



Water and Livelihoods in Karnataka

JAL KAUSHAL: WATER, LIVES, AND LIVELIHOODS

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STATE REPORT

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Abbreviations

ABhY	Atal Bhujal Yojana
CLART	Composite Landscape Assessment and Restoration Tool
CRP	Community Resource Person
CSOs	Civil Society Organisations
DIP	District Implementation Partner
DPMU	District Project Management Unit
GP	Gram Panchayat
JJM	Jal Jeevan Mission
JJN	JustJobs Network
MGNREGA	Mahatma Gandhi National Rural Employment Guarantee Act
NGOs	Non-Governmental Organisations
ISA	Implementation Support Agency
ISRA	Implementation Support Research Agency
IWRM	Integrated Water Resource Management
O&M	Operations and Management
PDO	Panchayat Development Officer
PGWMC	Participatory Ground Water Management Committee
PMKSY	Pradhan Mantri Krishi Sinchayee Yojana (PMKSY)
RO plant	Reverse Osmosis (water treatment) plant
SC	Scheduled Caste
ST	Scheduled Tribe
SPMU	State Project Management Unit
VWSC	Village Water and Sanitation Co mmittee
WUG	Water User Groups

Executive Summary

In India, the world's largest user of groundwater, there are several government and civil society interventions that promote water management with the goal of making India's villages water secure.¹ Most interventions, whether initiated by state and central governments or by civil society, are decentralised, emphasising the role of community members in their implementation and management.² They build on the understanding that water is an essential component of rural economies and is necessary to create and maintain jobs across sectors.³ Integrated water management, which includes managing the source, infrastructure, and water services, is both a job creator as well as a job enabler.

However, despite the understanding that water and water management are job creators and enablers, there is little record of community members' or frontline workers' tasks, responsibilities, training, skills, remuneration, and working conditions. This is further complicated by the fact that water management work at the local level is often part-time, voluntary, or unpaid. Thus, despite consensus that community members perform critical water management tasks, there remains a gap in knowledge about the work they do and the conditions they work in.

To address this, JustJobs Network (JJN) and Arghyam launched Jal Kaushal, a project that examines the jobs-tasks-skills nexus of rural water management. JJN hypothesises that an investigation and understanding of livelihoods engendered by the sector can enhance the sustainability and success of water management. This project draws from both secondary and primary research conducted in five states of focus.

A state-level study of Karnataka, one of the five states studied as part of the Jal Kaushal project, this report helps ground secondary data through primary research and maps the "who" of the water management sector. It also helps examine whether jobs, tasks, and skills in the water management sector align with aspirations and the perceived value of employment in the sector. With a focus on domestic use of water, JJN's research in Karnataka reveals that:

- Water management tends to have a singular focus on water supply
- Water jobs are concentrated at the state- and district-level despite broad consensus regarding the community's and Gram Panchayat's pivotal role in water management
- The onus of water management is squarely on government departments
- Workers at the village level have limited capacity to undertake essential water management tasks
- Most of the effort and money is spent on creation of infrastructure in a top-down manner, with very little or none spent on the upkeep and maintenance of the infrastructure – precisely where the Gram Panchayat can and is expected to play a major part.
- This is a vicious cycle; with no money available for operation and maintenance, and therefore no local capabilities or people, the infrastructure often falls into disrepair.

- With a little forethought, capability building, funds and community participation, this cycle can be reversed.

These findings are similar across Kalaburagi and Vijayanagar, the two districts surveyed for this project. The districts were shortlisted because of their location, distinct hydrogeological profiles, demography, status of water security, and active missions and schemes. In both districts, water supply – which is one only component of water management – dominated the sector. As a result, few work opportunities exist, and even fewer are productive and secure. In addition, frontline workers present are not adequately trained or skilled and are unable to undertake important water management tasks.

Split into three sections, this report provides information about how water is managed and the people who manage it; the jobs and tasks this sector creates as well as the nature and conditions of that work; gaps in this nexus; and JJN's findings as well as call to action.

The findings of this report are complemented by the JJN team's survey of five Gram Panchayats (GPs) in Kalaburagi and six in Vijayanagar. The GPs were selected based on ongoing government and NGO interventions, demography, infrastructure provisions, status of water security, and availability of respondents. Annexure 1 details the research methods and selection criteria for GPs in Kalaburagi and Vijayanagar.



Chapter 1: Introduction

In Karnataka, a primarily agrarian state, water is an essential component of the state's economy, and its adequate and integrated management is essential to create and maintain both life and livelihoods. Despite a robust presence of central- and state-government schemes as well as interventions by Civil Society Organisations (CSOs), water management in the state is overshadowed by an emphasis on household and irrigation water supply. While supplying water to households and farms is vital, a singular emphasis on it has resulted in a deprioritisation of other critical components of water management, such as source augmentation and demand management. This has ripple effects on water security in the state.

The newly approved State Water Policy 2022 also underscores this skewed approach: it recommends moving away from a singular focus on supply infrastructure to favour integrated water management. However, while the policy encourages user participation in water management, it fails to offer actionable steps to ensure community participation and engagement.⁴

Key water management missions and schemes currently implemented in Karnataka include Atal Bhujal Yojana (ABhY), Jal Jeevan Mission (JJM), Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS), and Pradhan Mantri Krishi Sinchayee Yojana – Watershed Development Component (PMKSY-WDC). These are implemented by four of many water-related departments in Karnataka. The table below maps each department's involvement in water management across the three dimensions of water management.

In theory, these missions and schemes aim to address all three components of integrated water management, namely source management, infrastructure management, and water services management. Source management encompasses all aspects of water collection from sources like rivers, lakes, or rainwater⁵ Infrastructure management involves the built aspects of pumping, diverting, storing or treating water. This could include dams, canals, reservoirs, and treatment plants, as well as systems of pipes, pumps, and storage tanks. Water services refer to the provisioning of water, tariffs, metering, operations and maintenance, and also could include aspects of education and awareness-building.⁶

A collective emphasis on all three components is essential because source management helps prevent overreliance on a single source, such as groundwater or surface water, and promotes conjunctive use of water; infrastructure management, across conservation and supply, ensures creation and maintenance of critical infrastructure such as pipelines, canals, and check dams; and service management ensures adequate distribution and water quality. However, JJN found that despite a top-level emphasis on all components of water management, only water supply interventions are prioritised at the village-level, as seen in Kalaburagi and Vijayanagar. In both districts, village residents rely on groundwater for household needs and have piped connections either to a public tap or into their homes.

Table 1

State Departments Involved in Rural Water Management

S No	State Departments	Dimensions of Rural Water Management		
		Source	Infrastructure	Services
1	Rural Drinking Water and Sanitation Department (RDWSD)			
	Works towards ensuring sanitation and providing clean drinking water to the rural areas of Karnataka. It administers the Swachh Bharat Mission Gramin (SBMG) Karnataka and Jal Jeevan Mission (JJM) Karnataka (also known as Mane Manege Gange) components.			
2	Rural Development and Panchayati Raj Department			
	Provides safe and adequate drinking water to all the rural habitations. The government of Karnataka also implemented a water conservation scheme Jalamrutha, which focused on drought-proofing measures, including protection and rejuvenation of water bodies. Also implements MGNREGS.			
3	Department of Minor Irrigation and Ground Water Department (MI & GWD), Ground Water Directorate			
	Implements the Atal Bhujal Yojana.			
4	Watershed Development Department			
	Oversees soil and water conservation and watershed development and implements the Pradhan Mantri Krishi Sinchayee Yojana – Watershed Development Component (PMKSY-WDC).			
5	Department of Water Resources			
	The PRD creates and maintains drinking water infrastructure for areas unaffected by water quality issues. It also handles the technical implementation of HGNKJ while the Bihar Vikas Mission handles administrative responsibilities.			
6	Department of Horticulture			
	Harnesses surface water for irrigation and drinking water purposes and handles major and medium irrigation projects.			
7	Karnataka Pollution Control Board			
	Keeps a check on water quality.			
8	Command Area Development Authority (CADA)			
	Under the WRD, the CADA ensures rapid and optimum utilisation of Irrigation potential created under major and medium irrigation projects and to increase the agriculture production.			
9	Karnataka Neeravari Nigam Limited (KNNL)			
	Responsible for planning, investigation, estimation, execution, operation and maintenance (O&M) of all irrigation projects.			

Household Water Management

Karnataka has provided functional household tap connections (FHTCs) to nearly 56 percent of its rural households, but a survey of Kalaburagi and Vijayanagar reveals gaps in this provision.⁷ Three of the five GPs surveyed in both Kalaburagi and Vijayanagar are water-stressed despite the provision of a Functional Household Tap Connection (FHTC); some village residents rely on water tankers in the summer while others receive inconsistent water supply. This lack of sustainable water supply is a direct result of emphasising supply and infrastructure creation without the surrounding components of water management. In addition, a narrow focus on supply through the JJM has resulted in the loss of an opportunity to revive traditional management practices, a lack of job creation in the sector at the village level, and lacunae around demand management.

While investment in crucial water supply systems has transformed lives in GPs such as Gotoor, Kalaburagi, a singular emphasis on supply could lead to sustainability concerns. This is reflected in the functioning of schemes such as MGNREGS and ABhY, which are supposed to promote natural resources management and groundwater management respectively, and yet do not converge with JJM, resulting in high levels of groundwater extraction to ensure water supply.

Additionally, it is also important to understand that JJM promotes dependency on groundwater. While the guidelines acknowledge traditional water management systems that leverage surface water, the mission is implemented through mini-

pipe, standalone, and multi-village structures, all dependent on groundwater.⁸ In Kalaburagi, several traditional water structures like *kalyanis* – traditional step-wells – are currently in disuse. While the mission did not cause a decline in their use, it missed a crucial opportunity to revive these traditional water structures and associated jobs, such as that of *Neerkatti*. Additionally, even though water supply is prioritised, it is not equitably delivered. In B. B. *Tanda*⁹ in Shivpura Gram Panchayat, Vijayanagar district, residents did not receive any FHTCs and depended on a single stand post. Almost all residents in the *Tanda* are landless farmers who rely heavily on community water sources for domestic and livelihood needs.

Irrigation Management

The Karnataka Irrigation Act 1965 and the Karnataka Irrigation (Amendment) Act 2003 enabled participatory irrigation management in the state by introducing Water User Cooperative Societies (WUCS). Similar to Water User Associations (WUAs) across the country, WUCSs are expected to improve water use efficiency and agricultural productivity by facilitating the equitable distribution of water, operating and maintaining minor canals, and collecting irrigation water charges.¹⁰

In 2014, the Government of Karnataka, in partnership with the Asian Development Bank, undertook the Karnataka Integrated and Sustainable Water Resources Management Investment Programme (KISWRMIP) to establish and strengthen WUCS across major irrigation projects. The programme helped establish 11 WUCS, created awareness amongst farmers about participatory irrigation management, mobilised

farmers and non-farmers to become members, and trained WUCS officers bearers in administrative tasks.¹¹ This was implemented in partnership with the Karnataka Neeravari Nigam Limited (KNNL) and the Water Resources Department (WRD) both of which are responsible for continued support to WUCS in the state.

However, despite these interventions, the area under canal irrigation – where WUCS play an important role – is gradually shrinking in favour of borewell irrigation.¹² Farmers are resorting to groundwater irrigation, even where surface water is present, because canal water use efficiency remains extremely low, depriving farmers of the water to which they are entitled.¹³ Low water efficiency is a direct result of poor management of water, making it evident that WUCS either do not exist in the state or are severely disempowered. This is not for a lack of investment in irrigation; the Government of Karnataka's irrigation allocation has steadily increased since 2002 at a rate of six percent annually.¹⁴ However, these investments are disproportionately catered towards creating mega irrigation projects and enhancing supply mechanisms instead of prioritising management of existing sources. As a result, increased expenditure in irrigation has neither translated to higher irrigated areas nor increased revenue generation for the government, leading to a net loss.¹⁵ Weakened or absent management institutions, then, impede the ability of participatory irrigation management to enable and create jobs in the state.

When viewed in the context of different levels of governance, it becomes clear that water management is present in discourse only at national- and state levels, and marginally at the district level. In prioritising water supply, the other components of water management – and the missions, schemes, and programmes that operationalise these – have taken a backseat.

This is evident in the jobs and tasks created by the water management sector. Chapter 2 offers more information on how water management jobs are concentrated at the state and district levels, despite consensus on communities' pivotal role in water management.

Chapter 2: Water Management – whose responsibility?

In India, the responsibility of water management is decentralised to the state level. Further, in rural areas, it falls within the purview of Panchayati Raj Institutions (PRIs), specifically the Gram Panchayats.¹⁶ In theory, community-led GP sub-committees such as Village and Water Sanitation Committees (VWSCs) and Participatory Ground Water Management Committees (PGWMC), Water User Cooperative Societies (WUCS), and frontline workers are supposed to play a major role in managing water. JN's research, however, led to two notable findings: first, most jobs in water management are concentrated at the state and district levels, with few jobs and tasks available at the village level. Second, only a fraction of the few jobs that do exist in villages are secure, empowered, rewarding, and just.

Most major missions and schemes in Karnataka discussed above are implemented by Gram Panchayats and suggest appointments of sub-committees as well as frontline workers. Table 2 offers more detail on their purpose, the expected role of the community, and the actors engaged. But while all government interventions emphasise community involvement, frontline workers are only appointed under JJM and, on occasion, under PMKSY-WDC and MGNREGS. In addition, frontline workers are also appointed by CSOs such as MYRADA, which implements a watershed management programme in Gotoor, Kalaburagi.

Box 1

Watershed Management by MYRADA

MYRADA, an NGO established in 1968, works in backward and drought-prone districts of Karnataka, Andhra Pradesh, and Tamil Nadu to protect and nurture natural resources with the support of local communities. The interventions' primary objective is to ensure livelihood security for the poor, especially the landless poor, through natural resource management and protection. To that end, MYRADA launched watershed management in Kalaburagi and helped build vented and normal check dams, rainwater harvesting structures, and recharge pits amongst others.

To successfully manage natural resources, especially water, MYRADA convened watershed committees to budget, manage, and oversee water management initiatives in a particular watershed. Understanding the heterogeneity of villages, MYRADA mandated representation of landless individual, labourers, skilled and unskilled workers, women, as well as SC/ST/OBC individuals in their committees. Once convened, these committees ran for three to five years and were supported by MYRADA in skilling and training. The NGO's larger goal in convening these committees was to ensure water and soil conservation, livelihood generation, and socioeconomic development. MYRADA also established independent watershed committees which carried on the NGOs work once it exited the GP. These committees are similar to self-help groups (SHGs) and sustained themselves by giving out small and micro livelihood loans to those in need. The JIN team observed this committee in action in Gotoor, where it had 11 members.

In addition, the NGO also identified, trained, and supported community resource persons (CRPs) who were responsible for assisting the Panchayat Development Officer, organising meetings, accepting grievances, collecting tax, and maintaining existing infrastructure. For the duration of MYRADA's active involvement, CRPs were paid between INR 7000-10,000 monthly; and once the NGO's project ended, the CRPs were paid between INR 1000 and 5000 depending on tax collection in the village. While appointed to support with water works, CRPs were always imagined as workers with diverse knowledge and skills who could move around laterally and support the committees, GPs, as well as intervening NGOs and CSOs in their work. The CRPs were also given the opportunity to grow in their roles, as demonstrated by the Programme Manager the JIN team interviewed who was a CRP several years ago.

Table 2

Notable Water Management Interventions in Karnataka

Mission/ Scheme/ Intervention	Department	Relevant purpose	Community's role	GP-level actors	Frontline workers
Atal Bhujal Yojana	Ground Water Directorate, Minor Irrigation Department	Groundwater management for domestic and agricultural use	Planning, mapping, implementation, operations, and maintenance, monitoring and reporting	Participatory Ground Water Management Committees (PGWMC), GP members, and Panchayat Development Officers	Bhujal Mitra (village-level community resource persons)
Jal Jeevan Mission	Rural Drinking Water and Sanitation Department	FHTC provision	Planning, implementation, operations, and maintenance	Village Water and Sanitation Committee (VWSC), GP members, Panchayat Development Officer	Pump Operator, Bill Collector, JJM contractor and subcontractor, masons, plumbers, and electricians
Mahatma Gandhi National Rural Employment Guarantee Scheme	Rural Development and Panchayati Raj Department	100 days of guaranteed employment per household	Natural resource management (NRM) asset construction including ponds, dug wells, check dams, embankments, farm ponds, soak pits, and compost pits	Panchayat Development Officer and GP members	MGNREGS worker, Barefoot Technician, Gram Kayka Mitra (only in villages with out-migration)
Pradhan Mantri Krishi Sinchayee Yojana – Watershed Development Component	Watershed Development Department	Enhance agricultural productivity through conservation and recharge	Planning, implementation, and NRM asset construction	Watershed Committee, GP members, Panchayat Development Officer	Watershed Assistant
Watershed Management	CSO-led	Ensure livelihood security through natural resource management	Planning, implementation, NRM asset construction, operation and maintenance, and reporting	Watershed Committee	Community Resource Person and Self-help Group member

Actors in household water management

As evident in the table above, active missions and schemes in Karnataka offer robust implementation mechanisms and human resources. For instance, in addition to specialised personnel hired by each department on a state- and district-level, JJM and ABhY necessitate programme management units that are cross-departmental and bring together varied officials and experts to ensure proper implementation. This creates many formal jobs on the state- and department levels.

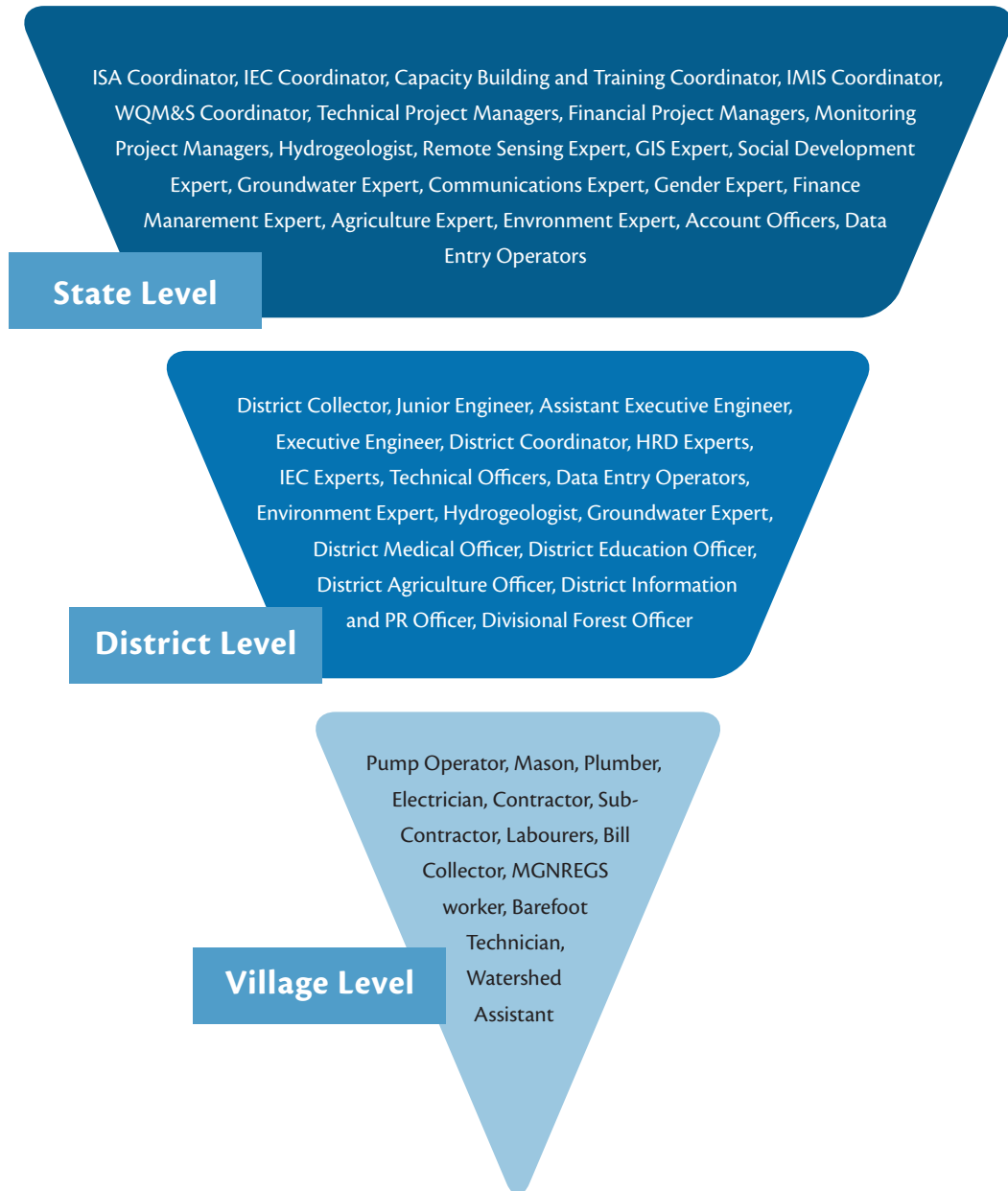
The Jal Jeevan Mission, for example, necessitates the appointment of a variety of experts across specialisations such as environment, gender, communications, and agriculture amongst others. Similarly, Atal Bhujal Yojana (ABhY), which aims to popularise groundwater management, requires the appointment of groundwater experts, social development experts, and Geographic Information System (GIS) experts, amongst others. The nature of these appointments as well as the roles and responsibilities of each job are defined by guidelines produced by the Ministry of Jal Shakti and by the state-level department responsible for hiring. These jobs, however, do not trickle down to the village level. With a singular emphasis on water supply, only jobs and tasks surrounding implementation, operations and maintenance exist in Karnataka's villages. Figure 1 illustrates this inequity in job creation across levels.

This is both a cause and symptom of inadequate water management at the village level. Owing to a lack of personnel in villages, water management is only focused on providing infrastructure instead of also managing sources and services. This shortage of personnel in Kalaburagi and Vijayanagar is offset by District Implementation Partners (DIPs) and Implementation Support Resource Agency (ISRAs) acting as stopgaps. For instance, in ABhY villages in Vijayanagar, DIPs developed Water Security Plans – a responsibility of the GP and its sub-committees – in addition to training GP and PGWMC members.

In addition to mapping the actors that exist across the state-, district-, and village levels in Kalaburagi and Vijayanagar, it is also important to understand their roles and responsibilities. As stated previously, integrated water management has three dimensions namely, source management, infrastructure management and services management, within which tasks are divided across four phases. These phases are planning, implementation, post-implementation, and governance. In Karnataka's villages, pump operators and bill collectors – both working in the post-implementation phase – are the most commonly seen frontline workers. Tasks such as planning, budgeting, and monitoring and reporting are under the purview of GP sub-committees, but VWSCs, PGWMCs and WUAs are inactive across 11 GPs in Kalaburagi and Vijayanagar. Table 3 maps the tasks performed by actors across levels, dimensions, and phases to offer a comparative understanding.

Figure 1

Water Jobs at State-, District-, and Village-level in Karnataka



Box 2

SPMUs and DPMUs

SPMUs and DPMUs are designated under ABhY. The SPMU for Karnataka is under the Department of Minor Irrigation & Ground Water Department (MI & GWD). In SPMU, the jobs are either permanent jobs, wherein the staff from government departments are posted to undertake ABhY works for the project period, or are new jobs created on contractual basis i.e., certain experts and staff members are hired for the duration of the project.

Similarly, a District Project Management Unit (DPMU) is instituted at the district level, with mostly contractual hiring. The DPMU is also supported by local NGOs for community mobilisation, capacity building of the community, and making the water security plans (WSPs), and are known as District Implementation Partners (DIP). They play a key role in planning, monitoring and demand management, and building the capacity of PGWMCs at the GP level. Over time, PGWMCs would have to undertake planning, monitoring, reporting and demand management at the GP level.

Similarly, under JJM, State Water Sanitation Mission (SWSM) under Rural Drinking Water and Sanitation Department (RDWSD) has been instituted. District Water Sanitation Mission (DWSM) and a project management unit have been instituted at the district level. Implementation Support Agency (ISA) and Implementation Support Research Agency (ISRA) are two local level NGOs supporting the district authority.

Box 3

Jala Sanjeevini – Using technology to facilitate community led water management

Jala Sanjeevini Programme is an ambitious initiative of the Government of Karnataka under the Mahatma Gandhi Rural Employment Guarantee Scheme (MGNREGS) aimed at improving water security across villages in the state. Through Jala Sanjeevini, the state hopes to ensure the participation of village communities in planning for management of water and other natural resources. Local actors such as Grama Kayaka Mitras, Barefoot Technicians and Technical Assistant Engineers are being trained on various aspects relating to community mobilisation, watershed approach and similar themes. In turn, they work with communities to create natural resource management plans for each Gram Panchayat.

Table 3

		PLANNING	IMPLEMENTATION	POST-IMPLEMENTATION	BEHAVIOUR CHANGE
STATE	State Departments				
	SPMUs				
DISTRICT	District-level Departments				
	DPMUs				
	DIPs/ ISRAs				
BLOCK LEVEL	Block-level Departments, BDO				
	Block level CSOs/ consultants				
GRAM PANCHAYAT LEVEL	Contractors and Sub-Contractors				
	Gram Panchayat				
	Sub-committees				
	Frontline workers				
	Semi-skilled workers Shramdaan, MNREGs				

HOUSEHOLD WATER MANAGEMENT FOR

- Water Source
- Water Infrastructure
- Water Service

ROLE

- Active
- Semi-active
- Inactive
- Not Responsible

JJN found, from its primary research, that village residents were not interested in convening sub-committees because of their weakened powers, especially in comparison to the VWSCs commissioned under Jal Nirmal, a World Bank project formerly implemented in Karnataka.¹⁷ VWSCs of yesteryear had greater procurement powers as well as a range of financial powers, including collecting community contributions and processing contractor payments. These financial functions do feature in JJM's operational guidelines but are not currently enforced in Karnataka. This weakening of power makes sub-committees beholden to the politics of GPs and, consequently, an unattractive venture for village residents.

Among frontline workers present in Karnataka, pump operators were not trained or provided adequate machinery to operate and maintain JJM machinery. Despite the presence of DPMUs and active ISAs and ISRAs, pump operators received no training on how to handle HDPE and GI pipes, as necessitated by the mission. As a result, when pipes break, village residents must contact the Junior Engineer or an experienced plumber, who may not be available immediately. Additionally, just as there is no convergence between missions and schemes, frontline workers and sub-committees do not converge either. MGNREGS workers such as Barefoot Technicians and Gram Kayaka Mitras operate in silos, separated from JJM workers such as Pump Operators

Actors in irrigation management

Community participation is a critical component of irrigation management because it aims to reform the irrigation sector by enabling government authorities to respond to farmers' demands.¹⁸ To that end, positions such as WUCS' president, vice president, secretary, and members are important roles, possessing the ability to enhance water delivery and management while empowering farmers. As part of KISWRMIP, the Asian Development Bank sought to capacitate WUCS to take on O&M roles, prepare water budgets, collect water charges, relieve disputes, and educate and train farmers in water use efficiency.¹⁹

However, despite these interventions, WUCS are either non-existent or disempowered. The National Water Mission in 2016 found that:

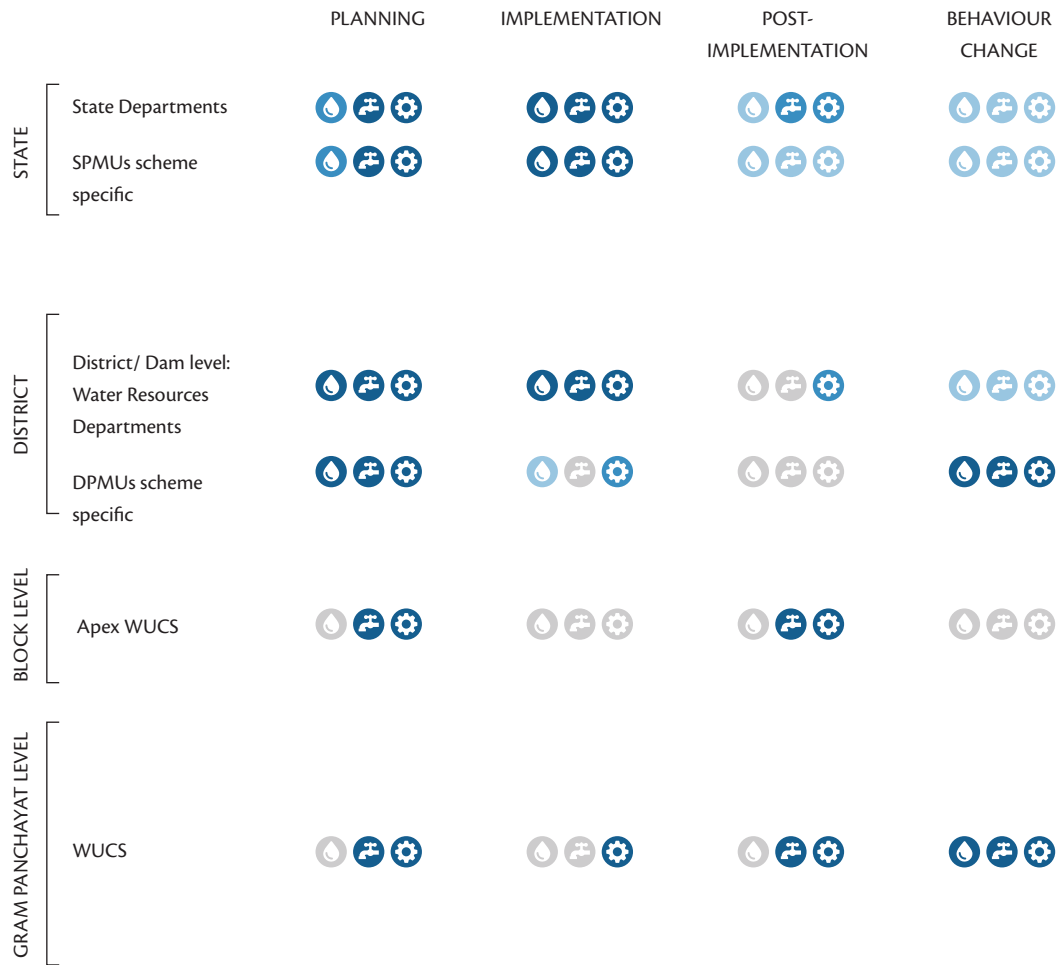
- Not all WUCS receive the same financial support, which limits their functions
- Permanent roles such as that of a secretary and other staff members need to be remunerated
- The Water and Land Management Institute needs to be revived in order to skill and train WUCS members
- Societies at all levels – apex, project, distributary, and minor – need to be strengthened
- Statutory powers on par with the Panchayati Raj Act need to be given to WUCS members
- the Water Resources Department needs to hire skilled personnel to supervise WUCS across the state.

Karnataka also implements the Pradhan Mantri Krishi Sinchayee Yojana – Watershed Development Component (PMKSY-WDC) which creates canals, check dams, and water conservation structures. Additionally, it promotes forestry and crop diversification and works independent of JJM and AbhY. Nine percent of the total budget has been assigned to support livelihood activities for landless and assetless households, in order to enhance income generation for households located in the watershed.²⁰ To this end, the scheme converges with MGNREGS and NRLM, supporting a cadre of semi-skilled workers in the state. In Vijayanagar, as part of the PMKSY-WDC, JIN researchers also met with watershed assistants who were hired for a period of three years by the GP to undertake semi-technical tasks. This was a remunerated role, paid through the livelihood component funds of the PMKSY-WDC. However, once the three-year period expired, these frontline workers were not folded into other governmental schemes or missions despite their training and valuable skills. Additionally, although SHGs are supposed to play a role in implementing the livelihood action plan, developed as part of PMKSY-WDC implementation, JIN researchers did not observe any in Vijayanagar.

The National Water Mission's findings, coupled with JIN's findings, reinforce the need to convene and support a cadre of frontline workers in a sustained fashion in order to ensure effective irrigation management that responds to farmers' needs and enhances water-use efficiency. Currently, these workers are only present in some places, weakening overall implementation and convergence.

Despite their low numbers, it is important to map these actors and their tasks to understand how water management practices can be better designed and implemented. A jobs and tasks map presented in Annexure 1 underscores JIN's findings that water services management is the most popular dimension and that all frontline workers in Kalaburagi and Vijayanagar are engaged either in infrastructure provision through MGNREGS or O&M through JJM.

Chapter 3 goes into greater detail and describes the nature of village-level jobs and tasks in the villages of both districts.



IRRIGATION WATER MANAGEMENT FOR

- Water Source
- Water Infrastructure
- Water Service

ROLE

- Active
- Semi-active
- Inactive
- Not Responsible

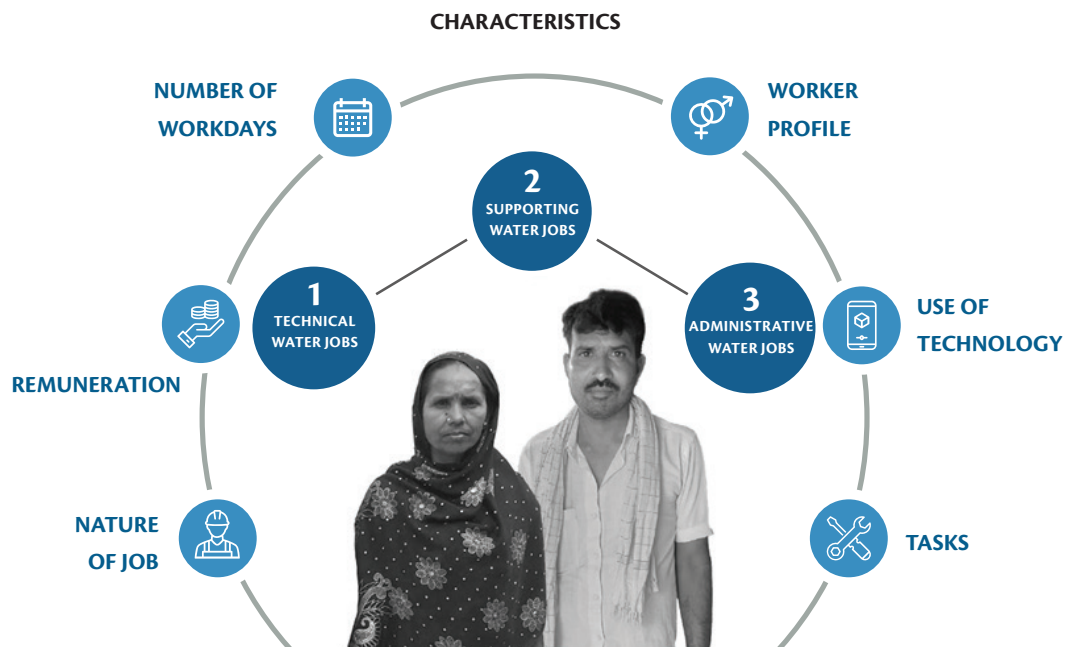
Chapter 3: Nature of Jobs in Water Management

As is evident from the previous chapter, jobs and tasks are present only in one dimension of water management in Kalaburagi and Vijayanagar districts. This chapter sheds light on the nature of these jobs and tasks to better understand the reasons behind why some jobs succeed and others fail. Figure 2 makes clear that water management includes various tasks such as mapping, planning, budgeting, implementation, O&M, and monitoring and reporting, some of which are performed by frontline workers present in the district. These workers can be divided into the following categories:

- Technically skilled workers who undertake water works
- Supporting workers who enable the water works ecosystem
- Administrative and institutional workers who provide governance support.

Examining the nature of frontline work available, including tasks performed, remuneration, requisite skills, working conditions, and the process of recruitment offers an understanding of the

Figure 2
Types and Characteristics of Water Jobs



reasons behind their absence and incapacitation. The characteristics of their work also help establish the social and economic aspirations of the worker, which, when realised, can enable successful water management initiatives.

A variety of technical, supporting, and administrative jobs are created at the state level. For instance, the JJM, which develops water infrastructure as well as water services besides water engineers, necessitates the appointment of a variety of experts

across specialisations – environment, gender, communications, and agriculture, among others. Similarly, Atal Bhujal Yojana, which aims to popularise groundwater management, requires the appointment of groundwater experts, social development experts, and GIS experts among others. The nature of these appointments as well as the roles and responsibilities of each job are defined by guidelines produced by the Ministry of Jal Shakti and by the state-level department responsible for hiring.

Box 4

Frontline Worker in Kalmood, Kalaburagi

Sangeeta is the pump operator in Paddu Naik Tanda, a habitation in the Kalmood GP in Kalaburagi district. She is a member of the Lambani community, a Scheduled Caste group in the state of Karnataka, and has served as a pump operator for the last 10 years, taking over the position from her husband who has since passed. She is a mother and the sole earner of her family, which includes her two children and her mother-in-law.

Sangeeta's typical workday as a pump operator involves switching on the pump for two hours between 7 and 9 am. Most of the residents in her habitation migrate to Hyderabad or Bengaluru for work. When they return, when seasonal employment is available, she switches on the pump for two additional hours in the evening between 5 and 7 pm. She also handles minor repair and maintenance works, such as fixing burned wires and cables, and cleans the tank weekly with bleaching powder. When asked about training, she mentioned that the Bill Collector, who was formerly a repair worker, taught her how to do basic electric and plumbing tasks, but she has received no other training or skilling. As a pump operator, she is paid INR 12,000 per month by the GP. As of May 2022, however, Sangeeta had not been paid for the past five months because, according to her, the Zila Parishad had not released the necessary funds.

While there exist technical and administrative jobs in the various departments and supporting DPMUs at the district level, they often face a shortage of technical expertise and manpower at the district level. Many of the technical and supporting jobs are also done by the NGOs supporting the district. Hiring of contractors and the associated labour for infrastructure works takes place at the district level, and frontline workers at gram panchayat level are largely responsible for managing the infrastructure.

This chapter maps state level, district level and village-level jobs and tasks in the water management sector in Karnataka, alongside type of work, remuneration, hours, tasks, and training offered, analysed from primary survey in the two districts of Vijayanagar and Kalaburagi, and interactions and secondary survey at the state level

Chapter 4: Findings and Call to Action

Of the few water work opportunities that exist at the village level, an even fewer number are realised. This, as is evident from the previous chapters, is because of an overemphasis on community involvement without adequate skilling, timely remuneration, and vertical mobility. In Karnataka, frontline workers such as pump operators are not skilled, MGNREGS workers do not receive their salaries on time, and VWSCs have no impetus to convene. To manage water effectively, then, it is necessary to make water jobs and tasks productive, secure, attractive, and just. This can be achieved by the following:

1. Integrated water management, which includes managing the source, infrastructure, and water services, is both a job creator as well as a job enabler. There is a significant gap in the skills, capabilities and resources and the human capital necessary for integrated water management. GPs need support to be made aware of these gaps as well as to understand how investment in human capital for integrated resource management could result in increased incomes, better health, and improvement in related indicators.
2. While JJM is a positive step towards ensuring water supply, water security in villages can be achieved by **shifting the focus from creating jobs and tasks only in water supply infrastructure to creating a cadre that can mobilise communities, manage demand, and support source augmentation.** Currently, these tasks are performed by volunteers – who rarely exist – or local NGOs, both unsustainable.
3. **Converging various missions and schemes at the programmatic level and at the level of frontline workers.** For example, a Gram Kayaka Mitra, who acts as a supervisor and mobiliser of MGNREGS works at the GP level, could be given the additional responsibility of mapping the requirements of water interventions. Similarly, a watershed assistant trained by PMKSY-WDC could also support planning, mapping, and water budgeting for the GP. This would allow personnel to find work beyond the window of a mission or scheme's implementation and deploy their skills in various avenues.
4. **Creating jobs dedicatedly at the village level and maintaining a registry of skilled personnel.** At present, jobs under SPMUs, DPMUs, and NGOs are all contractual in nature, with workers only hired for the duration of the project. However, they play a significant role. This is especially true of the technical jobs at the local district level NGOs such as hydrologist, agriculturalist, geologists, and community mobiliser, entirely absent from the present jobs landscape at the village level. Various schemes and CSO-led interventions also from train water professionals from time to time, but these trainings rarely continue beyond the intervention period. A common platform could be useful to give these workers visibility and leverage them for various tasks relating to water management.

5. **Providing financial security.** It is necessary to declassify frontline workers as volunteers and provide them with an adequate income commensurate with the skills and time needs of the jobs. Many of the jobs and tasks for water management are expected to be performed by volunteers under the instruments of VWMCs and WCs; this prevents the conversion of these jobs and tasks into livelihood opportunities.
6. **Making jobs accessible.** The recruitment of frontline workers such as pump operator and bill collector is currently driven by the GP leadership's preferences. A biased hiring process can discourage individuals from applying and can lead to remunerative opportunities being captured by a select few. In the case of pump operators, this is further exacerbated by jobs remaining within a single family.
7. **Offering skill development and entrepreneurship support trainings.** Most frontline workers do not receive any form of training. This restricts their capacity to undertake assigned tasks and adversely affects the quality of their work. For instance, pump operators in Kalaburagi are unable to undertake repair works on HDPE pipes because of lack of knowledge and adequate machinery. Entrepreneurship support training, in addition to adequate skilling, would allow repair workers to acquire necessary machinery. Similarly, works undertaken by MGNREGS workers are not technically sound because the workers are neither adequately skilled nor supervised.
8. **Ensuring vertical mobility.** While many workers acquire skills on the job, they may lose out on the recognition of these skills. Recognition and certification are crucial to vertical mobility. Official recognition of the skills of existing workers with Skill India certification may create newer avenues for gainful employment.
9. **Offering sustained technology support.** The CLART and PDA applications are useful tools in demystifying scientific knowledge and enabling community members to participate in groundwater management. However, one-off trainings are not enough. It is important to offer regular handholding support so that technology does not become a barrier to participation.

Even though officials and the community understand the nuances of water management in principle, they did not feel a pressing need to address the issues at the district and gram panchayat level. **It is crucial, therefore, to campaign through outreach and awareness activities on ground water management and the role that the community can and should play in it. This would also facilitate a clear "demand" from the community for a skilled water cadre.**

ANNEXURE 1: Jobs and Tasks in Water Management

Table 4

Technical Water Jobs

#	Job/Role and profile of worker	Formal/ Informal	Paid/ Unpaid	Work hours	Tasks	Skills and Training
STATE LEVEL						
1	Groundwater Expert	Formal	Paid, INR 15600+ 5400/ month	8 hours/full day work	Advising on all aspects related to hydrology, data analysis and prepare technical reports, groundwater resources assessment, groundwater monitoring programme and capacity building, providing guidance for maintenance of the assets, etc.	Postgraduate, given capacity building session as required
2	Hydro-geochemist	Formal	Paid, INR 15600+ 5400/ month	8 hours/full day work	Groundwater quality, recommending remedial measures, writing technical guidelines, relevant technical reports, field visits	Postgraduate, given capacity building session as required
3	Hydro geophysicist	Formal	Paid, INR 15600+ 5400/ month	8 hours/full day work	Geophysical work, site selection and development of piezometers, site selection for construction of water conservation, field visits for data collection and verification, technical reports	Postgraduate, given capacity building session as required
4	Water Resources Management Specialist	Formal	Paid, INR 15600+ 5400/ month	8 hours/full day work	Designing and preparing drawings of suggested irrigation systems, assessing the irrigation performance/efficiency, preparing guidelines for operation and maintenance, technical report writing, field visits	Graduate with experience, given capacity building session as required
5	Coordinator Water Quality Monitoring & Surveillance (WQM&S)	Formal	Paid	8 hours/full day work	Ensuring water quality, preparing guidelines, technical reports, site visits	Graduate with experience, given capacity building session as required
6	Hydro Geologists	Formal	Paid	8 hours/full day work	Across various state departments, collecting groundwater data (water level, water quality), developing groundwater models to trace groundwater contamination and determine sustainable water abstraction, and working closely with engineers in large infrastructure projects	Graduate with experience, given capacity building session as required
7	Engineers	Formal	Paid	8 hours/full day work	Across various state departments, infrastructural projects, pipelines, canals, major/minor irrigation, technical drawings and specifications, site visits, reports	Graduate with experience, given capacity building session as required
8	Hydrologist	Formal	Paid	8 hours/full day work	Across various state departments, examining and researching the distribution, circulation and properties of underground and surface water, technical reports, site visits	Graduate with experience, given capacity building session as required

#	Job/Role and profile of worker	Formal/ Informal	Paid/ Unpaid	Work hours	Tasks	Skills and Training
DISTRICT LEVEL						
1	Hydrogeologist	Formal	Paid	8 hours/ full day work	District departments, collecting groundwater data (water level, water quality), developing groundwater models to trace groundwater contamination and determining sustainable water abstraction and working closely with engineers in large infrastructure projects	Graduate with experience, given capacity building session as required
2	Hydrologist	Formal	Paid	8 hours/ full day work	Examining and researching the distribution, circulation and properties of underground and surface water, technical reports, site visits in DPMU and District departments	Graduate with experience, given capacity building session as required
3	Engineers (Junior, Assistant, Executive Engineers)	Formal	Paid	8 hours/ full day work	Infrastructural projects, pipelines, canals, major/minor irrigation, technical drawings and specifications, site visits, reports	Graduate. Postgraduate, given capacity building session as required
4	Agriculture/ Irrigation Expert	Formal	Paid	8 hours/ full day work	Assessing the irrigation performance/ efficiency, preparing guidelines for operation and maintenance, technical report writing, field visits	Graduate. Postgraduate, given capacity building session as required
5	Water expert, Agriculture Expert of DIP (NGO supporting DPMU- AbhY)	formal	paid	Till project timeline	One water expert and one agricultural expert – for 1 block	Trainings are provided by DPMU/SPMU under AbhY

#	Job/Role and profile of worker	Formal/ Informal	Paid/ Unpaid	Work hours	Tasks	Skills and Training
VILLAGE LEVEL						
1	Pump Operator (3-4 per GP, mostly male, while there is one female pump-operator since her father was a pump operator before)	Formal	Paid, INR 12,500 monthly	2-3 hours/day	<ul style="list-style-type: none"> Turning pump on and off twice a day Minor electrical and plumbing works, such as replacing a burned wire Cleaning and maintenance of tank Water Charges Collection Conducting awareness sessions on water use Maintenance of books of accounts Water Quality measurement 	<ul style="list-style-type: none"> No training has been provided, skilled on job Unable to work on HDPE pipes under JJM, due to lack of skills and adequate machinery
2	JJM private Contractors	Formal	Paid	8 hours/day	<ul style="list-style-type: none"> Creating and installing the water supply system, including laying pipelines, building overhead water tanks (OHTs), and installing household tap connections 	<ul style="list-style-type: none"> If required, trained by RDWSD and supervised by the Junior Engineer
3	RO Operator	Formal, private contractor	Paid (through profits)	1 hour/day	<ul style="list-style-type: none"> Owning and operating the RO plant 	<ul style="list-style-type: none"> None
4	MGNREGS worker	Formal, unskilled	Paid	100 days/year per household	<ul style="list-style-type: none"> Digging recharge pits, silt works, constructing check dams amongst other things 	<ul style="list-style-type: none"> None
5	PGWMC members	Formal	Voluntary	PGWMC meetings, on going	<ul style="list-style-type: none"> Role in planning Monitoring Reporting works 	<ul style="list-style-type: none"> According to DPMU, training has been provided, including training on CLART application
6	CRPs under watershed development	Formal, paid, for project duration	Paid	4 hours a day	<ul style="list-style-type: none"> Mapping of sources Monitoring Reporting 	<ul style="list-style-type: none"> Training provided
7	Barefoot technician under NREGA	Formal, paid	Paid	4-5 hours a day	<ul style="list-style-type: none"> Technical inputs on various kind of NRM and non-NRM works under NREGS Supervisory role during implementation 	<ul style="list-style-type: none"> Skilled through NREGS on water management (and other) works, and mobile application
8	Bhujjal Jankars	Informal	No clarity	No clarity	<ul style="list-style-type: none"> At present, Karnataka doesn't have a guideline for training CRPs in AbhY 	

Table 5

Supporting Water Jobs

#	Job/Role and profile of worker	Formal/ Informal	Paid/ Unpaid	Work hours	Tasks	Skills and Training
STATE LEVEL						
1	Remote Sensing Expert	Formal	Paid, INR 15600+ 5400/month	8 hours/ full day work	Preparing images, graphic reports, maps and charts, using computer modelling to gather data, preparing Technical Reports	Postgraduate
2	GIS Expert	Formal	Paid, INR 15600+ 5400/month	8 hours/ full day work	Creating the GIS data base for Hydrological Units in the GP clusters, Digitisation of Village Cadastral Maps, technical reports	graduate
3	Social Development Expert	Formal	Paid, INR 15600+ 5400/month	8 hours/ full day work	Developing a sustainable community based social audit mechanism, regular field visits, social development, gender and protection policy and strategies, developing processes for citizen engagement	Postgraduate
4	Gender Expert	Formal	Paid, INR 15600+ 5400/month	8 hours/ full day work	Developing a sustainable community based institutional mechanism for equal participation of men and women, technical reports	Postgraduate
5	Communication/ IEC Expert	Formal	Paid, INR 15600+ 5400/month	8 hours/ full day work	Developing communication strategy for IEC activities, preparing communication and training and capacity-building strategy for implementation, site visits, technical reports	Postgraduate
6	Finance Management Expert	Formal	Paid, INR 15600+ 5400/month	8 hours/ full day work	Developing a financial management system, scheduling of disbursements and timely fund transfer; maintaining books of account; internal and external audit	Postgraduate
7	Monitoring and Evaluation expert	Formal	Paid, INR 15600+ 5400/month	8 hours/ full day work	collecting and analysing environmental data, developing and enforcing environmental guidelines and practices, setting up a comprehensive Monitoring and Evaluation System	Postgraduate
8	Other supporting roles such as agriculture economist, procurement officer, accountant, data entry officer etc.					

#	Job/Role and profile of worker	Formal/ Informal	Paid/ Unpaid	Work hours	Tasks	Skills and Training
DISTRICT LEVEL						
1	Environment Expert	formal	Paid	8 hours/ full day work	Enforcing environmental guidelines and practices, collecting data	Graduate
2	AbhY DIP – Community Mobiliser (1 per Taluka)	formal	Paid	8 hours/ full day work	Community mobilisation, behaviour change, outreach	Trained by DPMU
3	Other supporting roles such as Implementation Assistants, data entry operator, accountant, gender specialists					
VILLAGE LEVEL						
1	Bill Collector	Formal	Paid, Rs. 15,000	8 hours/ day	<ul style="list-style-type: none"> Collecting water tax and house tax from households, data entry 	<ul style="list-style-type: none"> None
2	AbhY DIP – Community Mobiliser (1 per Taluka)	formal	Paid	8 hours/ day, till project timeline	<ul style="list-style-type: none"> Community mobilisation Behaviour change Outreach 	<ul style="list-style-type: none"> Trained by DPMU
3	Gram Kayaka Mitra	Formal	paid	Full time	<ul style="list-style-type: none"> NREGS works information & dissemination Supervisory, monitoring and reporting of NRM works Use of MNREGS application Community mobilisation and awareness generation on MGNREGS and NRM activities 	<ul style="list-style-type: none"> Training being provided
8	Other supporting roles such as agriculture economist, procurement officer, accountant, data entry officer etc.					

Table 6

Institutional/Administrative Water Jobs

S No	Job/Role of the worker	Formal/ Informal	Paid/ Unpaid	Work hours	Tasks	Skills and Training
DISTRICT LEVEL						
1	Mission directors, Departmental heads, state level directors, Chief Secretary, secretary etc.					
BLOCK LEVEL						
1	Administrative roles such as District commissioner, CEO, Executive officers, departmental heads, DPMU coordinators, Project manager(s) for technical, financial and monitoring at DPMUs					
VILLAGE LEVEL						
1	Village Water and Sanitation Committee (VWSC)	Formal	Unpaid	Meets sporadically	<ul style="list-style-type: none"> Planning, supervision, implementation, and monitoring duties as outlined by the JJM guidelines 	None
2	GP members	formal	Elected, paid	8 hours/full day work	<ul style="list-style-type: none"> Planning, implementation, management part of committees (PGWMC) develop GPDP 	None
3	Meets at gram sabhas	Formal	Paid		<ul style="list-style-type: none"> Planning, approvals, supervision, monitoring, part of committees such as the VWSC MGNREGS work allocation 	<ul style="list-style-type: none"> Training under Panchayati raj system
4	Panchayat Development Officer	Formal	Paid, government employee	8 hours/full day	<ul style="list-style-type: none"> Planning, supervision, implementation, monitoring, advise on water management, water quality Training provided 	<ul style="list-style-type: none"> Training provided by DPMU and DIP under AbhY

ANNEXURE 2: Survey Methodology and Selection Criteria

District Selection

Two districts of Kalaburagi and Vijayanagar were shortlisted for primary survey in Karnataka, considering their geographical location, distinct hydrogeological profiles, water security context, and active missions and schemes.

Kalaburagi

Kalaburagi, situated in northern Karnataka, is a water-scarce district²¹ and experiences drought in summer months. With 60 percent of its residents engaged in agriculture, landless farmers who migrate seasonally, and a lower per-capita income than the state average,²² managing the district's water is urgent and necessary.

Water is an essential component of the district's economy and is required to create and maintain livelihoods. The district has JJM and NREGS as active programmes working on water management. At the district level, water management is undertaken by frontline workers, community institutions, the GP, and district programme management units.

Like other districts in the state, water management jobs and tasks in Kalaburagi are largely concentrated around the delivery of water services. In the absence of an integrated approach to water management,

the district remains dependent on groundwater for household and irrigation purposes. While nearly 50 percent of households in the district have FHTCs, demonstrating marginal water supply success, the lack of source management raises alarm about the sustainability of this supply for both households and agriculture.²³

In Kalaburagi, pump operators are the most common frontline workers. Across the five GPs surveyed, three or four pump operators are found in each village, depending on its size, and one bill collector is responsible for collecting water tax from households. In many GPs, such as Kalmood, Dongargoan and Ghattarga, current pump operators were hired because someone in their family – a parent or spouse – held the position before they passed. Additionally, several pump operators in the district were landed and wealthy individuals who were hired because of their closeness to GP leadership, and remained in the role for several decades. As a result, the only well-remunerated water work position was captured by very few. Most pump operators who handle minor repair work learned these skills on their own or on the job, while several complained of their inability to repair HDPE pipes utilised under JJM because of a lack of skills and adequate machinery. Most pump operators also engaged in other jobs and tasks such as farming, farm labour, and plumbing.

Additionally, two types of water entrepreneurs were found in the district. The first was a contractor or sub-contractor, such as the one in Kalmood who implemented JJM in two villages and a habitation in his GP. By laying pipelines and installing FHTCs, the sub-contractor learned adequate technical as well as business skills. This allowed him to later set up and own a business. The second type comprised the RO plant owners, such as those in Kawalga and Ghattarga. These individuals set up small-scale manufacturing plants in their houses and sold purified drinking water for INR 5 per 20 litres. All RO plants observed were privately owned and operated.

The Village Water and Sanitation Committee (VWSC), an important actor in the implementation of JJM, was absent in all villages across the GPs surveyed. Despite GP members being aware of the VWSC, a lack of interest among village residents led to the sub-committee not being commissioned in Kawalga and Gutoor. These residents attributed this to the committee's weakened powers, especially in comparison to the VWSCs commissioned under Jal Nirmal. Finally, PMKSY-WDC, which creates canals, check dams, and water conservation structures to meet the irrigation needs of a watershed, necessitates a Watershed Committee, found to be absent in all GPs surveyed.

Despite their weakened presence, it is important to map these actors and their tasks to understand how water management practices can be better designed and implemented. This map reasserts JIN's findings that water services management is the most popular dimension and that **all frontline workers in Kalaburagi are engaged either in infrastructure provision through MGNREGS or O&M through JJM.**

Vijayanagar

Vijayanagar, situated in east Karnataka, is a newly carved out district from the Bellary district famous for mining activities, which are responsible for the water quality issues the district faces. This district is famous for the traditional canal system used for irrigation purposes, which now requires rejuvenation. The district has three water-stressed blocks selected under ABhY. Other water-management schemes active in the region are JJM, NREGS and PMKSY.

An in-depth study of five to six GPs in each district was undertaken.



Location map of the two districts in Karnataka

Thematic areas covered through primary survey

The following aspects were mapped from the GP survey, interaction with stakeholders at GP level, district level and state level:

- Situation of “water security” at district and GP levels (types of water commons/ availability & accessibility/ challenges)
- Understanding the institutional and governance mechanism for water management in district and GP (and state) (schemes, departments, convergence, effectiveness towards water management)
- Understanding the “water jobs” in the institutional/ governance framework – impact/challenges (who plays what role, what are the tasks, how effective)
- Supply side understanding of water jobs at GP level (what are the government-led jobs/tasks for water undertaken, trainings)
- Nature of supply side jobs and its relevance for water security (tasks, condition of work, nature of employment, salary, impact/challenge)
- Sources of funds for undertaking water linked tasks at the GP level
- Role of CSOs if present, and lessons
- Understanding of demand side water jobs – needs assessment, support, trainings
- Aspects of equity – water security
- Gender dimensions
- Use of technology (if any)
- Comparisons between GPs and districts

Stakeholders surveyed through semi structured interviews and FDGs

Interactions were held with village level, district level and state level stakeholders detailed below.

At the Village Level

- Village Residents (two Focus Group Discussions (FGD) or two individual interviews, and one discussion with a women's group)
- Community Resource Persons (CRPs)/frontline workers such as pump operator, bill collector, NREGA workers, Gram rozgar sahayak, gram kayaka mitra
- Village Water and Sanitation Committee (VWSC)/Water User Association (WUA), Ward Implementation Management Committee (WIMC), Participatory groundwater management committee (PGWMC)
- GP
- CSOs (if existing) and its associated establishments
- Panchayat Development Officers (PDOs)
- Private Contractors

At District and Block Level

- Zilla Parishad, CEO
- District Programme Management Unit (DPMU) under ABhY or other relevant departments addressing ground water management
- District Water and Sanitation Mission (DWSM) under JJM or other relevant departments addressing water supply, associated implementing partner NGO for JJM
- NREGA, Watershed and Horticulture
- Block Development Officer (BDO)/EO
- Tehsildaar/revenue department

At State Level

- Rural Water Supply Department, PR department, Public Health Engineering Department (PHED)
- Water Supply Department/State Water and Sanitation Mission (SWSM) - JJM/Panchayati Raj Department/Ground water department
- NREGS – Rural Development
- SPMU – ABhY

The information gathered through FGDs and interviews was analysed. Ultimately, as the nature of this project demands the mapping of jobs, JJN researchers developed a conceptual outline to map the tasks and jobs created within the water management sector in India. This outline divides tasks and jobs into three types: technical jobs, supporting jobs, and administrative jobs. In addition, the outline records the characteristics or attributes of jobs, including their status as a formal/informal job, remuneration, worker profile, tasks, number of hours or workdays, and use of technology. However, not all characteristics or attributes are relevant across states and, as a result, the JJN team exercises discretion in selecting characteristics or attributes to record.

Survey approach in Kalaburagi

In Kalaburagi, the JIN team began by conducting scoping interviews with the Assistant Director of the RDWSD and members of the JIM's DPMU. These scoping interviews helped the team verify their findings from their secondary research and gain greater insight into water management practices in the district.

In the GPs visited, the team conducted nine FGDs across eight villages and two habitations in five GPs, namely Kawalgi, Kalmood, Dongargaon, Gotoor, and Ghattarga. These FGDs were attended by 83 respondents including village residents, GP members, and SHG members. JIN researchers also conducted 22 in-depth interviews with frontline workers such as pump operators, motor mechanics, and sub-contractors, as well as bill collectors and Panchayat

Development Officers. These discussions were conducted in a mix of Kannada and Hindi. Both JIN researchers are fluent in Hindi and team members from partner organisations offered translation support with Kannada.

On a block- and district-level, JIN team interviewed the Executive Officer, generally known as the Block Development Officer, and the Junior and Executive Engineer of RDWSD.

Access to GPs as well as block- and district-level officials was facilitated by members of the Azim Premji Foundation (APF) based in Kalaburagi.

Table 7

Sample, sampling criteria, and methods

Sample	Sampling criteria	Methods
NGO and CSO members (N=8)	Criterion sampling	Scoping Interviews
Village Residents (N=64)	Criterion sampling (adults living in the village); Snowball sampling	Focus Group Discussions
Frontline workers (N=22)	Criterion sampling (workers engaged in frontline work, as defined by the study)	Semi-structured Interviews and Focus Group Discussions
GP members (N=19)	Criterion sampling (current and former GP members as well as officials)	Semi-structured Interviews
Block- and District officials (N=9)	Criterion sampling	Semi-structured Interviews

Table 8

Profiles of GPs visited

#	Village/ Habitation	Gram Panchayat	Block	No. of HHs	Demography	% of households with FHTC	Source of Water for Households
1	Zalki	Kawalga	Aland	535	33% SC, <1%ST	100%	Groundwater
2	Kawalga	Kawalga	Aland	812	15% SC	4%	Groundwater
3	Bheemnal	Kalmood	Kamalapur	101	88% SC	54%	Groundwater
3.1	Paddu Naik Tanda			222	100% SC		Groundwater
4	Kalamandargi	Dongargaon	Kamalapur	1523	53% SC, 20% ST	95%	Groundwater
5	Sugur	Gotoor	Kalagi	533	72% SC	3%	Groundwater
6	Gotur	Gotoor	Kalagi	520	27% SC, <1% ST, Dominantly Muslim	26%	Groundwater
6.1	Harijan Vada			60	100% SC	16%	Groundwater
7	Ghattarga	Ghattarga	Afzalpur	683	29% SC, Dominantly Muslim	95%	Groundwater
8	Kolnoor	Ghattarga	Afzalpur	139	18% SC, Dominantly Muslim	94%	Groundwater

Survey Approach in Vijayanagar

The Vijayanagar district in Karnataka was shortlisted considering the Jal Jeevan Mission and Atal Bhujal Yojana that are active in the district.

For this study, the researchers adopted a qualitative methods approach and interacted with relevant officials, community members, NGOs and other relevant stakeholders.

Access to Gram Panchayats as well as block- and district-level officials was facilitated by members of the Azim Premji Foundation (APF) based in Vijayanagar.

Six Gram Panchayats (GPs) were shortlisted for primary survey across four talukas/blocks in Vijayanagar considering the variations in water security, on-going government schemes and interventions, socio-economic profile, infrastructure provisions and availability of the respondents. The following talukas and GPs were visited in May 2022:

Table 9
Sample, sampling criteria, and methods

Respondents	Sampling criteria	Methods
NGO/CSO members (N=8, 2 organisations)	Criterion sampling	Scoping Interviews
Village residents (N=20)	Criterion sampling (adults living in the village); Snowball sampling	Focus Group Discussions
Frontline workers (pump operator, bill collector, NREGA Mate) (N=6)	Criterion sampling (technical and supporting workers, as defined by the study)	Semi-structured Interviews and Focus Group Discussions
Participatory ground water committee members, village and water sanitation committee members and GP officials (N=38)	Criterion sampling; Snowball sampling	Semi-structured Interviews
Block- and District officials, DPMU member (N=11)	Criterion sampling	Semi-structured Interviews
State officials (N=2)	Criterion sampling	Semi-structured Interviews

Table 8

Profiles of GPs visited

#	Taluka/ Block	Gram Panchayat	Villages surveyed	Active Schemes	Socio-Economic profile	Water Context
1	Hosapete	Hampi	Hampi, Kaddirampura	16 52	100%	Groundwater
2	Harapanahalli	Koolahali	Adavihalli, Tippanayakana Halli,	ABhY, JJM in next phase	Agriculture	Rain-fed agriculture, water stressed
		Adavihalli				
3	Hagaribommanahalli (H.B. Halli)	Kadihalli	Kadalabalu, Kadihalli	ABhY, JJM in next phase	Agriculture	Rain-fed agriculture, water stressed
		kadalabalu				
4	Kudligi	Shivapura	B.B. Tanda, Shivapura, Golarhati village, Jangama Suvenahalli	No current scheme	Tanda, economic poverty, lambani tribe, high migration, landless farmers	Lack of water supply, water stressed,

Vijayanagar District Profile

Vijayanagara district, traditionally famous for water management with its unique system of irrigation canals, is now dependent on groundwater for domestic purposes wherein villages have access to piped connections either to a public pump or into their homes. Agricultural activities are primarily supported through surface water (rain-fed) and groundwater-extracting private borewells. Traditional structures such as *Kalyanis* are few, and there are no active wells in the district. Over time, borewells tend to dry out calling for deeper drilling, depleting the groundwater resource. Further, the quality of water in the district is also compromised, contaminated with fluoride and nitrates. Despite the overexploitation of groundwater, the district has not yet adopted a holistic perspective to water management that could ensure water security.

At present water management for domestic in Vijayanagara focuses only on the management of water infrastructure i.e., laying and management of water supply delivery system under JJM, which is in Phase 1 of implementation. However, attention is being paid to groundwater management and convergence of various initiatives through water security plans in the blocks in which ABhY is being implemented

The onus of water management is on government departments, contracted NGOs as implementation support partners and GP level committees. VWSCs and PGWMCs have recently been instituted in the district, and are not empowered at present.

In most villages, there is no holistic understanding of water management and there are little to nil efforts made towards source augmentation, demand management, rainwater harvesting, revival of traditional water structures, and moving away from high reliance on groundwater.

Water security plans that converge all planned water management interventions across departments and schemes have been prepared in ABhY villages. These villages have also prepared water budgets, considering the demand and supply of water. These activities have been undertaken by NGO partners through community consultation. This is a positive step and needs to scale up to all villages – irrespective of ABhY interventions. However, the key challenge for such scaling up is the lack of skilled cadre at GP level for activities relating to community mobilisation, demand management, water budgeting, and planning.

Status of Water Workers

In the typology of frontline workers, it is evident that the majority of workers are linked with water supply works. The community plays a very minor role in mapping of water sources, planning, and undertaking water budgeting.

Under JJM, the onus of management of water infrastructure lies primarily on pump operators (three to four operators in a village, depending on the size of the village) and the bill collector is responsible for collecting water tax at gram panchayat level. Pump operators who are responsible for operating the

motor, minor repairs, and water quality check are often recruited from within a family over generations. Most of the operators JJN met during this study had been in the job for over two decades and it over to a family member – their spouse, child or close relative. Further, even though the pump operators and bill collectors are guaranteed fixed pay, they do not receive their salaries for long stretches of time.

An operator's work involves a couple of hours of responsibility in the morning and the evening. Therefore, many operators engage in other livelihood activities. The role of the pump operator in other aspects of water management – i.e., planning, mapping, budgeting, monitoring etc. should be explored. This would also require that these frontline workers be adequately skilled to perform their existing and any other additional tasks.

Repair workers, whether plumbers or pump operators, are not adequately skilled to install or repair HDPE and GI pipes. As a result, when pipes break, village residents or GPs must contact the Junior Engineer or hire a knowledgeable plumber, who is usually not immediately available.

JJM's VWSCs are inoperative and powerless. As stated earlier, they rarely exist, and even when they do, are often ineffective. Their lack of procurement powers and financial dependence on the PDO makes them unattractive, severely impeding community involvement in water management works. The voluntary nature of this committee also makes the participation of members very limited. ABhY's PGWMCs are in a nascent stage and would need to be capacitated and empowered. Bhujal jankaars under ABhY do not exist at present.

Under NREGS, infrastructural works are taken up by unskilled workers, mostly during pre-monsoon season; this impacts the quality of work. NREGS workers are engaged for 100 days, per household, for NRM or non-NRM works under NREGS. As a result, there is no continuity in these workers' engagement in water associated works and they do not build any skills to act as a "water cadre" at the village level. They are only engaged in soft-desilting works and lack knowledge of water management. Barefoot technicians, hired, trained, and deployed by the department provide technical support (with one barefoot technician catering to four or five GPs, and are skilled to have semi-technical understanding of water management and the works entailed, including civil works), but since they are over-worked, there exists a clear demand for such a technical person at each GP level.

Gram Kayak Mitras (GKMs) under NREGS are women NREGS Sakhis or frontline workers selected and recruited by the department, from the GP itself. These GKMs help in mobilising the NREGS workers, supervise their attendance on project sites and undertake relevant monitoring and reporting works. GKM are recruited only in GPs which experience outbound migration. According to officials, expanding the role of GKMs and providing them training on water management would help improve the technical quality of NREGS water conservation measures at GP level. However, the community members expressed their apprehension regarding this; they believed GKMs, being women, would not have adequate knowledge about water, especially relating to agricultural needs.

Under PMKSY, community level watershed assistants are hired and trained from the GP for a period of three years on semi-technical tasks related to water management. Their jobs do not outlive the project. There are no avenues to absorb these workers into the water management landscape at the GP level, even though there is potential to deploy them as Bhujjal Jankars or para hydrologists or semi-technical barefoot technicians at the GP level, in paid positions. At present, this role of para hydrologist is performed by DIPs.

There are no active frontline workers at the GP level who undertake the tasks of demand management through behaviour change and outreach. Even though PGWMCs are supposed to play this role, they are unable to do so as they are newly instituted and lack capacity. At present, this is the responsibility of the DIP project team.

Discussions with villagers and district officials revealed that there was a definitive need for a semi-technical person at the GP level (like a barefoot technician) who could take on NRM works, including water management. This frontline worker could also help in the convergence of all water associated schemes at the GP level. It remains to be seen if this role can be performed by GKM or an existing actor, or if it would require an additional frontline worker.



Notes

- ¹ World Bank, "India Groundwater: a Valuable but Diminishing Resource," March 6, 2012. <https://www.worldbank.org/en/news/feature/2012/03/06/india-groundwater-critical-diminishing>
- ² Government of India, *Community participation in water related programmes*, Press Information Bureau, 2021. <https://pib.gov.in/PressReleaseframePage.aspx?PRID=1703211>
- ³ United Nations Economic and Social Commission for Asia and the Pacific (UNESCAP), *Economic and Social Survey of Asia and the Pacific 2016: Year-end Update*, 2016. <https://www.unescap.org/sites/default/files/2016-year-end-update.pdf>
- ⁴ Hindustan Times, "Water Policy 2022: Karnataka to restrict groundwater, penalty for water wastage," August 21, 2022. <https://www.hindustantimes.com/cities/bengaluru-news/water-policy-2022-karnataka-to-restrict-groundwater-penalty-for-water-wastage-101661065085263.html>
- ⁵ United Nations Department of Economic and Social Affairs (UNDESA), *International standard industrial classification of all economic activities: Revision 4*, Statistical Papers Series M. No. 4. New York: United Nations, 2008.
- ⁶ UNESCO World Water Assessment Programme (WWAP), *Water in a changing world: The United Nations world water development report 3*. Paris: UNESCO, 2009. <https://unesdoc.unesco.org/ark:/48223/pf0000181993>
- ⁷ Ministry of Jal Shakti (MoJS), Government of India, JJM Dashboard. 2019. <https://ejalshakti.gov.in/jjmreport/JJMIndia.aspx>
- ⁸ Ministry of Jal Shakti (MoJS), 2019.
- ⁹ Tandans in Karnataka are habitations found either attached to or near a village. *Tandans* are inhabited by Lamani communities as well as other marginalised groups.
- ¹⁰ Asian Development Bank, "Water users' cooperative society and agriculture development at subproject and state level," *Karnataka integrated and sustainable water resources management investment program*, 2014. <https://www.adb.org/projects/documents/india-43253-013-5>
- ¹¹ Ibid., and Karnataka Neeravari Nigam Limited (KNNL), *List of WUCS with Contact Details*, n.d. <http://knnlindia.com/kaveri2/pdf/ListofWUCS%20withContactDetails.pdf>
- ¹² N. Nagaraj, "Key issues facing the Irrigation Sector in Karnataka: Some Policy Interventions," Institute for Social and Economic Change Policy Brief-34, 2020. http://www.isec.ac.in/PB%2034%20-%20Key%20issues%20facing%20the%20Irrigation%20Sector%20in%20Karnataka_Final.pdf
- ¹³ Ibid.
- ¹⁴ S. Poovanna, "Why Karnataka's irrigation plans are no solution to farming woes," *Mint*, January 10, 2019. <https://www.livemint.com/Politics/hXeLXsckiRT3gOg-PHOtBN/Why-Karnatakas-irrigation-plans-are-no-solution-to-farming.html>
- ¹⁵ Nagaraj, "Key issues facing the Irrigation Sector in Karnataka: Some Policy Interventions," 2020.
- ¹⁶ Panchayati Raj Institutions (PRIs) are local self-governance institutes created through the 73rd amendment to Constitution of India. Gram Panchayats are one of three levels of PRIs which convene on a village-level.
- ¹⁷ ICR Wash, *Jal Nirmal Project*, 2013. https://view.officeapps.live.com/op/view.aspx?src=https%3A%2F%2Fwww.ircwash.org%2Fsites%2Fdefault%2Ffiles%2Fjal_nirmal-delhi_20-9-2013.pptx&wdOrigin=BROWSELINK
- ¹⁸ Basavaraj Biradar, "Participatory Irrigation management (PIM) "A problematic implementation" in Indi Branch Canal (IBC) in Upper Krishna Project in Karnataka," Irrigation and Water Engineering Group, Wageningen University, 2012.

- ¹⁹ Asian Development Bank, "Water users' cooperative society and agriculture development at subproject and state level," *Karnataka integrated and sustainable water resources management investment program*, 2014. <https://www.adb.org/projects/documents/india-43253-013-5>
- ²⁰ Government of Karnataka, *Demography | Kalaburagi District*, n.d. <https://kalaburagi.nic.in/en/demography/>
- ²¹ Ibid.
- ²² Kalaburagi's per capita income was INR 123,489 for 2019-20 as against INR 326,099 in Bengaluru, according to the Karnataka Economic Survey.
- ²³ Ministry of Jal Shakti (MoJS), 2019.
- ²⁴ These figures are obtained from the JJM dashboard, available at <https://ejalshakti.gov.in/jjmreport/>.

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