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DEPARTMENT OF
SCIENCE & TECHNOLOGY

Policy Brief 2

JJM Database: From Monitoring to Decision Support Tool

DST- Centre for Policy Research in STI at
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Introduction

Policy Brief I highlighted the milestones achieved in the Rural Drinking Water (RDW) sector and detailed the Jal Jeevan Mission (JJM) programme, especially its digital governance features, emphasising its significant position in the broader spectrum of drinking water provision. The ambitious JJM programme essentially focuses on achieving universal coverage of households through functional household tap connection (FHTC) and undeniably has a better reach than the previously run rural water programmes. Functionality is the cornerstone of achievement or success, serving as the bedrock for sustainable water supply systems. The previous rural water programmes overlooked functionality assessments at the post-implementation stage, a gap that the JJM programme is expected to bridge. Given the substantial investments by the government, it becomes crucial to establish a dependable framework evaluating functionality aspects within the JJM.

In Policy Brief 2, we examine the concept of functionality, emphasising its significance within the broader framework of water service sustainability. We explore the indicators utilised to measure functionality as outlined in the JJM and existing studies. Furthermore, we assess whether there exists a necessity to incorporate other indicators that influence the water service delivery. Our overarching objective is to formulate a comprehensive framework to assess the functionality. To achieve this, we leverage the comprehensive JJM database, including the Integrated Management Information System (IMIS) and JJM dashboard. Through this process, we endeavour to refine how the JJM database can be utilised in decision-making for improved functionality and water service delivery.

Understanding Functionality

JJM operational guidelines (2019) define functionality as “water supply of 55 lpcd to rural households as per the Bureau of Indian Standards (BIS) norms” (Government of India, 2019; p23). According to JJM MIS data, till March 2024, 76% of rural households have access to piped connections, a substantial increase from the mere 18% recorded in 2019. This progress signifies a significant achievement in expanding access to clean water in rural areas. However, while the JJM aims to provide FHTC (refer to Figure 1), in practice, it often translates to merely extending pipe and tap connections to rural households, i.e., improving physical infrastructure. Numerous studies have also highlighted this limitation of the target-based approach in RDW programmes (Hutchings et al., 2016; Narayanan et al., 2023; Singh, 2014). Hence, the disparity highlights a persistent challenge: ensuring the functionality and sustainability of the physical infrastructure. This emphasises a broader vision for inclusive and efficient water provision in rural areas.

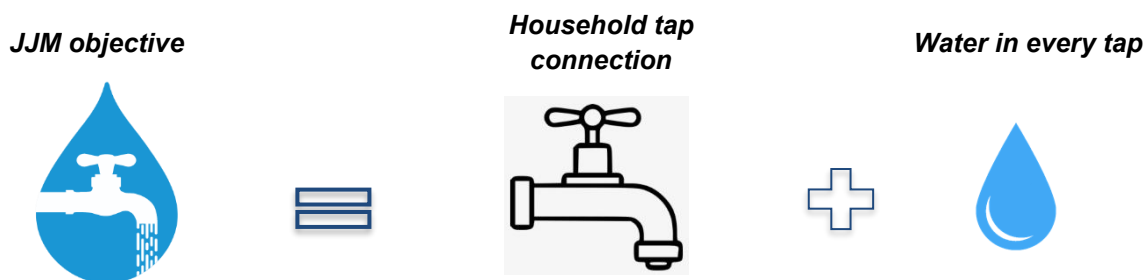


Figure 1: Meaning of Functionality of Household Tap Connection (FHTC)

Figure 2 shows the compilation of the indicators assessing water service delivery in India, as documented in studies conducted in India. These studies were based on evaluating the RDW supply programmes, checking the efficacy, or undertaking a sustainability assessment. These studies focused on certain aspects of functionality; for instance, TISS (2015) work is based on the premises of social equity, gender equality, socioeconomic profile of the households for reliable water supply; IITB and UNICEF (2018) analysed performance of the schemes; World Bank (2008) looked at the affordability and review of water supply models; and further in 2017, World Bank study included the modes of improvement in the programme design by incorporating institutional capacity and asset management for sustainable water supply. Yet, these studies share several common themes, albeit described differently: ensuring sustainable and reliable water sources, establishing secure funding mechanisms for building and maintaining assets, setting up effective institutional frameworks, and implementing robust asset monitoring systems.

Due to the targeted nature of coverage of previous programmes, the existing studies utilised metrics to evaluate physical and financial progress, analyse the equity, performance and modes of improvement based on partial and selective coverage of households. The primary concern of the past research was identifying households that did not get access to water based on their socioeconomic profile.

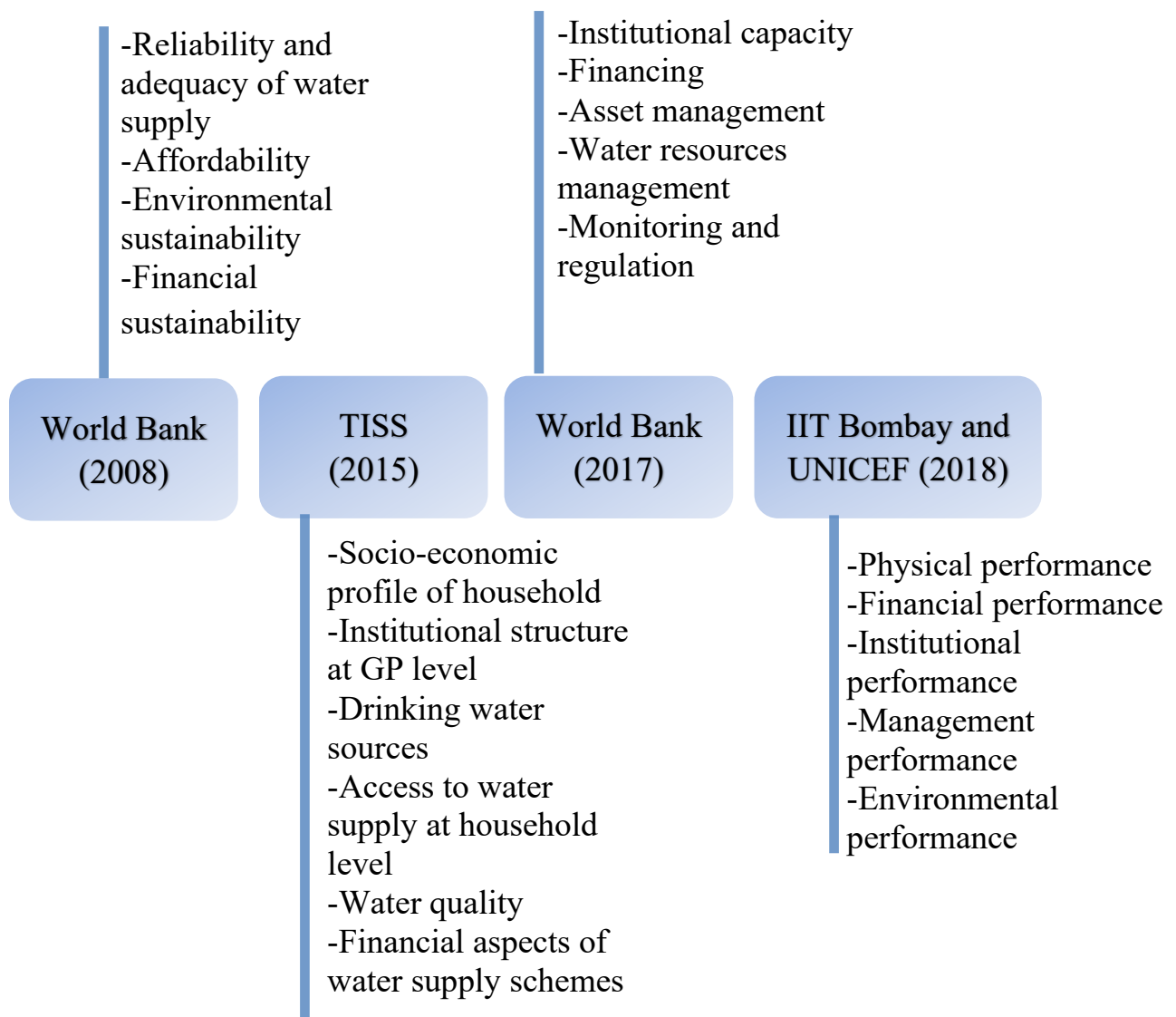


Figure 1 Indicators used in different frameworks for water supply functionality

The earlier programmes progressively tried to assess the lack of access to drinking water. They developed indicators to evaluate the programme which was based on exclusion. With the JJM now prioritising the provisioning of universal coverage as its objective, the focus has shifted towards the functionality of taps from the erstwhile target of achieving coverage. The JJM database provides a wider scope for developing a new framework for evaluating functionality. Therefore, to assess functionality, this study is rooted in the premise that households have been provided with tap connections¹.

[The JJM Functionality Report 2022](#) (Government of India, 2022) also utilised specific indicators to assess and evaluate the FHTC at both households and village-level public

¹ Note: we are not assessing the progress or coverage in JJM; instead, we are focussing on functionality for which coverage is a pre-requisite

institutions, as mentioned in Box 1. Additionally, the report incorporates service delivery parameters and institutional arrangement indicators, which, while not directly influencing the functionality, play a crucial role in the overall water service delivery.

I. Working tap connections (%) - HHs that received water through a tap connection at least once in the last 7 days
II. Quantity of water received by households (%)
A. Adequate quantity (>55 LPCD)
B. Partially adequate quantity (> 40 LPCD - < 55 LPCD)
C. Inadequate quantity (<40 LPCD)
III. Regularity of water received by households (%)
A. Fully Regular Supply (as per schedule)
B. Partially Regular Supply (not as per schedule)
C. Irregular Supply (less than 9 months' supply)
D. Potable (Quality) water received by households

Box 1 Indicators in Functionality Assessment Report 2022

Taking reference from earlier studies (Figure 2), the JJM Functionality Report 2022 (Box 1) and the JJM guidelines, we are attempting to design a comprehensive set of indicators influencing the functionality aspect of the water service delivery. Table 1 provides a list of indicators that require monitoring to achieve the goal of 'functionality' in FHTC. The initial column of Table 1 displays the key indicators followed by the sub-indicators and then explains each sub-indicator. It is worth highlighting that since functionality represents a snapshot of sustainability at a given time (Lockwood & Smits, 2011) and not overall sustainability, it is crucial to monitor a given set of indicators to minimise the post-implementation failures which can impede sustainable water service delivery (Narayanan et al., 2023; Whaley & Cleaver, 2017).

Table 1 Indicators for monitoring the RDW functionality

Indicator	Sub Indicator	Explanation
Source	Source of water supply	Sustainability of water source throughout the year
	Quantity of Water Supply	Water supply 55 lpcd
	Quality of Water Supply	Water quality as per the defined the BIS standards

Institutional	ISA (Implementation support agency)	The presence of a supporting agency in the design and implementation of schemes
	VWSC Formation	Formation of village water and sanitation committees
	Composition of members	Details about the VWSC members who are key stakeholders in decision making
	Training of Members	The capacity building of VWSC members and operator as per the modern infrastructure requirements
	Complaints Redressal	Details of complaints raised by the households/ other stakeholders and the status of their complaints
	Source of O&M Expenditure	Details about the O&M funds
	Percentage of HH paying for O& M	Details of HHs contributing towards the O&M charges
	Total O&M fund available against expenditure	Utilisation of O&M funds
	Source of payment to operators	The budget available for the operator
Technical	Frequency of service breakdown	The average time duration of any disruption in water services
	The average duration of repairing	The average time interval to restore the pipe network

Aligned with JJM's goal of universal coverage, this study adopts a similar approach, exploring factors impacting tap functionality. In the subsequent section, using this set of indicators, this study examines the JJM database to evaluate how the data aligns with the concept of sustainable service delivery.

How well does the JJM Database explain the water service delivery?

The JJM database comprises an IMIS and a database. IMIS has over 50 formats and 200 parameters, and the dashboard can be explored up to the village level. The database can be used

to identify cases of partially or non-functional schemes and further be used to take appropriate actions. To check whether the JJM dashboard can provide functionality data spatially and temporally, it has been analysed against the indicators mentioned in Table 1.

The dashboard provides a live visualisation (updated daily) of the programme at the national, state, district, panchayat and village levels (refer to Fig. 3 and 4). There is a clear demarcation in the portal that facilitates the process of identifying areas lagging in terms of physical and financial performance. It is now easier to visualise year-wise and cumulative physical and financial progress of schemes at national and state levels (refer to Fig. 4). The analysis reveals that although the JJM dashboard has been carefully designed to provide a user-friendly visualisation of the programme's progress, making it highly valuable for monitoring the overall programme, the database provides a limited picture of water functionality.

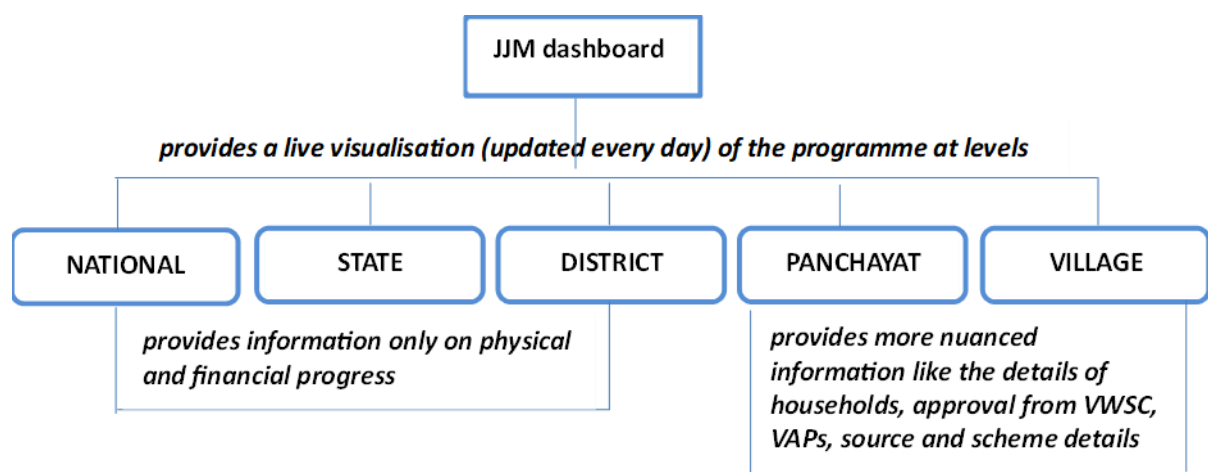


Figure 3 Information provided by the JJM dashboard at various levels

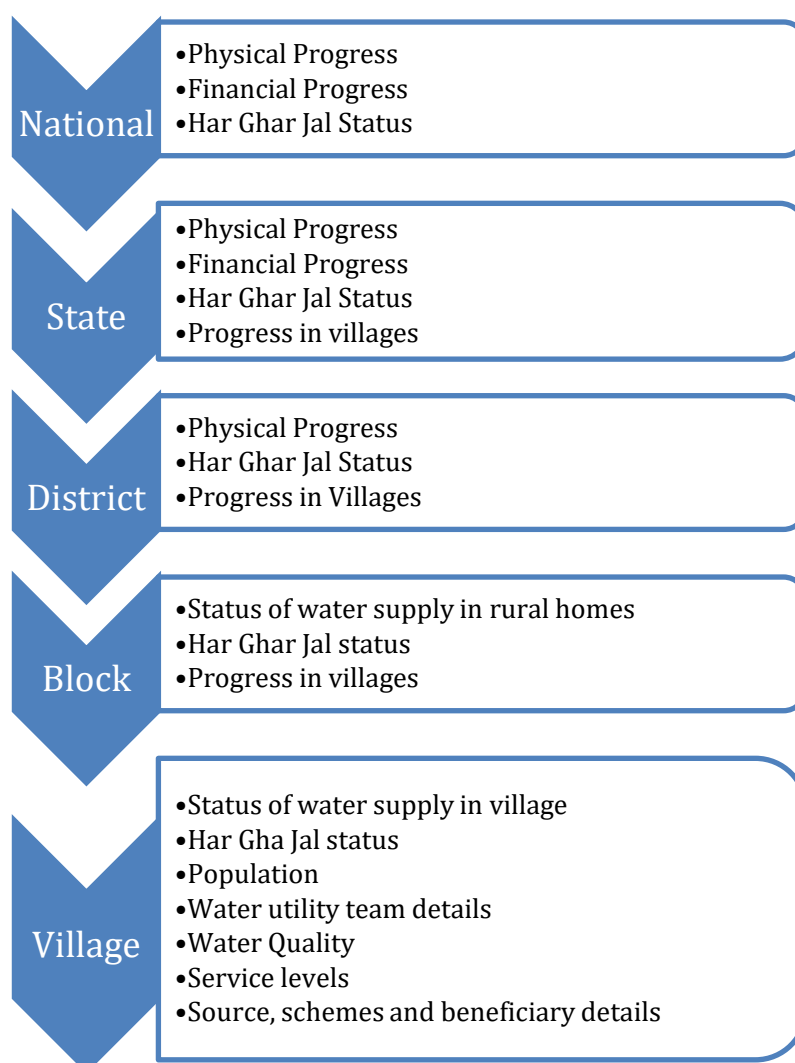


Figure 4 Data availability at different levels in the JJM Dashboard

The next analysis compares various formats available at the JJM IMIS against the functionality indicators (as shown in Table 2). It has been found that there are data available from the village to the national level, but not all indicators are available on the IMIS portal.

Table 2 Analysis of JJM IMIS against the Functionality Indicators

Indicator	Sub Indicator	Data Availability in IMIS			
		Village	District	State	National
Source	Source of water supply	Type of source	Type of source	Type of source	Type of source
	Quantity of Water Supply	Available	DNA	DNA	DNA

	Quality of Water Supply	Available	Data for number of testing, safe and unsafe sources available		
Institutional	ISA (Implementation support agency)	DNA	Data for number of ISA involved available		
	VWSC Formation	Details of VWSC members available	Data for number of VWSC formed available		
	Composition of members	Details of VWSC members	DNA	DNA	DNA
	Training of Members	DNA	Data on number and types of training		
	Complaints Redressal	DNA	DNA	DNA	DNA
	Source of O&M Expenditure	DNA	DNA	DNA	DNA
	Percentage of HH paying for O& M	DNA	DNA	DNA	DNA
	Total O&M fund available against expenditure	DNA	DNA	DNA	DNA
	Source of payment to operators	DNA	DNA	DNA	DNA
Technical	Frequency of service breakdown	DNA	DNA	DNA	DNA
	The average duration of repairing	DNA	DNA	DNA	DNA

DNA- Data not available

Table 2 highlights two important issues. First, a few indicators are not visualised on the dashboard, like the type of water source (although geotagged in the IMIS). Visualisation data, in this way, helps pinpoint the gaps across a given geographic region. Thus, it simplifies the process of flagging specific issues. Second, unavailability of data for indicators like benchmarking of service levels, the water quality of the supply water, VWSC details, and operator details. These indicators can represent the nature of failure for any given scheme in JJM. While certain data is available at the panchayat level, integrating it at the state level will offer a comprehensive perspective for broader analysis and policymaking. They include

institutional arrangements, types of O&M issues, types of grievances, types of governance challenges, and capacity. The study suggests that the assessment of the service delivery and functionality aspects should be conducted at the state and district levels. Such analysis would also help identify the existing data gaps and provide a scope of intervention for improving functionality.

Assessing Service Delivery for a State

Since states implement JJM within their respective institutional framework, parameters often vary between states. To understand the service delivery situation within a specific state and identify limitations in available data, a standardised process can be followed, as detailed in this section.

The JJM operational guidelines (2019) provide a description of activities to be undertaken for any scheme design in three phases: planning and mobilisation phase, implementation phase, and post-implementation phase². It also describes the comprehensive list of activities to be carried out in each phase, along with the corresponding agency responsible for executing each task. The following steps can be employed to understand the governance of JJM within a state using the digitally available data (refer to Figure 4):

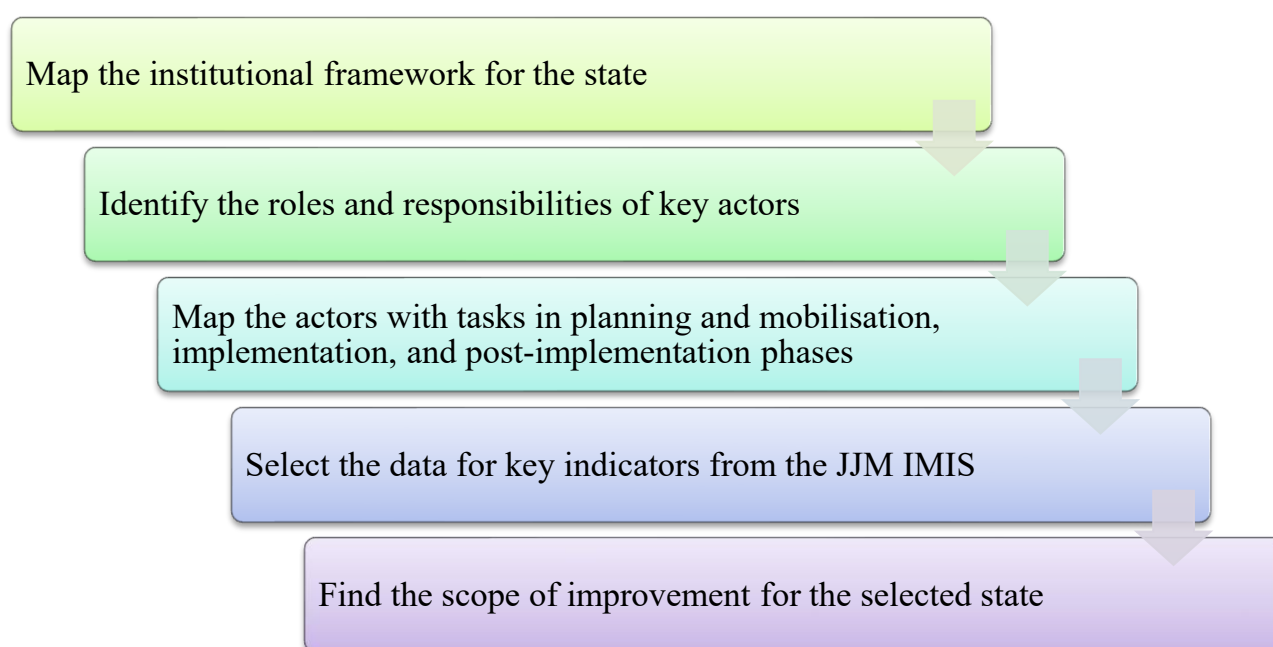


Figure 4: Standardised process to gain insight into service delivery

The challenge of analysing functionality, or any other analysis in JJM, raises the question of how we should improve the water service delivery for rural households at large.

² Page 39, JJM Operational Guidelines, 2019, Government of India.

Way forward

In continuation of the first policy brief explaining the data and digital governance aspects of JJM, the current policy brief focuses on creating a comprehensive set of indicators assessing the functionality aspect of water service delivery. For an effective assessment of the water service delivery, the study argues for the digitisation of specific key indicators (outlined in Table 2) that influence the governance of the RDW programme: source, finance, technology, and institutions. However, only certain parameters associated with these indicators are available in the JJM database, limiting our assessment. To make these datasets available and represented in the dashboard, first, we need to understand the process through which the JJM-related data is collected, collated, analysed and represented on the database, and then how the decision makers at various levels use the database for water service delivery.

The next policy brief will focus on two key avenues:

1. Identifying the process for documenting non-aggregated data at the state level.
2. Checking the scope of further refining the JJM database considering its utilisation by the state, district and local administration in key decision-making processes.

Policy Brief III will explain the primary data collection process within the JJM based on semi-structured interviews with the relevant stakeholders in the state of Maharashtra. The analysis of this data aims to provide insights into the JJM data collection process ~~and~~ explore the possibility of further improving it, and the ways state departments and officials can leverage it for decision-making

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