

# Scoping Study on Monitoring, Reporting and Verification (MRV) in Ecosystem Restoration with a Focus on Agro-ecological Landscapes



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Restoration with a Focus on Agro-ecological Landscapes

Nakul Mohan Heble, Neha Bhadbhade, Abraham Samuel, K. J. Joy, and Kiran Lohakare



Society for Promoting Participative Ecosystem Management (SOPPECOM), Pune

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## Foreword and Acknowledgement

Society for Promoting Participative Ecosystem Management (SOPPECOM) is a non-profit, non-governmental organisation based in Pune, India working in the area of Natural Resource Management in India, primarily in rural areas. The organisation is committed to the principles of sustainable and rational use of natural resources, equity, and social justice in the distribution of benefits, especially to disadvantaged groups like dalits, the landless, and women. As an organisation committed to these principles, SOPPECOM extends its support to grassroots groups working on NRM issues through training, resource literacy, participatory planning, research, and policy advocacy.

TMG Research gGmbH is a Berlin-based research organisation working on sustainability issues in the areas of sustainable management and responsible governance of land and oceans, food systems, and climate. As an organisation, TMG brings sound knowledge and practical experience in facilitating national, European, and international processes and is dedicated to the analysis and solution of new and complex challenges. As an independent entity, TMG works with actors from science, politics, the private sector, and civil society.

The following study commissioned to SOPPECOM by the TMG Research group is a part of the SEWOH lab project. The purpose of the SEWOH lab project is to analyse the linkages between digital and social innovations for achieving Sustainable Development Goal 2 and especially to understand the potential of digital solutions for inclusive rural and agricultural development in sub-Saharan Africa and India.

Within this larger project, SOPPECOM conducted the study under the *Ecosystem Restoration Workstream: “Digital Tools to Cover the Last Mile in Restoration Monitoring”*. The study focussed on two distinct work packages – i) *Situational Analysis of current monitoring systems*: To understand existing tools (digital or otherwise) for monitoring and impact assessment of SOC and soil health resulting from agricultural and farm management practices; ii) *Scoping study on the monitoring, verification, and reporting in ecosystem landscape restoration*: To assess, how the implementation of programmes and projects in the field of ecosystem restoration is reported to the state and national level in India. This report, “Scoping Study on Monitoring, Reporting, and

Verification (MRV) in Ecosystem Restoration with a Focus on Agro-ecological Landscapes” presented below is the synthesis of the research work done under work package two as mentioned above. The study was done over a period of months from February – June 2022.

First and foremost, we thank the TMG Research Group for collaborating with us on this very critical subject of digitalization in agroecological systems. Especially, we are very thankful to Larissa Stiem-Bhatia from the TMG Research group for coordinating with our team and sharing her valuable feedback with our team from time to time.

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We are thankful to all the government officials who helped us understand the different monitoring, reporting, and verification frameworks at the state and national levels. We are also thankful to all the experts from this field who helped us get a nuanced understanding of the subject. A special thanks to all the experts who participated in the peer group consultation conducted in Pune on April 8, 2022, and the final virtual workshop on June 10, 2022. Their insights, thoughts, and experiences have immensely helped us in shaping the final report.

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Nakul Mohan Heble, Neha Bhadbhade, Abraham Samuel, K. J. Joy and Kiran Lohakare

SOPPECOM, Pune

## List of Acronyms and Abbreviations

ADP	Aspirational Districts Programme
CPMU	Central Program Monitoring Unit
CS	Central Sector Schemes
CSOs	Civil Society Organisations
CSR	Corporate Social Responsibility
CSS	Centrally Sponsored Schemes
DAC	Department of Agriculture Co-operation
DBT	Direct Benefit Transfer
DEA	Department of Economic Affairs
DIF	District Indicator Framework
DMEO	Development Monitoring and Evaluation Office
DoAFW	Department of Agriculture and Farmer's Welfare
DPMU	District Program Management Unit
DPR	Detailed Project Report
DSS	Decision Support System
EC	Electrical Conductivity
FAO	Food and Agriculture Organization
GIDR	Gujarat Institute of Development Research
GIF	Global Indicator Framework
GIS	Geographic Information System
Gol	Government of India
GS	Gram Sabha
IAEG-SDGs	Inter-Agency and Expert Group on SDG Indicators
ICT	Information and Communications Technology
IDEA	India Digital Ecosystem of Agriculture
IEO	Independent Evaluation Office
IndEA	India Enterprise Architecture

ISRO	Indian Space Research Organisation
IWMP	Integrated Watershed Management Programme
M/Ds	Ministries and Departments
M&E	Monitoring and Evaluation
MEL&D	Monitoring, Evaluation, Learning and Documentation
MEITY	Ministry of Electronics and Information Technology
MIS	Management Information System
MLE	Monitoring, Learning and Evaluation
MoAFW	Ministry of Agriculture and Farmer's Welfare
MoEFCC	Ministry of Environment, Forests and Climate Change
MoJS	Ministry of Jal Shakti
MoRD	Ministry of Rural Development
MoSPI	Ministry of Statistics and Programme Implementation
MRV	Monitoring, Reporting and Verification
MWS	Micro Watersheds
NABARD	National Bank for Agriculture and Rural Development
NAM	National Mission on Agriculture
NAPCC	National Action Plan on Climate Change
NeGP-A	National E-Governance Plan in Agriculture
NGOs	Non-Governmental Organisations
NIF	National Indicator Framework
NITI Aayog	National Institution for Transforming India
NMSA	National Mission for Sustainable Agriculture
NMAET	National Mission on Agricultural Extension and Technology
NREGS	National Rural Employment Guarantee Scheme
NRM	Natural Resource Management
NRSC	National Remote Sensing Centre

NWDPRA	National Watershed Development Project for Rainfed Area
OC	Organic Carbon
OGD	Open Government Data
OOMF	Output Outcome Monitoring Framework
PC	Planning Commission
PDO	Project Development Objective
PEO	Programme Evaluation Office
PFA	Project Facilitating Agency
PIA	Project Implementation Agency
PMO	Prime Minister's Office
PMU	Project Management Unit
PoCRA	Project on Climate Resilient Agriculture
RAD	Rainfed Area Development
RAPI	Rainfed Areas Prioritization Index
SDGs	Sustainable Development Goals
SHC	Soil Health Card
SHGs	Self Help Groups
SHM	Soil Health Management
SIF	State Indicator Framework
SLCs	State Level Committees
SLNA	State Level Nodal Agency
SMAE	Sub-Mission on Agricultural Extension
SMAF	Sub-Mission on Agro-Forestry
SOC	Soil Organic Carbon
SOP	Statement of Purpose
SOPPECOM	Society for Promoting Participative Ecosystem Management
SPMU	State Programme Monitoring Unit

UFSI	Unified Farmer Service Interface
UNDP	United Nations Development Programme
UNGA	United Nations General Assembly
UNRCO	United Nations Resident Coordinator Office
VCRMC	Village Climate Risk Management Committee
VWC	Village Watershed Committee
WC	Watershed Committee
WCDC	Watershed Cell-cum-Data Centre
WDC-PMKSY	Watershed Development Component of Pradhan Mantri Krishi Sinchayee Yojana
WDF	Watershed Development Fund
WDT	Watershed Development Team
WOTR	Watershed Organisation Trust
WSD	Water Shed Development

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## Executive Summary

This scoping study has been commissioned by TMG Think Tank for Sustainability gGmbH, a Berlin-based research organisation, under its SEWOH Lab project and it analyses the linkages between digital and social innovations for achieving Sustainable Development Goal 2. Under SEWOH Lab's Soil Organic Carbon (SOC) work stream, the specific objectives of this study are:

- To understand the Monitoring, Reporting and Verification (MRV) process of ecosystem restoration projects in agro-ecological landscapes in India from the ground to the state and central governments.
- To understand the contribution local level data makes in informing development, climate and SDG objectives.

The decade of 2021–2030 has been declared as the UN Decade on Ecosystem Restoration (UNGA, 2019) and heralds a new era of action to restore rapidly declining ecosystems across the globe. Much like in other spaces, ecosystem restoration in agro-ecological landscapes has had a long history and the essence of the coming decade is largely to build and improve upon interventions such as drought proofing, watershed development and other ecosystem based adaptations that will improve productivity and safeguard agrarian livelihoods sustainably. While well-meaning interventions, both by government and non-government actors, have already been implemented in this sector since the 1970s, they have often suffered from fragmentation of action, inconsistent or varying approaches and lack of transformation objectives (MoEFCC, 2018). Thus, it then becomes doubly difficult to bring them under a systematic and comparable MRV system that facilitates measurable impacts and meaningful results.

As far as we know, this is the first study that examines MRV processes of ecosystem restoration work in the sector of agriculture in India. Much of the earlier data pertained to broad explanations of how historical and current government institutions functioned and contributed to the strengthening of M&E processes of government projects, programmes and schemes.

The following are the key takeaways emerging from this study:

- **Centralisation of agricultural data is a defining feature of the MRV processes in India.** While almost all the work around agro-ecological ecosystem restoration in India is undertaken by the states, the reporting and analysis of data is highly centralised, largely led by the NITI Aayog and the Ministry of Statistics and Programme Implementation (MoSPI). Both these organisations work with states to strengthen MRV processes, especially in streamlining and embedding SDG thinking in their development objectives.
- **Non-governmental restoration activities** led by NGOs, CSOs and private companies through their Corporate Social Responsibility (CSR) initiatives do not figure in any aggregated metrics handled by the states or the central government. Data generated in this space is highly disaggregated. Nevertheless, we believe that, in the current manner in which indicators are formulated at the NITI Aayog and the MoSPI, especially in the areas of watershed development, it is entirely possible to assimilate data from non-governmental programmes. We have, however, found no evidence yet of such an effort. This is equally true for tripartite projects funded by multi-lateral organisations that seem to have a stronger MRV process but do not report any of this data to the central government.
- **Digitisation of agricultural data and new forms of digital ecosystems** such as Agristack raises the question of data privacy, consent framework and ownership. While multiple benefits have been envisioned by such aggregation of data (PIB, 2021b), including those of MRV, we believe that the absence of strong laws and policies around data use and privacy can lead to unintended outcomes (Saha, 2021).
- **Dashboards, frameworks and digital platforms** that have been listed in the report contain analysed information presented either diagrammatically or in easily understandable measures of analysis. While this allows for easy access and understandability, access to raw data is conspicuous by its absence. Both the central and the state governments must strive to be more transparent and open to sharing data with the public, adhering to data safeguard and privacy measures

# Chapter 1. Introduction

## **1.1. Digitisation of Restoration Activities in Agro-Ecological Landscapes in India**

Digitisation in agriculture and the inclusion of sustainability ideas and goals are at the forefront of agricultural policies in India. In India, the agriculture sector is the largest in terms of public investments and population working within it and it is the most volatile sector in terms of growth (PRS, 2017). Converting investments into tangible economic and social outcomes in a rapidly changing world, made worse by a looming climate crisis, is a challenge for this sector. Such a crisis of agriculture comes in the backdrop of multiple pressures mounted on natural resources, starting from the early 1970s as part of the green revolution.

This prompted the government to take action through ecosystem-based restoration and adaptation programmes such as organic farming techniques, irrigation efficient technologies, soil management, watershed development and agro-ecological solutions, which have begun to percolate into the language of policy and practice at all governance levels. For such action to effect a change requires a deeper understanding of restoration processes, timeframes and impacts, along with continuous monitoring.

In India, broad frameworks, policy directives and monitoring processes that facilitate these changes, such as the Sustainable Development Goals (SDGs), the National Mission on Agriculture (NAM) of the National Action Plan for Climate Change (NAPCC), and digitisation efforts such as the National E-Governance Plan in Agriculture (NeGP-A) and more recently, the IDEA-Agristack are some examples of the efforts taken by the Government of India (GoI).

Yet, agro-ecological landscapes across India suffer from numerous problems today. The protection of water sources and ensuring the right infrastructure to make water available where currently it is not, still proves to be a challenge, while the excessive use of fertilisers has led to the degradation of soil and groundwater (Bhattacharyya et al., 2015). One of the largest sectors of consumptive water use and withdrawal in the world, agriculture also suffers from land

fragmentation, loss of top soil, abandonment due to low income, among many other ecological and negative social outcomes.

A key axis of the implementation of ecological restoration activities relates to the impact it creates. Thus, it becomes imperative that such activities be catalogued and understood to inform similar initiatives in the future or elsewhere in the present. An entire gamut of activities are put into practice to help us understand the outcomes of schemes, projects and programmes of the government, non-government and privately led ecosystem restoration activities in agriculture. They include, but are not limited to, monitoring and evaluation (M&E), reporting of project outcomes at various stages of the project or verification processes that inform, in real time, how restoration activities are faring.

The following sections will outline the background and evolution of the MRV systems in India, thereby setting the context of the study.

## **1.2. Background**

Conducting ecosystem restoration work in agrarian landscapes in India is a highly heterogeneous exercise. Interventions in multiple agro-ecological governance structures, spanning several states with a diverse set of ecological and agrarian needs, present a unique challenge. Keeping track of its progress and outcomes depends heavily on the development, climate and sustainability objectives of the central and the individual state governments. Apart from governments, non-governmental and civil society organisations have also been working to improve the outcomes of interventions in ecosystem restoration, whether it is watershed development, soil restoration or agro-forestry. The need for monitoring all the activities in a more robust and dynamic manner will help in avoiding duplication of action and pilferage of resources as well as in improving accountability. The shift in focus from implementation to improving M&E, along with robust mechanisms of reporting and verification, thus becomes highly essential.

Since the green revolution began in the 1970s, India's agricultural milieu has seen tremendous change. The improvements in grain stock, reduction in fiscal deficits and rise in income for select farming communities also brought with it ecological destruction, groundwater reduction and issues of soil health. From the initial Watershed Programme in 1983-84, India has come a long way in implementing multiple ecological solutions to agricultural challenges. Yet, there is no one

specific definition or a classification of what constitutes ecosystem restoration in the context of agriculture in India. Furthermore, sustaining agrarian economies into the future is a major challenge in India. While much work has happened over the last few decades in the areas of watershed development, soils and biodiversity conservation, most ecosystem restoration work still remains disaggregated, with multiple actors across various geographies and little integration of data.

Keeping this in mind, understanding the structure of MRV in India becomes important. In the early years, India's intention towards monitoring and evaluation of schemes showed a layered approach. In the early 1950s, as the Planning Commission (PC) started developing the five-yearly plans, the Programme Evaluation Organisation (PEO) was constituted to function as the primary evaluation body of the PC and was given full freedom to evaluate the plans of the Govt (Chandrasekar, 2015). A reorganisation of the body in the 1970s reduced its role drastically to only evaluate 'operational, financial and administrative aspects of schemes and programmes' (Diwakar, 2018). This restricted the freedoms of the organisation as well as watered down its strength, something that it had enjoyed for almost two decades. All the while, monitoring was decentralised to the ministry or department (M/D) that implemented the scheme.

### **1.3. Setting the Context**

The SEWOH Lab Project, implemented by TMG Think Tank for Sustainability is a project that explores the role of digitalisation in creating socially inclusive and transformative food systems through the analysis of the linkages between digital and social innovations for achieving Sustainable Development Goal 2. Under the SEWOH Lab Project, this report analyses the way implementation of programmes and projects in the field of landscape restoration (e.g., watershed development, sustainable soil and land management, ecosystem-based adaptation, etc.) are reported to the state and the national level.

This report situates the importance of local level data in informing its contribution to achieving development and climate related goals, including the SDGs. The locations of information to conduct a scoping study have been pre-defined and are limited to the literature review and interviews with experts from policy and programme implementation. A specific output expected is to understand the data reviewed as part of a larger vision to showcase MRV data in a digital format, similar to the CADASTA Global Impact Dashboards.

Dashboards at both the national and the state levels have become a defining feature of digital reporting of government data. From individual Prime Minister/Chief Minister dashboards<sup>1</sup> to those that report department/ministry datasets, dashboards have become a ubiquitous presence at all governance levels. Specifically in the areas of agriculture, and deeper still within the ecosystem restoration arena, monitoring toolkits, frameworks and dashboards have to be understood for their potential to effectively report and communicate data, leading to improvements in both agricultural production and income potential of farmers, especially the marginalised.

Fundamentally, such a study requires the adoption of a broader set of review tools, as is commonly seen in scoping studies. Given that the MRV pertaining to agro-ecological restoration cannot be easily separated from the MRV that focuses on the entire range of activities of the government, the report will broadly explain the processes of MRV at the national and the state level and, where possible, extract the work around agro-ecological restoration work and present it here.

A detailed description of the methodology along with the framework is provided in the next section.

#### **1.4. Methodology**

A scoping study, unlike a systematic literature review, is the mapping of all available literature on a specific topic. Unlike systematic literature reviews, a scoping study may not be based on a specific question that requires a study design to be pre-conceived. The process of conducting a scoping study is iterative and is intended to be a quick assessment of relevant literature, amenable to the adoption of a variety of review methods. A scoping study can also contain datasets spanning a wide range that includes, but is not limited to journals, reports, websites, existing networks and publicly and privately available datasets that are reinforced by interviews with experts in the field (Arksey & O'Malley, 2005).

As described by Mays et al. (2004), 'Scoping studies aim to map rapidly the key concepts underpinning a research area and the main sources and types of evidence available, and can be

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<sup>1</sup> Please refer to Annexure I for a detailed list of links to Chief Minister dashboards across all states of India.

undertaken as standalone projects in their own right, especially where an area is complex or has not been reviewed comprehensively before’.

The report adopts this method to quickly scan the landscape in question and present a concise, yet adequately detailed report of the MRV processes prevalent around agro-ecological restoration in India at the central and the state levels.

#### *1.4.1. Objectives*

The section will elaborate on the following two objectives of the scoping study:

- To understand the Monitoring, Reporting and Verification (MRV) process of ecosystem restoration projects in agro-ecological landscapes in India, from the ground to the state and central governments.
- To understand the contribution local level data makes in informing development, climate and SDG objectives.

#### *1.4.2. Strategies for the Scoping Study*

The scoping study was conducted over a period of three months and involved a combination of literature review, discussions with key informants and the outcomes of a peer review consultation meeting.

Given the novel nature of the study, the work was divided into three broad categories. The first step involved the understanding of the basic structure of M&E in India. MRV is a term that is rarely used in the country. Most of the reporting and verification systems are subsumed under the monitoring mechanisms in India. Evaluation of projects is a separate process within the government structure and is often conducted by external agencies. Multiple government websites were accessed along with reports from several monitoring and evaluation offices within various ministries and departments at the central level. State statistics and programme implementation departments were also visited along with multiple dashboards of relevant ministries and departments.

The second step was to interview experts in the area of MRV. We have interviewed five people from both government and civil society organisations whose inputs have informed the report greatly. Inputs from experts in a peer review consultation meeting held on 8 April 2022, have also

been helpful in shaping the study, especially the section on NREGS and MRV details at the state and district levels.

### *1.4.3. Organisation of the Report*

The report is organised under four chapters. Following this introductory chapter, Chapter 2 and 3 will list the multiple avenues through which governments monitor and report ecosystem restoration data in general and specifically those pertaining to agro-ecological work. Chapter 2 will elaborate on the schemes and programmes spearheaded by the GoI on the themes of watershed development, soil and land management as well as a cross-cutting theme that plays a supportive role in the implementation of agro-ecological restoration work at the state level. Chapter 3 has been reported in two distinct stages. The first is the system currently in place at the central level, and the second is the structure established at the state level. This chapter will end with a case study of a tripartite climate resilience project called PoCRA in the state of Maharashtra. Finally, Chapter 4 will broadly list out our observations from the study, key findings, recommendations, and suggest a way forward.

## Chapter 2. An Introduction to Programme Level MRV and Processes in India

Mapping of the MRV system along with the central and state mechanisms that drive it will be the first step in this report. We have mapped the structure of MRV in India and presented it in a diagrammatic manner (Figure 2.1). The rows in the figure are divided into centre, states and districts while the columns represent the various ministries and departments, and programmes under them related to ecosystem restoration work in India. The columns also contain the various frameworks, toolkits and schemes under each ministry that are of relevance to this report. Under each of them, their reporting mechanisms, from the district to the state and finally to the centre, have been reported. The final column contains a small list of examples of quasi and non-government bodies such as think tanks, premier education institutions and NGO/CSOs which have devised their own toolkits, frameworks and technical capacities to assist their restoration interventions or those of the governments, in agro-ecological landscapes.

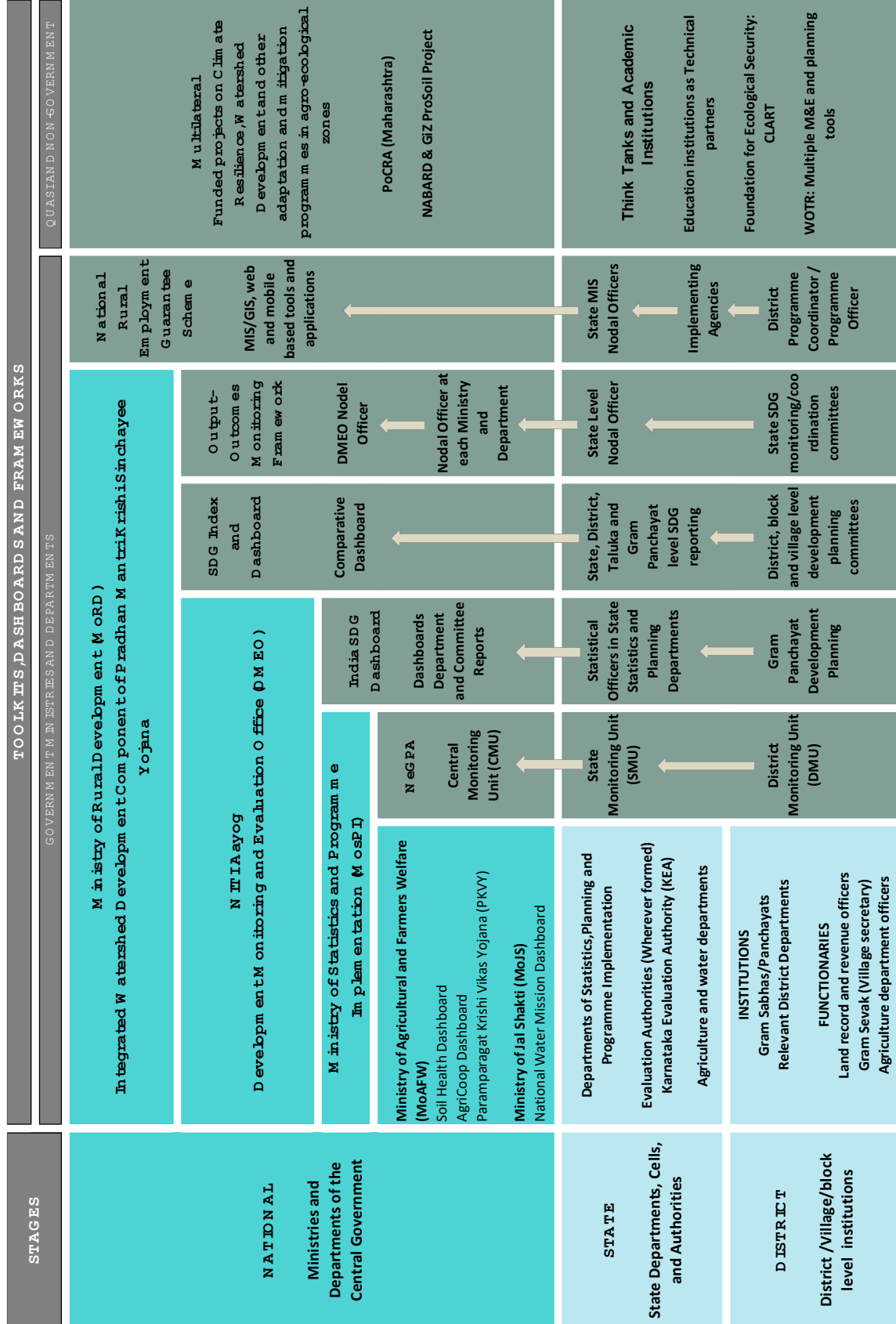


Figure 2.1: Mapping the Structure of Monitoring, Reporting and Verification in India

As illustrated in Figure 2.1, a number of components make up the system of MRV and evaluation in India. They span several five-year plans in terms of time (2012–17 being the last one), and multiple departments in each state in terms of space. The crux of the ecosystem restoration work in India is led by the states, owing to the federal structure of India’s governance system. Several activities around the sector of agriculture in India find a mention in the union, the state as well as the concurrent lists of the constitution. These provide sole power to the central government, the state government and at times to both, to be able to enact laws, implement projects or release funds to the sector. The majority of the powers fall in the hands of the state according to the Seventh Schedule of the Constitution of India and as a consequence, the bulk of the activities around agriculture is carried out at the state level.

The centre has a stake in the manner in which agriculture is handled at the state level and provides financial and technical assistance to the states for the implementation of various Central Sector Schemes (CS) and Centrally Sponsored Schemes (CSS). Starting from the top, going all the way to the district level, Figure 1 clearly depicts the functioning of the central and state machinery involved in the process of MRV and evaluation in India.

At the national level, three ministries hold the maximum responsibility to oversee all agricultural activities in India and by association, all the activities related to ecosystem restoration in agro-ecological zones. The three ministries are: the Ministry of Agriculture and Farmer’s Welfare (MoAFW), Ministry of Jal Shakti (MoJS) and the Ministry of Rural Development (MoRD).<sup>2</sup> Housed within these ministries are schemes, projects and missions pertaining to agro-ecological restoration. Broadly, they can be divided into three themes: Water, Soil and Land Management and Cross-cutting or Supporting themes. Water based ecosystem restoration activities in India can be clubbed under the Centrally Sponsored Scheme titled the Watershed Development Component of Pradhan Mantri Krishi Sinchayee Yojana (WDC-PMKSY). Schemes such as Rainfed Area Development (RAD), Soil Health Management (SHM) and Sub-Mission on Agro-Forestry

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<sup>2</sup> The Ministry of Environment, Forests and Climate Change (MoEFCC), the nodal environmental agency of the GoI, engages in domestic climate policymaking and internationally, in reporting of climate related outcomes. It formulates broad GHG reduction policies and does so by engaging with state governments. Such a role is illustrated in the list of 14 national schemes, none of which pertain to agriculture specifically.

(SMAF) fall under Soil and Land Management and schemes such as the National Rural Employment Guarantee Scheme (NREGS) support the restoration activities by providing the budget for gainful employment of the rural population. The following table and the subsequent note will explain one scheme from each theme in detail, listing out its reporting mechanisms, indicators used and the digital tools in use under each scheme.

**Table 2.1: Illustrative List of Government of India Schemes under Each Ecosystem Restoration Theme**

Theme	Schemes, Projects or Programmes	Reporting Infrastructure (Institutions + Functionaries)	Digital Tools for MRV	Set of Ecosystem Restoration Indicators – Classification Heads
Water	Watershed Development Component of the Pradhan Mantri Krishi Sinchayee Yojana (WDC-PMKSY)	Department of Land Resources (DoLR-MoRD)   State Level Nodal Agency (SLNA) Monitoring, Evaluation, Learning and Documentation (MEL&D)   District: Watershed Cell/Data Centre (WCDC)   Sub-watershed/watershed: Project Implementation Agency (PIA) (Watershed Development Team - WDT)   Micro watershed: Watershed Committees (WCs)	Drishti – A mobile app  Srishti – GIS based geo-portal	<ul style="list-style-type: none"> <li>• Agronomic measures (7 parameters)</li> <li>• Vegetative measures (14 parameters)</li> <li>• Structural measures (11 parameters)</li> <li>• Pond-Tanks (11 parameters)</li> <li>• Nala-Channels (8 parameters)</li> <li>• Bunds (11 parameters)</li> <li>• Live Stock (3 parameters)</li> <li>• Livelihood (12 parameters)</li> <li>• Others (8 parameters)</li> </ul>
Soil and land management	Sub-mission on agro-forestry (SMAF)	SMAF-NMSA - Mission Director   State Level Committees (SMCs)/State Forest Department   District Mission Committees (DMCs)	MIS/GIS systems for M&E	<ul style="list-style-type: none"> <li>• Area under plantation</li> <li>• Number of plants in area/periphery</li> <li>• Soil carbon sequestration</li> <li>• Soil organic matter</li> <li>• Improvement in livelihood</li> <li>• Productivity of crop and cropping systems</li> </ul>

Theme	Schemes, Projects or Programmes	Reporting Infrastructure (Institutions + Functionaries)	Digital Tools for MRV	Set of Ecosystem Restoration Indicators – Classification Heads
Cross-cutting themes	National Rural Employment Guarantee Scheme (NREGS)	Ministry of Rural Development (MoRD) Rural Development Department (Director/Commissioner)   State MIS Nodal Officers District Panchayats (District Programme Coordinator)   Implementing Agencies (SHGs/NGOs) Intermediate Panchayat (Programme Officer)   Gram Panchayat (Employment Guarantee Assistant)   Gram Sabha	NREGASoft – MIS based reporting tool GEOMGNREGA – GIS based monitoring tool. JANMANREGA – Citizen centric mobile application	Category A : Public Works Relating to Natural Resources Management Watershed development indicators: Number of contour trenches/contour bunds/farm bunds, etc. Category B : Individual Assets for Vulnerable Sections Household specific works on dug wells, farm ponds, water harvesting structures, etc. Category C: Common Infrastructure for NRLM Compliant Self-Help Groups Bio-fertiliser pits

Source: DoAFW, 2016; Faridi et al., 2017; MoRD, 2013; NRSC, 2015

## 2.1. Detailed Analysis of Schemes under the Water, Soil/Land Management and Cross-Cutting Themes

### 2.1.1. Watershed Development Component of Pradhan Mantri Krishi Sinchayee Yojana (WDC-PMKSY)

Government-led watershed development interventions in India go back several decades. Multiple ecosystem restoration interventions are bundled today in what is known as 'Watershed Development' (WSD) that aims to improve rain water capture and storage, reduce soil erosion and improve moisture, carbon storage and nutrient values in soil. Several administrative changes have taken place within WSD in the decades that it has been around. Largely, a shift has been observed from a technical and bureaucratic system of top down management, to a more 'participatory, ecosystems-based approach including social, ecosystem-based, and technical interventions' (Gray & Srinidhi, 2013)<sup>3,4</sup>

Before diving into the WDC-PMKSY, it is important to highlight the relevance and contribution of the strides made with regard to the M&E of the Integrated Watershed Management Programme (IWMP) of the GoI as well as the contribution of the states to the larger programme. Under the National Watershed Development Project for Rainfed Areas (NWDPA), the M&E systems put in place highlighted the need for a 'participatory, outcome and impact-oriented and user-focused monitoring, evaluation and learning system' (NRAA, 2011). To put such an idea into practice, the components of M&E for IWMP broadly included:

1. **Concurrent process monitoring:** Monitoring key processes, which include preparation of DPR and action plan, list of activities such as awareness and sensitisation, capacity building, understanding fund flows and other indicators that monitor data collection and implementation of the projects at all levels.

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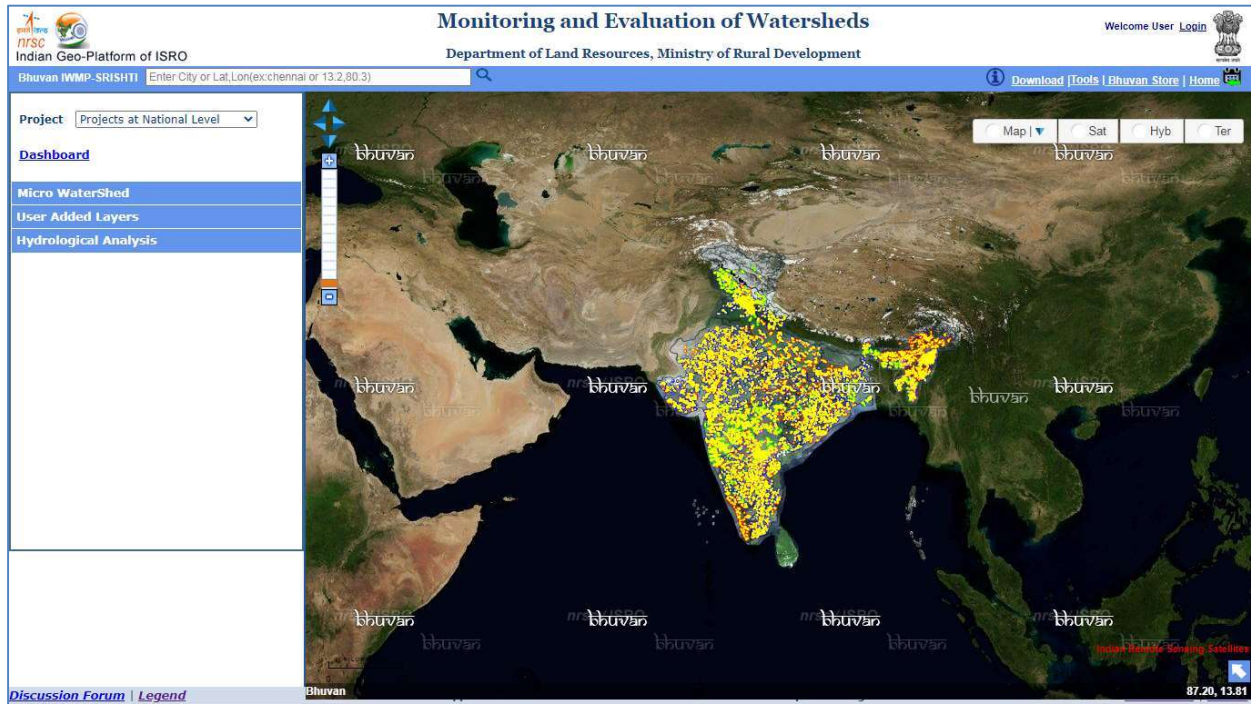
<sup>3</sup> Please refer to the original working paper (Gray & Srinidhi, 2013) and (NRAA, 2011) for a detailed note on the history and evolution of WSD in India.

<sup>4</sup> Much of the work in participatory WSD has been achieved in the 1990s and emerged from the Hanumantha Rao Committee report, 1994 and institutionalised further in subsequent WSD guidelines that came out in 2001 and 2003. For a detailed understanding of this, please refer to Chapter 6 of the 2006 'Watershed Development in Maharashtra' report (Samuel et al., 2006).

2. **Input-output monitoring:** Physical and financial status of the work on ground using MIS. For example, 'Sujala Mahithi' in Karnataka.
3. **Impact evaluation:** Assessment of project performance at set intervals (baseline/mid-term and end project evaluation) conducted by external agencies.

A third-party or external agency called the Monitoring, Evaluation, Learning and Documentation (MEL&D) agency (DoLR, 2013b; 2013a) at the SLNA level was chosen in each state by the SLNAs to perform the M&E tasks aided by the National Remote Sensing Centre (NRSC) of the Indian Space Research Organisation (ISRO), which provided their satellite and GIS platform to plan and monitor the various watersheds projects across the country. The MEL&Ds have been tasked with ensuring a smooth data integration and flow between the committees managing micro watersheds/sub watersheds to the district WCDC and the SLNA (DoLR, 2016).

The existing M&E structure of the WDC-PMKSY carries on from the M&E infrastructure that was set up under the IWMP. It consists of multiple layers of governance structures all the way from the level of the village to the state and then to the central ministry. At the level of the MWS, the Gram Sabha or the elected local governance body at the village level oversees the micro level planning by constituting a Watershed Committee (WC). The WC reports to the Project Implementation Agency (PIA) which handles multiple MWS and can be comprised of panchayat, government or non-government agencies. Data is collected and stored at the district Watershed Cell-cum-Data Centre (WCDC), which also handles all IWMP projects in the district. The State Level Nodal Agency (SLNA) primarily handled by the departments of agriculture, soil conservation, land resources, water resources or rural development in various states, is headed by a nodal officer reporting directly to a liaison officer in the Department of Land Resources (DoLR), MoRD. The MoRD, in turn, is governed by a steering committee with members from across ministries, scientific organisations and special invitees from the non-governmental space. All the data collection mechanisms and verification systems are put in place at the state level, while the centre plays a steering role.



**Figure 2.2: Monitoring and Evaluation Dashboard of the WDC-PMKSY**

(Source: DoLR BHUVAN Portal, <https://bhuvan-app1.nrsc.gov.in/iwmp/index.php?type=citizen>)

The M&E portals of the WDC-PMKSY are handled by the NRSC. A GIS based geo-portal called ‘Srishti’ and a mobile application tool called ‘Drishti’ have been created for this purpose.

Srishti empowers policymakers (Administrator Level), government personnel (Data Provider Level) and the public (Citizen Level) towards ‘creating, visualizing, analysing as well as assessing the watershed management process and its activities’ in micro-watersheds (MWS) across 10 states and special MWS from 50 districts across India (NRSC, 2015). Data Provider Level access is given to the state (SLNA) or the district (WCDC) which have the option to report by uploading action plans for the MWS, field data, activities planned, and also the option to add layers on the base map provided. The list of indicators that can be accessed in the portal have been listed in Table 2.1.

Drishti, the mobile application used for collecting MWS field attributes<sup>5</sup> by users and uploading them directly into their mobile phones, is another helpful monitoring tool. It replaces traditional

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<sup>5</sup> Attributes include various interventions including afforestation activities, watershed activities, livelihood related capacity building, among others.

methods of data collection. Similar to the data that is available on the Srishti portal, Drishti too allows Data Provider Level users to complete 'field truthing' procedures and together with Srishti, the MoRD claims that the 'integration of 3 streams of information, namely, satellite imaging, mobile smartphone based field information and geospatial technology would help in unbiased and reliable monitoring of watersheds across the country, continuously' (NRSC, 2015).

### *2.1.2. Sub-mission on Agro-forestry (SMAF) under the National Mission for Sustainable Agriculture (NMSA)*

The sub-mission on agro-forestry aims to promote sustainable land use management systems through management of trees with crops and/or animal production systems within agrarian settings. The aim is to integrate both traditional and modern land use systems in both irrigated and rain-fed agro-ecological zones, providing multiple benefits through the provisioning of firewood, food, fodder, timber and mulching materials, among other tangible benefits to the farmer. Additionally, ecosystem benefits include carbon storage, biodiversity protection, and soil and water conservation, apart from reducing risks emerging from changing climate (MoAFW, 2014a).

The reporting structure of the SMAF is the same as that of the NMSA. The NMSA is a mission under the Department of Agriculture and Farmer's Welfare (DoAFW), and it follows a three-tier structure for planning, implementation and monitoring. District level Mission Committees (DMCs) are responsible for designing the SMAF projects using the guidelines as well as implementing and monitoring them. State-level Committees (SLCs) support and actively assist districts to carry out their activities, and the SLCs, in turn, report to the various committees headed by the Mission Director of the NMSA.

The sub-mission envisages the use of Management Information System (MIS) to provide the digital support necessary for monitoring and evaluation of the projects under SMAF. Given the cross-cutting nature of activities planned, monitoring of projects will involve the support of relevant line departments, scientific institutions and implementation agencies. For the purposes of reporting, states are required to provide periodic progress reports and mid/end term evaluations are carried out using the help of third-party services. Lists of indicators that are to be reported and monitored are presented in Table 2.1 (DoAFW, 2016).

Indicators to assess soil improvement include 'Soil Carbon Sequestration' and 'Soil Organic Matter'. While the former can be gleaned from a review of soil health cards at the site of SMAF intervention (DoAFW, 2016), there are no details on how the latter is measured.

### *2.1.3. National Rural Employment Guarantee Scheme (NREGS)*

The NREGS is a rural jobs scheme, which is a Gol flagship programme that is run across the length and breadth of the country. The programme guarantees 'right to work' by providing at least 100 days of gainful wage employment in a particular financial year to any rural household whose adult members are willing to do unskilled manual work. As of 2021-22, the budget allocated for the project stood at Rs. 73,000 crore (\$955 million).

Following the principle of implementation as prescribed in the NREGA guidelines, the scheme promotes a collaborative environment where the local community, the panchayats and the state and central governments work together to ensure that the demand for employment is met, workers are paid their entitlements on time, and that the work carried out is done in a manner that meets the developmental requirements of the region.

From a list of nine initial thrust areas under which NREGS works are permitted, six of them can directly or indirectly be identified as ecosystem restoration works in agro-ecological zones. The first six ecosystem restoration works, followed by the remaining three are:

1. Water conservation and water harvesting;
2. Drought proofing, including afforestation and tree plantation;
3. Irrigation canals, including micro and minor irrigation works;
4. Provision of irrigation facility to land owned by households belonging to the SC/ST, or to land of the beneficiaries of land reforms, or to land of the beneficiaries under the Indira Awas Yojana;
5. Renovation of traditional water bodies, including de-silting of tanks;
6. Land development;
7. Flood-control and protection works, including drainage in waterlogged areas;
8. Rural connectivity to provide all-weather access. The construction of roads may include culverts where necessary, and within the village area may be taken up along with drains;

9. Any other work that may be notified by the central government in consultation with the state government.

As described in point 9, states have the freedom to add new categories of work depending on local demand and developmental needs. Thus, the right to use NREGA funds for more ecosystem restoration purposes is available if states wish to exercise it.

The requirement for a robust monitoring system for such large schemes is high so as to avoid a number of governance, financial and operational issues that so often tend to crop up in such large nation-wide schemes. The following is a brief note on the M&E setup of the NREGS.<sup>6</sup>

The crux of the reporting mechanism of NREGS is the MIS based tool called NREGASoft. The platform is a work flow based application which records all transaction details of the scheme from the centre all the way down to the village panchayat level. The platform is multilingual and can also be accessed and used by a person with low literacy levels. Apart from handling the worker management module and the fund management module, the software also provides a detailed reporting of the various works undertaken through the work management module. The works management module captures all the data pertaining to the works in the thrust areas as well as state level works decided by the state in consultation with the centre. (MoRD, 2014) The platform also allows for citizens to generate customised reports on all aspects of the works (ongoing and completed) under NREGS (MoRD, 2014).

The GIS tool, GeoMGNREGA, is an asset tracking management solution which geo tags assets created under the works, as shown in the table. Other asset details including photographs can be uploaded by users in this tool. The tool, along with the JANMANREGA mobile application, provides

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<sup>6</sup> The NREGS is a geographically widespread and comprehensively planned scheme of the Gol. Its institutional structure presents a complex web of interactions between various levels of the government and its multiple functions cannot be elaborated in detail in this report. For more information on this, please refer to the guidelines document provided in the references (MoRD, 2013).

a monitoring and report generating service that is differentially accessible by government users as well as by citizens.

## **2.2. Digital Initiatives of the Government of India**

Apart from this, two peripheral, service oriented, digital schemes such as the National e-Governance Plan in Agriculture (NeGPA), and the India Digital Architecture's (IndEA) IDEA-Agristack, have been set in place which play a supportive role in the area of agriculture and rural development.

The rest of this section will describe the role of the NeGPA and IDEA-Agristack of the IndEA, in brief, for their existing or potential role in MRV of ecosystem restoration.

### *2.2.1. National e-Governance Plan in Agriculture (NeGPA)*

The NeGPA, a centrally sponsored scheme (CSS), started as a pilot in seven states in the year 2010-11 and was extended in 2014-15 to all the states of the country. It is a project imagined under the National Mission on Agricultural Extension and Technology (NMAET), specifically under the Sub-Mission on Agricultural Extension (SMAE) (MoAFW, 2015a). This ensured that all the Information Technology schemes developed and implemented by the Department of Agriculture Co-operation (DAC) fell in line with the mission. The step was likely the first concrete step towards introducing Information and Communications Technology (ICT) in the agricultural sector in India.

Under this project, apart from the Central Program Monitoring Unit (CPMU), State Program Management Units (SPMUs) and District Program Management Units (DPMUs) were to be established, each unit being responsible for tasks that were reported up the line of control to the CPMU (MoAFW, 2015b).

Although the NeGPA was envisioned predominantly to act as a single point of digital contact for farmers to avail services clubbed within 12 different clusters, most services are advisory and ancillary in nature. Relevant to the topic of this report is number 8<sup>7</sup> of the 12 clusters, which

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<sup>7</sup> It is not clear as to who the end beneficiary of the service was. Given the nature of the service and the detailed list of information offered under it, it is likely that the end users, in this case, the farmers, could access only the available schemes and programmes using customisable queries and

pertains to 'Monitoring implementation/evaluation of schemes and programmes' under which, information about the schemes and programmes at the state level is provided along with grievance redressal, customisable queries, monitoring mechanisms and reports as well as evaluation reports from the last five years.

The relationship between NeGPA and the recently announced IDEA-Agristack<sup>8</sup> has not been established yet, given how similar their functions are. The Ministry of Electronics and Information Technology (MEITY) houses both these initiatives. The NeGPA was extended till 31 March 2021 (PIB, 2021a).

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access to the grievance mechanism and not the entire data. Access to the gamut of information would possibly be available only in the back end for M&E purposes. What is also not clear is whether such a service was actually put into practice on the ground in India.

<sup>8</sup> In 2021, the Gol proposed, via a consultation paper, the digital structure of Agristack. It is envisioned as a set of digital layers or stacks that will hold all agricultural information within that set. The stack will serve as a primary platform housing all existing schemes, advisories, extensions and other value-added services by the Gol, providing access and service across the entire value chain of agricultural activities, centring the farmer with proximate structures of governance and market mechanisms. For a detailed discussion, refer to the consultation paper (DoAFW, 2021).

## Chapter 3. Review of the Monitoring, Reporting and Verification (MRV) System at the National and State Level

### **3.1. Output-Outcome Monitoring Framework (OOMF)**

The Development Monitoring and Evaluation Office (DMEO) was constituted by the issuance of a notification in the year 2015 by the NITI Aayog, the premier think tank of the GoI. The Programme Evaluation Office (PEO) of the erstwhile Planning Commission (PC) and the Independent Evaluation Office (IEO) were merged to form the DMEO. All activities assigned to the PEO and the IEO were moved under the mandate of the DMEO, reorganised within the ambit of monitoring and evaluating GoI's 'programmes and initiatives including the identification of the needed resources so as to strengthen the probability of success and scope of delivery' (GoI, 2015).

Shortly after the formation of the DMEO, following a 2016 letter from the Department of Expenditure to prepare measurable outcomes for CS/CSS, the DMEO set itself on a task to create the OOMF. This framework would comprise of 'Outputs' which were measurable results of the activities under the schemes and of 'Outcomes' which were measurable results representing the objectives of the schemes. Indicators that defined each of these Outputs and Outcomes were arrived at through the use of a Logical Framework (LogFrame) Tool. Much of the activities that were implemented under each scheme or a programme were to be documented and reported back to the departments or ministries for the evaluation and appraisal of the schemes and programmes, and if needed, their review and redesign (DMEO, 2021e).

More than 600 CS and CSS of the 67 ministries and departments of the GoI are currently monitored via the OOMF. Close to 6000 output and outcome indicators are constantly monitored through an online dashboard which is accessible only by the ministry and department officials for the entry of data as well as viewing of quarter-year, half-year and annual compliance and progress reports. Selection of the indicators and targets are contingent on the announcement of the annual budget, after which they are modified and opened to the various ministries and departments to update the dashboard.

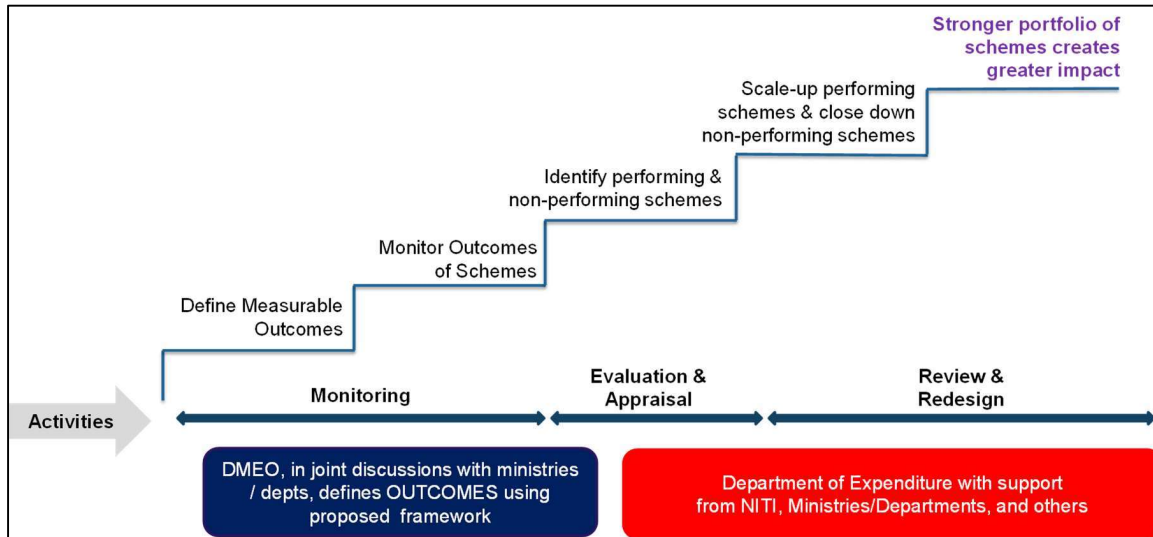
### *3.1.1. MRV of the OOMF*

The reporting of the indicators and targets under each scheme and programme is done at the level of the M/D under which it exists (DMEO, 2021d). Access is provided to the DMEO and Prime Minister's Office (PMO) users as well as to the Ministry users. The dashboard claims to provide data granularity up to the district level, audit trails, MIS Integration for automated data capture from other M/Ds and different access rights. The point of contact between the DMEO and the various M/Ds is a Nodal Officer (NO) appointed by the respective M/Ds, who handles all activities related to the OOMF.

The data on the dashboard is entered quarterly (inputs indicators) and annually (output indicators) by the users, primarily by the nodal officers at each of the M/Ds. These nodal officers are a single point of contact for the DMEO, which in turn connects them to a team member from an appropriate vertical within the NITI Aayog to liaison with.

Furthermore, a reporting module on the dashboard allows the DMEO and M/D users to generate compliance and progress reports. The compliance report can be extracted either in a detailed format which gives the user a detailed report on each indicator within each scheme, or in a summary format which gives an assessment of any particular ministry at the scheme level. The progress report shows what progress has been made in reporting under each scheme as against the targets set during the budget announcements. The budgetary outlays can be compared to the actual utilisation of the money towards each scheme.

As mentioned earlier, data verification is carried out using a Logical Framework Analysis (Logframe). Each measurable indicator formed using identified objective/output/activity is supported by a data source that acts as a 'means of verification'. The example mentioned in the Statement of Purpose (SOP) for reviewing the OOMF document is useful to understand this. For example: for an outcome of 'improve[ing] reading proficiency among children in Grades 5-6 by 20% within 3 years' to measure the indicator of 'reading proficiency among children in Grades 5-6', a 'six monthly reading proficiency test using the national assessment tool' is used as a means to verify it.



**Figure 3.1: Principles & Activities of the OOMF**

Source: OOMF Dashboard Presentation (DMEO, 2021a)

From a review of the latest (2021-22) framework, the following schemes and programmes can be classified as ecosystem restoration activities in agro-ecological systems:

**Table 3.1: List of Central Sector and Centrally Sponsored Schemes that Pertain to Ecosystem Restoration in India**

Ministry	Name of the Scheme
Ministry of Agriculture and Farmer's Welfare (MoAFW)	<p>Department of Agriculture Cooperation and Farmer's Welfare</p> <ul style="list-style-type: none"> <li>• Pradhan Mantri Krishi Sinchai Yojna (PMKSY): Per Drop More Crop (CSS)</li> <li>• Green Revolution: National Project on Soil Health and Fertility (CSS)</li> <li>• Green Revolution: Rainfed Area Development and Climate Change (CSS)</li> <li>• Green Revolution: National Project on Agro Forestry (CSS)</li> <li>• Green Revolution: Sub-Mission on Plant Protection and Plant Quarantine (CSS)</li> </ul> <p>Department of Agriculture Research and Education</p> <ul style="list-style-type: none"> <li>• Management of Natural Resources (CS)</li> </ul>
Ministry of Jal Shakti (MoJS)	<p>Department of Water Resources, River Development and Ganga Rejuvenation</p> <ul style="list-style-type: none"> <li>• Pradhan Mantri Krishi Sinchayee Yojana (PMKSY) (CSS) <ul style="list-style-type: none"> <li>○ Accelerated Irrigation Benefits Programme (AIBP)</li> </ul> </li> <li>• Har Khet Ko Pani (HKKP) <ul style="list-style-type: none"> <li>○ Command Area Development &amp; Water Management (CADWM)</li> <li>○ Surface Minor Irrigation (SMI) &amp; Repair, Renovation and Restoration (RRR) of Water Bodies</li> <li>○ Ground Water (sic)</li> </ul> </li> <li>• Special Package for Irrigation Projects in Maharashtra</li> </ul>
Ministry of Rural Development (MoRD)	<p>Department of Land Resources</p> <ul style="list-style-type: none"> <li>• Integrated Watershed Development Component of Pradhan Mantri Krishi Sinchayee Yojana (CSS)</li> </ul>

Source: The Output-Outcome Indicator Framework (OOMF) 2021-22 (DME0, 2021b)

The goals under each scheme/programme are well defined and pertain to either developmental or climate goals. We are yet to come across a study or a report that connects this to the SDGs

explicitly. We will see in the coming sections, how the SDGs dashboard takes its data from multiple sources, none of which are from the OOMF.

### **3.2. SDG Index and Dashboards of the NITI Aayog and MoSPI**

The structure of SDG action in India is defined by the MoSPI and the NITI Aayog. The MoSPI develops the National Indicator Framework (NIF), which, as of 2021, has 17 goals, 169 targets and 295 indicators (MoSPI, 2021). The NITI Aayog uses indicators (115 as of 2021) from this list to illustrate the progress made by the states and the districts towards the achievement of the goals. The dashboard of MoSPI is a comprehensive assessment of the progress made and presents data under each of the indicators providing links to the data collected from the ministries at the centre. It acts as a decision-making tool, a readily available platform for information on the progress made under each indicator, helping ministries to take key decisions on how to proceed with schemes, programmes and projects geared towards development, climate and SDG achievement. The dashboard of the NITI Aayog, on the other hand, is a comparative dashboard collecting state and district level data for a select list of indicators to provide a healthy competitive and comparative avenue for states to work within.

Given the overlaps between the two dashboards and the common framework that both of them use in the form of the NIF, they have been reported here together. To begin with, let us look at how the NIF was designed as a common framework that ties both the MoSPI's and the NITI Aayog's dashboards together.

#### *3.2.1. The National, State and District Indicator Frameworks (NIF/SIF/DIF)*

The official SDG framework of the Govt is called the National Indicator Framework (NIF) which has been developed in 2018 by the Ministry of Statistics and Programme Implementation (MoSPI), with support from the NITI Aayog and other ministries. MoSPI formulated the NIF on the lines of the Global Indicator Framework (GIF) that was formulated a year before to achieve the goals set under the Global SDGs. The GIF was developed by the Inter-Agency and Expert Group on SDG Indicators (IAEG-SDGs), a group formed under the Department of Economic and Social Affairs of the United Nations. Understanding the indicators in the GIF and matching them with indicators nationally, played a key role in the way the NIF has been shaped. Additionally, consultations with UN agencies such as the United Nations Resident Coordinator Office (UNRCO), M/Ds and other

stakeholders such as CSOs helped frame the NIF. This is an annual exercise and the indicators have been revisited for their efficacy in achieving the targets under each goal. The data that is presented to realise these indicators are taken from nearly 30 sources from the ministries and from the National Statistical Office, which in turn have institutionalised the process of collection of data from the state and district levels.

It has already been established that much of the work in the agricultural sector is carried out by the states and union territories of India. They are also key contributors to the SDG goals, constantly engaging with and striving to achieve the indicators. In an environment where SDG driven action is a necessary function of governments, the task of monitoring SDGs at the state level has been taken up by the NITI Aayog through various degrees of engagement. The NITI Aayog performs these functions by centralising the SDG framework in multiple avenues, collaborating with state and district level governments, para-statal bodies, government and private financial institutions, CSOs, multi-lateral organisations and other ministries at the centre.<sup>9</sup> This process of localisation of SDGs is another essential action point in the quest to realising SDGs in India. Both the MoSPI and the NITI Aayog actively engage and collaborate with states and union territories to help them prepare State Indicator Frameworks (SIFs) and District Indicator Frameworks (DIFs) through technical trainings, workshops, seminars, consultation meetings and through the preparation of guidelines that help restructure their monitoring and data systems to allow for the SDGs to be monitored effectively. For example, till date, the NITI Aayog has organised 25 national and state consultations on, among other things, SDG implementation. On the other hand, in 2019, the MoSPI published a 'Guidelines for Development of Sustainable Development Goals (SDGs) State Indicator Framework (SIF)' (MoSPI, 2021). While the task of creating an SIF/DIF is not an easy one given the varying levels of data availability, different development and

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<sup>9</sup> For a detailed discussion on this, please refer to pg. 13, section on 'Collaborative Advantage Framework' (NITI Aayog, 2021).

climate priorities and infrastructures, as of 2021, 21 states and union territories have operational SIFs, while 12 of them have developed DIFs.<sup>10</sup>

#### ASPIRATIONAL DISTRICTS PROGRAMME (ADP)

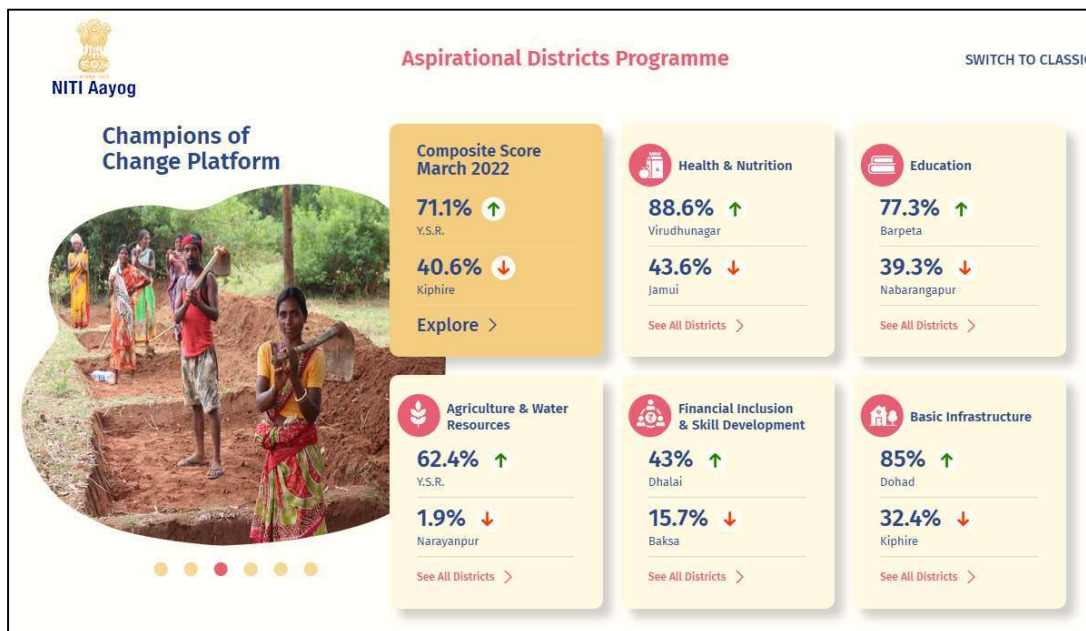
In January of 2018, the NITI Aayog identified 112 districts (117 in 2022) that needed the most attention, broadly under the themes of Health & Nutrition, Education, Agriculture & Water Resources, Financial Inclusion & Skill Development and Infrastructure. Specifically designed to address and improve on the ranking of the Human Development Index (131 in 2016), the NITI Aayog anchors this initiative with support from various line ministries and departments of the GoI and state governments. The basic tenets of the ADP are (CSBS, 2022):

‘To Converge state and central schemes, encourage Collaboration of central and state level officers as well as district collectors, and drive healthy Competition among districts through a mass movement.’

The ‘Champions of Change’ platform of the ADP is a dashboard that outlines the progress made by these 117 districts under each theme. The dashboard provides information on 49 key performance indicators (81 data points) collected by the states and reported to the centre.

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<sup>10</sup> Refer to pg. 279, section on ‘Localisation of SDGs: Progress in States and Union Territories’ in the SDG India Dashboard Index and Dashboard 2020-21: Partnerships in the Decade of Action (2021) document (NITI Aayog, 2021).



**Figure 3.2: The Champions of Change' Dashboard**

Source: Champions of Change Dashboard. <http://championsofchange.gov.in/site/coc-home/>

### 3.2.2. Reporting Mechanisms of NITI Aayog and MoSPI

Institutionalising SDG goals within the mechanisms of state and district governance has been one of NITI Aayog's lasting contributions. The NITI Aayog's contributions towards mainstreaming SDG thinking at these levels are numerous. Through its efforts, the language of SDGs has been strongly embedded in that of the states and UTs, allowing various departments to collaborate on 'goal driven partnerships'. Creating robust linkages between indicators and reporting mechanisms, often missing from or siloed within individual departments, helps the NITI Aayog establish a space of what they call competitive and co-operative federalism. This ensures partnerships not only within state government bodies but also between states and state-CSOs. Furthermore, planning and statistics departments across the states as well as the statistical officers within state departments have a mandate to map out the data flow of each indicator, as decided in the respective SIFs. It is also recommended by MoSPI's SIF Guideline document that Development Plans at the Gram Panchayat level, the basic village governing body, be aligned with SDGs as much as possible.

This exercise of reporting is a crucial element that threads the various activities on the ground to the state and then to the centre, and aids in statistical analysis of the data, providing the opportunity for them to take better decisions. At the state level, mostly in the planning, statistics and programme implementation departments, SDG cells have been established by leveraging the partnership with the United Nations Development Programme (UNDP) through the GoI-UN Sustainable Development Framework and the NITI Aayog-UNDP Partnership Framework. The United Nations International Children’s Emergency Fund has partnered with several states to help them develop dashboards where SDG progress can be reported.

Apart from using pre-existing research and technical support structures at the state level, many state governments have also established state SDG monitoring/coordination committees, placed nodal officers at each department or appointed them for individual goals and have empowered district, block and village level development planning committees through a sustained orientation and capacity building process to help orient their respective plans to the SDGs.<sup>11</sup>

Deepening the process of reporting and monitoring enables MoSPI and the NITI Aayog to present highly granular data, sometimes all the way up to the district level on indicators as listed in the NIF.

### *3.2.3. Dashboards of the MoSPI and the NITI Aayog*

MoSPI’s India SDG dashboard has been developed in collaboration with the UNRCO. The dashboard lists down all the indicators noted in the NIF and presents them in a format such that users can follow the progress of each indicator under each target for a specific goal all the way from the national level to the district within each state and union territory of India. Metadata details for each of the 295 indicators, along with the source of data, are listed on the dashboard as well.

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<sup>11</sup> The task of involving and building the capacities of local governance mechanisms like the panchayats is a daunting task. For a detailed discussion on how the NITI Aayog has worked with states to empower local governance structures in aligning their development goals to SDGs, refer to NITI Aayog (2021).

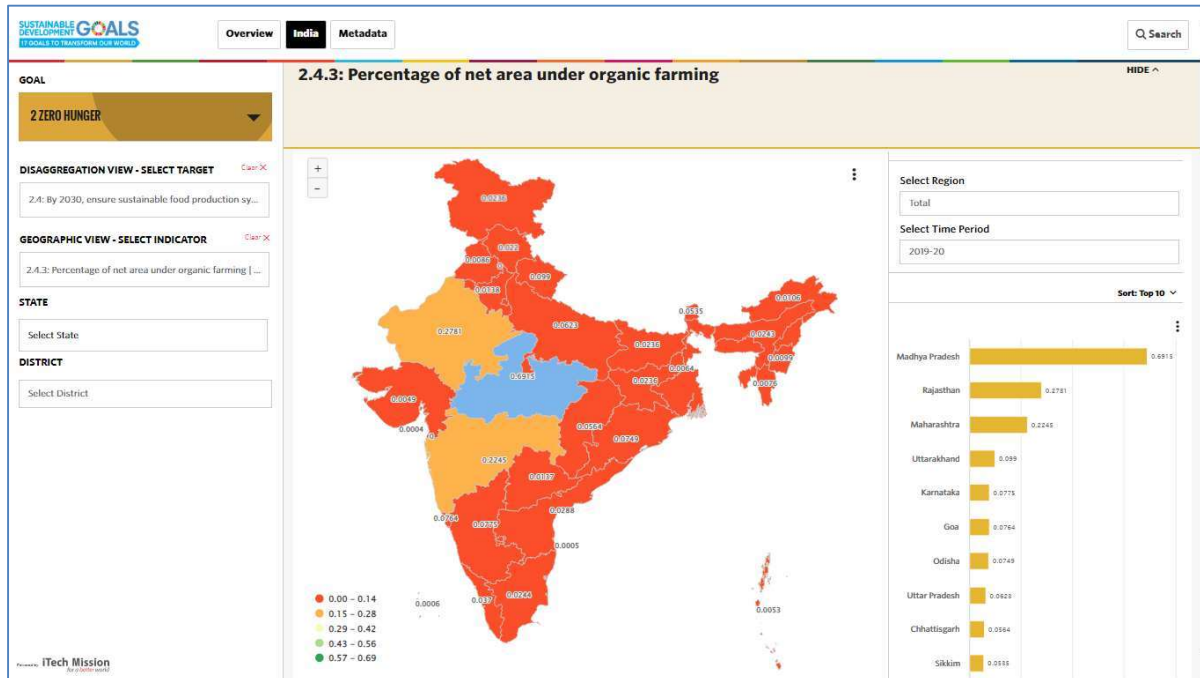
Two indicators in the NIF pertain to ecosystem restoration in agro-ecological zones. Both of them fall under the SDG 2 'Zero Hunger' and speak to the target 2.4: 'By 2030, ensure sustainable food production systems and implement resilient agricultural practices that increase productivity and production, that help maintain ecosystems, that strengthen capacity for adaptation to climate change, extreme weather, drought, flooding and other disasters and that progressively improve land and soil quality.' The two indicators<sup>12</sup> are:

- Percentage of farmers issued Soil Health Cards
- Percentage of net area under organic farming

Such level of focus on restoration activities is illustrative of the reach/depth (or lack thereof) of the NIF in addressing the actions towards engaging with ecosystem-based restoration work in the agricultural sector in India. Multiple outcome indicators such as those around poverty and rural development and improvement of the lives of the marginalised seem not be connected to actions in the agricultural sector. On the other hand, the SIFs and DIFs take a more proactive approach. Many states have included indicators that determine the performance of watershed management programmes, degraded land development and other water and soil conservation initiatives. For a detailed list of state-wise SIF and DIF indicators, please refer to Annexure I.

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<sup>12</sup> For more details, please refer to sections 2.4.2 and 2.4.3 under Metadata in MoSPI's SDG dashboard.

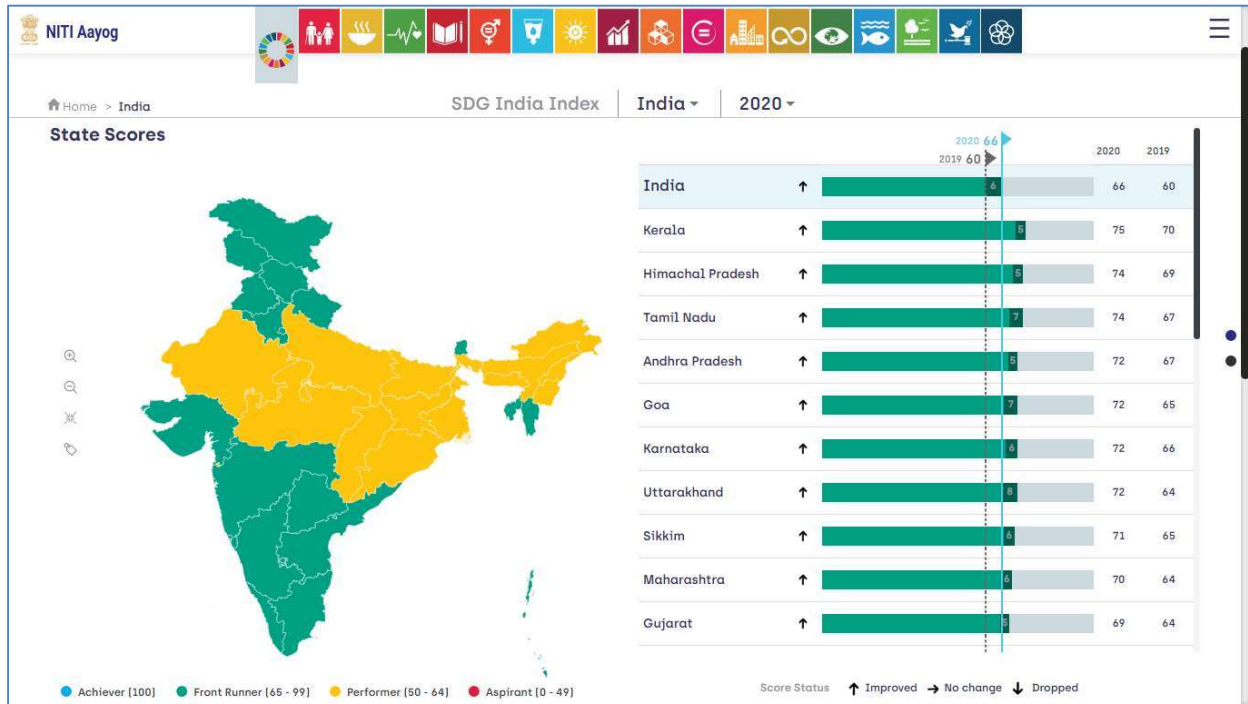


**Figure 3.3: The Ministry of Statistics and Programme Implementation's SDG Dashboard**

Source: MoSPI's SDG India Dashboard, <http://www.sdgindia2030.mospi.gov.in/dashboard/>

The NITI Aayog's SDG India Index Dashboard is a comparative dashboard that currently uses 16 goals, 70 targets and 115 key indicators that are aligned to the NIF. Out of the 115 indicators, 76 are completely aligned and 31 are derived from the NIF, while eight have been set in consultation with the ministries. The selection of the indicators has been defined by the relevance to the SDGs, alignment with the NIF, availability of data at the national level for states and union territories, consent from ministries and data sufficiency defined by at least 50 per cent coverage for each state. This ensures uniformity and allows for a more robust comparison between the states. Given the wide range of data sources and collection methodologies, the NITI Aayog has also ensured that adequate proxy indicators have been used in consultation with ministries and states.

State level data for individual SDGs and performance can be accessed via the dashboard which is calculated as a measure of 'distance traversed towards SDG targets on various SDG parameters integrating economic, social, and environmental dimensions' (NITI Aayog, 2021).



**Figure 3.4: The NITI Aayog's SDG India Index and Dashboard**

Source: SDG India Index Dashboard, <https://sdgindiaindex.niti.gov.in/>

From a review of 115 indicators of the NITI Aayog's SDG Index, the report notes that none of the indicators pertain to ecosystem restoration in agro-ecological zones in India.

### 3.3. Review of the Monitoring, Reporting and Verification (MRV) System at the State Levels

The performance of state level MRV in India can depend on multiple factors. Some states may have enough capacities to set up separate M&E wings or even departments, some may even use digital tools to monitor and measure performance. In the past, states have often restricted themselves to monitoring budgetary allocations and not consider outcomes of projects that speak to the objectives and goals of any scheme. To be able to use MIS at the state level, states had to move beyond monitoring aspects such as Direct Benefit Transfers (DBT), outlay expenditure and targets. Although this is happening at the state level in India, the extent to which they are successful is hard to ascertain because of a lack of uniformity in M&E systems.

There is no one common system or mandate prescribed by the Gol to set up an institutional structure around MRV in India. Owing to the federated structure of governance, states have the

freedom to work within the constitutional structure under the seventh schedule which provides a list of activities that states have the liberty to carry out or plan as decided by the government. Although the central government monitors all CS and CSS activities planned by them at the state level and has a well-formed structure of MRV through the NITI Aayog, the MoSPI and the nodal system at the state level as discussed in section 3.1.1, state governments running schemes of their own are not bound by a mandate to set up similar structures. They still do so, following the principle of good governance. Reports evaluating M&E systems in India suggest setting up a national M&E guideline for states to follow which may help in bringing a certain uniformity in M&E structure and parity in data indicators.

States, as noted in Annexure 1, have multiple departments that handle monitoring of state schemes. Traditionally, it is the planning and statistics department that coordinates the reporting of data, given their economic and statistical capacities. If needed, a separate Programme Monitoring and Information division is also created within these departments. Digitising the collection of data on spending, operationalising and measurement of output for schemes hastens the process of decision making or course correction. A number of states have slowly begun to introduce a dedicated MIS whereby government personnel have to upload data on the status of programmes and projects, expenditure and progress made on each of them. For example, the state of Karnataka has recently launched a decision support system (DSS) called Avalokana which is used by various state departments to upload data on programmes which have been categorised under various heads such as SDGs, Gender, Special Development, Centrally Sponsored Plans, Tribal Sub-plan, etc.

The list of schemes pertaining to ecosystem restoration at the state level are far too many to note in this report and a list of departments handling the MRV functions for individual states has also been mentioned in Annexure 1.

This disaggregated nature of collecting data, reporting and analysing it for it to be used for evaluation of the programmes and projects makes it hard to assess state level MRV processes.

Another set of ecosystem restoration projects that is implemented at the state level has a system of MRV that is different from the regular system of MRV as described in this section. These projects are tripartite agreements between a multi-lateral funder, such as the World Bank, the Centre and the state.

### *3.3.1. A State Level Case Study of a Climate Resilience Project from Maharashtra*

#### **3.3.1.1. Project on Climate Resilient Agriculture (PoCRA)**

PoCRA was conceptualised by the Department of Agriculture, Government of Maharashtra, and funded by the World Bank to develop a long-term and sustainable climate-resilient strategy to mitigate the impacts of droughts and other likely impacts of climate change at the village scale. The Project Development Objective (PDO) is to bring about transformations in the agriculture sector by scaling up the adoption of climate-smart technologies and practices at the farm and micro-watershed level, to drought-proof villages and create new avenues for them by using the following strategies (Government of Maharashtra, 2018):

- Enhance water security at the farm level—by adopting the latest technologies for increasing water use efficiency in agriculture, increasing surface water storage capacity, groundwater recharge and in situ water conservation.
- Improve soil health—by adopting good agricultural practices to improve soil fertility, soil nutrient management and promotion of soil carbon sequestration.
- Increase farm productivity and crop diversification—by adopting climate-resilient seed varieties and crops that have better income potential in the market.

PoCRA is currently being implemented in 5000 villages of the 15 drought-prone districts of eastern Maharashtra. It is being implemented through a comprehensive community-driven micro-planning exercise which includes measures for optimal utilisation of natural resources, appropriate cropping patterns, adoption of the latest technologies and improved access to markets. The major components of the project are summarised in Table 3.2. Each of the components of the project has digital support and the relevant data, and reports are maintained by the project management unit (PMU) which will be covered in detail in a later section.

**Table 3.2: Components and Sub-Components of PoCRA**

Component A Promoting Climate-resilient Agriculture Systems	Component B Climate-smart Post-harvest Management and Value Chain Promotion	Component C Institutional Development, Knowledge, and Policies for a Climate-resilient Agriculture	Component D
<ul style="list-style-type: none"> <li>➤ Participatory development of mini watershed plans</li> <li>➤ On-farm climate-resilient technologies and agronomic practices</li> <li>➤ Climate-resilient development of catchment areas</li> </ul>	<ul style="list-style-type: none"> <li>➤ Strengthening farmer producer companies</li> <li>➤ Strengthening emerging value-chains for climate-resilient commodities</li> <li>➤ Improving the performance of the supply chain for climate-resilient seeds</li> </ul>	<ul style="list-style-type: none"> <li>➤ Sustainability and institutional capacity development</li> <li>➤ Maharashtra Climate Innovation Centre</li> <li>➤ Knowledge and policies</li> </ul>	<ul style="list-style-type: none"> <li>➤ Project Management</li> </ul>

Source: Project Implementation Plan, PoCRA (Government of Maharashtra, 2018)

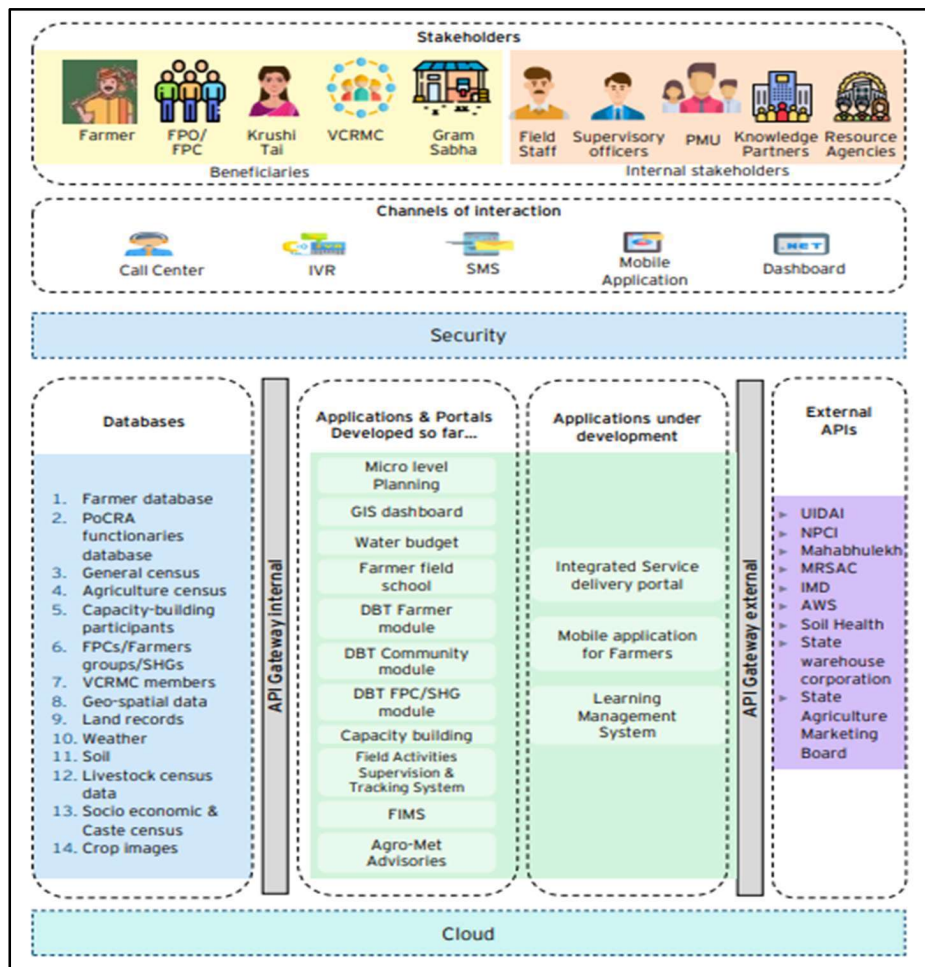
The digital architecture as shown in Figure 3.4 shows the different channels and platforms that form the interface between the beneficiaries and the Department of Agriculture of the Government of Maharashtra. The digital tools that are used for planning and implementation are centred around three themes: a) GIS-driven planning and decision-making, b) Bringing transparency, accountability and efficiency in service delivery and c) Scaling up extension. Refer to Annexure II for a list of digital tools that have helped streamline PoCRA and achieve the goals effectively.

## **Monitoring, Learning and Evaluation (MLE) System**

PoCRA has a Programme Management Unit (PMU) which is responsible for the implementation, management and monitoring of the project outputs and outcomes. The monitoring framework of the project captures all the project outputs and outcomes through the MIS, which is real-time.

The objectives of the MLE system are (Government of Maharashtra, 2018):

- To capture all activities, outputs and outcomes within an MIS platform.
- To understand the impacts of the development interventions in comparison to the baseline situation.
- To set up a standardised procedure of learning for stakeholders and dissemination to the wider communities.
- To carry out impact and outcome analysis, monitoring and audits, and feedback systems that will inform decision making and enhance capacity-building activities of the stakeholders.



**Figure 3.5: Digital Architecture of PoCRA**

Source: Project Implementation Plan, PoCRA (Government of Maharashtra, 2018)

The key components of the MLE system are:

- **MIS:** It is the most critical tool used for project management and monitoring. The MIS is a platform where all the input and output data, both raw and processed, is maintained. The MIS of the PoCRA is a real-time system, where the PMU can track the progress of the various components of the programme.
- **Third-Party or External Monitoring:** External monitoring has been introduced in the programme in order to gain a better and more nuanced understanding of the situation on the ground. The third-party or external monitoring agency is expected to carry out the monitoring at three different time periods of the project, i.e., baseline, midline and end line.

- **Baseline Survey:** The baseline survey is an indispensable component of the project to understand the pre-intervention situation which includes all the socio-economic and biophysical aspects. The baseline survey also includes certain ‘control sites’ (non-project areas) which are used to assess the impacts closely (incremental) compared to the generic changes over time.
- **Concurrent monitoring:** Interventions in the field are monitored half-yearly by an identified external MLE agency. The focus of the concurrent monitoring is on key performance indicators of the project.
- **Impact Assessment:** The impact studies are undertaken at the mid-term and at the end of the project. The idea of carrying out these assessments is to get a comparative analysis of the performance indicators in the project areas with those in the selected control sites.

### Results Management Framework and Indicators

The table below summarises the key indicators that are used for the monitoring of the project at different levels:

**Table 3.3: Key Indicators of PoCRA**

Project Development Objective Level Indicators	Intermediate Outcome Indicators - Component A	Intermediate Outcome Indicators - Component B	Intermediate Outcome Indicators - Component C	Cross-cutting Indicators
Percentage of farmers adopting improved agriculture technologies	Improved spatial and temporal yield of the crop in different sowing seasons	Share of arable land under cultivation with improved seed varieties	Number of updated districts SREPs centred around climate resilience	Number of approved participatory mini watershed plans implemented/under implementation
Area with new and improved irrigation or	Surface storage capacity from new farm ponds	Number of project-supported FPCs	Number of clients (FPCs, SMEs) receiving services from	

Project Development Objective Level Indicators	Intermediate Outcome Indicators - Component A	Intermediate Outcome Indicators - Component B	Intermediate Outcome Indicators - Component C	Cross-cutting Indicators
drainage services		with growth in annual profit	Climate Innovation Centre (CIC)	
Net GHG emissions <sup>13</sup>	Area with good agricultural practices for improved management of saline and sodic soils			
Increase in annual farm income				
Number of farmers reached with agriculture assets or services				

Source: Project Implementation Plan, PoCRA (Government of Maharashtra, 2018)

### 3.4. How is Soil Health Monitored in India?

Improvement in soil health is a crucial indicator of how the agricultural economy is faring. While the issue of soil health is being addressed at various governance levels targeting biological,

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<sup>13</sup> NET GHG Emissions are being measured using the Ex-Ante Carbon-Balance Tool (Ex-ACT) developed by the FAO (Government of Maharashtra, 2018).

chemical and physical indicators, the role played by multiple initiatives and the overall impact they have on soil health needs to be understood.

The most recent initiative by the GoI is the Soil Health Management (SHM)<sup>14</sup> component of the National Mission on Sustainable Agriculture (NMSA) under the National Action Plan on Climate Change (NAPCC) introduced in the year 2014-15. Addressing the problems faced by soils across various agro-ecological zones in India, the SHM concentrates on improving soil quality through the setting up of a robust physical and technical infrastructure through soil and fertiliser testing facilities as well as providing training and test-based advisories. Under this sub-mission, Soil Health Cards (SHC) are issued to farmers availing testing facilities provided through multiple government labs and outsourced agencies. By the end of 2021, GoI had issued 229 million soil health cards through its Soil Health Card (SHC) scheme (PIB, 2021c) and has kept track of testing activities and soil quality parameters down to the village level through a Soil Health Dashboard. The 12 parameters and a screen grab of the dashboard are shown below.

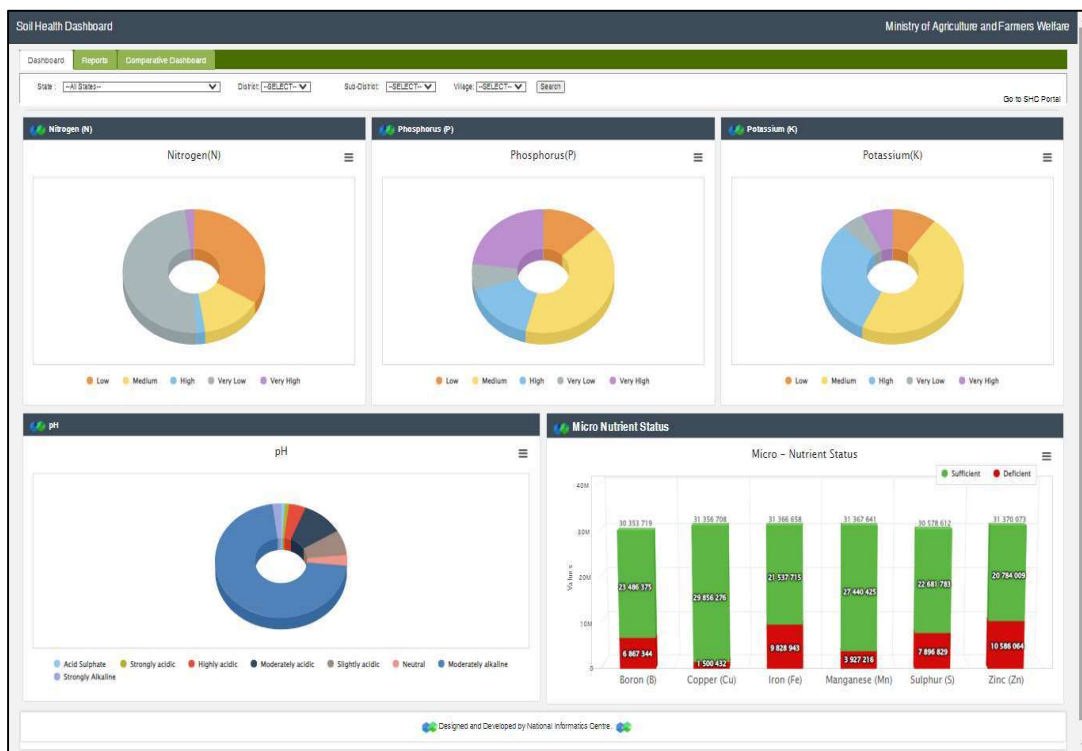


Figure 3.6: The Soil Health Dashboard

<sup>14</sup> The National Project on Management of Soil Health and Fertility (NPMSH&F) was a programme that is now subsumed under the SHM component (PIB, 2015).

Source: Soil Health Dashboard, <https://www.soilhealth.dac.gov.in/NewHomePage/StateWiseNPKChart>

**Table 3.4: The 12 Parameters Assessed in the Soil Health Card**

PARAMETERS	
Macro Nutrients	Micro Nutrients
Nitrogen (N)	Boron (B)
Phosphorus (P)	Copper (Cu)
Potassium (K)	Iron (Fe)
	Manganese (Mn)
Secondary Nutrient	Zinc (Zn)
Sulphur (S)	
	Physical Parameters
	pH
	Electrical Conductivity (EC)
	Organic Carbon (OC)

Source: Soil Health Scheme – FAQ (MoAFW, 2014b)

The various soil components within programmes and projects of the GoI are illustrative of the attention soil health receives on the ground. Under the WDC-PMKSY, the total area covered under ‘soil and moisture conservation’ is reported on a quarterly basis to the Ministry and is factored in the OOMF framework of the DMEO (DMEO, 2021c). Similarly, targets for the number of soil, fertiliser and village soil testing labs have been set as an output indicator under the National Project on Soil Health and Fertility (now the SHM component of NMSA) (DMEO, 2021c). To assess the progress under the SMAF, direct outcome indicators such as soil carbon sequestration and soil organic matter are measured. Similarly, multiple NRM activities under the NREGS actively work towards improving soil health by promoting the construction of soil conservation infrastructures such as bio-fertiliser pits. The National Bank for Agriculture and Rural Development (NABARD) project on soil health (NABARD, 2018) implements soil conservation methods such as deep ploughing.

Measuring soil parameters over time will not only provide a detailed understanding of how soil quality has changed but may also be able to shed light on the performance of the various soil health programmes listed above, although it is unclear whether all of them are monitored on a regular basis within their respective MRV structures.

### *3.4.1. KfW Soils Project (Phases I, II and III) – An Example*

The KfW soils project is an initiative under the Watershed Development Fund of NABARD in collaboration with KfW. Supported by the German Government (BMZ), under its SEWOH initiative, the project has been conceptualised to serve areas where communities in seven states of India are particularly vulnerable to negative impacts of climate change (NABARD, 2019).

The initiatives under the project's phase I and II focus on improving degraded soils as well as reducing erosion in the states of Andhra Pradesh, Chattisgarh, Karnataka, Odisha, Telangana, Jharkhand and Kerala. Phase III of the project, scheduled to run between 2020 and 2024, will expand the work to the states of Bihar, Tamil Nadu and Maharashtra. Districts have been identified using the 'Rainfed Areas Prioritization Index (RAPI)', climate risks using the Risk and Vulnerability Assessment Report 2019 of CRIDA, and other developmental criteria. A total of 48 watersheds have been chosen in these states for phase III of the project.

The various stakeholders include mobilising of pre-existing and newly created institutions and groups that will assist in the implementation, knowledge dissemination, monitoring and reporting of the project. They include Common Interest Groups (CIG)/Common Livelihood Group (CLG) and Self-Help Groups (SHG) at the lowest level which report to the Village Watershed Committee (VWC) or the Village Climate Risk Management Committees (VCRMC) that will in turn report to the Gram Sabha (GS), the institution responsible for implementing projects at the watershed level.

Coordination of the activities of the stakeholders and facilitation of the implementation of the project will be done by the Project Facilitating Agency (PFA), the criteria of selection of which have been listed in the Comprehensive Watershed Development Fund (WDF) Guidelines, 2016 (NABARD, 2016). Regional offices in each state will liaison with the PFAs for grant releases and actively engage with the project from start to finish.

As under the WDC-PMKSY, the KfW Soils project uses NRSC's BHUVAN portal, its web-based monitoring platform, to monitor all its watershed projects along with other projects of NABARD's WDF. The GIS-based platform helps NABARD in the 'digitization of watersheds and field boundaries, digitization of watershed data (pre & post development), online tracking of physical and financial progress, impact evaluation through the use of satellite images, etc.' (NABARD,

2019). The platform is freely accessible to the public. Activities under this project have been categorised under the following five core components (NABARD, 2018):

- Soil & water conservation
- Soil health improvement & productivity enhancement measures
- Promotion of sustainable NRM, CCA & food security
- Measures to mitigate climate change risk
- Capacity building, institutional building & knowledge management

Sub-activities under each of these components can be accessed through the BHUVAN portal.<sup>15</sup> Both on-going and completed watershed projects can be accessed in this portal and the progress along with other statistical data of each of them can be accessed as well. Figure 3.6 is illustrative of the details that can be accessed on the BHUVAN portal. For example, in the figure, farm level details including the sub-activity of the construction of the bio compost pit under the activity of ‘Soil health improvement & productivity enhancement measures’ along with associated points have been recorded. The details also note the PFA and the personnel in the organisation who entered these details.

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<sup>15</sup> For more details, please visit NABARD’s BHUVAN portal at <https://bhuvan-app1.nrsc.gov.in/nabard/nabard.php?type=citizen#>

Monitoring of NABARD watershed projects

Welcome User | Login

Bhuvan NABARD | Indian Geo-Platform of ISRO

Overall Summary | IGWDP | WDF | KFW | IGWDP\_C | WDF\_C | Springshed\_RSC | KFW\_RSC | WDF\_C\_RSC | WDF\_RSC | WDF\_Aikaline

Map | Sat | Hyb | Ter

**NABARD Watersheds**

**Field Data**

Project: KFW (KFW Soil Pro...)

State: KARNATAKA

District: GADAG

Watershed: Kurahatti

Activity: Soil improvement ...

Subactivity: All

Date Mode:  Day  Period

Start Date: mm/dd/yyyy

End Date: mm/dd/yyyy

Remove

Total No. of Points Found: 42

Discussion Forum | Legend

**Summary of Watersheds**

FDCProjectname:	BhuvanNABARD
themename:	BhuvanNABARDFDC1dot4
profilename:	SoilImprovementSoilProductivityEnhar
observname:	Vijayshankar kurudgi
org:	Priyadarshi self employment training c
mobilen:	9731918717
creationtime:	2020-9-2 10:16:33
uuid:	8de1e38b9c58b344
deviceid:	ka_ga_kura_pfa_kfw
projcode:	KFW
projname:	KFW Soil Project
state_code:	29
state_name:	KARNATAKA
dist_code:	2908
dist_name:	GADAG
watershed:	Kurahatti
SubActivity:	Bio compost pit
VillageName:	Kurahatti
StatusOfActivity:	Completed
StartDate:	11092019
CompletionDate:	11092019
SurveyNumber:	179
FarmerName:	Muttapp pujar
Approved By:	kar_gada_ddm_kfw

Figure 3.7: NABARD-BHUVAN WDF Project Portal – KfWs Soils Project  
 Source: NABARD BHUVAN Portal

## Chapter 4. Key Findings, Recommendations and Way Forward

### 4.1. Key Findings

1. **Strength of MRV more in the centre than in the states:** The history of MRV in India has its roots in the formation of the Planning Commission (PC) through their evaluation initiatives. While it was and still continues to be impossible to evaluate all government schemes, programmes and projects in each budget year, the Programme Evaluation Office (PEO) under the PC would regularly evaluate crucial five-year plan schemes and programmes. The task of monitoring or continuous tracking of the progress of each programme happens by the collection of data at individual M/Ds. While this continues till today, the NITI Aayog, through its Development Monitoring and Evaluation Office (DMEO) has expanded its monitoring capacities by adding new frameworks and toolkits under its belt. Through the use of tools such as Output-Outcome Monitoring Framework (OOMF), the DMEO is actively able to track the annually pre-defined targets against their outputs and outcomes for individual CS and CSS. While this is being done at the centre, the uptake of a similar approach at the state level is limited due to low access to personnel and knowledge capacities. At the moment, most states have set up some monitoring capacities but limit themselves to measuring budget spending and disclosures. The NITI Aayog is currently working with states to build their M&E capacities.

MoSPI, on the other hand, builds on the statistical and data collection capacities it has developed through the decades, and currently spearheads the conceptualisation of the National SDG indicators via the NIF. It also leads the efforts to collect SDG related data and has engaged extensively with state level statistical and programme implementation departments to strengthen their data collection and SDG integration capacities. This level of interaction, we believe, will increase over time as the need for more digital monitoring, reporting and government data visualisation will arise.

It has to be noted that states do not have the necessary tools and capacities that the centre does for effectively carrying out MRV functions but compensates for this in terms of the robust local governance set-up that exists. Resources, both in terms of technical expertise and as a substantial investment into MRV processes through hard and soft infrastructures will provide the impetus needed in the states to strengthen MRV at the local level.

2. **Data from non-governmental restoration works not captured:** A number of organisations, especially those that work in the area of natural resource management in India, have been around for decades. Much of their work has evolved from a deep understanding of local conditions, resource availability, carrying capacity and livelihood needs on the ground. While these interventions have evolved and improved, much of the MRV data generated has not been aggregated at any level. Central government databases do not have any access to such knowledge owing to the disaggregated nature of these organisations. In some cases, many governments have also benefited by working with such organisations on the ground but cross organisational knowledge sharing does not occur.
3. **Strengthening digital data and access:** Data governance systems in India are currently undergoing a change, especially with the introduction of NeGPA and Agristack which aims to digitise service delivery and establish a digital agricultural architecture in India. To achieve a strong evidence-based decision-making system and data preparedness mechanisms, the DMEO has conceptualised a tool called the Data Governance Quality Index (DGQI) which helps M/Ds measure their data maturity. The DGQI claims that this would help in the 'deepening of digitisation in the Government of India'. The initiative could potentially help states as well as central M/Ds disseminate their data more efficiently and improve on their current efforts to digitise data collection through MIS systems and dashboards.
4. **MRV of tripartite programmes is high and robust:** As observed in the PoCRA example, the MRV of tripartite programmes is stronger and efficient, given the scale at which these projects are implemented. The requirement of a digital platform for continuous reporting of activities on the ground by the funding agency, often a multi-lateral organisation,

provides the impetus to set up a dedicated digital architecture encompassing not just the tracking of payments, but also advisories, project activities and other GIS and MIS based systems.

5. **Democratic decision making:** The bulk of the ecosystem restoration projects in agro-ecological landscapes in India are project driven. Projects such as PoCRA push the boundaries of such a framing by providing a set of climate resilient solutions only to those farmers who wish to enrol in the project. Schemes such as the NREGS take this a step further and provide panchayats the freedom to decide the areas of intervention by enabling them to create Gram Panchayat Development Plans from the available shelf of projects coupled with estimated labour demand. Mandating similar restoration works that happen in agro-ecological landscapes, through the setting up of grounding institutions and strengthening village level governing bodies will empower communities to meet local ecosystem demands.

6. **Indicators informing SDGs and other development and climate goals:** The universality of the SDGs makes it easy for schemes, projects and programmes to find synergies between the set project outcomes and the targets set under each SDG. This allows states and the centre to find common ground and match indicators to the extent where they can be shown on the same platform. This may not be the case with other ecosystem restoration-based indicators described in this report. For example, the central and the state governments do not prioritise the collection of GHG emission data like the PoCRA does, or soil carbon sequestration or soil organic matter like the SMAF under the NMSA does.

Having said that, it appears from the review of the National, State and District Indicator Frameworks, that states have improvised on the NIF to include indicators that speak to multiple developmental outcomes. For example, in the state of Andhra Pradesh, nine core areas of governance have been identified, out of which one is agriculture, but within that, none of the indicators are associated with ecosystem restoration. Rather, the indicators have been arrived at keeping in mind development outcomes and a push for populist schemes such as free electricity and bore wells.

## 4.2. Recommendations

1. **Understanding non-governmental restoration works:** Although government projects make up a significant portion of the ecosystem restoration work in India, a number of CSR bodies and NGOs/CSOs work on ecosystem restoration activities as well. Finding common ground with respect to indicators and data collection would help governments expand their reach and also minimise the chances of overlaps. It must be noted here that streamlining the collection and ensuring uniformity and quality of such data is a challenge, and constant engagement with CSOs, private think tanks, research institutions and grassroots organisations will help bridge this gap. The DMEO's efforts (DMEO, 2022) towards this, through its Partnerships Initiative, are commendable.
2. **Data access and transparency:** Despite the strides made towards access to monitoring tools and dashboards, much of the data that informs the tables, charts and graphs, lies in the background. Barring some exceptions such as NREGS data, the current processes and digital architecture in place do not allow for raw data to be downloaded by researchers and the public in general. With adequate data privacy and security policies in place, we find no reason to make back-end data publicly available for better transparency and accountability. Ensuring such access is crucial in verifying government data through independent evaluations. Open data initiatives by the GoI through the Open Government Data (OGD) platform rely on ministries to proactively disclose the data that they collect. Such initiatives must be supported and promoted. At the state level, retrofitting existing MRV systems with pre-existing differential access system can be extended to the public.
3. **Strengthening data of tripartite projects:** Evidence suggests that multilateral funded tripartite projects such as the PoCRA have immense potential to contribute to the achievement of SDG, development and climate goals through the collection of indicators that specifically address climate resilience in agro-ecological landscapes. Discussions with an M&E expert from PoCRA suggests that, although projects like the PoCRA are housed under the respective agriculture department in the state, connecting the data collected at the state level with central databases or frameworks is not happening. Multiple state level projects and programmes of this kind have already been implemented

and are at different stages of progress in the country. We also know that the Department of Economic Affairs (DEA) manages the financing of these projects through the tripartite agreements. The DEA also hosts multi-state tripartite discussions. Such a pre-existing institutional mechanism that exists for ensuring financial accountability can be extended to bringing together and matching ecosystem restoration data from multiple states.

4. **Data security protocols:** Digitising data collection must run parallel with the establishment of data privacy and protection policies and protocols to ensure that data is not misused. To that effect, legal protection of citizens against data misuse is missing, but necessary. The Personal Data Protection Bill, 2019 attempts to fill this gap, but is yet to pass through parliamentary procedures to be put into practice. This is especially important to consider when collecting data in the agricultural sector, given its vast potential to be misused by private interests.
5. **Community capacities:** From the report, it must be clear that data collection at any level of government happens without the implicit consent of the end user or beneficiary. It is also not collected through methods of self-reporting. Building capacities of communities to use digital tools—which, at the moment is not something that most states do—is important if ecosystem restoration schemes and projects aim to reduce transaction costs. Following up with communities along with ‘ground truthing’ by line M/Ds will be necessary post initial data collection.
6. **Participation and digital literacy:** Emerging from our field observations and our interactions with farmers on the ground, we note that the uptake of digital tools is higher within the younger groups of farmers. Furthermore, the tool largely used for data collection, a mobile smartphone, was predominantly in the hands of men. This forecloses access to digital tools to certain groups of farmers, specifically the aged and the women, who are both the largest as well as the most vulnerable categories of farmers in India. While at first glance, there is a certain level of enthusiasm shown by all farmers towards the use of digital tools, the skills to do so and the power to take informed decisions about water and soil management must be strengthened—an initiative that governments and NGOs/CSOs must focus on.

7. **Dashboard access and its use:** The need for a dashboard to succinctly distil data and clearly relay information about the performance of ecosystem restoration indicators is being felt across the country. From the dashboards we have reviewed and analysed, we can conclude that a majority of them stop short of providing access to raw data from which the metrics are extracted. While governments create them to provide policymakers a chance to quickly gather information to take decisions, it is used less widely as a tool to communicate outputs to the general public.

### 4.3. Way Forward

1. **State level reporting mechanisms:** Although the institution of the state level reporting mechanism is shown in this report in detail, its impact and effectiveness at the point of intervention are not entirely clear. We know of government functionaries that perform reporting duties. Much of this data is also collated at various levels and is passed on to the centre. We still do not know how robust these mechanisms are. Understanding this may involve detailed studies on capacity building and strength of local governance structures.
2. **Development-climate debate:** Developmental needs often clash with climate commitments in rapidly developing countries such as India. The current flow of funding for restoration activities in agro-ecological landscapes is predominantly guided by climate resilience work, as is illustrated by the PoCRA project. It is not clear whether such interventions consider pre-existing vulnerabilities that have been troubling the agricultural sector as a whole. Further research is needed in understanding this debate as the country moves ahead with investments in both these spaces.
3. **The future of digitalisation:** The introduction of digital tools in an inherently analogue sector such as agriculture in India presents a unique challenge. Acceptance of these tools, their relevance to solving a problem and the concerns of data protection and security of individuals needs more research

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## Annexures

### Annexure I: List of State Departments, SIF and NIF Indicators and Dashboards

State	Reporting body	State and District Indicator Framework Lists	Chief Minister and SDG Dashboard
Andhra Pradesh	<ul style="list-style-type: none"> <li>Planning Department</li> <li>Andhra Pradesh State Development Planning Society</li> </ul>	<p>SIF</p> <p>Goal 2: Area covered under Zero Budget Natural Farming (ZBNF) Navaratnalu Free bore wells</p>	<p><b>CM Dashboard:</b> <a href="#">Link</a></p> <p><b>SIF Dashboard:</b> <a href="#">Link</a></p> <p><b>DIF Dashboard:</b> <a href="#">Link</a></p> <p><b>Navaratnalu Monitoring:</b> <a href="#">Link</a></p>
Bihar	<ul style="list-style-type: none"> <li>Planning and Development Department</li> </ul>	<p>Adopted from the NIF</p> <p>No separate SIF or DIF</p>	<p>SIF Dashboard: Not Available</p>
Goa	<ul style="list-style-type: none"> <li>Planning Department;</li> <li>Directorate of Planning, Statistics &amp; Evaluation</li> </ul>	<p>Adopted from the NIF</p> <p>Separate SIF or DIF in process</p>	<p><b>CM Dashboard:</b> <a href="#">Link</a></p>
Gujarat	<ul style="list-style-type: none"> <li>General Administration Department (Planning Division)</li> </ul>	<p>SIF and DIF prepared but not in public domain</p>	<p><b>CM Dashboard:</b> Not in public domain <a href="#">Link to document</a></p> <p>SIF Dashboard: Not in public domain</p>
Haryana	<ul style="list-style-type: none"> <li>Swarna Jayanti Haryana Institute for Fiscal Management</li> </ul>	<p><a href="#">SIF</a></p> <ul style="list-style-type: none"> <li>Soil health cards</li> <li>Percentage of area covered under watershed management for irrigation,</li> </ul>	<p><b>CM Dashboard (Behind wall):</b> <a href="#">Link</a></p> <p><b>SIF Dashboard:</b> Not in place yet. Analytical</p>

State	Reporting body	State and District Indicator Framework Lists	Chief Minister and SDG Dashboard
		<ul style="list-style-type: none"> <li>plantations, fisheries, pasture development</li> <li>Percentage of agriculture and horticulture area covered under micro-irrigation</li> </ul>	<p>framework for software based M&amp;E system developed.</p>
Himachal Pradesh	<ul style="list-style-type: none"> <li>Planning Department</li> </ul>	SIF and DIF not prepared yet	<b>CM dashboard (Behind wall): <a href="#">Link</a></b>
Jharkhand	<ul style="list-style-type: none"> <li>Planning and Finance Department</li> </ul>	SIF and DIF in process	<b>CM dashboard (Behind wall): <a href="#">Link</a></b>
Karnataka	<ul style="list-style-type: none"> <li>Department of Planning, Programme Monitoring and Statistics</li> </ul>	<p>SIF</p> <p>Number/target of Soil health cards</p> <p>Number of Water bodies rejuvenated</p> <p>% of net sown under micro-irrigation</p>	<p>CM Dashboard: Announced</p> <p><b>SIF dashboard: <a href="#">Link</a></b></p>
Kerala	<ul style="list-style-type: none"> <li>Planning &amp; Economic Affairs Department</li> <li>Kerala Institute of Local Administration</li> <li>Kerala State Planning Board (KSPB)</li> </ul>	SIF prepared but not available in public domain.	<p>CM, SIF and NIF Dashboards not available</p>

State	Reporting body	State and District Indicator Framework Lists	Chief Minister and SDG Dashboard
	<ul style="list-style-type: none"> <li>Department of Economics &amp; Statistics (DES)</li> </ul>		
Madhya Pradesh	<ul style="list-style-type: none"> <li>MP State Policy &amp; Planning Commission</li> </ul>	SIF prepared but not available in public domain.	<b>CM Dashboard:</b> <a href="#">Link</a> SIF and NIF In development
Maharashtra	<ul style="list-style-type: none"> <li>Planning Department</li> </ul>	SIF and DIF not finalised yet. <a href="#">SIF</a> Soil Health Cards Farmers benefitted under PMKSY/PMFBY Net area under organic farming Reduction in use of NPK/Pesticides	<b>SIF Dashboard:</b> Not publicly accessible: <a href="#">Link</a>  <b>CM dashboard (Behind wall):</b> <a href="#">Link</a> <b>SIF Dashboard:</b> Under development
Punjab	<ul style="list-style-type: none"> <li>Department of Planning</li> </ul>		
Arunachal Pradesh	<ul style="list-style-type: none"> <li>Planning &amp; Investment Division of Finance, Planning &amp; Investment Department</li> </ul>	<a href="#">SIF</a> % of farmers issues Soil Health Cards	<b>CM Dashboard:</b> <a href="#">Link</a> SIF Dashboard: Not available
Assam	<ul style="list-style-type: none"> <li>Transformation &amp; Development (T&amp;D) Department in Centre for SDGs (CSDG)</li> </ul>	<a href="#">SIF and DIF</a> % of farmers issues Soil Health Cards % use of nitrogen fertiliser out of total NPK	<b>CM Dashboard:</b> <a href="#">Link</a> SIF Dashboard: Not available
Manipur	<ul style="list-style-type: none"> <li>Planning Department</li> </ul>	<a href="#">SIF and DIF</a>	CM Dashboard: Not available

State	Reporting body	State and District Indicator Framework Lists	Chief Minister and SDG Dashboard
			SIF Dashboard: Not available <b>CM Dashboard:</b> <a href="#">Link</a> SIF Dashboard: Not available
Meghalaya	<ul style="list-style-type: none"> <li>Department of Planning</li> </ul>	<a href="#">SIF and DIF</a>	CM Dashboard: Not available <b>SIF Dashboard:</b> <a href="#">Link</a>
Mizoram	<ul style="list-style-type: none"> <li>Planning &amp; Programme Implementation Department</li> </ul>	<a href="#">SIF</a> Soil health cards % of net area under organic farming % change in NPK use	CM Dashboard: Not available <b>SIF Dashboard:</b> <a href="#">Link</a>
Nagaland	<ul style="list-style-type: none"> <li>Planning &amp; Coordination Department</li> </ul>	<a href="#">SIF</a> % of farmers issues Soil Health Cards <a href="#">DIF</a> % of net area under organic farming	<b>CM Dashboard:</b> <a href="#">Link</a> SIF Dashboard: Not available
Sikkim	<ul style="list-style-type: none"> <li>Department of Planning, Economic Reforms &amp; North East Region</li> </ul>	<a href="#">SIF and DIF</a>	<b>CM Dashboard:</b> <a href="#">Link</a> SIF Dashboard: Not available
Tripura	<ul style="list-style-type: none"> <li>Planning (Statistics) Department</li> </ul>	<a href="#">SIF and DIF</a> % of Soil health cards issued	<b>CM Dashboard:</b> <a href="#">Link</a> SIF Dashboard: Not available
Tamil Nadu	<ul style="list-style-type: none"> <li>Planning &amp; Development Department</li> </ul>	<a href="#">SIF</a> Soil health	CM Dashboard: Announced <b>SIF Dashboard:</b> <a href="#">Link</a>

State	Reporting body	State and District Indicator Framework Lists	Chief Minister and SDG Dashboard
		Area under organic farming Area under farm ponds Area under Micro Irrigation	
Telangana	<ul style="list-style-type: none"> <li>Planning Department</li> </ul>	SIF under preparation	CM Dashboard: Not available <b>SIF Dashboard:</b> Not available
Uttar Pradesh	<ul style="list-style-type: none"> <li>Planning Department</li> <li>State SDG Cell</li> </ul>	<a href="#">SIF and DIF</a> Proportion of degraded land to net sown area Soil health cards Area under organic farming	<b>CM Dashboard:</b> <a href="#">Link</a> <b>SIF Dashboard:</b> <a href="#">Link</a>
Uttarakhand	Department of Planning (Centre for Public Policy and Good Governance)	<a href="#">SIF</a> Soil health cards Area under organic farming	<b>CM Dashboard:</b> <a href="#">Link</a> <b>SIF Dashboard:</b> Not available
Andaman and Nicobar	Planning Department	<a href="#">SIF</a> Soil health cards Net sown area (organic) Area under organic farming	<b>CM Dashboard:</b> <a href="#">Link</a> <b>SIF Dashboard:</b> Not available
Delhi	Planning Department	SIF Prepared but not publicly available	<b>CM Dashboard:</b> <a href="#">Link</a> <b>SIF Dashboard:</b> Not available

State	Reporting body	State and District Indicator Framework Lists	Chief Minister and SDG Dashboard
Lakshadweep	Directorate of Planning, Statistics and Taxation	<a href="#">SIF</a> %Soil Health Cards issued % of Area under organic farming	<b>CM dashboard:</b> Not applicable <b>SIF dashboard:</b> Not available

Annexure II: List of Indicators, Interventions and Tools Used under the PoCRA

## Digital tools helped streamline PoCRA interventions & achieve project goals effectively

Indicator	PoCRA Interventions	Digital Tools
Increase in water productivity at farm level	Drip, sprinklers, farm pond, electric motor, pipes, demonstration & promotion of climate resilient technologies	<ul style="list-style-type: none"> <li>▶ Direct Benefit Transfer Portal</li> <li>▶ MLP App</li> <li>▶ Farmer Field School App</li> <li>▶ GIS Dashboard</li> </ul>
Spatial and temporal yield variability for soybean and pigeon pea	Promotion of climate resilient seed varieties & technologies under FFS	<ul style="list-style-type: none"> <li>▶ DBT Farmer portal</li> <li>▶ FPC Portal</li> <li>▶ NRM Portal</li> <li>▶ Farmer Field School</li> <li>▶ GIS Dashboard</li> <li>▶ Training App</li> </ul>
Number of project supported FPCs with growth of annual profits	Assistance of business plans of FPC & Farmer groups	<ul style="list-style-type: none"> <li>▶ FPC rating tool</li> <li>▶ FPC portal</li> </ul>
Net greenhouse gas emissions	Activities taken for carbon sequestration such as horticulture plantation & Agroforestry	<ul style="list-style-type: none"> <li>▶ DBT Farmer, FPC &amp; NRM</li> <li>▶ Farmer Field School</li> <li>▶ EXACT- Tool</li> <li>▶ Training App</li> </ul>
Annual farm income comparator	Assets & services provided under project such as DBT, NRM, FPC, FFS, training, etc.	<ul style="list-style-type: none"> <li>▶ DBT Farmer, FPC &amp; NRM</li> <li>▶ Farmer Field School</li> <li>▶ Training App</li> </ul>
Farmers reached with agricultural assets or services	Connecting farmers to access project benefits through digital applications (DBT, FFS, Training, etc.)	<ul style="list-style-type: none"> <li>▶ DBT Farmer, FPC &amp; NRM</li> <li>▶ GIS Dashboard</li> <li>▶ Farmer Field School</li> <li>▶ Training App</li> </ul>
Number of approved participatory mini watershed plans	Water balance computation, micro level planning, soil and water conservation works for natural resource management	<ul style="list-style-type: none"> <li>▶ MLP app</li> <li>▶ NRM portal</li> <li>▶ Water budget model</li> </ul>

### Annexure III: List of Interviewees

S. No.	Respondent Name	Designation and Affiliation
1.	Dr. Manjunatha A V	Director (Evaluation), Karnataka Evaluation Authority
2.	Ms. Geetha Halli	Deputy Director of Agriculture, Watershed Development Department
3.	Mr. P.S. Vijayshankar	Founder member, Samaj Pragati Sahayog
4.	Ms. Chetna Nahata	Senior Consultant, NABARD
5.	Mr. Sachin Kadam	Monitoring and Evaluation Specialist, Maharashtra Project on Climate Resilient Agriculture (PoCRA)

### Annexure IV: List of Participants at the Expert Consultation Meeting held on 8 April 2022

S. No.	Name	Organisation	Email
1	Amita Shah	GIDR, Ahmedabad	<a href="mailto:amitagidr@gmail.com">amitagidr@gmail.com</a>
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3	Vijay Shankar	SPS, Dewas, MP	<a href="mailto:viju28@gmail.com">viju28@gmail.com</a>
4	Yugandhar Mandavkar	GRASP, Pune	<a href="mailto:yugandharm@rediffmail.com">yugandharm@rediffmail.com</a>
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19	Tanaji Nikam	SOPPECOM, Pune	<a href="mailto:t90nikam@gmail.com">t90nikam@gmail.com</a>