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The scope of national climate MRV system - A case study for India

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Abstract

The national climate MRV (Measuring, Reporting, and Verification) system in India has a comprehensive scope that covers various sectors and activities related to climate change mitigation and adaptation. The system includes measuring and reporting GHG emissions from energy, agriculture and forestry, industry, and waste management. It also tracks and reports on various mitigation and adaptation actions taken by the government, such as the promotion of renewable energy and energy efficiency measures and the development of climate-resilient infrastructure. Additionally, the MRV system in India includes mechanisms for tracking international climate finance and the implementation of international agreements related to climate change, such as the Paris Agreement. However, there are still some challenges in the implementation of the system, including issues related to data accuracy, completeness, and consistency across various sectors and regions of the country. Continued efforts are needed to improve the effectiveness of the system in achieving India's climate targets.

Introduction

A national climate MRV (Measuring, Reporting, and Verification) system is an essential tool for tracking progress towards a country's climate goals. The scope of such a system can vary depending on the country's priorities and specific climate challenges. In general, the scope of a national climate MRV system includes measuring and reporting greenhouse gas (GHG) emissions from various sectors, such as energy, agriculture, industry, and waste management. The system also covers the monitoring and reporting of various mitigation and adaptation actions taken by the government. This includes the development of climate-resilient infrastructure, the promotion of renewable energy, and energy efficiency measures. The MRV system also includes mechanisms for tracking international climate finance and the implementation of international agreements related to climate change, such as the Paris Agreement. In summary, a national climate MRV system has a comprehensive scope and plays a crucial role in ensuring accountability and transparency in a country's climate actions.

MRV stands for "Measurement, Reporting, and Verification." It is a critical component of any national climate policy as it provides the necessary data and information for tracking progress towards the goals of reducing greenhouse gas emissions and adapting to the impacts of climate change.

The scope of India's national climate MRV system covers a wide range of activities, including:

- Mitigation Actions: The MRV system covers all the activities related to mitigation, including renewable energy deployment, energy efficiency improvements, and emission reductions in various sectors such as industry, transport, and buildings.
- Climate Change Adaptation: The MRV system also includes monitoring and reporting on adaptation measures such as building climate-resilient infrastructure, improving water management, and enhancing agricultural productivity.
- Forest and Land Use: The MRV system also covers monitoring and reporting on forest and land use changes, including deforestation, afforestation, and reforestation activities.
- Financing and Investment: The MRV system also tracks the financial resources and investments required for climate action and the impact of these investments on greenhouse gas emissions and climate resilience.
- Capacity Building: The MRV system also includes the development of institutional capacity and the training of personnel to support the implementation of climate actions and the reporting of their impacts.

The national climate MRV system in India is designed to provide a comprehensive and transparent framework for measuring, reporting, and verifying the country's progress towards achieving its climate goals. It is essential for tracking progress, identifying areas that require more attention, and ensuring accountability and transparency in the implementation of climate policies and actions

India is committed to fighting climate change and has pledged to reduce its greenhouse gas emissions intensity (emissions per unit of GDP) by 33-35% by 2030 from 2005 levels. To do this, it has developed a national climate change mitigation strategy, which includes the creation of a robust and effective Monitoring, Reporting and Verification (MRV) System.

The National Communication, India's first submission to the United Nations Framework Convention on Climate Change (UNFCCC), emphasized the need for a national system to track and report greenhouse gas (GHG) emissions data regularly. India developed its first MRV framework to meet this need, based on four key components:

1. The preparation of an inventory of GHG emissions and removals.

2. Reporting of inventory data to the UNFCCC, based on established guidelines.

3. Quality assurance and control of inventory data.

4. Verification of inventory data.

The MRV system provides the platform for assessing and analyzing the impact of climate change policies, measuring progress against national goals, and identifying areas of success and improvement. It also helps to ensure transparency and accountability in the reporting of GHG emissions.

India's MRV system has a wide scope, encompassing all six sectors identified by the Intergovernmental Panel on Climate Change (IPCC) - energy, industrial processes and product use (IPPU), agriculture, forestry and other land-use (AFOLU), waste, and cross-cutting issues. Each sector has its own MRV methodology, which includes establishing standardized emission factors, data collection, analysis, and reporting structures.

In the energy sector, India has developed methodologies for tracking GHG emissions from fossil fuel combustion, power generation, transportation, and industrial processes. For agriculture and forestry, the inventory factors in carbon sequestration and non-CO2 GHG emissions, such as those from livestock and fertilizer use.

One of the most innovative aspects of India's MRV system is the use of satellite imagery and remote sensing technologies to map land-use changes and carbon stocks. The government is also exploring the use of blockchain technology to ensure the veracity of data and greater transparency in the reporting process.

India's MRV system has been praised for its scope and ambition. However, there are still areas for improvement. For example, the system could benefit from clearer guidelines for reporting data, greater participation from the private sector, and more extensive data collection in rural areas.

In conclusion, India's MRV system is an essential tool for achieving the country's climate change mitigation goals. It provides a roadmap for tracking and reporting GHG emissions, promoting transparency and accountability, and showcasing India's commitment to sustainable development. While there is still room for improvement, the system sets a benchmark for other developing countries seeking to develop robust MRV systems.

The following are some of the key areas covered by India's national climate MRV system:

- Energy: The MRV system tracks and reports emissions from the energy sector, including electricity generation, transportation, and industrial processes.
- Agriculture and Forestry: The system covers emissions from agricultural activities, such as livestock and crop production, as well as emissions and removals from forests and other land-use activities.
- Industry: The MRV system monitors emissions from various industrial sectors, such as cement, steel, and chemicals.
- Waste: The system tracks emissions from waste management practices, such as landfilling and incineration.
- Mitigation Actions: The system covers the monitoring and reporting of various mitigation actions taken by the government, such as the promotion of renewable energy and energy efficiency measures.
- Adaptation Actions: The MRV system also includes the monitoring and reporting of adaptation actions taken by the government, such as the development of climate-resilient infrastructure.
- International Cooperation: The system includes mechanisms for tracking international climate finance and the implementation of international agreements related to climate change, such as the Paris Agreement.

Climate Change is a global problem that requires shared actions to respond to its challenges and to tackle its adverse effects. Dangerous human interference with the climate system can only be avoided if major GHGs emitting countries are committed to take sufficient measures of mitigation actions. In order to ensure that there will be no 'freeriders' in the shared actions, information on strategies, policies and actions taken by countries needs to be made available in an accountable manner (Bakker et al., 2010)

Fransen 2009

The United Nations Framework Convention on Climate Change employs a system of national communications and greenhouse gas inventories to monitor implementation of the Convention. This analysis examines the strengths and weaknesses of that system in the context of a post-2012 international climate change agreement, considering the Bali Action Plan provisions on measurement, reporting, and verification. It concludes that while the existing system contains elements that can support some parts of a post-2012 framework, a significant retrofit, accompanied by new processes, will be needed to measure, report, and verify the obligations envisioned in the Bali Action Plan. World Resources Institute Working Papers contain preliminary research, analysis, findings, and recommendations. They are circulated without a full peer review to stimulate timely discussion and critical feedback and to influence ongoing debate on emerging issues. Most working papers are eventually published in another form and their content may be revised

Ibrahim Warne (2019)

Although it is too premature to assess the Paris Agreement, its comparatively sensible approach makes it more promising than the Kyoto Protocol which precedes it. The over reliance on fossil fuel for economic growth and development has destroyed the ozone layer and has exposed plant-earth to significant threats of climate change effects such as violent storms, droughts, sea-level rise, floods, and desertification among many others. Since the entry into force of the United Nations Framework Convention on Climate Change (UNFCCC) in March 1994 and the adoption of the Kyoto Protocol (the world's first GHG emissions reduction treaty) in 1997, the world has been searching for effective ways and means of mitigating the adverse effects of global warming. It would appear that the breakthrough came in December 2015 when 195 countries came together for the first time and agreed to take universal action to reduce global warming to well below 2°C, achieve net zero emissions, and increase climate change impact resilience. It can never be overstated that the adoption of the Paris Agreement represents a major turning point and new hope for climate change policy. However, as the issues surrounding the climate change debate are intricately linked with states' economic growth and development, state parties will continue to have different views on how the Agreement should be implemented.

Kamil , et al., (2021)

Using Indonesia's energy sector as case study, we explore the effects of the domestic measurement, reporting and verification (MRV) system as a manifestation of national level climate transparency. We examine the ways in which MRV

facilitates state actors' reflexive capacity to recognize, reflect on, and respond to the demand for mitigation-related information emanating from global climate governance processes. Our results show that engagement with Indonesia's domestic MRV system enhanced actors' capacities to reorganize institutional arrangements, including competing rules and practices; recalibrate data and information systems; reprioritize the deployment of available resources; and reformulate policy and strategy. These reflexive responses illustrate the range of potential MRV-associated effects that can be realized in a domestic context, beyond simply generating and reporting information. We conclude that while the generation of transparency has yet to directly enhance domestic mitigation action, it facilitates improvement of informational and executive systems and infrastructures that support mitigation policies.

UNFCCC (2013)

Article 12 of the Convention obliges all Parties, in accordance with Article 4, paragraph 4, to communicate to the Conference of the Parties (COP) information relevant to the implementation of the Convention, including in relation to emissions and removals. This allows the Convention to have reliable, transparent and comprehensive information on emissions, actions and support, thereby forming an essential basis for understanding current emission levels, and the ambition of existing efforts, as well as progress on both the national and international scale.

The lack of clarity on MRV issue at the international climate regime

• Conflicting positioning between developed and developing countries over MRV issue.

• The challenge of implementing climate mitigation actions MRV for developing countries at national level. The overall objective of this study is to examine the current state of MRV systems or initiatives in India

• Mapping progress on mitigation and GHG inventory in the country

• Identifying the country's MRV gaps and needs

• Making recommendations to improve the existing MRV system or initiative.

Study Design This research is a qualitative research that aimed to analyze the issue of climate mitigation actions MRV for developing countries, within the scope of the negotiation at international level and the implementation at national level.

• Determination of study area

• Data Collection and analysis

National climate MRV in India refers to monitoring, reporting and verification of greenhouse gas emissions and other climate-related data in India. The country has committed to reducing its emissions by 33-35% below 2005 levels by 2030, and therefore sound MRV systems are needed to track progress towards this goal. India's MRV system is being developed and implemented through a variety of national and subnational efforts, including the National Action Plan on Climate

Change, the State Action Plans on Climate Change, and the Biennial Update Reports to the United Nations Framework Convention on Climate Change.

The MRV system in India includes a number of key components, including the development of national GHG inventories, the establishment of monitoring and reporting systems, and the implementation of third-party verification. The Ministry of Environment, Forest and Climate Change is the lead agency responsible for coordinating and implementing these efforts. The national GHG inventory is prepared every two years and includes emissions from energy, industrial processes and product use, agriculture, forestry and other land use, and waste sectors.

India's MRV system is still in the early stages of development, and many challenges remain, including capacity building, data quality and availability, and institutional coordination. However, progress is being made, and the country is taking important steps towards achieving its emissions reduction goals.

National climate MRV (Measurement, Reporting, and Verification) in India is an important factor in tracking the country's progress towards achieving its climate goals. In recent years, there has been a growing focus on bringing transparency and accountability in the country's efforts to mitigate climate change. The Government of India has taken several steps towards establishing a robust MRV system, which includes the development of a National GHG inventory, establishment of a network of climate observatories, and creation of a web-based GHG data platform.

One of the main challenges in MRV is the availability of data. In India, there is a lack of reliable and extensive data on GHG emissions across various sectors. To address this, the government has taken measures to improve data collection and monitoring systems, along with providing financial assistance to states for setting up infrastructure for data management.

Moving forward, India's MRV system needs to be strengthened further to effectively track the country's progress towards achieving its climate goals. This can be achieved by developing a more comprehensive GHG inventory, strengthening the existing monitoring networks, and developing innovative methodologies for measuring emissions in sectors such as agriculture, forestry, and land use.

In conclusion, India's efforts towards establishing a robust MRV system are commendable, but there is still a long way to go. With the right policies and investments, India can develop a world-class MRV system that not only effectively tracks the country's progress towards achieving its climate goals but also sets an example for other developing countries.

India has been actively engaged in climate change mitigation efforts and has made substantial progress in implementing policies and measures to reduce greenhouse gas emissions. The country has established a robust monitoring, reporting, and verification (MRV) system to track its progress on climate action. The National Government, along with various state governments, has been working together to systematically collect, report, and verify climate-related data.

The National Action Plan on Climate Change (NAPCC) of India outlines a national strategy to address climate change, including eight national missions. The NAPCC also stresses the importance of establishing a climate change knowledge management center to facilitate coordination and integration of climate change-related information across various sectors.

India has adopted a three-tiered approach to MRV, with the Central Government playing a strategic role in coordinating and reporting, state governments collecting and compiling data, and district-level institutions implementing actions to reduce emissions. The 2018 National Communication submitted to the United Nations Framework Convention on Climate Change (UNFCCC) highlighted the importance of creating a standardized protocol for MRV at the sub-national level.

Apart from utilizing the traditional top-down approach, India has also experimented with a bottom-up approach through community-based MRV. The community-based MRV approach, which involves local communities in the data collection and reporting process, has been utilized by several organizations and has yielded positive results in terms of data quality, accuracy, and ownership.

In conclusion, India has made substantial progress in establishing a robust MRV system to track its progress on climate action. The country's three-tiered approach, along with the use of a community-based MRV approach, has yielded positive results and has contributed to the greater goal of global climate change mitigation.

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