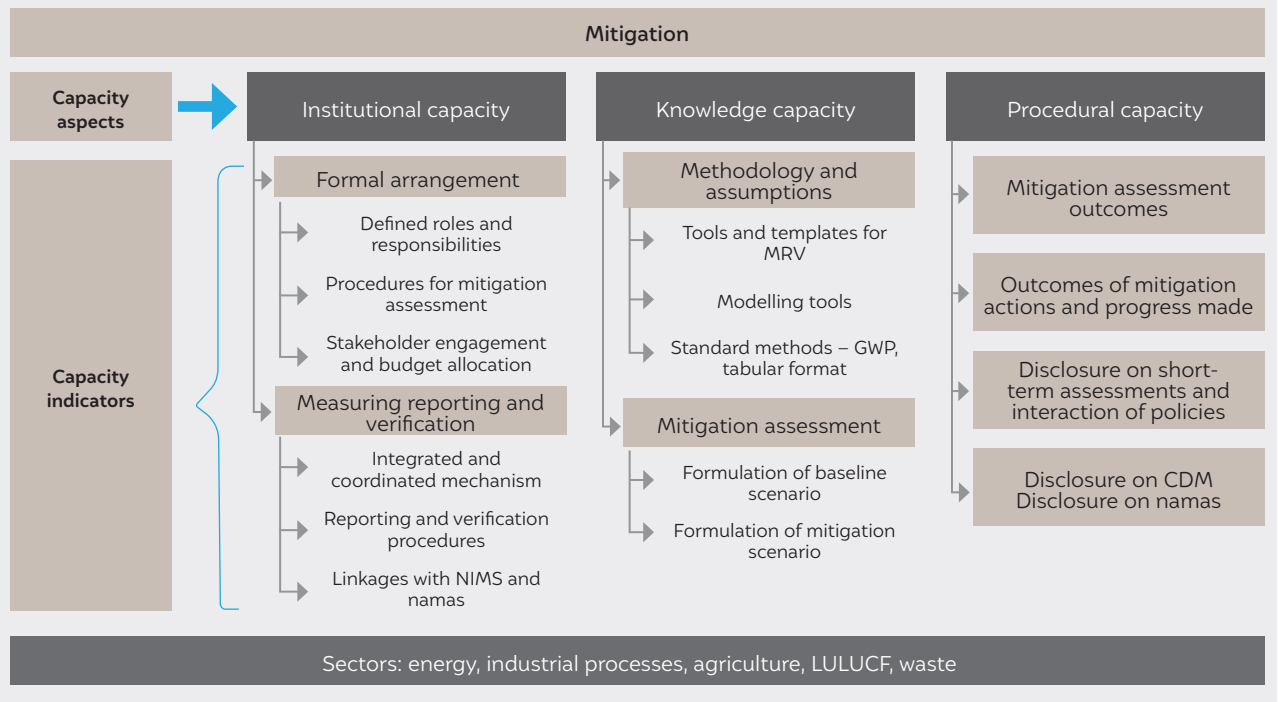


Source: Authors' formulation

4.3 Capacity indicators for mitigation reporting

Mitigation reporting is all about showcasing reductions in the GHG emissions responsible for global warming. The indicators for institutional capacity mainly focus on the formal arrangements and MRV of mitigation actions. For knowledge capacity, the indicators centre on the technical capabilities needed for mitigation reporting, such as the availability of modelling tools, knowledge required to formulate mitigation and baseline scenarios, and the use of tools and templates for MRV. In case of procedural capacity, indicators focus on the disclosure of the following aspects: outcomes of the mitigation assessment, outcomes of the mitigation action, short-term assessments, information on CDM and NAMAs. Figure 6 showcases the main capacity indicators across the capacity aspects of mitigation. A detailed list of individual capacity indicators and its sub-elements can be found in the Annexures 2.

Figure 6: Capacity indicators for mitigation reporting



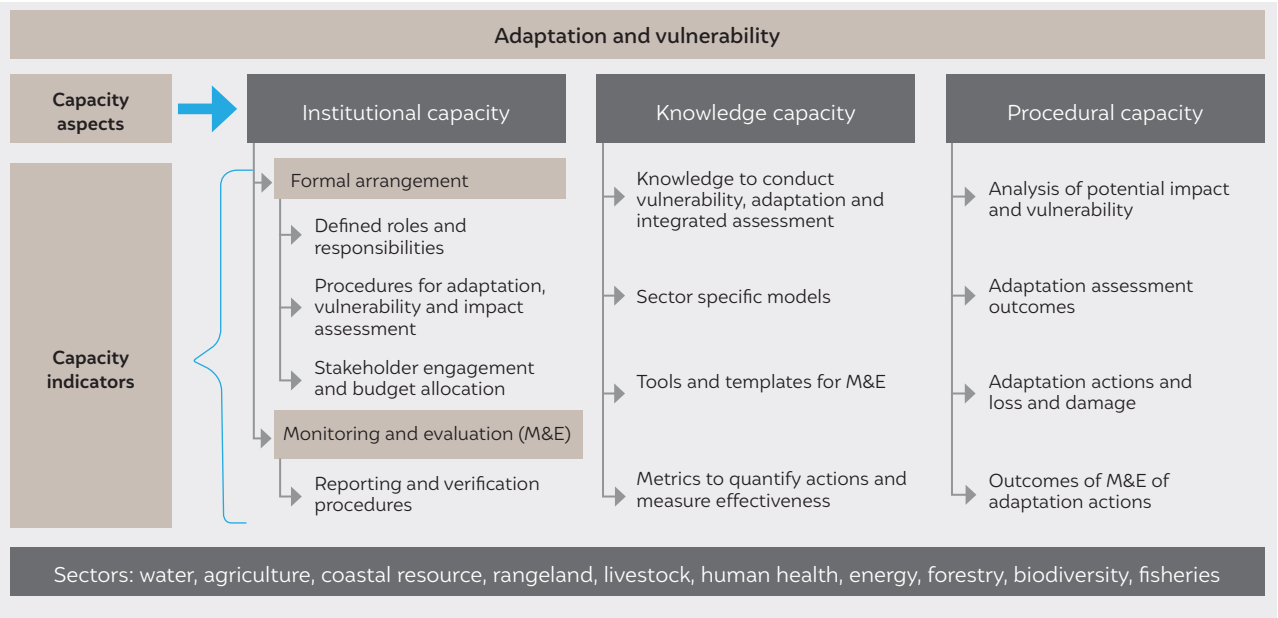
Source: Authors' formulation

4.4 Capacity indicators for adaptation and vulnerability reporting

Climate change impacts national economies, livelihoods, and natural ecosystems. Hence, the reporting of adaptation and vulnerability is considered as one of the important features of transparency. The indicators associated with institutional capacity for adaptation and vulnerability are formal legal arrangements and monitoring and evaluation (M&E) procedures of the adaptation actions (similar to institutional capacity of mitigation). In case of knowledge capacity, the capacity indicators are technical aspects such as: knowledge to conduct vulnerability, adaptation, and integrated assessments; availability of sector specific models; use of tools and templates for M&E processes; and formulation of metrics to measure the effectiveness of actions. For procedural capacity, indicators focus on the disclosure of the following aspects: analysis of potential impact and vulnerability, outcomes of adaptation assessments, adaptation measures undertaken, and outcomes of M&E of

climate actions. Figure 7 showcases the main capacity indicators across the capacity aspects of adaptation and vulnerability. A detailed list of individual capacity indicators and their sub-elements can be seen in the Annexures 2.

Figure 7: Capacity indicators for adaptation and vulnerability reporting

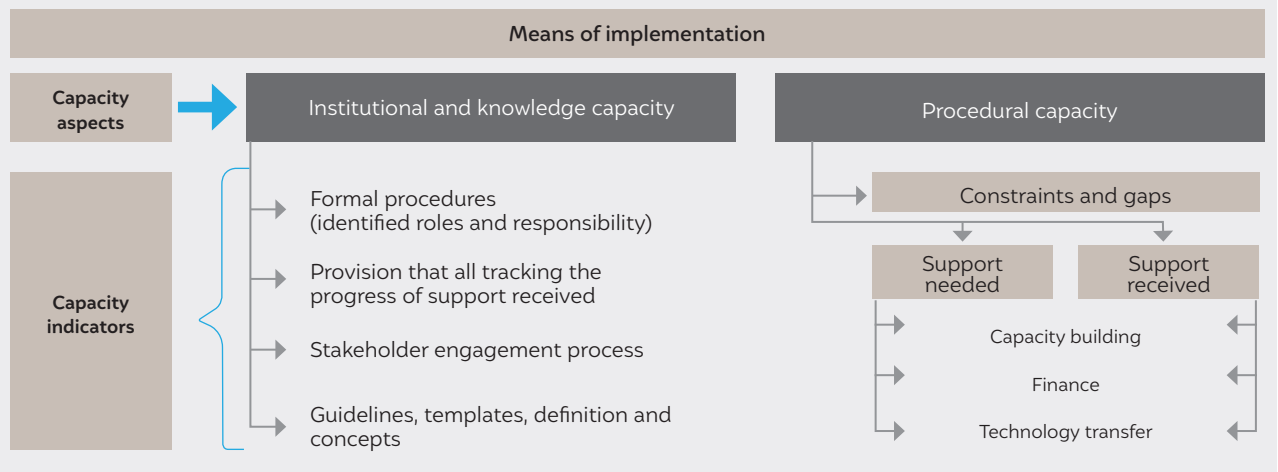


Source: Authors' formulation

4.5 Capacity indicators for means of implementation reporting

Not all the developing countries have the knowledge and the tools to undertake climate action. Hence, developing countries are encouraged to identify their needs and constraints (for mitigation, adaptation, and transparency) in the form of capacity building, finance, and technology transfer. The capacity indicators associated with institutional and knowledge capacity for means of implementation are: presence of a formal legal arrangement, presence of provisions for tracking the support received and progress made in enhancing capacities, presence of a stakeholder engagement process, and clarity with respect to the conceptual definition of what constitutes capacity building or climate finance to reduce instances of double counting while reporting. The indicators of procedural capacity focus on the disclosure of the following aspects: capacity constraints and challenges to undertaking mitigation, adaptation, and other obligations (such as climate reporting); and support needed and received in the form of capacity building, financial support, and technology transfer. Figure 8 showcases the main capacity indicators across the capacity aspects of means of implementation. A detailed list of individual capacity indicators and its sub-elements can be obtained in the Annexures 2.

Figure 8: Capacity indicators for means of implementation reporting

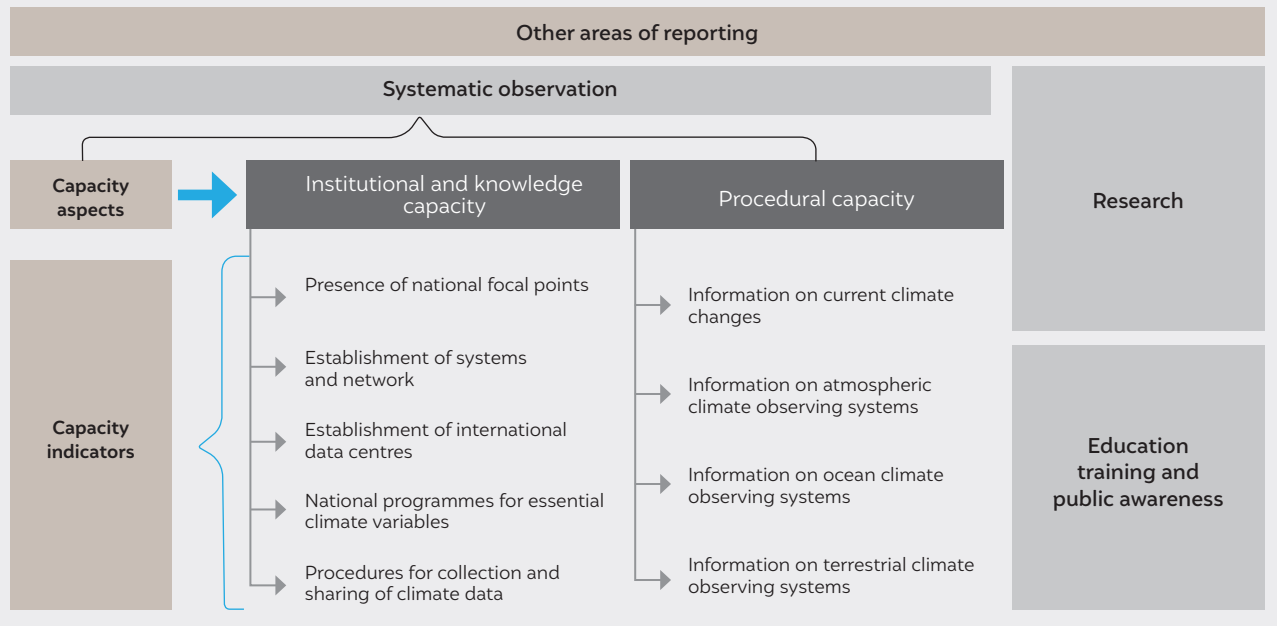


Source: Authors' formulation

4.6 Capacity indicators for other areas of reporting

Other areas of reporting cover disclosures on systematic observations (global climate change observing systems), research across the sectors, education, training, and public awareness. For systematic observation, the indicators associated with institutional and knowledge capacity are: presence of national focal points, establishment of systems and networks as well as international data centres, establishment of procedures for data collection, and existence of national programmes for essential climate variables. In case of procedural capacity, the capacity indicators focus on the disclosure of the following aspects: information on current climate changes and information on essential climate variables such as atmospheric essential climate variables, oceanic essential climate variables, and terrestrial essential climate variables. The figure below showcases the main capacity indicators across the capacity aspects of other areas of reporting. A detailed list of individual capacity indicators can be found in the Annexures 2.

Figure 9: Capacity indicators for other areas of reporting

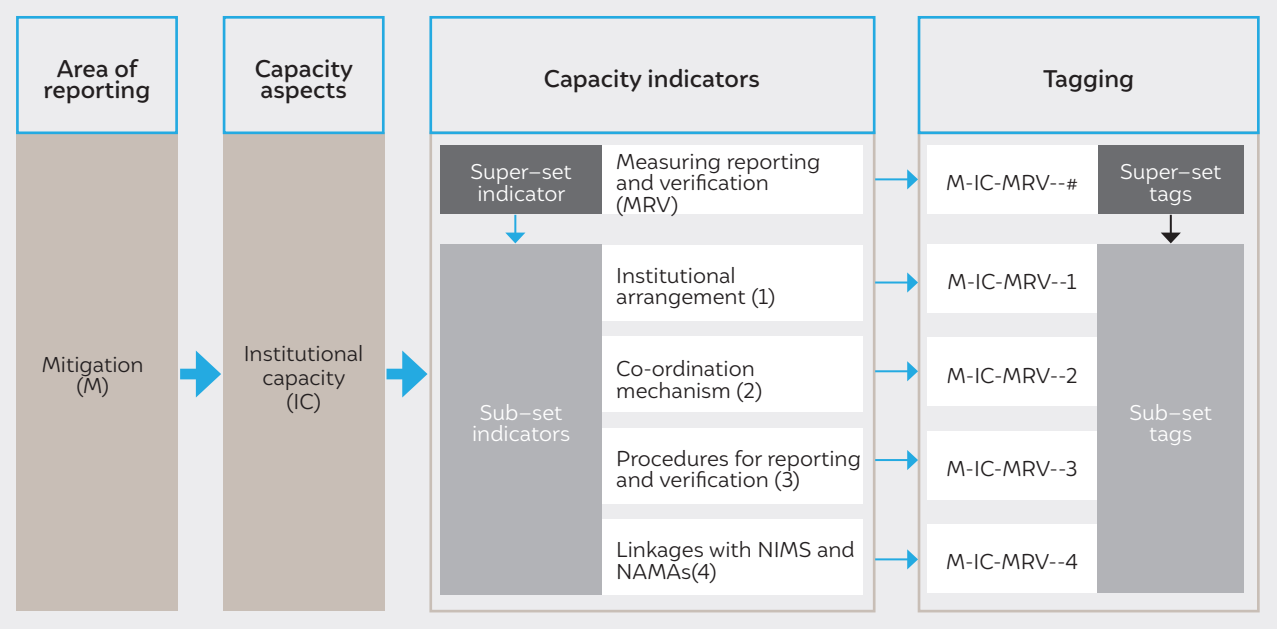


Source: Authors' formulation

4.7 Tag formulation

There are around 500 capacity indicators across all areas of reporting. These indicators are generic in nature and are also cross cutting across the sectors (see sector applicability in Table 5). In order to differentiate between these capacity indicators, each one of them is assigned a unique tag. A hierarchical approach is followed in assigning the tags, where the sub-set indicator builds upon the tag assigned to the super-set indicator. For example, as seen in Figure 10, one of the important aspects of institutional capacity for mitigation reporting is measuring the reporting and verification of actions (which has four sub-set indicators). The tag assigned to the coordination mechanism under MRV of mitigation reporting is "M-IC-MRV--2", where "M", "IC", and "MRV" represent the tags of mitigation, institutional capacity and measuring, and reporting and verification, respectively (see the brackets). Also, the symbol "#" is used to represent all the sub-set indicators of a super-set indicator, which in this case is M-IC-MRV--# and it represents four sub-set indicators.

Figure 10: Tag formulation



Source: Authors' formulation

5. Assessment methods

It is important to examine capacity building efforts, not just in the form of financial or technical support received, but also in terms of their outcomes, and the development of standalone systems capable of learning without continuous hand-holding. There is a need to bring in more clarity on following aspects:

- What are the critical needs for enhancing capacity across multiple areas?
- Was support received against all the historical needs expressed?
- How have different support activities across various projects and timelines helped developing countries build their capacity?
- What are the areas where issues with respect to capacity retention are visible?

The assessment methods defined under CBAM aim to answer all these questions. Also, it would facilitate tracking of progress made in enhancing capacity and formulation of improvement plans.

5.1 Capacity assessment: establishing the baseline for capacity and gaps

The main objective of capacity assessment is to understand the present capacity against the ACB-CT formulated. It also aims to identify the gaps in existing systems and processes. For this, an evidence-based approach is adopted to evaluate the extent to which a country has the capacity to adhere to the indicators of ACB-CT.

Parameter	Score	Explanation
Is there	1	Capacity is visible
Partly there	0.5	Capacity is partly visible
Is not there	0	Capacity is not there
Reported	1	Indicator reported to UNFCCC (or reported in the public domain)
Not reported	0	Indicator not reported to UNFCCC (or not reported in the public domain)
Unclear	UC	Evaluator is not clear about the capacity (needs to verified)
Not a sector specific indicator	NSS	Indicator is not relevant for sector specific evaluation
Sector specific indicator	SS	Indicator is relevant for sector specific evaluation
Not applicable	NA	Indicator is not applicable as country does not carry out measures for that indicator

Table 6: **Likert scale for capacity assessment**

Source: Authors' formulation

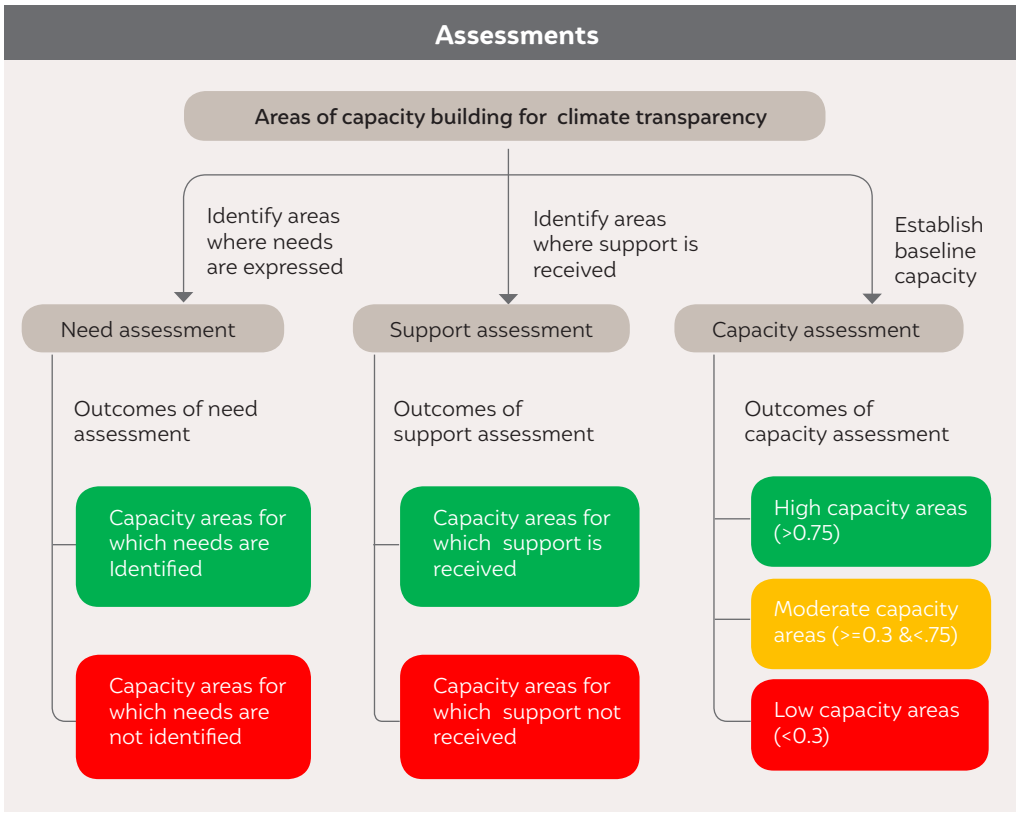


Figure 11: **Block diagram of assessment procedures**

Source: Authors' formulation

This evaluation is based on extensive secondary research, which comprises going through already existing climate reporting documents (NATCOMs, BURs), as well as the best available information in the public domain. Based on the quality of information (content) available, the Likert scale scoring system (maximum 1 to minimum 0) is used to indicate the capacity with respect to a specific indicator of the ACB-CT (see Table 6). Further, it is important to note that individual expertise in the subject matter is critical to retrieve, validate, and justify the evaluation of these indicators.

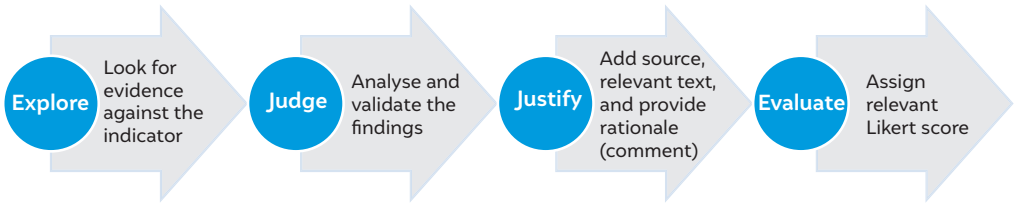


Figure 12:
Steps involved in capacity assessment

Source: Authors' formulation

There are cases where indicators of ACB-CT are applicable to more than one sector. For such cases, the indicator is evaluated for all the relevant sectors and a summed value of all the applicable sectors becomes the score of that indicator. In the end, the capacity could be assessed at various levels of hierarchy by aggregating the scores of the sub-set indicators. For the purpose of analysis, three capacity levels are defined based on the capacity score below:

Capacity levels	Capacity score	Nomenclature
High capacity	>=0.75	H
Moderate capacity	>=0.3 and <0.75	M
Low capacity	<0.3	L

Table 7:
Levels of capacity

Source: Authors' formulation

Note on figure 13

The illustration in Figure 13 showcases the capacity assessment for mitigation reporting. It is important to note that mitigation is applicable across six sectors, as highlighted in Table 5. But for this specific example, we have taken three sectors (energy, industrial processes, and agriculture) and overall category across few capacity indicators.

It is visible from the assessment that formal procedures for data collection and mitigation assessment are assessed as "is partly there", because the country lacks permanent processes and the approach towards mitigation reporting is project-oriented. Hence, the actual score (0.5) and the maximum score (1) are calculated for them across the sectors, and in the end, the ratio of the actual score to the maximum score represents the capacity. A capacity indicator for which there is no clarity is assessed as "unclear". No scores are assigned to such indicators. For example, it is not clear whether the MRV arrangement ensures linkages with the national inventory management system (NIMS) and NAMAs.

The hierarchy followed for tagging indicators is also followed for the capacity assessment to sum up the score. This means that the score of institutional capacity is the sum of all super-set indicators, and each super-set indicator is the sum of its respective break-up criteria (sub-set indicators). All the indicators that are not applicable are removed from the scoring system. In this illustration, the total actual score for institutional capacity is 8.5 and total maximum score is 21. Hence, the overall institutional capacity is 40 per cent (moderate capacity) which is the ratio of the total actual score to the total maximum score.

Figure 13: **Capacity assessment illustration**

Tags	ACB-CT	Source	Text	Evaluator's Comment	Evaluation			Actual Score				Maximum				"Capacity (Ratio)"
					Energy	Industrial Processes	Agriculture	Energy	Industrial Processes	Agriculture	Total	Energy	Industrial Processes	Agriculture	Total	
M-----#	Mitigation															
M-IC----#	Institutional Capacity							3	3	2.5	8.5	7	7	7	21	40%
M-IC-IA---#	Institutional arrangement							2	2	2	6	3	3	3	9	70%
M-IC-IA---1	National focal point	BUR II / NC II		Ministry of Environment in the national focal point	Is there	Is there	Is there	1	1	1	3	1	1	1	3	100%
M-IC-IA---2	Procedures for data collections, mitigation assessment	BUR II / NC II		No formal procedures in place (Adhoc and project oriented way)	Is partly there	Is partly there	Is partly there	0.5	0.5	0.5	1.5	1	1	1	3	50%
M-IC-IA---3	Formal arrangement for stakeholder engagement	BUR II / NC II		No formal procedures in place (Adhoc and project oriented way)	Is partly there	Is partly there	Is partly there	0.5	0.5	0.5	1.5	1	1	1	3	50%
M-IC-MRV---#	MRV							1	1	0.5	2.5	4	4	4	12	21%
M-IC-MRV---1	Institutional arrangement	BUR I / BUR II		Partly seen for few sectors	Is partly there	Is partly there	Is not there	0.5	0.5	0	1	1	1	1	3	33%
M-IC-MRV---2	Coordination mechanism	BUR I / BUR II		No formal procedures in place (Adhoc and project oriented way)	Is partly there	Is partly there	Is partly there	0.5	0.5	0.5	1.5	1	1	1	3	50%
M-IC-MRV---3	Formal procedures to adhere to methodology	BUR I / BUR II		No evidence found	Is not there	Is not there	Is not there	0	0	0	0	1	1	1	3	0%
M-IC-MRV---4	Procedures for reporting and verification	BUR I / BUR II		No evidence found	Is not there	Is not there	Is not there	0	0	0	0	1	1	1	3	0%
M-IC-MRV---7	Linkages with NIMS/NAMAs	BUR I / BUR II		Doubt	Unclear	Unclear	Unclear	0	0	0	0	0	0	0	0	NA

Source: Authors' formulation

5.2 Stated need assessment: nation's perspective

A country expresses its constraints and gaps as well as its needs for ensuring transparency in its submission to UNFCCC (NATCOM, BUR) and through technical ICA reports. Figure 14 illustrates the various sources through which a country can express its needs to enhance transparency.

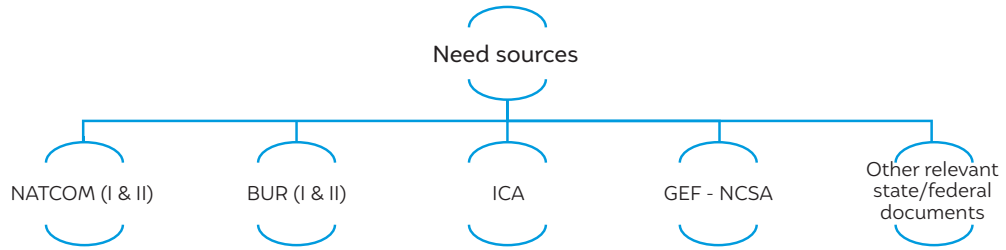


Figure 14:
Sources for identification of needs

Source: Authors' formulation

This assessment involves textual analysis of the stated transparency needs in these existing literature bases. The identified historical needs are mapped to unique tags of ACB-CT depending on the kind of capacity it aims to build across the area of reporting. This would help in understanding what the key priorities are, as well as in identifying the areas where needs were not expressed. For the purpose of analysis, a maximum of three tags can be assigned to each need. In cases where more than three tags could relate to a specific need, a super-set tag is assigned. A step-by-step procedure towards the tagging of historical needs can been seen in Figure 15.

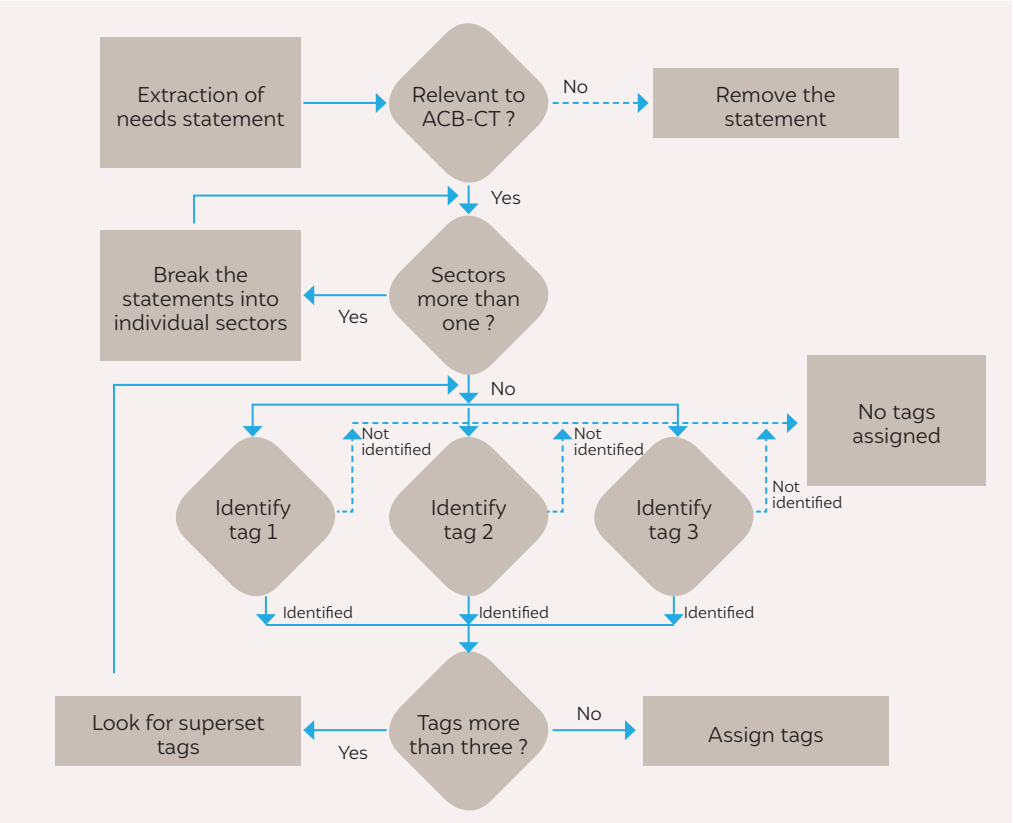


Figure 15:
Decision tree for tagging the stated need

Source: Authors' formulation

Sr no.	Needs identification	Sector	Tags			Capacity Indicators associated with needs			
			Tag 1	Tag 2	Tag 3	Tag 1	Tag 2	Tag 3	Total
1	Strengthening and building of human and institutional capacity in India for energy and environment sector modelling	Energy	M-IC----4	M-KC-AP---#	NA	1	6	0	7
2	Forestry: Establishment of a national MRV system for NAMAs, REDD+, and CDM projects	LULUCF	M-IC-MRV---#	NA	NA	7	0	0	7
3	Enabling better coordination among relevant regions and institutions to design, implement and measure, report, and verify (for all sectors)	All	M-IC-MRV---2	NA	NA	5	0	0	5

Table 8:
Need assessment illustration
Source: Authors' formulation

Note on table 8

As seen in the Table 8, three needs are extracted from the literature review, against which tags as well as sectors are identified. For the second need, it could be interpreted that for the LULUCF sector, the entire MRV system is needed, hence a super-set indicator (M-IC- MRV---#) is assigned (see Figure 10 for tagging details). This superset indicator has about seven sub-set capacity indicators. In contrast, there is a case where only one tag could fulfil the need, in such a case, the other two tags become not applicable. See the third need, where only the sub-set indicator tag is assigned. But since this need is expressed for all the sectors, the number of capacity indicators associated with it is five.

5.3 Support assessment: learnings from the past

There are many sources from which one can trace the support provided towards capacity building for transparency (see Figure 16). The capacity building portal under the Convention acts as the repository of all capacity building activities related to climate change. These activities are categorised on the basis of priority areas defined under the Convention. Apart from this portal, there are other donors as well as implementation agencies' databases that provide information on support projects. Figure 16 showcases a non-exhaustive list of various sources where information (in the form of project proposals and evaluation reports) related to the support received for enhancing transparency capacity is available.

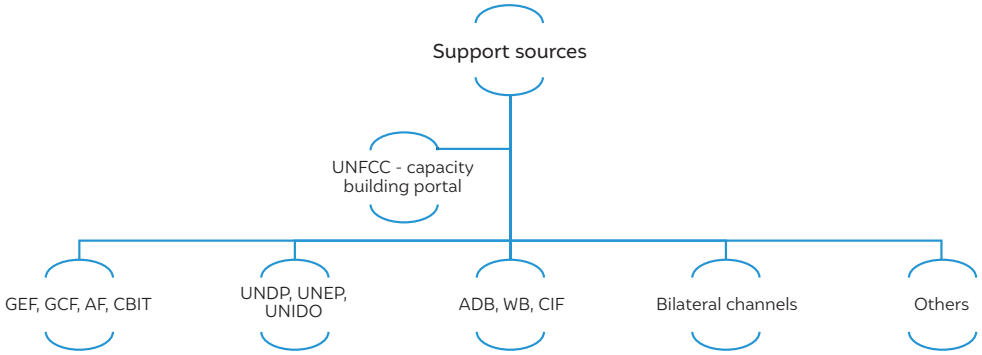


Figure 16:
Sources for capacity building support

Source: Authors' formulation

The support assessment involves data mining for various information on the support received, such as the name of the project, the countries involved in it, activities undertaken, the outcomes (output) achieved, and the finance received for each activity. Similar to the previous assessment, unique tags are assigned to the support activities. In order to determine the indicative financial support received by any country, finance associated with each activity is uniformly distributed among all the countries involved. The resultant amount is divided equally among the tags assigned to that activity. This would lead to a better understanding of the coverage of support and the amount received across all the capacity indicators. A step-by-step procedure for tagging support activities can been seen in Figure 17.

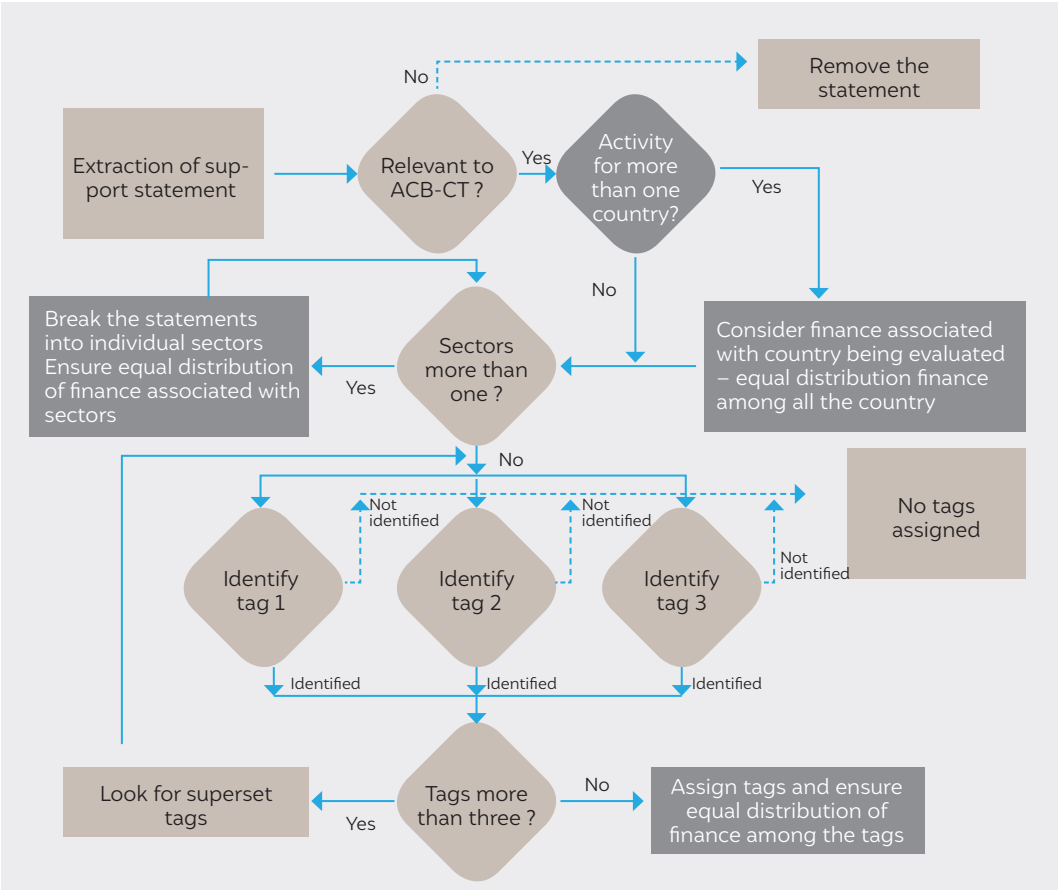


Figure 17:
Decision tree for tagging of support assessment

Source: Authors' formulation

Note on table 9

As seen in the Table 9, four support activities are extracted from the literature review, against which tags are assigned. For the fourth support, it could be interpreted that it is provided to strengthen MRV systems for the waste sector, which would facilitate reporting for NAMAs; hence, two super-set indicator tags (M-IC-MRV---#, M-PC-NAMA--#) are assigned. In contrast, there are cases where only one tag could fulfil the need; in such cases, the other two tags become inapplicable (see the third support). Further, the finance associated with the tags is also distributed. In the case of the second support, the finance associated with that activity is divided into two (i.e., 585,000/2 = 292,500) and attributed to each tag (M-KC—AP--#, M-PC-AO---#) at the backend.

ID	Support identified	Sector	Finance support (USD)	Tags			Capacity indicators associated with support			
				Tag 1	Tag 2	Tag 3	Tag 1	Tag 2	Tag 3	Total
140	Progress on national actions to reduce GHG emissions	All	359,634	M-PC-A&P---12	M-PC-A&P---13	NA	16	4	0	20
188	Mitigation potential for energy and land-use change	Energy & LULUCF	585,000	M-KC—AP--#	M-PC-AO---#	NA	10	9	0	19
202	Information on mitigation actions and their effects, including methodologies and assumptions	All	2,328,750	M-KC—A--#	NA	NA	16	0	0	16
206	Establishment of MRV system for reporting GHG mitigation and NAMAs	Waste	1,300,000	M-IC-MRV---#	M-PC-NAMA--#	NA	8	5	0	13

Table 9: Support assessment illustration

Source: Authors' formulation

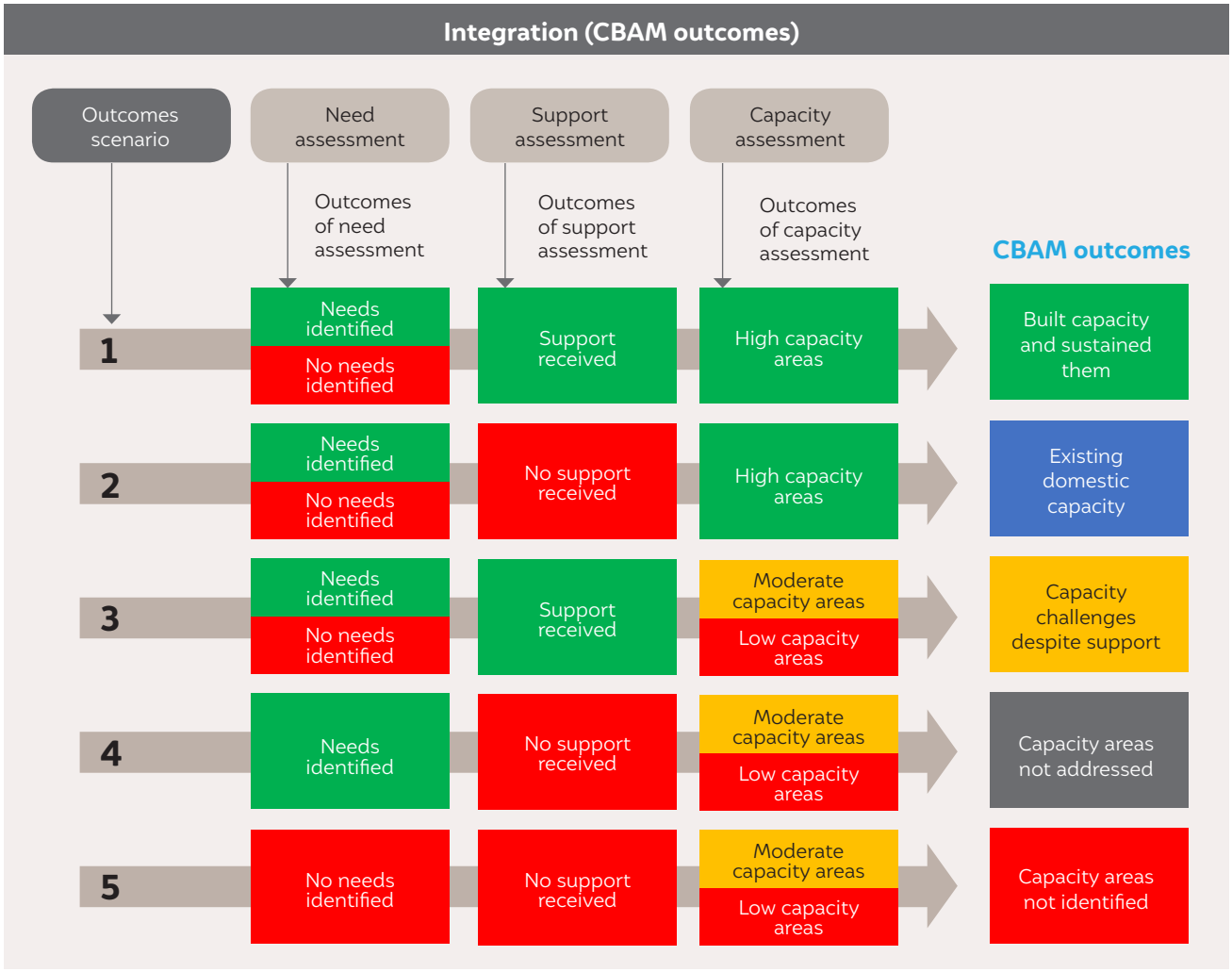
5.4 Integrating assessments: CBAM outcomes

All three assessments are standalone assessments. But a common reference is established when the assessments are mapped onto the tags of ACB-CT. Hence, for a specific capacity indicator of ACB-CT, its historically stated needs, the support received, and the present capacity can be established (see Figure 18). This would help in identifying areas of concern by establishing critical gaps in the capacity, prioritising needs, and identifying repetitive support across all the capacity indicators. Based on this, the outcomes of CBAM can be summarised for the five scenarios:

i. Existing domestic capacity – indicators where no support is received but capacity exists
ii. Built capacity and sustained them – indicators where support has been received and capacity is built
iii. Capacity challenges despite support received – indicators having low or moderate capacity, despite needs being identified and support received
iv. Capacity area not addressed – indicators having low and moderate capacity, for which needs are identified but no support is received

Capacity area not identified – indicators where no needs are identified and no support is received despite visible gaps in capacity

Figure 18: CBAM – outcomes



Note: In the later section, each CBAM outcome follows the colour theme as assigned in this figure
Source: Authors' formulation

India's

Initial National Communication to the United Nations Framework Convention on Climate Change

Government of India
2004

India

Second National Communication to the United Nations Framework Convention on Climate Change

Ministry of Environment & Forests
Government of India
2012

INDIA

First Biennial Update Report to the United Nations Framework Convention on Climate Change

Ministry of Environment, Forest and Climate Change
Government of India
December 2015

India

Second Biennial Update Report to the United Nations Framework Convention on Climate Change

So far India has submitted two National Communication and two Biennial Update Reports to the UNFCCC.

6. India's climate transparency

India is amongst the countries in the world that are the most vulnerable to climate change. Changes in monsoon patterns are affecting around 650 million Indians who depend on rain-fed agriculture for their livelihoods. The country, as a whole, is experiencing a 1–1.5°C increase in the mean annual air temperature, which has profound implications for agriculture and crop production. The loss and damage resulting from extreme events related to climate change are estimated to be at USD 5–6 billion per annum. About USD 1 trillion would be needed to adapt to the adverse impacts of climate change during 2015–2030 (IIM-A, 2015). Additionally, India is the fourth-largest emitter of carbon dioxide in the world and accounted for about seven per cent of global emissions in 2017 (The Hindu, 2018). All of this demands that India undertake ambitious climate actions (mitigation and actions) and contribute to global efforts to reduce global warming.

Owing to the potential impact of climate change, the Government of India is committed to playing a constructive role in combating it. Most of its policies have multiple objectives that ensure the conservation of nature without undermining the country's development goals. In 2008, the National Action Plan for Climate Change (NAPCC) was introduced to focus on eight areas, namely: solar energy, energy efficiency, sustainable habitat, water, Himalayan ecosystem, green India, sustainable agriculture and strategic knowledge for climate change. In 2010, India took a voluntary pledge to reduce the emission intensity of its GDP by 20–25 per cent of its 2005 level by 2020 (excluding emissions from agriculture). Within the Paris Agreement, India has a target to reduce its emission intensity by 33 to 35 per cent by 2030 from its 2005 level. There is also an ambitious plan to create additional carbon sinks of 2.5 to 3 billion tonnes of CO_2e by 2030 through increased forest cover. In addition, India's NDC specifies plans to ramp up renewable power capacity and increase the overall share of non-fossil fuels in power generation(GoI, 2015).

Given these global commitments, India is obliged to communicate the outcomes of its climate actions through NATCOMs and BURs. Moreover, adhering to reporting obligations is essential for India to demonstrate the nation's low carbon development efforts to the global community, as well as to understand the domestic impact of climate change.

Owing to the potential impact of climate change, the Government of India is committed to playing a constructive role in combating it

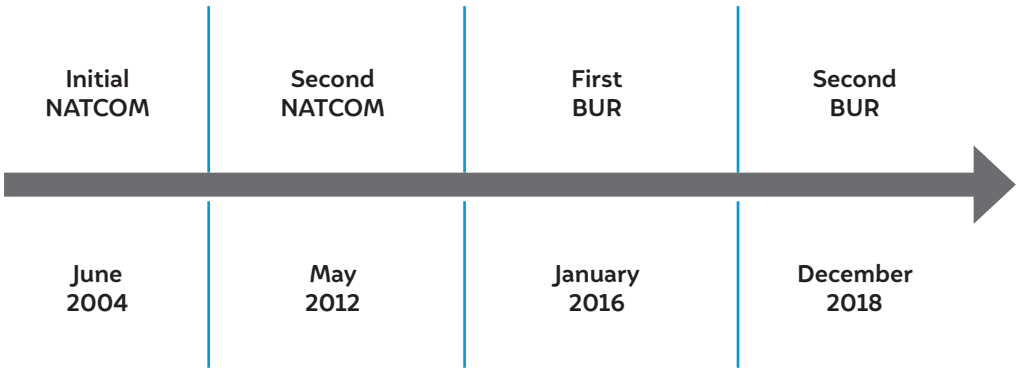


Figure 19: India's communication submission timeline

Source: Authors' analysis

As of now, India has submitted four communications (see figure 19) to UNFCCC and is in the process of preparing the third NATCOM. In these communications, India has highlighted its capacity constraints and identified various needs for enhancing its capacity to report accurate and credible data in a timely manner. Further, the transparency framework of the Paris Agreement would demand more enhanced climate reporting. Hence, it is important to not only bridge the present capacity gaps, but also to ensure that the domestic arrangements be appropriate and suitable for meeting the newer reporting requirements under the Paris Agreement.

6.1 Transparency status quo

In this assessment, The Council has undertaken a textual analysis of the needs expressed in four communications submitted by the Government of India. For support assessment, many multilateral and bilateral databases were explored to identify financial and non-financial support received for strengthening capacity areas for enhanced climate reporting. A detailed list of support projects related to climate transparency is provided in the annexures. For establishing the baseline capacity for the ACB-CT, evidence was obtained from existing literature available in the public domain and focus group discussions was organised at CEEW with subject experts.

Sources of need assessment	Sources for support assessment
National Communication I & II Biennial Update Report I & II	Database: • Capacity Building Portal (UNFCCC) • UNDP • GEF • Germany's International Climate Initiative

Table 10: Sources for need and support assessment

Source: Authors' analysis

An indicative financial support received for strengthening institutional, knowledge, and procedural capacity for climate reporting is about USD 74.7 million, of which USD 42 million was received for preparing of communications (three NATCOMs and three BURs). While looking at the support received across the areas of reporting, uniform distribution is observed for inventory, mitigation, and adaptation (see Figure 20).

An indicative financial support received for strengthening institutional, knowledge, and procedural capacity for climate reporting is about USD 74.7 million, of which USD 42 million was received for preparing of communications

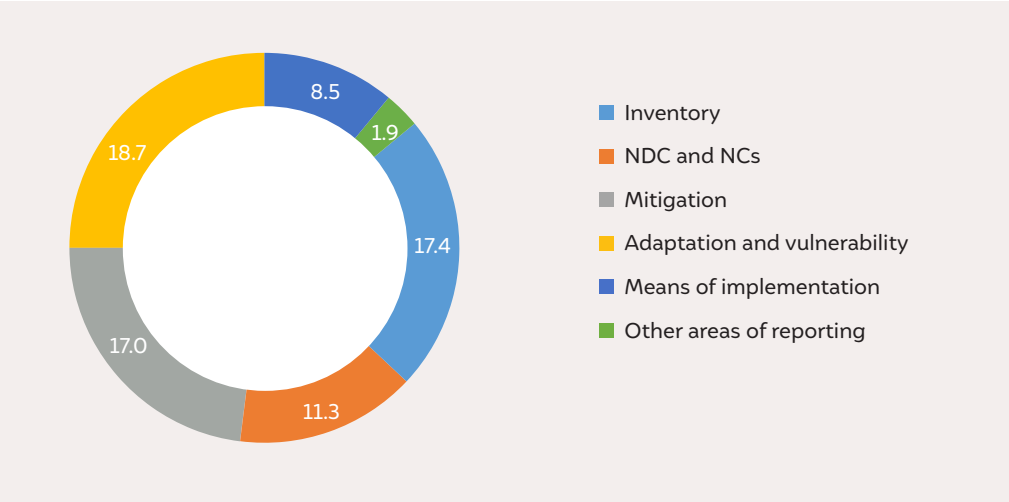
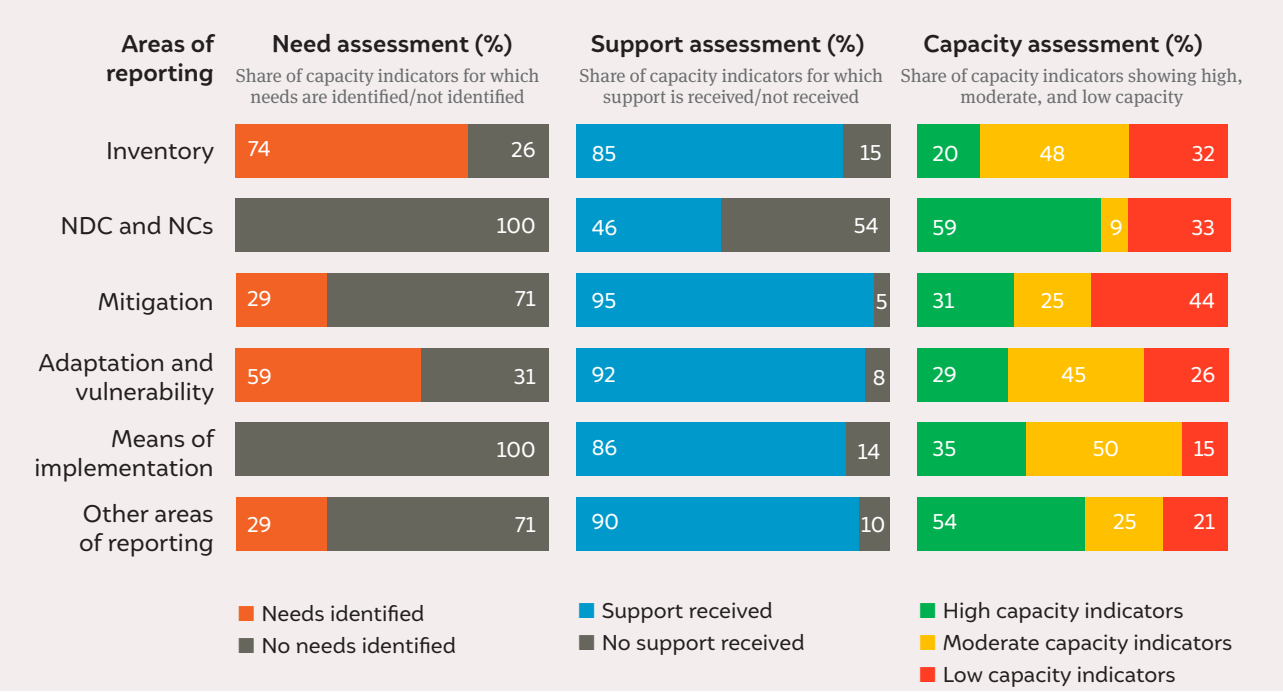


Figure 20: **Indicative finance support (in million USD) received by India for climate transparency**

Source: Authors' analysis

Figure 21 showcases the outcomes of assessments for India. It is evident from the need assessment that enhancing inventory (74 per cent) and adaptation (59 per cent) reporting were major stated needs. On the other hand, support was received for about 85-95 per cent of the capacity indicators for most of the areas of reporting (except NDC and NC). This is because the support activities and outcomes were broadly stated, and they related to multiple capacity indicators. Also, the biggest area of concern is the capacity associated with mitigation reporting, as 44 per cent of its capacity indicators are low capacity indicators.

Figure 21: **Outcomes of stated needs assessment, support assessment, and capacity assessment**



Source: Authors' analysis

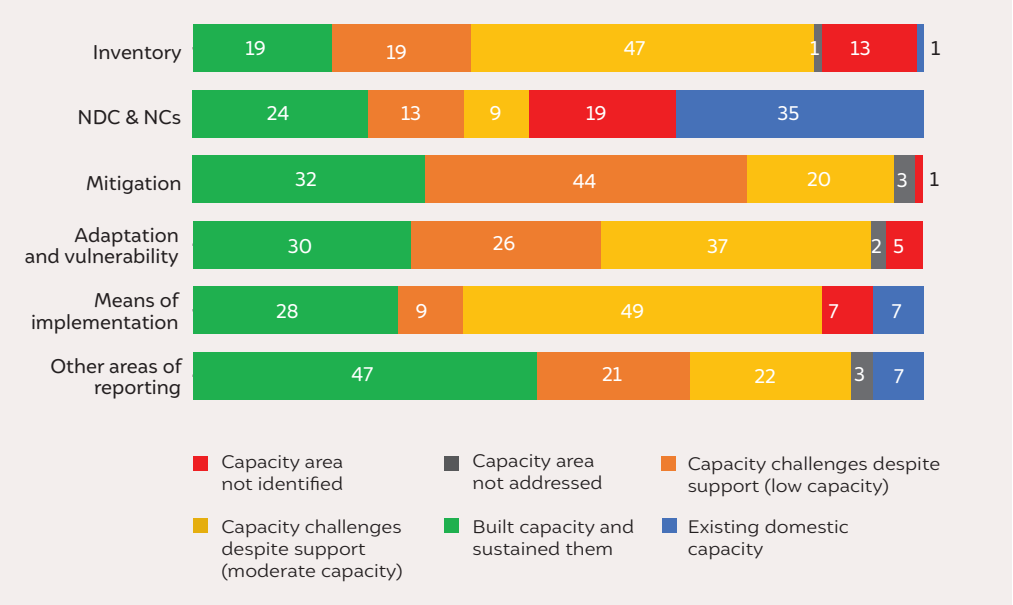


Figure 22:
Overall outcomes of CBAM (%)

Source: Authors' analysis

Outcomes of the CBAM (see Figure 22) vary across the areas of reporting. A good sustained capacity for NDC and NC reporting is visible, which is supported by the existing domestic capacity. Also, for inventory, mitigation, adaptation, and means of implementation reporting, capacity challenges (in terms of lack of retention or support being insufficient) were observed for about 60 per cent (and more, for a few cases) of their capacity indicators.

6.2 Inventory

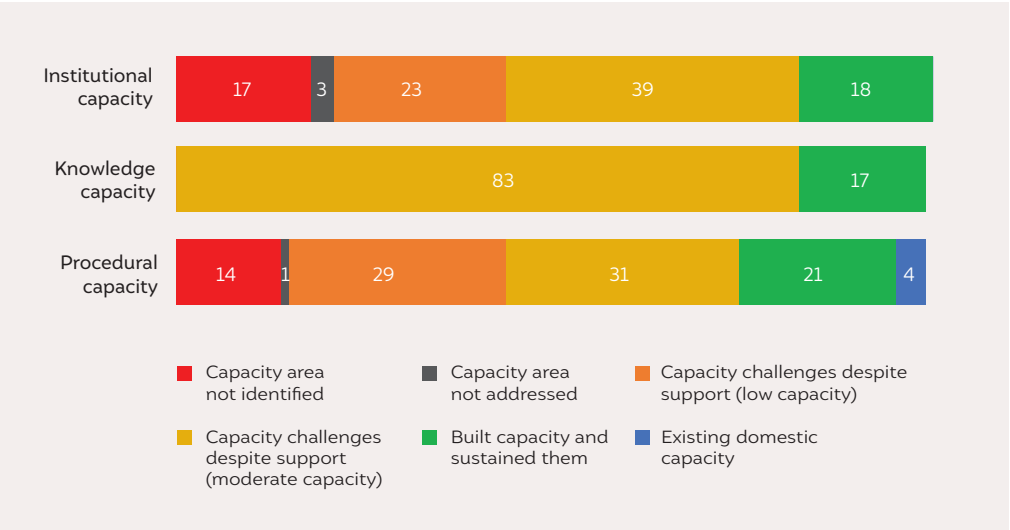


Figure 23:
CBAM outcomes – capacity aspects of inventory (%)

Source: Authors' analysis

Institutional capacity

- **National co-ordinating body**: India has established the NATCOM cell, which is placed within the Ministry of Environment, Forest and Climate Change. The NATCOM cell is responsible for overall management, coordination with other agencies, and engagement with the Convention (GoI, 2018). However, the institutional capacity of the NATCOM cell needs to be strengthened so that it can act as a legal authority with the power to mandate other institutions to report on climate change.

- **Defined roles and responsibilities**: Presently, the approach for inventory reporting is project-oriented, and there is no focus on defining a formal legal arrangement for the roles and responsibilities associated with the inventory preparation process. This is important to ensure a continuous reporting process.
- **Data collection procedures**: For many ministerial departments and governmental organisations, there are sound formal arrangements to report activity data, especially for the energy and LULUCF sectors. But there is a need for formal arrangements to govern the sharing of restricted or confidential data, ensure the timely reporting of data, and establish procedures to ensure the conversion of raw data to useful inventory data.
- **Procedures to internalise the process**: The Government of India has taken concrete steps towards creating sustainable institutional arrangements for the preparation of NATCOMs and BURs on a continuous basis. India has constituted a National Steering Committee, chaired by the Secretary of the Ministry of Environment, Forest, and Climate Change (MoEFCC), to prepare and submit the BUR. it has also created the Technical Advisory Committee, with members from government, academia, and civil society, to oversee the preparation of the BUR (GoI, 2018). However, their functioning depends on the international support received for the preparation of NATCOMs and BURs. Further, there are no formal arrangements to ensure staff retention and the use of templates across the sectors.

Table 11: CBAM outcome – institutional capacity of inventory

Capacity indicator	Assessment outcomes (%)	CBAM outcomes and descriptions	
National coordinating Body	Baseline capacity - 78.57 **Share of capacity indicators** • High capacity - 57.14 • Moderate capacity - 42.86 • Low capacity - 0 • Needs identified - 0 • Support identified - 100	Built capacity and sustained them (H)	• Responsible for overall management and coordination • Engagement with the Convention
		Capacity challenges despite support (M)	Acts as the legal authority – jurisdiction includes mandating other institutions to report on climate change
Defined roles and responsibility	Baseline capacity - 5.56 **Share of capacity indicators** • High capacity - 0 • Moderate capacity - 11.11 • Low capacity - 88.89 • Needs identified - 11.11 • Support identified - 11.11	Capacity area not identified (L)	Formalise roles for the inventory coordinator, sector lead, data document manager, QA/QC manager, uncertainty analysis coordinator, expert review, data provider, and others
		Capacity area not addressed (L)	Formalise the role of the QA/QC manager
		Capacity challenges despite support (M)	Formalise the role of the data document manager
Data collection procedures	Baseline capacity - 47.44 **Share of capacity indicators** • High capacity - 10.26 • Moderate capacity - 74.36 • Low capacity - 15.38 • Needs identified - 100 • Support identified - 100	Built capacity and sustained them (H)	Formal procedure for collecting existing data (for all sectors)
		Capacity challenges despite support (M)	• Formal procedures for timely reporting, data sharing, and generation of new data • Mandate institute to collect data using surveys, technology, and satellites, and turn raw data into useful inventory data • Procedures for adhering to uncertainty and QA/QC processes, and monitoring of the deliverable process
		Capacity challenges despite support (L)	• Formal procedures for dealing with restricted or confidential data

Capacity indicator	Assessment outcomes (%)	CBAM outcomes and descriptions	
Procedures to internalise the process	Baseline capacity - 27.27 **Share of capacity indicators** • High capacity - 18.18 • Moderate capacity - 18.18 • Low capacity - 63.64 • Needs identified - 100 • Support identified - 100	Built capacity and sustained them (H)	• Procedures for maintaining permanent institutions • Compiling and integration process
		Capacity challenges despite support (M)	• Provisions which ensure budget support • Presence of an archiving system and portals
		Capacity challenges despite support (L)	Staff retention policy and provisions which ensure the use of templates for the inventory preparation process

Note: H – high capacity; M – moderate capacity; L – low capacity

Source: Authors' analysis

Knowledge capacity

Sound knowledge of IPCC Guidelines is visible. However, there are challenges in the retention of knowledge capacity to undertake key category analysis, uncertainty analysis, QA and QC procedures, and other parameters because of the project-oriented way of functioning and absence of templates. These templates are the building blocks for the internalisation of the process. They ensure an efficient system for the identification of priorities for future improvement and standardisation of tasks, besides serving as a manual as well as a starting point for future inventory teams.

Table 12: CBAM outcome – knowledge capacity of inventory

Capacity indicator	Assessment outcomes (%)	CBAM outcomes and descriptions	
Guidelines	Baseline capacity - 87.5 **Share of capacity indicators** • High capacity - 75 • Moderate capacity - 25 • Low capacity - 0 • Needs identified - 100 • Support identified - 100	Built capacity and sustained them (H)	Knowledge of IPCC Guidelines 1996, IPCC Good Practice Guidelines, global warming potential
		Capacity challenges despite support (M)	Knowledge of IPCC Guidelines 2006
Approach and methodology	Baseline capacity - 50 **Share of capacity indicators** • High capacity - 0 • Moderate capacity - 100 • Low capacity - 0 • Needs identified - 100 • Support identified - 100	Capacity challenges despite support (M)	Knowledge of methods for key category analysis, uncertainty analysis, time-series, QA/QC procedures, IPCC Emission Factor Database, recalculation, notation keys, tabular formats and other relevant guidelines
Tools and templates	Baseline capacity - 50 **Share of capacity indicators** • High capacity - 0 • Moderate capacity - 100 • Low capacity - 0 • Needs identified - 100 • Support identified - 100	Capacity challenges despite support (M)	Template for institutional arrangement, methods and data documentation, QA & QC procedures, archiving system, National Inventory Improvement Plan

Note: H – high capacity; M – moderate capacity; L – low capacity

Source: Authors' analysis

Procedural capacity

- **Overview**: Institutions in India have the ability to understand the sectoral emissions. However, there is little clarity on quantum of emissions at the sub-sectoral level, especially for industrial processes and waste. Also, the outcomes of key category analysis, QA and QC procedures, and uncertainty analysis relate more to the general landscape and are not sector-specific.
- **Activity data**: There is sound reporting on activity data as well as the capacity to update this data. However, there is a need for much more enhanced disclosure on the methodology used, as well as the assumptions adopted to turn raw data into activity data.
- **Emission factor**: Except for LULUCF, and to some extent, the energy (power) sector, most of the sectors face challenges in the adoption of higher emission factors and updating data frequently.
- **Gases covered**: Sound coverage of major gases (CO_2, CH_4, N_2O) is seen for the energy sector and for methane emissions from industrial processes. Disclosure on other gases (NO_x, CO, NMVOC, SO_2) are not present, as these were non-mandatory disclosures.

Table 13: CBAM outcome – procedural capacity of inventory

Sectors	Assessment outcomes (%)	CBAM – outcomes and descriptions	
Energy	Baseline capacity - 52.1 **Share of capacity indicators** • High capacity - 34.78 • Moderate capacity - 34.78 • Low capacity - 30.43 • Needs identified - 91.3 • Support identified - 100	Built capacity and sustained them (H)	• Reporting on the activity data and its updating frequency • Coverage of major gases (CO_2, CH_4, N_2O)
		Capacity challenges despite support (M)	• Disaggregated levels – sub-sector disclosures • Methodology and assumptions for activity data and emission factors • Disclosure on QA and QC procedures and uncertainty analysis
		Capacity challenges despite support (L)	• Use of higher tiers of emission factors; frequency of updating emission factors • Coverage of other gases (NO_x, CO, NMVOC, SO_2)
Industrial processes	Baseline capacity - 39.66 **Share of capacity indicators** • High capacity - 22.22 • Moderate capacity - 33.33 • Low capacity - 44.44 • Needs identified - 74.07 • Support identified - 100	Built capacity and sustained them (H)	• Reporting on the activity data and its updating frequency • Coverage of CH_4 emissions
		Capacity challenges despite support (M)	• Disclosure on QA and QC procedures and uncertainty analysis • Methodologies and assumptions for calculating emission factors • Coverage of CO_2 emissions, coverage of F gases (HFCs, PFCs, SF_6)
		Capacity challenges despite support (L)	• Disaggregated levels – sub-sector disclosures • Methodology and assumptions adopted for activity data • Use of higher tiers of emission factors; frequency of updating emission factors • Coverage of other gases (NOx, CO, NMVOC, SO_2), N_2O, NF_3 emissions

Sectors	Assessment outcomes (%)	CBAM – outcomes and descriptions	
Agriculture	Baseline capacity - 43.75 **Share of capacity indicators** • High capacity - 23.81 • Moderate capacity - 33.33 • Low capacity - 42.86 • Needs identified - 100 • Support identified - 100	Built capacity and sustained them (H)	Disclosure on the activity data and its updating frequency
		Capacity challenges despite support (M)	• Disclosure on QA and QC procedures; uncertainty analysis • Methodologies and assumptions adopted for emission factors • Coverage of major gases (CH_4 and N_2O)
		Capacity challenges despite support (L)	• Disaggregated levels – sub-sector disclosure • Methodology and assumptions adopted for activity data • Use of higher tiers of emission factors; frequency of updating emission factors • Coverage of other gases (NO_x, CO, NMVOC, SO_2), N_2O emissions
LULUCF	Baseline capacity - 51.36 **Share of capacity indicators** • High capacity - 23.81 • Moderate capacity - 57.14 • Low capacity - 19.05 • Needs identified - 100 • Support identified - 100	Built capacity and sustained them (H)	Disclosure on the activity data and its updating frequency
		Capacity challenges despite support (M)	• Disaggregated levels – sub-sector disclosure • Disclosure on QA and QC procedures and uncertainty analysis • Methodologies and assumptions for calculating emission factors • Use of higher tiers and coverage of major gases (CO_2, CH_4, and N_2O)
		Capacity challenges despite support (L)	• Methodology and assumptions adopted for activity data • Frequency of updating emission factors and coverage of other gases (NOx, CO) emissions
Waste	Baseline capacity - 43.43 **Share of capacity indicators** • High capacity - 23.81 • Moderate capacity - 33.33 • Low capacity - 42.86 • Needs identified - 100 • Support identified - 100	Built capacity and sustained them (H)	Disclosure on the activity data and its updating frequency
		Capacity challenges despite support (M)	• Disclosure on QA and QC procedures and uncertainty analysis • Disclosure on methodologies and assumptions for emission factors • Coverage of major gases (CH_4, N_2O) emissions
		Capacity challenges despite support (L)	• Disaggregated levels – sub-sector disclosure • Disclosure on the methodology and assumptions adopted for activity data • Use of higher tiers of emission factors; frequency of updating emission factors • Coverage of other gases (NOx, CO, NMVOC, SO_2)
Others (memo)	Baseline capacity - 36.58 **Share of capacity indicators** • High capacity - 22.22 • Moderate capacity - 25.93 • Low capacity - 51.85 • Needs identified - 3.7 • Support identified - 0	Built capacity and sustained them (H)	Disclosure on the activity data and its updating frequency
		Capacity area not identified (L)	• Disaggregated levels – sub-sector disclosure • Methodology and assumptions for activity data and emission factors • Coverage of major gases, F gases, and other gases • Disclosure on QA and QC procedures; uncertainty analysis • Use of higher tiers; frequency of updating emission factors

Note: H – high capacity; M – moderate capacity; L – low capacity

Source: Authors' analysis

Some sectoral level insights are as follows:

- **Energy**: The challenge with the energy sector lies in collating and analysing a huge, scattered collection of information.
  - Reporting templates are to be formulated for various departments and ministries to reduce the mismatch in sectoral details across different published documents
  - There is little clarity on emissions from the informal sector; hence, data gathering systems need to be strengthened for non-commercial sectors
  - There is a need to support technological advancement and formal procedures to measure emission factors at regular intervals for the following areas:
    - Power plants, for new technologies
    - Informal energy-intensive sectors such as brick manufacturing, sugar, and ceramics
    - Biomass used for energy purposes
    - Analysis of current vehicle types and their distribution in various cities and their fuel use
    - Open-cast mining and all the major oil-exploration sites

- **Industrial processes**: The challenge with the industry sector is the use of proprietary data for inventory reporting at the Tier III level.
  - There is a need to develop formal procedures or guidelines to deal with the use of restricted or confidential data which should also ensure:
    - Collecting and mapping data on individual industrial processes and product use from plants and micro, small, and medium enterprises
    - Procedures to include a larger base of industry associations, particularly the industry associations of large energy consuming industries
  - Facilitate arrangements to transform critical datasets into electronic formats
  - There is a need to support technological advancement and formal procedures to measure emission factors at regular intervals for the following areas:
    - For industrial processes like nitric acid production, aluminium production, soda ash usage, and pulp and paper production
    - Cement plants, steel plants, and petroleum refineries

- **LULUCF and agriculture**
  - There is a need to support technical enhancement in the LULUCF sector for the following areas:
    - Understanding carbon sequestration rates for different forest types and plantations
    - Geo-referencing areas under different land categories and areas subjected to change for the GHG inventory by using remote sensing and global information systems
    - Enhancing the resolution of forest data generated through satellite imagery
    - Establishing national forest inventory system and QA/QC procedures
  - Strengthening local capacity to collect agricultural data at the regional level
  - Data collection on livestock dung production, cattle feed, and enteric fermentation needs enhancement and refinement
  - Establishment of country-specific emission factors for fruit tree systems

- **Waste:** The challenge with the waste sector is that there is no time-series data for some specific inventory sub-categories – for example, municipal solid waste sites. Further, accurate information is not available for all regions of the country on the quantity of methane recovered for power production or flared from sewage treatment plants. Hence, there is a need to strengthen the existing formal arrangement to generate and maintain relevant data sets.

- Facilitate a formal arrangement to ensure data collection in the following areas:
  - Industrial discharges into the sewage treatment plant
  - Methane emissions from landfills at various locations: Mumbai, Delhi, Chennai, Kolkata, Bangalore, Hyderabad, and Ahmedabad
  - Methane and nitrous oxide emission generated from sectors which are not compiled, for example: textile, food processing, and beverages
  - Methane production from wastewaters from domestic sources
- Capacity building of state officials and departments to enhance awareness and sensitise them to different aspects of climate change to enable continuous reporting

6.3 National determined contribution and national circumstances

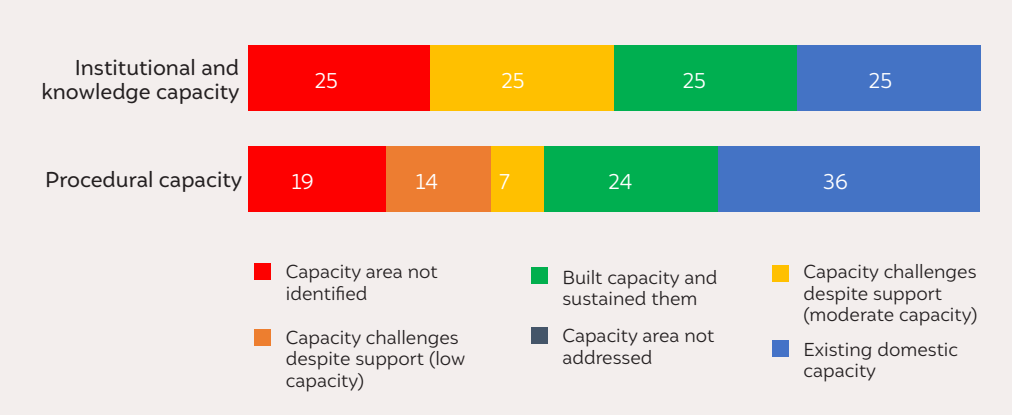


Figure 24:
CBAM outcomes – Capacity aspects of NDC and NC (%)

Source: Authors' analysis

Institutional and knowledge capacity

India has established the Prime Minister's Council on Climate Change (PMCCC) to coordinate the response to climate change at the national level, provide oversight of action plans, and monitor key policy decisions. The Prime Minister of India chairs the meetings of the PMCCC, along with members from other ministries and sectoral experts. This showcases the strong political willingness at the national level for ensuring the implementation of climate action. However, there are some challenges in strengthening these processes at the state level, and in aligning them with the NDC at the national level. This is because the present guidelines for the SAPCC are very broadly defined, resulting in little synchronisation of state and national goals.

Table 14: CBAM outcome – institutional and knowledge capacity of NDC and NC

Capacity aspects	Assessment outcomes (%)	CBAM – outcomes and descriptions	
Institutional and knowledge capacity indicators	Baseline capacity - 62.5 **Share of capacity indicators** • High capacity - 50 • Moderate capacity - 25 • Low capacity - 25 • Needs identified - 0 • Support identified - 50	Existing domestic capacity (H)	Strong political willingness (ministerial-level committee)
		Capacity challenges despite support (M)	Establishment of national legal (formal) arrangements for NDCs (states Vs federal)
		Built capacity and sustained them (H)	Formal stakeholder engagement process
		Capacity area not identified (L)	Models and approach – sensitivity analysis

Note: H – high capacity; M – moderate capacity; L – low capacity

Source: Authors' analysis

Procedural capacity

- **National circumstances:** Comprehensive reporting on national circumstances is visible in India. This is because of the existing domestic institutional capacity, where most of the ministries via their department annually report their performance.
- **NDC description and progress:** India has been reporting on the progress made to achieve its commitments without availing of any support. Moving forward, more detailed reporting would be needed on progress made toward the NDC, for which India is required to report on the level of uncertainty associated with the progress of NDCs. Hence, India should consider enhancement of knowledge capacity and understand the different methods (sensitivity analysis) needed to track the progress on the NDC.
- **Reporting on projections:** In the past, India has received support for enhancing reporting on emission projections, but no reporting was seen on the same. Under the enhanced transparency framework, developing countries are now mandated to report on emission projections. Hence, learnings from the past could be utilised to report on this aspect.

Table 15: CBAM outcome – procedural capacity of NDC and NC

Capacity indicators	Assessment outcomes	CBAM – outcomes and descriptions	
National circumstances	Baseline capacity - 86.26 **Share of capacity indicators** • High capacity - 76.92 • Moderate capacity - 23.08 • Low capacity - 0 • Needs identified - 0 • Support identified - 100	Built capacity and sustained them (H)	• General information – government structure, population profile, geographic profile, climate profile, economic profile • Sector-specific information – energy, transportation, agriculture, forest
		Capacity challenges despite support (M)	• Sector-specific information – industry, waste, building stock and urban structure
NDC description	Baseline capacity - 88.89 **Share of capacity indicators** • High capacity - 88.89 • Moderate capacity - 0 • Low capacity - 11.11 • Needs identified - 0 • Support identified - 0	Existing domestic capacity (H)	• Clearly defined goals, reference year, timeframe • Conditional and unconditional components • Policies and programme (Quantified and Qualified) and key sectors
		Capacity area not identified (L)	• Intention of usages of market mechanism

Capacity indicators	Assessment outcomes	CBAM – outcomes and descriptions	
NDC progress	Baseline capacity - 50 **Share of capacity indicators** • High capacity - 50 • Moderate capacity - 0 • Low capacity - 50 • Needs identified - 0 • Support identified - 0	Existing domestic Capacity (H)	• Define progress indicators (GHG intensity) • Disclosure on quantified and qualified progress • Disclosure on NDC linkages with long-term goals and the social and economic consequences of response measures
		Capacity area not identified	• Disclosure on methodologies to measure progress • Linkages with market mechanism
Disclosure on projections	Baseline capacity - 0 **Share of capacity indicators** • High capacity - 0 • Moderate capacity - 0 • Low capacity - 100 • Needs identified - 0 • Support identified - 100	Capacity challenges despite support (L)	• Projections – with measures and without measures • Linkages of projections with NDCs and sectoral analysis • Outcomes of sensitivity analysis

Note: H – high capacity; M – moderate capacity; L – low capacity

Source: Authors' analysis

6.4 Mitigation

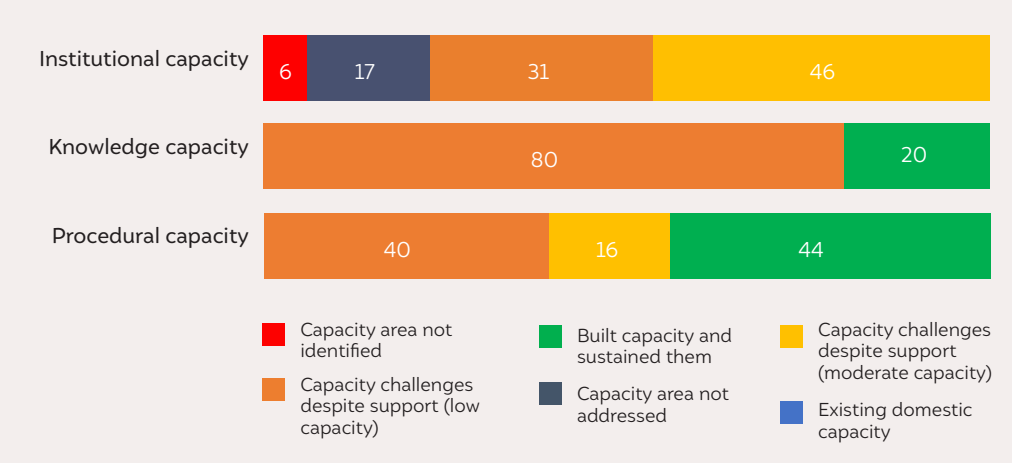


Figure 25: CBAM outcomes – capacity aspects of mitigation (%)

Source: Authors' analysis

Institutional capacity

- **Institutional arrangement**: A sound governance system already exists within the domestic legal framework, as most of the ministries via their departments annually report their programmes and actions. However, for mitigation actions, the mode of operation for gathering information is on the basis of need, which should be institutionalised.
- **Measuring reporting and verification**: While a substantial amount of financial support is received for enhancing MRV capacity, it is visible from the assessment that the present MRV capacity across all sectors is limited and decentralised. Without having a robust MRV process, it is difficult to establish any NAMAs. Hence, there is a need to identify the core issues associated with the implementation of MRV.

Table 16: CBAM outcome – institutional capacity of mitigation

Capacity indicators	Assessment outcomes (%)	CBAM – outcomes and descriptions	
Institutional arrangement	Baseline capacity - 50 **Share of capacity indicators** • High capacity - 0 • Moderate capacity - 100 • Low capacity - 0 • Needs identified - 36.67 • Support identified - 50	Capacity challenges despite support (M)	Mandates which define the roles and responsibilities of institutions
		Capacity area not addressed (M)	• Formal arrangement that includes all relevant institutions (sectors, CDM, NAMAs) • Formal procedures for mitigation assessments
		Capacity area not identified (M)	Formal procedures for budgetary support
MRV	Baseline capacity - 21.43 **Share of capacity indicators** • High capacity - 0 • Moderate capacity - 42.86 • Low capacity - 57.14 • Needs identified - 100 • Support identified - 100	Capacity challenges despite support (M)	• Formal procedures for timely reporting, data collection and archiving, verification and review processes
		Capacity challenges despite support (L)	• Integrated arrangement for MRV • Presence of coordination mechanism • Formal procedures to adhere to the methodology, tools, and templates for reporting progress • Formal procedures which ensure linkages of MRV with NAMAs and National Inventory Management System (NIMS)

Note: H – high capacity; M – moderate capacity; L – low capacity

Source: Authors' analysis

Knowledge capacity

- **Methodology and assumptions:** Sound knowledge on the use of standard units, GWP, and tabular formats is visible. However, there are no templates for MRV arrangement, and awareness on modelling tools for mitigation is absent.
- **Mitigation assessment:** The knowledge capacity in terms of undertaking mitigation assessment (modelling exercise) is very limited or nil. There are independent research institutes which do have modelling capacities for a few sectors, but there is little clarity about whether there is any capacity within government institutions to undertake modelling exercises.

Table 17: CBAM outcome – knowledge capacity of mitigation

Capacity indicator	Assessment outcomes (%)	CBAM – outcomes and descriptions	
Methodology and assumptions	Baseline capacity - 50 **Share of capacity indicators** • High capacity - 50 • Moderate capacity - 0 • Low capacity - 50 • Needs identified - 40 • Support identified - 100	Built capacity and sustained them(H)	Knowledge of standard units, GWP, tabular formats
		Capacity challenges despite support (L)	Knowledge of templates for MRV, modelling tools, and assumptions to be considered for the analysis
Mitigation assessment procedures	Baseline capacity - 0 **Share of capacity indicators** • High capacity - 0 • Moderate capacity - 0 • Low capacity - 100 • Needs identified - 100 • Support identified - 100	Capacity challenges despite support (L)	Preparing baseline scenarios, screening mitigation options, preparing mitigation scenarios, analysing impacts, linkages with other sections (inventory and adaptation)

Note: H – high capacity; M – moderate capacity; L – low capacity

Source: Authors' analysis

Procedural capacity

- **Disclosure on mitigation assessment**: There is no reporting for the outcomes of mitigation assessment.
- **Outcomes of mitigation actions and other information**: Because of the existing reporting processes of ministries (via their departments) on their programmes and policies, there appears to be good reporting on the progress made on mitigation actions. However, disclosures could be enhanced in reporting the outcomes of short-term assessments and the costs associated with these actions.
- **Disclosure on CDM**: India has constituted a National CDM Authority to undertake evaluation of CDM projects, and also to collect, compile, and publish information related to CDM initiatives in India.[2] Its responsibility could be enhanced considering the inclusion of internationally transferred mitigation outcomes (ITMOs) under the enhanced transparency framework.
- **Disclosure on NAMAs**: India does not have NAMAs; hence, there is no reporting for this aspect.

Table 18: CBAM outcome – procedural capacity of mitigation

Capacity indicators	Assessment outcomes (%)	CBAM – outcomes and descriptions	
Disclosure on mitigation assessment	Baseline capacity - 0 **Share of capacity indicators** • High capacity - 0 • Moderate capacity - 0 • Low capacity - 100 • Needs identified - 20 • Support identified - 100	Capacity challenges despite support (L)	Assessment summary: reference scenario, screening of mitigation actions, modelling tools used, cost-benefit analysis, uncertainty with finding
Outcomes of mitigation actions and other information	Baseline capacity - 80 **Share of capacity indicators** • High capacity - 63 • Moderate capacity - 35 • Low capacity - 3 • Needs identified - 0 • Support identified - 100	Built capacity and sustained them(H)	• List of actions and objectives • Source of funding, implementing entities, year of implementation • Methodology and assumptions, results and progress, gases affected, barriers • Planned actions, interaction of mitigation actions with other policies
		Capacity challenges despite support (M)	Cost associated with mitigation actions Outcomes of MRV assessment
Disclosure on CDM	Baseline capacity - 75 **Share of capacity indicators** • High capacity - 73.81 • Moderate capacity - 2.38 • Low capacity - 23.81 • Needs identified - 0 • Support identified - 100	Built capacity and sustained them (H)	• Details of project • Issue of certified emission reduction (CERs), cost associated • Documentation of methodology
		Capacity challenges despite support (L)	Avoidance of double counting Linkages with NDC
Disclosure on NAMAs	Baseline capacity - 0 **Share of capacity indicators** • High capacity - 0 • Moderate capacity - 0 • Low capacity - 100 • Needs identified - 0 • Support identified - 100	Capacity challenges despite support (L)	• Actions and programmes, entities involved • Timeframe, financial aspects • Estimated and actual emission reduction • Methodology adopted and references

Note: H – high capacity; M – moderate capacity; L – low capacity

Source: Authors' analysis

2 http://ncdmaindia.gov.in

Sector-specific inputs

LULUCF (forestry)

- One of the significant needs of the LULUCF sector is capacity building for MRV and the implementation of the REDD+ mechanism.
  - This would enable better coordination at all the levels (including state- and district-level forest departments, research organisations, and non-governmental organisations) across all the relevant regions.
- There is also a need to strengthen the local capacity for collecting LULUCF data to analyse them (modelling tools and techniques):
  - Monitoring changes in carbon stocks using remote sensing techniques
  - Formulating baseline scenarios for estimating the mitigation potential
  - Understanding carbon sequestration rates for different forest types

6.5 Adaptation and vulnerability

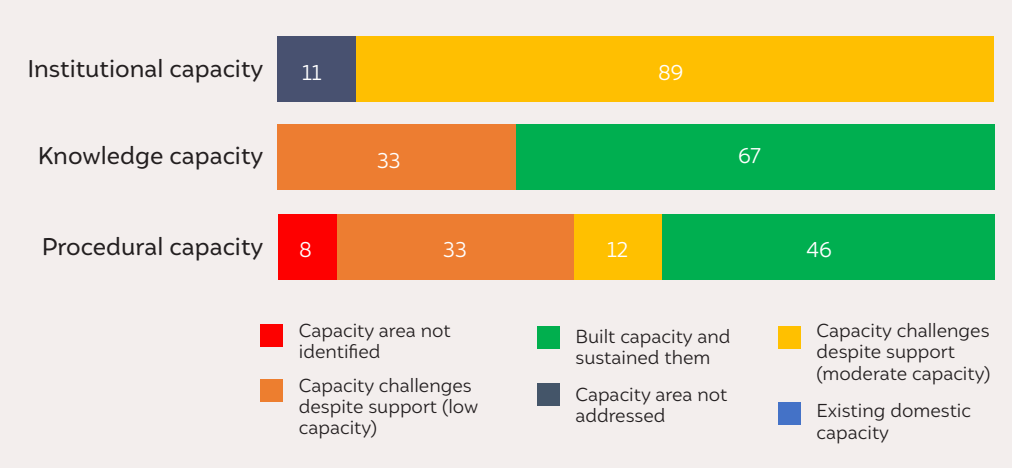


Figure 26: CBAM outcomes – capacity aspects of adaptation and vulnerability (%)

Source: Authors' analysis

Institutional and knowledge capacity

Though there are a network of institutions at almost every level of governance, adaptation reporting demands cross-sectoral convergence, including inter-departmental synchronisation, as well as engagement with all the concerned stakeholders at both the state and national levels. At present, most of the adaptation actions under the NAPCC are implemented by state governments via SAPCC. The formal arrangements for M&E of adaptation actions are visible for each mission under NAPCC. But there are gaps in developing M&E templates and determining indicators (metric) which would help in understanding the outcomes of the actions. Also, there is little clarity on the retention of knowledge to conduct vulnerability and adaptation assessments and other parameters. This is because of the project-oriented approach to reporting and the lack of processes that would facilitate knowledge transfer to future teams.

Table 19: CBAM outcome – institutional and knowledge capacity of adaptation and vulnerability

Capacity indicator	Assessment outcomes (%)	CBAM – outcomes and descriptions	
Institutional capacity	Baseline capacity - 50 **Share of capacity indicators** • High capacity - 0 • Moderate capacity - 100 • Low capacity - 0 • Needs identified - 69.44 • Support identified - 88.89	Capacity challenges despite support (M)	• Formal arrangements for: • Data collection and archiving systems • Procedures to adhere to tools and templates • Procedures to ensure budgetary support and M&E
		Capacity area not addressed (M)	Formal procedure for undertaking adaptation assessment
Knowledge capacity	Baseline capacity - 33.33 **Share of capacity indicators** • High capacity - 0 • Moderate capacity - 66.67 • Low capacity - 33.33 • Needs identified - 100 • Support identified - 100	Capacity challenges despite support (M)	Knowledge to conduct vulnerability and adaptation assessment, create an adaptation framework, and develop a climate change scenario (global climate change models)
		Capacity challenges despite support (L)	• Knowledge of tools and templates for monitoring and evaluation • Define indicators to quantify the outcomes of actions and understand their success

Note: H – high capacity; M – moderate capacity; L – low capacity

Source: Authors' analysis

Procedural capacity

Sound reporting on the impact of climate change and vulnerable areas is visible. This is relatable because India is amongst the countries most vulnerable to climate change, and its prime focus is to understand this impact and adapt to it. However, at present, there are inadequate measures to track the progress (or to understand the outcomes) of adaptation actions. There are no indicators on the basis of which one can understand or relate the outcomes. Also, despite M&E procedures being defined under the missions for NAPCC, there is no regular reporting on domestic adaptation measures. For most of the cases, M&E is treated as a one-time activity and is conducted on the basis of need, limited to a few parameters. Hence, the M&E procedures defined under these missions are yet to gain an institutional structure for reporting on the progress of adaptation actions.

Table 20: CBAM outcome – procedural capacity of adaptation and vulnerability

Capacity indicators	Assessment outcomes (%)	CBAM – outcomes and descriptions	
Analysis of potential impacts and vulnerabilities	Baseline capacity - 85 **Share of capacity indicators** • High capacity - 70 • Moderate capacity - 30 • Low capacity - 0 • Needs identified - 100 • Support identified - 100	Built capacity and sustained them (H)	• Identification of vulnerable areas, integrated analysis, and the country's priorities • Impact assessment: direct and indirect effect • Information on loss and damage • Identification of adaptation actions and options
		Capacity challenges despite support (M)	Disclosure on the uncertainties in the methodologies adopted
Disclosure on adaptation assessment	Baseline capacity - 0 **Share of capacity indicators** • High capacity - 0 • Moderate capacity - 0 • Low capacity - 100 • Needs identified - 11.11 • Support identified - 100	Capacity challenges despite support (L)	• Disclosure on the methodology and tools adopted • The outcomes of scenario formulations and evaluations of strategies, the effectiveness of actions, feasibility and cost implications
Disclosure on adaptation actions	Baseline capacity - 100 **Share of capacity indicators** • High capacity - 100 • Moderate capacity - 0 • Low capacity - 0 • Needs identified - 0 • Support identified - 100	Built capacity and sustained them (H)	• National situation and priorities • National adaptation programmes
	Baseline capacity - 50 **Share of capacity indicators** • High capacity - 0 • Moderate capacity - 100 • Low capacity - 0 • Needs identified - 0 • Support identified - 0	Capacity area not identified (M)	• Outcomes of M&E (progress) • Effectiveness of actions

Note: **H** – high capacity; **M** – moderate capacity; **L** – low capacity

Source: Authors' analysis

6.6 Means of implementation

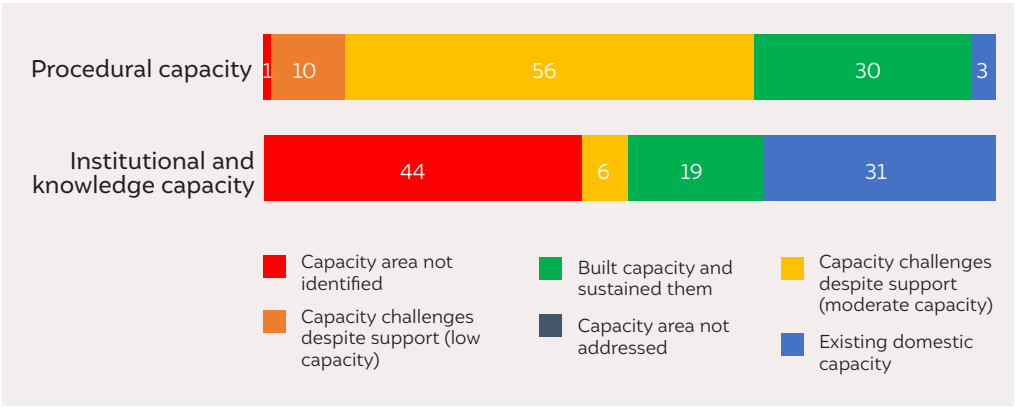


Figure 27: CBAM outcomes – capacity aspects of means of implementation (%)

Source: Authors' analysis

Institutional and knowledge capacity

Under NAPCC, one of the missions is the National Mission on Strategic Knowledge for Climate Change (NMSKCC), which aims to promote the formation of knowledge networks and ensure the development of appropriate institutional and human resource capacity across the country. The Department of Science and Technology, Ministry of Science and Technology, is responsible for the implementation of this mission. Also, the Climate Change Finance Unit under the Department of Economic Affairs, Ministry of Finance, deals with matters of climate finance. While a sound institutional capacity already exists, there is scope to enhance the existing mandate of these institutions to evaluate the impact as well as the effectiveness of the support received from various bilateral and multilateral channels and learn from them. Also, opportunities should be explored to strengthen the knowledge capacity, i.e., enhanced understanding of the conceptual definition of climate finance, methods to quantify the financial aspects with needs identified, and development of tools and templates to monitor the effectiveness of the support received.

Table 21: CBAM outcome – institutional and knowledge capacity of means of implementation

Capacity aspects	Assessment outcomes (%)	CBAM – outcomes and descriptions	
Institutional and knowledge capacity	Baseline capacity - 56.25 **Share of capacity indicators** • High capacity - 50 • Moderate capacity - 12.5 • Low capacity - 37.5 • Needs identified - 0 • Support identified - 25	Built capacity and sustained them (H)	Institutional arrangement (formal roles and responsibilities) for capacity building, technology transfer reporting
		Existing domestic capacity (H)	Institutional arrangement (formal roles and responsibilities) for finance reporting
		Capacity area not identified (L)	Provision that allows tracking of support received and progress made for constraints and gaps, capacity building, finance and technology transfer
		Existing domestic capacity (H)	Provision for the stakeholder engagement process for identification of constraints and gaps, capacity building, finance and technology transfer
		Capacity area not identified (L)	Guidelines, templates, definitions, and concepts for - constraints and gaps, capacity building, finance reporting
		Capacity challenges despite support (M)	Guidelines, templates, definitions, and concepts for technology transfer reporting

Note: H – high capacity; M – moderate capacity; L – low capacity

Source: Authors' analysis

Procedural capacity

While the reporting on the means of implementation is very comprehensive, there are challenges in clearly establishing needs associated with constraints. At multiple places, needs are broadly stated and there is little clarity whether they refer to capacity building or financial support or technology transfer. Also, disclosures of the support received are very generic, and do not reflect the effectiveness of support received. There is a need to explore various databases (GEF, UNDP, GCF, AF) in which support projects could be traced, to provide detailed information on the areas of support received, and the progress made in enhancing capacity.

Table 22: CBAM outcome – procedural capacity of means of implementation

Capacity indicator	Assessment outcomes (%)	CBAM – outcomes and descriptions	
Disclosure on constraints and gaps	Baseline capacity - 82.35 **Share of capacity indicators** • High capacity - 70.59 • Moderate capacity - 23.53 • Low capacity - 5.88 • Needs identified - 0 • Support identified - 100	Built capacity and sustained them (H)	Data challenges Institutional, human, technical, and technological constraints
		Capacity challenges despite support (M)	Financial gaps and improvement plans Challenges in project implementation
		Capacity challenges despite support (L)	Progress made on past capacity gaps Methods and tools adopted
Disclosure on Capacity Building	Baseline capacity - 55.56 **Share of capacity indicators** • High capacity - 22.22 • Moderate capacity - 66.67 • Low capacity - 11.11 • Needs identified - 0 • Support identified - 100	Built capacity and sustained them (H)	National priority and expected impact Linkages of capacity building needs and NDC
		Capacity challenges despite support (M)	Capacity building needs not addressed Capacity building support received: project details, outcomes, funding received and other details
		Capacity challenges despite support (L)	Disclosure on timeframe of needs, implementing agency, and planned investment (grant and co-finance)
Disclosure on finance	Baseline capacity - 55.56 **Share of capacity indicators** • High capacity - 25.93 • Moderate capacity - 59.26 • Low capacity - 14.81 • Needs identified - 0 • Support identified - 85.19	Existing domestic capacity (H)	National priority and linkages with NDCs Finance needs not addressed
		Capacity challenges despite support (M)	Financial support received: project details, outcomes, funding received, and other details
		Capacity challenges despite support (L)	Disclosure on timeframe of needs, implementing agency, and planned investment (grant and co-finance)
		Capacity area not identified (L)	Reporting on methodologies to track and monitor support received, avoiding double counting
Disclosure on technology transfer	Baseline capacity - 57.41 **Share of capacity indicators** • High capacity - 25.93 • Moderate capacity - 62.96 • Low capacity - 11.11 • Needs identified - 0 • Support identified - 100	Built capacity and sustained them(H)	National priority and linkages with NDCs Technology needs not addressed
		Capacity challenges despite support (M)	Technology support received: project details, outcomes, funding received and other details
		Capacity challenges despite support (L)	Disclosure on timeframe of needs, implementing agency, and planned investment (grant and co-finance)

Note: H – high capacity; M – moderate capacity; L – low capacity

Source: Authors' analysis

6.7 Other areas of reporting

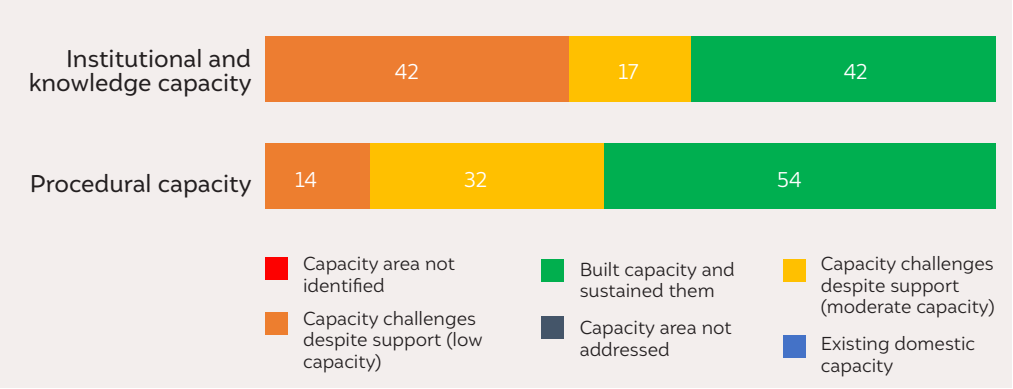


Figure 28: CBAM outcomes – capacity aspects of systematic observations (%)

Source: Authors' analysis

Reporting on research, education, training, and public awareness is visible in NATCOM. Several central government ministries/departments undertake and coordinate climate change related research (based on existing domestic capacity) and raise awareness across the country. Hence, apart from NATCOM, there are several other sources of literature available in the public domain that provide detailed insights into these aspects. In the case of systematic observation (global climate change observing systems), there are dedicated institutions in India that monitor essential climate variables. The Indian Space Research Organisation (ISRO) has the scientific and technical capacity to undertake various research activities related to the Earth's climate system and to design sensors, satellites, and ground-based observation systems to study climate and environmental parameters (GoI, 2012). Atmospheric, environmental, and oceanic research are the focus areas of the following institutions: the National Physical Laboratory (NPL), the National Environmental Engineering Research Institute (NEERI), the Centre for Mathematical Modelling and Computer Simulations (CMMACS), the National Institute of Oceanography (NIO), and the National Geophysical Research Institute. The Council for Scientific and Industrial Research (CSIR) also has dedicated atmospheric research institutes across the country (GoI, 2012). Due to this, India has reasonably good capacity for systematic observation for most of the reporting areas. However, there is little clarity on whether there exist any provisions that allow sharing of climate data and responsibility with international data centres.

Table 23: CBAM outcome – capacity aspects of systematic observations

Capacity indicators	Assessment outcomes (%)	CBAM – outcomes and descriptions	
Institutional and knowledge capacity	Baseline capacity - 50 **Share of capacity indicators** • High capacity - 41.67 • Moderate capacity - 16.67 • Low capacity - 41.67 • Needs identified - 8.33 • Support identified - 100	Built capacity and sustained them (H)	Presence of national focal points and national programmes for essential climate variables
		Capacity challenges despite support (M)	Establishment of systems and networks
		Capacity challenges despite support (L)	Procedures for collection and sharing of climate data Establishment of international data centres
Procedural capacity	Baseline capacity - 69.64 **Share of capacity indicators** • High capacity - 53.57 • Moderate capacity - 32.14 • Low capacity - 14.29 • Needs identified - 21.43 • Support identified - 100	Capacity challenges despite support (M)	Information on current climate changes
		Capacity challenges despite support (L)	Disclosure on terrestrial climate observing systems
		Built capacity and sustained them (H)	Disclosure on atmospheric climate observing systems, ocean climate observing systems

Note: H – high capacity; M – moderate capacity; L – low capacity

Source: Authors' analysis

7. The India summary

Incremental progress towards enhancing climate reporting is necessary to build trust and confidence among countries. With the adoption of the enhanced transparency arrangement under the *Paris Agreement Rulebook*, it is even more important for India to identify areas of concern and strategically present its needs to avail international support. While India has made considerable efforts towards enhancing climate transparency, it important to internalise this process through a formal and long-term arrangement and move away from a need-based, ad hoc, project-oriented approach. This is because India has the advantage of having dedicated institutions for several economic areas, across all levels of governance, that collect and gather information. This would enhance inter-departmental synchronisation and coordination and ensure the timely reporting of authenticated data. Table 24 summarises the key outcomes of the CBAM assessment for India.

Areas of reporting	Strengths	Opportunities for enhancement	Enhanced intervention needed
Inventory	Presence of dedicated institutions (ministry and its department)	• Strengthen the NATCOM cell to act as the legal authority to mandate other institutions to report on climate change • Develop templates to internalise the reporting process	• Formalise the data collection process (how to handle confidential data, timely reporting, data sharing responsibility, and procedures to turn raw data into useful inventory data and other aspects)
NDC and NCs	Strong political willingness (ministerial-level committee)	• Projections on NDC – with measures and without measures • Linking NDC with the market mechanism	Establishment (strengthening) of national legal (formal) arrangements for NDCs (state Vs federal)
Mitigation	Interlinkages between the domestic agenda and mitigation policies	• Methodology and assumptions – adopt best available methods to estimate emission reduction • CDM – role of the national CDM authority for future market mechanism ITMOs	• Mitigation assessments procedures and templates • Strengthening MRV and NAMAs
Adaptation and vulnerability	Identification of vulnerable areas and national priorities	Strengthening the institutional arrangement – inter-departmental synchronisation	• M&E of adaptation actions – develop indicators (metrics) to enhance understanding of outcomes of actions • Outcomes of adaptation assessment
Means of implementa-tion	Identification of needs – capacity building, finance, and support	Explore opportunities to avail support for technology needs assessment (implemented by the UNEP DTU Partnership) and develop technology action plans.	Provisions to monitor and track support received to understand its effectiveness

Table 24:
Summary of CBAM outcomes

Source: Authors' analysis

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Annexure 1
List of support projects

Support project list (financial support received)

Project name	Source/database	Transparency objective associated with the project	Indicative associated finance (USD)
Enabling Activities for the Preparation of India's Initial National Communication to the UNFCCC	GEF	National Communication formulation	1,969,400
Enabling Activities for Preparation of India's Second National Communication to UNFCCC	GEF	National Communication formulation	6,500,000
Preparation of the Third National Communication (TNC) and Other New Information to the UNFCCC	GEF	National Communication formulation	34,300,074
Workshop on Transforming Building and Transport Sectors through NAMAs	Capacity Building Portal (UNFCCC)	Strengthening NAMAs	4,444
Global Environmental Change and Human Health: Extreme Events and Urbanisation in the Asia Pacific Region	Capacity Building Portal (UNFCCC)	Supporting Adaptation and Vulnerability Assessment	6,166
Training: Assessing Loss and Damage from Climate Change in Vulnerable Communities	Capacity Building Portal (UNFCCC)	Supporting Adaptation and Vulnerability Assessment	28,667
Hands-on Training Workshop for the Asia and Pacific Region on National GHG Inventories (experts from Non-Annex I Parties involved in the process and preparation of National Communications from Non-Annex I Parties)	Capacity Building Portal (UNFCCC)	Training on National Communication guidelines	4,210
Handbook for Assessing Loss and Damage in Vulnerable Communities	Capacity Building Portal (UNFCCC)	Supporting Adaptation and Vulnerability Assessment	46,667
Establishing and Strengthening National Designated Authorities (NDAs) or Focal Points	Capacity Building Portal (UNFCCC)	Institutional Strengthening – Enabling Environment	150,000
Strategic framework including the preparation of country programmes for national engagement with the Fund by building on existing strategies and plans	Capacity Building Portal (UNFCCC)	Institutional Strengthening – Enabling Environment	150,000
Climate Resilient Coastal Protection and Management	Capacity Building Portal (UNFCCC)	Adaptation – development of guidelines and information systems and strengthening central agencies	835,000

Project name	Source/database	Transparency objective associated with the project	Indicative associated finance (USD)
GCF Readiness Support to Strengthen the National Designated Authority and to Develop a Strategic Framework for Engagement with the Fund	Capacity Building Portal (UNFCCC)	Institutional Strengthening – Enabling Environment	300,000
Promoting Market Transformation for Energy Efficiency in Micro, Small, and Medium Enterprises	Capacity Building Portal (UNFCCC)	Establishing monitoring & verification protocols and enhancing awareness	400,000
Facility for Low Carbon Technology Deployment	Capacity Building Portal (UNFCCC)	Strengthening Technology Transfer Support Facility	1103,582
Market Transformation and Removal of Barriers for Effective Implementation of the State Level Climate Change Action Plans	Capacity Building Portal (UNFCCC)	Mitigation – framework formulation for mitigation options for SAPCC	3566,253
Stabilizing GHG Emissions from Road Transport Through Doubling of Global Vehicle Fuel Economy: Regional Implementation of the Global Fuel Economy Initiative (GFEI)	Capacity Building Portal (UNFCCC)	Knowledge – impact of various policy options	100,211
GEF Small Grants Programme Mitigation Portfolio	Capacity Building Portal (UNFCCC)	Knowledge – sharing best practices and lessons learned	21,368
National Communications Support Programme (NCSP)	Capacity Building Portal (UNFCCC)	Training – inventories, mitigation, and adaptation assessment	29,333
Initiative for Climate Action Transparency (ICAT)	Capacity Building Portal (UNFCCC)	Tool formulation for collection of climate data	476,190
Development and Management of NAMA in India	Germany's International Climate Initiative	Formulation of NAMA and corresponding MRV	5,400,000
From NDCs to Pathways and Policies: Transformative Climate Action After Paris	Germany's International Climate Initiative	Supporting the formulation of long-term strategies (projections) for NDCs	856,635
ICT-based Adaptation to Climate Change in Cities	Germany's International Climate Initiative	Strengthening information communication and technology	1,400,000
Measurement and Performance Tracking (MAPT) of Climate Change Mitigation Activities	Germany's International Climate Initiative	Guidance on e-learning modules for inventory	1,439,849
MRV in States and Regions of Developing and Newly Industrialised Countries	Germany's International Climate Initiative	Technical assistance for MRV systems	839,995
Partnership for Market Readiness (PMR)	Germany's International Climate Initiative	Support establishment of carbon market	705,882
Support to Institutionalising Capacity Building on Climate Change in India (I-CCC)	Germany's International Climate Initiative	Support formal establishment of extensive capacity development measures	4,799,976
Tracking and Strengthening Climate Action (TASCA)	Germany's International Climate Initiative	Impact assessment methodologies	2,375,590
Strengthening of Madhya Pradesh Climate Change Cell	UNDP	Institutional strengthening – enabling environment	100,769
Capacity Building for Addressing Climate Change	UNDP	Institutional strengthening – enabling environment	115,589
Sustainable Industrialisation: Building Stakeholder Capacities and Involvement	UNDP	Enhancing the stakeholder engagement process	750,000
Climate Change Adaptation	UNDP	Supporting enhancement of vulnerability and risk management capabilities	920,888
Strategic Programmatic Engagement at the State Level	UNDP	Support creation of platform for sharing best practices and solutions	5,000,000

Source: Authors' compilation

List of support projects with no financial support but with activities that were associated with capacity building of transparency
Capacity Building Climate Smart Farmers for Food Security and Sustainable Livelihood
13th Energy Statistics Course
14th Energy Statistics Course
Asia Pacific Fishery Commission Regional Consultative Workshop: Implications of Climate Change on Fisheries and Aquaculture: Challenges for Adaptation and Mitigation in the Asia Pacific
Awareness raising on Climate Change and Disaster Risk Reduction (DRR)
Capacity Development for Adaptation to Climate Change & GHG Mitigation on Non-Annex I Countries (C3D+): Inception Workshop
Megacities Alliance for Water and Climate
Child-centred Comprehensive Climate Vulnerability assessment
Climate and Disaster Risk Analysis and Vulnerability assessments
CORDEX South Asia Training Workshop
Development of Urban Risk Assessment Methodology
Disaster Risk Analysis and Vulnerability assessments
Linking agrobiodiversity value chains, climate adaptation and nutrition: empowering the poor to manage risk
Media Action Plan – India
National Climate Change Adaptation projects
Provide technical assistance to Non-Annex I Parties for the regular development of mitigation assessment through updating the CGE training materials and hands-on training workshops
Regional Calibration Workshop for Applicant Entities/Designated Operational Entities (AEs/DOEs)
Regional Climate Outlook Forums
Regional Workshop on GLOF Risk Reduction in the Himalayas
SANDWATCH – Adapting to Climate Change and Educating for Sustainable Development
Side event at COP21: The Impact of Climate Change on Children
South Asia Media Workshop on Adaptation to Climate Change
Study tour of Paris district cooling system by Rajkot city government
Support to national/local climate change and DRR offices on policy frameworks on climate change and DRR
Sustainable Urban Mobility in Developing Countries
Third Joint Workshop on Enhancing the Regional Distribution of CDM Projects in Asia and the Pacific
Training and Guidance on Vulnerability and Adaptation Assessment Study Design for Health Authorities
Training workshop for trainers with 41 participant-trainers from 15 countries in Asia and the Pacific region entitled Cities in Climate Change Initiative (CCCI-Asia and the Pacific) – Creating Climate Change Champions
UNEP In-Person Training on District Cooling in Asia Pacific
UNFCCC workshop on Technology Needs Assessments
Webinar: Combining Building Efficiency and District Energy for More Sustainable Cities
Workshop to exchange views on the possible elements to be considered in the future revision of the UNFCCC Guidelines for the preparation of NATCOMs from Non-Annex I Parties

Source: Authors' compilation from capacity building portal

Annexure 2

Area of capacity building for climate transparency

Colour theme for the annexure 2	
	Represents areas of reporting
	Represents capacity aspects
	Represents super-set indicators
	Represent sub-set indicators
	Represents individual indicators

Tags	ACB-CT
I-----#	Inventory
I-IC----#	Institutional capacity
I-IC-N---#	National coordinating body (legal and formal arrangement)
I-IC-N---1	Responsible for overall coordination (gov and non-gov organisations)
I-IC-N---2	Responsible for overall management
I-IC-N---3	Placing of coordinating body (within the ministry responsible for climate change)
I-IC-N---4	High level authority: capable of facilitating and mobilising work across institution; acts as the legal authority
I-IC-N---5	Jurisdiction to mandate other institutions (to report on climate change)
I-IC-N---6	Sustainable long-term institution (ensuring a continuous process)
I-IC-N---7	Engagement with Convention
I-IC-F---#	Presence of formal legal framework (mandate)
I-IC-F-R--#	Defined roles and responsibilities for reporting
I-IC-F-R--1	Inventory directory (coordinator)
I-IC-F-R--2	Sector lead
I-IC-F-R--3	Data document manager
I-IC-F-R--4	QA/QC manager
I-IC-F-R--5	Uncertainty analysis coordinator (Expert)
I-IC-F-R--6	Expert review/judgement
I-IC-F-R--7	Data provider
I-IC-F-R--8	Consultant compiling estimates
I-IC-F-R--9	Others (technical coordinator, GHG policy specialist)

Tags	ACB-CT
I-IC-F-DSC--#	Formal approval process and flow of information – data collection strategy (activity data and emission factors)
I-IC-F-DSC--1	Arrangement to include all relevant institutions and teams
I-IC-F-DSC--2	Procedures for the generation of new data
I-IC-F-DSC--3	Dealing with restricted or confidential data
I-IC-F-DSC--4	Procedures for the collection of existing data
I-IC-F-DSC--5	Timely reporting of data (procedures for scheduling activities in a timely manner)
I-IC-F-DSC--6	Procedure to turn raw data to useful inventory data in an electronic format
I-IC-F-DSC--7	Means to measure data: survey, technology, satellite, modelling tool
I-IC-F-DSC--8	Procedures for data sharing
I-IC-F-DSC--9	Engagement with non-government institutions
I-IC-F-DSC--10	Multi-stakeholder process – frequency of engagement with stakeholders
I-IC-F-DSC--11	Procedures for uncertainty analysis
I-IC-F-DSC--12	Monitoring of deliverable process
I-IC-F-DSC--13	Overseeing the implementation the QA/QC strategy
I-IC-F-IP--#	Procedures to internalise processes
I-IC-F-IP--1	Procedures for maintaining permanent institutions
I-IC-F-IP--2	Managing the overall budget
I-IC-F-IP--3	Compiling and integration process (documentation preparation)
I-IC-F-IP--4	Presence of archiving system (website and internal portals)
I-IC-F-IP--5	Staff retention policy (permanent representatives; succession plan)
I-IC-F-IP-PP-#	Inventory preparation process (shift from a project-based approach to a more internalised and institutionalised approach)
I-IC-F-IP-PP-1	Template – Institutional Arrangement
I-IC-F-IP-PP-2	Template – Methods and Data Documentation
I-IC-F-IP-PP-3	Template – QA & QC Procedures
I-IC-F-IP-PP-4	Template – Archiving System
I-IC-F-IP-PP-5	Template – Key Category Analysis
I-IC-F-IP-PP-6	Template – National Inventory Improvement Plan
I-KC----#	Knowledge capacity
I-KC-G---#	Guidelines
I-KC-G---1	Knowledge of IPCC Guidelines 1996
I-KC-G---2	Knowledge of IPCC Good Practice Guidelines
I-KC-G---3	Knowledge of IPCC Guidelines 2006
I-KC-G---4	Knowledge of GWP
I-KC-A---#	Approach/methodology
I-KC-A---1	Knowledge of methods for key category analysis: Approach 1 – level and trend assessment; and Approach 2 – level/trend + uncertainty assessment
I-KC-A---2	Knowledge of methods for uncertainty analysis: error propaganda and Monte Carlo method

Tags	ACB-CT
I-KC-A---3	Knowledge of methods for time-series: overlap/surrogate/interpolation/extrapolation
I-KC-A---4	Knowledge of QA/QC procedures
I-KC-A---5	Knowledge of IPCC Emission Factor Database
I-KC-A---6	Knowledge of recalculation (ensuring time-series consistency)
I-KC-A---7	Knowledge of notation keys, tabular format, and other relevant guidelines
I-KC-TT---#	Templates and tools
I-KC-TT---1	Template – Institutional Arrangement
I-KC-TT---2	Template – Methods and Data Documentation
I-KC-TT---3	Template – QA & QC Procedures
I-KC-TT---4	Template – Archiving System
I-KC-TT---5	Template – Key Category Analysis
I-KC-TT---6	Template – National Inventory Improvement Plan
I-KC-TT---7	IPCC Inventory Software
I-PC----#	Procedural capacity
I-PC-O---#	Overview
I-PC-O---1	Institutional arrangement; ability to understand sector emissions (rational for trends)
I-PC-O---2	Levels of disclosure (disaggregated levels)
I-PC-O---3	Disclosure on QA/QC processes
I-PC-O---4	Disclosure on uncertainty/key category analysis
I-PC-A---#	Activity data
I-PC-A---1	Reporting values
I-PC-A---2	Disclosure on references
I-PC-A---3	Methodology disclosure and assumptions
I-PC-A---4	Rationale for choice on activity data
I-PC-A---5	Frequency for updating activity data
I-PC-E---#	Emission factor
I-PC-E---1	Reporting on emission factors/coefficients
I-PC-E---2	Use of tiers (method applied)
I-PC-E---3	References
I-PC-E---4	Methodology disclosure and assumptions
I-PC-E---5	Rationale for choice of emission factors
I-PC-E---6	Frequency of updating emission factors
I-PC-CG---#	Gases covered
I-PC-CG-MG--#	Major gases
I-PC-CG-MG--1	CO_2 emissions
I-PC-CG-MG--2	CO_2 removals
I-PC-CG-MG--3	CH_4
I-PC-CG-MG--4	N_2O

Tags	ACB-CT
I-PC-CG-FG--#	F gases
I-PC-CG-FG--1	HFCs
I-PC-CG-FG--2	PFCs
I-PC-CG-FG--3	SF_6
I-PC-CG-FG--4	NF_3 (nitrogen trifluoride)
I-PC-CG-OG--#	Other gases
I-PC-CG-OG--1	Nox
I-PC-CG-OG--2	CO
I-PC-CG-OG--3	NMVOC
I-PC-CG-OG--4	SO_2
NDC/NC-----#	NCs and NDCs
NDC/NC-IC&KC----#	Institutional and knowledge capacity
NDC/NC-IC&KC----1	Strong leadership (ministerial-level committee)
NDC/NC-IC&KC----2	Establishment of national legal (formal) arrangements for NDCs (States Vs Federal)
NDC/NC-IC&KC----3	Formal stakeholder engagement process
NDC/NC-IC&KC----4	Models and approach for sensitivity analysis
NDC/NC-PC----#	Procedural capacity
NDC/NC-PC-NC---#	National Circumstances
NDC/NC-PC-NC-GI--#	General information
NDC/NC-PC-NC-GI--1	Government structure
NDC/NC-PC-NC-GI--2	Population profile
NDC/NC-PC-NC-GI--3	Geographic profile
NDC/NC-PC-NC-GI--4	Climate profile
NDC/NC-PC-NC-GI--5	Economic profile
NDC/NC-PC-NC-SSI--#	Sector specific Information
NDC/NC-PC-NC-SSI--1	Energy (by fuel types where appropriate)
NDC/NC-PC-NC-SSI--2	Transportation
NDC/NC-PC-NC-SSI--3	Industry
NDC/NC-PC-NC-SSI--4	Waste
NDC/NC-PC-NC-SSI--5	Building stock and urban structure
NDC/NC-PC-NC-SSI--6	Agriculture
NDC/NC-PC-NC-SSI--7	Forest
NDC/NC-PC-NC-SSI--8	Other sectors
NDC/NC-PC-NDCD---#	NDCs description
NDC/NC-PC-NDCD---1	Clearly defined goals, policies, and programmes (Quantified)
NDC/NC-PC-NDCD---2	Clearly defined goals, policies, and programmes (Qualified)
NDC/NC-PC-NDCD---3	Disclosure on reference year
NDC/NC-PC-NDCD---4	Stated unconditional components (target)
NDC/NC-PC-NDCD---5	Stated conditional components (target and support needed)
NDC/NC-PC-NDCD---6	Defined scope (economy-wide, cross-sectoral, sector specific, technology based)

Tags	ACB-CT
NDC/NC-PC-NDCD---7	Defined coverage (sectors, categories or sources and sinks, carbon pools and gases)
NDC/NC-PC-NDCD---8	Stated timeframes (target year)
NDC/NC-PC-NDCD---9	Disclosure on market mechanism (intentions)
NDC/NC-PC-NDCP---#	Progress
NDC/NC-PC-NDCP---1	Defined progress indicators (GHG emissions, GHG intensity, peak in GHG emissions or other metrics)
NDC/NC-PC-NDCP---2	Defined reference points (level(s), baseline(s), base year(s) or starting point(s))
NDC/NC-PC-NDCP---3	Disclosure on methodologies (approach) to measure progress
NDC/NC-PC-NDCP---4	Disclosure on methodologies (approach) to measure co-benefits
NDC/NC-PC-NDCP---5	Disclosure on methodologies to link with the market mechanism
NDC/NC-PC-NDCP---6	Reporting on the baseline of NDCs
NDC/NC-PC-NDCP---7	Disclosure on quantified progress on indicators
NDC/NC-PC-NDCP---8	Disclosure on qualified progress on Indicators
NDC/NC-PC-NDCP---9	Establish linkages of NDC's progress with long-term goals
NDC/NC-PC-NDCP---10	Establish linkages of NDC's progress with market mechanism
NDC/NC-PC-NDCP-A&M--#	Reporting on assumptions and methodology for NDCs
NDC/NC-PC-NDCP-A&M--1	Clear identification of boundary, sectors, gases, and other aspects
NDC/NC-PC-NDCP-A&M--2	Data sources – disclosure on reference
NDC/NC-PC-NDCP-A&M--3	Identification of key parameters or drivers in the calculations; ensure data quality reported
NDC/NC-PC-NDCP-A&M--4	Disclosure on social and economic consequences of response measures
NDC/NC-PC-NDCPJ---#	Reporting of projections
NDC/NC-PC-NDCPJ---1	Disclosure on indicative impacts on mitigation
NDC/NC-PC-NDCPJ---2	Reporting on projections – with measures and without measures
NDC/NC-PC-NDCPJ---3	Disclosure on linkages of projections with NDCs
NDC/NC-PC-NDCPJ---4	Disclosure on sectoral analysis of the projections
NDC/NC-PC-NDCPJ---5	Reporting on uncertainty with projections (outcomes of sensitive analysis)
NDC/NC-PC-NDCPJ---6	Disclosure on methodologies and assumptions
M-----#	Mitigation
M-IC----#	Institutional capacity
M-IC-IA---#	Institutional arrangement
M-IC-IA---1	Arrangement to include all relevant institutions (sectors, CDM, NAMAs)
M-IC-IA---2	National focal point
M-IC-IA---3	Defined roles and responsibilities
M-IC-IA---4	Formal procedures for mitigation assessment
M-IC-IA---5	Formal arrangement for stakeholder engagement
M-IC-IA---6	Formal procedures for supporting budgetary (or technology) capacity

Tags	ACB-CT
M-IC-MRV---#	MRV
M-IC-MRV---1	Integrated institutional arrangement
M-IC-MRV---2	Presence of coordination mechanism
M-IC-MRV---3	Formal procedures to adhere to methodology, tools, and templates for progress
M-IC-MRV---4	Formal procedures for timely reporting, data collection, and archiving
M-IC-MRV---5	Formal verification procedures
M-IC-MRV---6	Expert review process
M-IC-MRV---7	Formal procedures which ensures linkages of MRV with NAMAs and NIMS
M-KC----#	Knowledge capacity
M-KC-AP---#	Mitigation assessment procedures
M-KC-AP---1	Preparing baseline scenarios
M-KC-AP---2	Screening mitigation options
M-KC-AP---3	Preparing mitigation scenarios
M-KC-AP---4	Analysing impacts
M-KC-AP---5	Preparing strategy
M-KC-AP---6	Linkages with other sections (inventory and adaptation)
M-KC-A---#	Methodology and assumptions
M-KC-A---1	Knowledge of tools (templates for MRV)
M-KC-A---2	Knowledge of modelling tools
M-KC-A---3	Knowledge of standard units, GWP, tabular formats
M-KC-A---4	Assumptions to be considered for baseline and associated uncertainty
M-PC----#	Procedural capacity
M-PC-AO---#	Disclosures on mitigation assessment
M-PC-AO---1	Baseline formation
M-PC-AO---2	Screening of mitigation actions
M-PC-AO---3	Scenarios reference and business as usual (BAU)
M-PC-AO---4	Modelling tools used
M-PC-AO---5	Historic projected data
M-PC-AO---6	Cost benefit analysis
M-PC-AO---7	Uncertainty analysis and finding
M-PC-AO---8	Barriers
M-PC-AO---9	Results (assessment summary)
M-PC-A&P---#	Outcomes of mitigation actions (progress)
M-PC-A&P---1	Sector overview: general arrangement and circumstances
M-PC-A&P---2	List of actions, goals, policies, projects, and programmes
M-PC-A&P---3	Scope of actions – economy-wide, cross-sectoral, and technology based (renewable energy technology)
M-PC-A&P---4	Objective (baseline included)
M-PC-A&P---5	Qualitative/quantitative (goals)
M-PC-A&P---6	Source of funding (national/international)
M-PC-A&P---7	Status (planned, implementing, completed, delayed)

Tags	ACB-CT
M-PC-A&P---8	Implementing entities
M-PC-A&P---9	Methodology and assumptions
M-PC-A&P---10	Start year of implementation
M-PC-A&P---11	Gases affected
M-PC-A&P---12	Result/progress in terms of quantified impact for actions implemented (GHG or adaptation)
M-PC-A&P---13	Result/progress in terms of qualified impact for actions implemented (GHG or adaptation)
M-PC-A&P---14	Cost associated (estimated)
M-PC-A&P---15	Cost associated (actual)
M-PC-A&P---16	Barriers
M-PC-OI---#	Other information
M-PC-OI---1	Actions planned
M-PC-OI---2	Interaction between mitigation polices and other policies
M-PC-OI---3	Outcomes of short-term assessment
M-PC-ITMO/CDM---#	Disclosure on CDM-related information
M-PC-ITMO/CDM---1	Governance structure
M-PC-ITMO/CDM---2	Countries' plan
M-PC-ITMO/CDM---3	Type of market mechanism
M-PC-ITMO/CDM---4	Project-based or sector-based
M-PC-ITMO/CDM---5	Quantification of issues or expected credits
M-PC-ITMO/CDM---6	Use of units
M-PC-ITMO/CDM---7	Linkages with commitments (NDCs)
M-PC-ITMO/CDM---8	Avoidance of double counting
M-PC-ITMO/CDM---9	Cost associated
M-PC-ITMO/CDM---10	Transparent documentation of generated units (procedures)
M-PC-NAMA---#	Disclosure on NAMAs related Information
M-PC-NAMA---1	National implementing entity
M-PC-NAMA---2	Associated timeframe
M-PC-NAMA---3	Financial aspects (costs)
M-PC-NAMA---4	Estimated emission reduction
M-PC-NAMA---5	Disclosure on the methodology adopted, references, and sources
AV-----#	Adaptation and vulnerability
AV-IC----#	Institutional capacity
AV-IC----1	Designated national agency (focal point)
AV-IC----2	Defined roles and responsibilities
AV-IC----3	Formal procedures for assessment
AV-IC----4	Formal data collection procedures
AV-IC----5	Formal procedures to adhere to tools, templates, and the use of archiving system storage mechanisms
AV-IC----6	Formal evaluation arrangements (reporting and verification process)
AV-IC----7	Formal arrangement for stakeholder engagements/enhancing networking

Tags	ACB-CT
AV-IC----8	Formal procedure to ensure budgetary capacity (or technology capacity)
AV-KC----#	Knowledge capacity
AV-KC----1	Knowledge to conduct vulnerability, adaptation, and integrated assessments
AV-KC----2	Knowledge of the adaptation framework and the decision-making tools Caribbean Climate Online Risk and Adaptation tool (CCORAL) and Community-based Risk Screening Tool - Adaptation and Livelihoods (CRiSTAL)
AV-KC----3	Knowledge of global climate models (methods and tools: MAGICC/ SCENGEN - , SimCLIM, PRECIS, SDSM) and formulation of baseline socioeconomic scenarios
AV-KC----4	Knowledge of sector specific models and assessment capabilities
AV-KC----5	Knowledge of tools and templates for M&E
AV-KC----6	Knowledge for metrics or indicators to quantify the outcomes of actions and understand their success
AV-PC----#	Procedural capacity
AV-PC-I&V---#	Analysis of potential impacts and vulnerabilities
AV-PC-I&V---1	Impact assessment: estimate the impacts of climate change without considering adaptation
AV-PC-I&V---2	Identification of vulnerable areas
AV-PC-I&V---3	Scope of their vulnerability assessment
AV-PC-I&V---4	Transparent reporting on appropriate methodologies and guidelines for assessment (model used and assessment procedure)
AV-PC-I&V---5	Any uncertainties inherent in the methodologies
AV-PC-I&V---6	Key findings and direct and indirect effects arising from climate change
AV-PC-I&V---7	Include various scenarios for the assessment of the impacts of climate change
AV-PC-I&V---8	An integrated analysis of the country's vulnerability to climate change
AV-PC-I&V---9	Set vulnerability priority
AV-PC-I&V---10	Identify adaptation needs and options
AV-PC-AO---#	Identification and analysis of adaptation options
AV-PC-AO-IAA--#	Information on adaptation assessment
AV-PC-AO-IAA--1	Scope of adaptation assessment
AV-PC-AO-IAA--2	Baseline socioeconomic scenarios; climate change scenarios
AV-PC-AO-IAA--3	Emphasis on proactive and reactive adaptation
AV-PC-AO-IAA--4	Evaluation of strategies and measures for adapting to climate change, including those of high priority
AV-PC-AO-IAA--5	Effectiveness of adaptations
AV-PC-AO-IAA--6	Costs, feasibility, and other factors, e.g., co-benefits and potential harm to other systems
AV-PC-AO-IAA--7	Transparent reporting on appropriate methodologies and guidelines for assessment (models and assessment procedure)
AV-PC-AO-IAA--8	Any uncertainties inherent in the methodologies

Tags	ACB-CT
AV-PC-AO-AA--#	Adaptation actions
AV-PC-AO-AA--1	Reflect national situation
AV-PC-AO-AA--2	Adaptation priorities
AV-PC-AO-AA--3	Report on the use of policy frameworks such as national adaptation programmes and plans and policies for developing and implementing adaptation strategies and measures
AV-PC-AO-AA--4	Information on adaptation measures being undertaken to meet their specific needs and concerns arising from the adverse effects
AV-PC-AO-MEA--#	M&E of adaptation measures
AV-PC-AO-MEA--1	Information of domestic systems
AV-PC-AO-MEA--2	Effectiveness of actions (resilience, co-benefits)
AV-PC-AO-OI--#	Other information
AV-PC-AO-OI--1	Activities related to loss and damage
AV-PC-AO-OI--2	Cooperation, good practices, experience, and lessons learned
MI-----#	Means of implementation
MI-IC&KC----#	Institutional capacity and knowledge capacity
MI-IC&KC-FP---#	Formal procedures / roles identified
MI-IC&KC-FP---1	Constraints and gaps
MI-IC&KC-FP---2	Capacity building
MI-IC&KC-FP---3	Finance support
MI-IC&KC-FP---4	Technology transfer
MI-IC&KC-MP---#	Mandates/provisions/arrangements that allows tracking or monitoring progress
MI-IC&KC-MP---1	Constraints and gaps
MI-IC&KC-MP---2	Capacity building
MI-IC&KC-MP---3	Finance support
MI-IC&KC-MP---4	Technology transfer
MI-IC&KC-G&T---#	Guidelines, templates, definitions, and concepts
MI-IC&KC-G&T---1	Constraints and gaps
MI-IC&KC-G&T---2	Capacity building (retention mechanism)
MI-IC&KC-G&T---3	Finance support (definition of climate finance)
MI-IC&KC-G&T---4	Technology transfer (TAP, TNA)
MI-IC&KC-SE---#	Stakeholder engagement
MI-IC&KC-SE---1	Constraints and gaps
MI-IC&KC-SE---2	Capacity building
MI-IC&KC-SE---3	Finance support
MI-IC&KC-SE---4	Technology transfer
MI-PC----#	Procedural capacity
MI-PC-CG---#	Constraints and gaps
MI-PC-CG---1	Key national priorities to be addressed
MI-PC-CG---2	Linkages with NDCs/UNFCCC obligations

Tags	ACB-CT
MI-PC-CG-DC--#	Reporting on data challenges
MI-PC-CG-DC--1	Collection of data/data organisation
MI-PC-CG-DC--2	Discernible data gaps not reported/acknowledged
MI-PC-CG-DC--3	Data accessibility
MI-PC-CG-DC--4	Ways to improve them
MI-PC-CG---3	Other difficulties/challenges (lack of mandates, continuous reporting of NATCOM/BUR)
MI-PC-CG---4	Institutional gaps
MI-PC-CG---5	Human gaps
MI-PC-CG---6	Technical gaps
MI-PC-CG---7	Financial gaps (support limitations)
MI-PC-CG---8	Technology constraints (technology constraints)
MI-PC-CG---9	Capacity building constraints (retention)
MI-PC-CG---10	Challenges in project implementation
MI-PC-CG---11	Progress on past constraints and gaps
MI-PC-CG---12	Methods to estimate any quantitative or qualitative needs for constraints and gaps
MI-PC-CG---13	Improvement plans
MI-PC-CB---#	Capacity building
MI-PC-CB-GI--#	General information
MI-PC-CB-GI--1	National priorities
MI-PC-CB-GI--2	Linkages with NDCs/UNFCCC obligations
MI-PC-CB-GI--3	Participation and promotion of South-South Cooperation
MI-PC-CB-GI--4	Report on capacity building activities not addressed
MI-PC-CB-N--#	Capacity building needs (list of activities)
MI-PC-CB-N--1	Objectives
MI-PC-CB-N--2	Area of needs (sectors, sub-sectors)
MI-PC-CB-N--3	Timeframe
MI-PC-CB-N--4	Implementing entity
MI-PC-CB-N--5	Planned investment (grant and financed)
MI-PC-CB-N--6	Stage
MI-PC-CB-N--7	Expected impact
MI-PC-CB-S--#	Capacity building support received and ongoing (list of activities)
MI-PC-CB-S--1	Objectives
MI-PC-CB-S--2	Area of support (sectors, sub-sectors)
MI-PC-CB-S--3	Timeframe
MI-PC-CB-S--4	Implementing entity
MI-PC-CB-S--5	Status (ongoing/planned/completed)
MI-PC-CB-S--6	Overall support needed
MI-PC-CB-S--7	Support received
MI-PC-CB-S--8	Additional support needed
MI-PC-CB-S--9	Information on exchange rate

Tags	ACB-CT
MI-PC-CB-S--10	Impact – effectiveness of capacity building activities (national/sub-national levels)
MI-PC-CB-S-FS-#	Funding source
MI-PC-CB-S-FS-1	Multilateral sources: Global Environment Facility, Least Developed Countries Fund, Special Climate Change Fund, Adaptation Fund, Green Climate Fund, UN agencies, and others
MI-PC-CB-S-FS-2	Funding from Annex II and other developed countries: grants, concessional loans, non-concessional loans, overseas development aid
MI-PC-CB-S-FS-3	Multilateral financial institutions, including regional development banks
MI-PC-CB-S-FS-4	Multilateral financial institutions, including regional development banks: World Bank, International Finance Corporation, Asian development banks
MI-PC-CB-S-FS-5	In-kind support
MI-PC-CB-S-FS-6	Support by private sector
MI-PC-F---#	Finance
MI-PC-F-GI--#	General information
MI-PC-F-GI--1	Identified national priorities
MI-PC-F-GI--2	Linkages with NDCs/UNFCCC obligations
MI-PC-F-GI--3	Reported on methodologies to track and monitor support received, avoiding double counting
MI-PC-F-GI--4	Report on financial support not addressed
MI-PC-F-N--#	Finance needs (list of activities)
MI-PC-F-N--1	Objectives
MI-PC-F-N--2	Area of needs (sectors, subsectors)
MI-PC-F-N--3	Timeframe
MI-PC-F-N--4	Implementing entity
MI-PC-F-N--5	Planned investment (grant and co-financed)
MI-PC-F-N--6	Stage
MI-PC-F-N--7	Expected impact
MI-PC-F-S--#	Finance support received and ongoing (list of activities)
MI-PC-F-S--1	Objective
MI-PC-F-S--2	Area of support (sectors, sub-sector)
MI-PC-F-S--3	Timeframe
MI-PC-F-S--4	Implementing entity
MI-PC-F-S--5	Status (ongoing/planned/completed)
MI-PC-F-S--6	Overall support needed
MI-PC-F-S--7	Support received
MI-PC-F-S--8	Additional support needed
MI-PC-F-S--9	Information on exchange rate
MI-PC-F-S--10	Impact (co-benefits, effectiveness of the support received)

Tags	ACB-CT
MI-PC-F-S-FS-#	Funding source
MI-PC-F-S-FS-1	Multilateral sources: Global Environment Facility, Least Developed Countries Fund, Special Climate Change Fund, Adaptation Fund, Green Climate Fund, UN agencies, and others
MI-PC-F-S-FS-2	Funding from Annex II and other developed countries: grants, concessional loans, non-concessional loans, overseas development aid
MI-PC-F-S-FS-3	Multilateral financial institutions, including regional development banks
MI-PC-F-S-FS-4	Multilateral financial institutions, including regional development banks: World Bank, International Finance Corporation, and Asian development banks
MI-PC-F-S-FS-5	In-kind support
MI-PC-F-S-FS-6	Support by private sector
MI-PC-T---#	Technology
MI-PC-T-GI--#	General information
MI-PC-T-GI--1	Identification of key sectors and technology
MI-PC-T-GI--2	Linkages with NDCs/UNFCCC obligations
MI-PC-T-GI--3	Disclosure on assistance through the UNFCCC technology mechanism, including reporting on successful outcomes from TNAs, TAPs, or requests through the CTCN
MI-PC-T-GI--4	Report on technology support not addressed
MI-PC-T-N--#	Technology needs (list of activities)
MI-PC-T-N--1	Objectives
MI-PC-T-N--2	Area of needs (sectors, sub-sectors)
MI-PC-T-N--3	Timeframe
MI-PC-T-N--4	Implementing entity
MI-PC-T-N--5	Planned investment (grant and co-financed)
MI-PC-T-N--6	Stage
MI-PC-T-N--7	Expected impact (described the benefits and risks, consequences, technology performance, sustainability, and replication as appropriate)
MI-PC-T-S--#	Technology support received and ongoing (list of activities)
MI-PC-T-S--1	Objective
MI-PC-T-S--2	Area of support (sectors, sub-sectors)
MI-PC-T-S--3	Timeframe
MI-PC-T-S--4	Implementing entity
MI-PC-T-S--5	Status (ongoing/planned/completed)
MI-PC-T-S--6	Overall support needed
MI-PC-T-S--7	Support received
MI-PC-T-S--8	Additional support needed
MI-PC-T-S--9	Information on exchange rate
MI-PC-T-S--10	Impact

Tags	ACB-CT
MI-PC-T-S-FS-#	Funding source
MI-PC-T-S-FS-1	Multilateral sources: Global Environment Facility, Least Developed Countries Fund, Special Climate Change Fund, Adaptation Fund, Green Climate Fund, UN agencies and others
MI-PC-T-S-FS-2	Funding from Annex II and other developed countries: grants, concessional loans, non-concessional loans, overseas development aid
MI-PC-T-S-FS-3	Multilateral financial institutions, including regional development banks
MI-PC-T-S-FS-4	Multilateral financial institutions, including regional development banks: World Bank, International Finance Corporation, Asian development banks
MI-PC-T-S-FS-5	In-kind support
MI-PC-T-S-FS-6	Support by private sector
O------#	Other areas of reporting
SO-----#	Systematic observation
SO-IC&KC----#	Institutional capacity & knowledge capacity
SO-IC&KC-NP---#	National programmes for essential climate variables
SO-IC&KC-NP---1	Coordination among organisations
SO-IC&KC-NP-PA--#	Arrangement for planning activities
SO-IC&KC-NP-PA--1	Observing
SO-IC&KC-NP-PA--2	Archiving
SO-IC&KC-NP-PA--3	Analysing
SO-IC&KC-IDC---#	Establishment of international data centres
SO-IC&KC-IDC---1	Responsibilities of ECV (essential climate variables)
SO-IC&KC-IDC---2	Responsibilities of world data centres
SO-IC&KC-IDC---3	Actions undertaken
SO-IC&KC-IDC---4	Preparation of data sets, metadata, historical data
SO-IC&KC-IDC---5	Routine and regular analysis, measures of uncertainty
SO-IC&KC-IDC---6	Coordination and collaboration among reanalysis centres
SO-IC&KC-IDC---7	Diagnosing quality, availability, and communication issues (WMO/IOC)
SO-IC&KC-CD---#	Procedures for collection and sharing of climate data
SO-IC&KC-CD---1	Efforts to ensure high quality
SO-IC&KC-CD---2	Template for data collection
SO-IC&KC-CD---3	Retention mechanism
SO-IC&KC-CD-MA-#	Making accessible to other scientists
SO-IC&KC-CD-MA-1	National Policy International ECV exchange
SO-IC&KC-CD-MA-2	Policy to remove barriers
SO-IC&KC-CD-MA-3	Procedures to adhere to global climate change observing systems (GCOS) monitoring principles
SO-IC&KC-CD-MA-4	Steps taken towards protecting data integrity
SO-IC&KC-NFP---#	National focal points
SO-IC&KC-NFP---1	Atmospheric climate observing systems
SO-IC&KC-NFP---2	Ocean climate observing systems
SO-IC&KC-NFP---3	Terrestrial climate observing systems

Tags	ACB-CT
SO-IC&KC-ESN---#	Established systems and networks
SO-IC&KC-ESN---1	Atmospheric climate observing systems
SO-IC&KC-ESN---2	Ocean climate observing systems
SO-IC&KC-ESN---3	Terrestrial climate observing systems
SO-PC----#	Procedural capacity
SO-PC-ICC---#	Information on current climatic changes
SO-PC-ICC---1	Historical context
SO-PC-ICC---2	Actions undertaken/introduced
SO-PC-ICC---3	Initiative undertaken to acquire paleoclimate data
SO-PC-ICC---4	Activities to extend data record in regions as well improvements
SO-PC-ICC-D-5#	Challenges in data
SO-PC-ICC-D-5.1	Difficulties encountered
SO-PC-ICC-D-5.2	Support needed to improve data
SO-PC-ICC-D-5.3	Steps taken to improve the data
SO-PC-ICC---6	Multinational and international support received
SO-PC-ICC---7	Capacity building plans
SO-PC-ATMOs---#	Atmospheric climate observing systems
SO-PC-ATMOs---1	Describe the NDC
SO-PC-ATMOs---2	Reporting on institutional arrangements
SO-PC-ATMOs---3	Inclusion of satellite observations
SO-PC-ATMOs---4	Plans to ensure the availability of past and future data and metadata records of the satellite measurements for the atmospheric ECVs and associated global products
SO-PC-ATMOs---5	Narrative on implementation plan
SO-PC-ATMOs---6	Improvement plans
SO-PC-OCOs---#	Ocean climate observing systems
SO-PC-OCOs---1	Describe the NDC
SO-PC-OCOs---2	Reporting on institutional arrangements
SO-PC-OCOs---3	Inclusion of satellite observations
SO-PC-OCOs---4	Plans to ensure the availability of past and future data and metadata records of the satellite measurements for the oceanic ECVs and associated global products
SO-PC-OCOs---5	Narrative on Implementation plan
SO-PC-OCOs---6	Improvement plans
SO-PC-TCOs---#	Terrestrial climate observing systems
SO-PC-TCOs---1	Describe the NDC
SO-PC-TCOs---2	National programmes: coordination and planning
SO-PC-TCOs---3	Reporting on institutional arrangements
SO-PC-TCOs---4	Inclusion of satellite observations
SO-PC-TCOs---5	Plans to ensure the availability of past and future data and metadata records of the satellite measurements for the terrestrial ECVs and associated global products
SO-PC-TCOs---6	Narrative on Implementation plan
SO-PC-TCOs---7	Improvement plans

Tags	ACB-CT
R-----#	Research
R-----1	Measure to mitigate/adaptation
R-----2	Facilitate adequate adaptation
R-----3	Development of emission factors and activity data (inventory studies)
R-----4	Climate process and climate system studies, including paleoclimate studies
R-----5	Modelling and prediction, including general circulation models
R-----6	Research on the impacts and vulnerability of climate change
R-----7	Socioeconomic analysis, including analysis of both the impacts of climate change and response
R-----8	Other specific studies
EDU-----#	Education, training, and public awareness
EDU-----1	General policy towards education, training, and public awareness: national-level programmes, state level programmes, and others
EDU-----2	Public information and education materials
EDU-----3	Resource or information centres
EDU-----4	Training programmes
EDU-----5	Participation in international activities
EDU-----6	Public participation in the preparation or domestic review of the National Communication
EDU-----7	Public access to information
EDU-----8	Other initiatives
NA	Not applicable to any of the tagging

Stakeholder consultations informing the development of the Assesment Matrix

L to R (visible to the camera) Aman Gupta - Shakti Sustainable Energy Foundation; Damandeep Singh, CDP (formerly Carbon Disclosure Project); Subrata Chakrabarty, World Resources Institute (WRI); Ulka Kelkar, World Resources Institute (WRI); Elizabeth Gogoi, Oxford Policy Management India; and Sumana Bhattacharya, IORA Ecological Solutions.

Sumit Prasad (CEEW) presenting the framework idea at a stakeholder consultation to develop the assesment matrix.

Joydeep Gupta - The Third Pole, India Climate Dialogue.

Images: Riddhima Sethi/CEEW

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