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INDIA: KARNATAKA SUSTAINABLE RURAL WATER SUPPLY PROGRAM (P179039)

PROGRAM-FOR-RESULTS

2023-2028

Technical Assessment

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Prepared by

WATER GLOBAL PRACTICE
SOUTH ASIA REGION

ABBREVIATIONS AND ACRONYMS

ACS	Additional Chief Secretary
AE	Assistant Engineer
AEE	Assistant Executive Engineer
BCC	Behavior change communications
BOT	Build Operate Transfer
CEO	Chief Executive Officer
CPF	Country Partnership Framework
DBOT	Design Build Operate Transfer
DLI	Disbursement Linked Indicator
EE	Executive Engineer
EO	Executive Officer
ESC	Energy service company
FHTC	Functional Household Tap Connection
GoI	Government of India
GoK	Government of Karnataka
GP	Gram Panchayat
GRM	Grievance Redress Mechanism
GSDP	Gross State Domestic Product
IA	Implementing Agencies
ISA	Implementation Support Agencies
IVA	Independent Verification Agent
IVDN	In-Village Distribution Network
JE	Junior Engineer
JJM	Jal Jeevan Mission
KFRA	Karnataka Fiscal Responsibility Act
LPCD	Liters per Capita per Day
MVS	Multi-Village Scheme
NGO	Non-Governmental Organization
O&M	Operations & Maintenance
OHT	Overhead Tank
PforR	Program-for-Results
PPP	Public Private Partnership
PRED	Panchayati Raj Engineering Division
RA	Result Areas
RD&PR	Rural Development and Panchayat Raj
RDWSD	Rural Drinking Water and Sanitation Department
RWS	Rural Water Supply
SCADA	Supervisory Control and Data Acquisition
SDG	Sustainable Development Goal
SVS	Single-Village Scheme
SBM(G)	Swachh Bharat Abhiyan (Grameen)
TP	Taluka Panchayats
VAP	Village Action Plan
VWSC	Village Water and Sanitation Committee
WQMIS	Water Quality Monitoring Information System
ZP	Zilla Panchayat

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Background

Country Context

1. **India's economy may slow down, coming off a strong recovery in FY21/22 (April 2021–March 2022).** The spillovers from the Russia-Ukraine war and the global monetary policy tightening cycle are expected to weigh on India's economic outlook: elevated inflation on the back of higher prices of key commodities, heightened global uncertainty, and rising borrowing costs could affect domestic demand, while slowing global growth may dampen India's export growth. Despite these challenges, India is expected to remain one of the fasted growing major economies in the world, due to robust domestic demand. The growth in FY22/23 is likely to moderate to 6.9 percent from 8.7 percent in FY21/22.[1] Domestic demand is expected to remain on a recovery path, despite external headwinds. The Government's strong capital expenditure (CAPEX) program will support investment, while private consumption will benefit from consumer spending in high- and middle-income groups. Net exports may continue to drag on growth due to slowing global growth and high commodity prices. The rising merchandise trade deficit is likely to push the current account deficit to 3.2 percent of Gross Domestic Product (GDP) in FY22/23. Due to recovering demand, elevated global commodity prices and adverse weather conditions, headline inflation crept above the Reserve Bank of India's tolerance range in January 2022. It remained above the target range for ten months before returning to below the upper end of the target range of 6 per cent in November 2022 and is expected to gradually ease further next year.[2] The Government's gradual fiscal consolidation efforts will be bolstered by strong revenue performance. Goods and Services Tax (GST) collections continue to be strong, having crossed the INR 1 trillion mark every month since July 2021, reaching as high as INR 1.67 trillion in April 2022.

2. **Although India has made remarkable progress in reducing extreme poverty over the past two decades, the COVID-19 pandemic has slowed progress and poses risks to welfare.** Before the pandemic, the share of the population living below US$2.15 per person per day (2017 purchasing power parity) is estimated to have fallen from 22.5 in 2011 to 10 percent 2019.[3] This was accompanied by a sharp decline in the incidence of multidimensional poverty, from 27.7 percent in 2005/06 to 16.4 percent in 2019/21.[4] However, the pace of poverty reduction has slowed in recent years, with key welfare indicators being slow to improve.[5] More than 40 percent of India's population lived below the lower-middle-income poverty line even before the pandemic.[6] Inequality in consumption has remained stable, with a Gini index of around 35 over the past two decades. Child malnutrition has remained high, with 35.5 percent of children under the age of 5 years being stunted and 67 percent of children aged 6–59 months being anemic in 2019–21.[7] Despite a substantial social protection response from the Government of India (GoI), the COVID-19 pandemic has likely reversed recent welfare gains, exposed vulnerabilities in the labor market, and posed new risks to welfare. Headline labor market indicators have improved since the pandemic and unemployment has reduced and been stabilized at 7.5 percent in 2020-21.[8]

[1] World Bank real GDP forecasts for FY22/23 published in India Development Update, December 2022.
[2] IMF, World Economic Outlook.
[3] World Bank Poverty and Inequality Platform. https://pip.worldbank.org/country-profiles/IND. In 2004, India's extreme poverty rate was 39.9 percent using the same international poverty line.
[4] United Nations Development Programme (UNDP) and OPHI (Oxford Poverty and Human Development Initiative (OPHI). 2022. 2022 *Global Multidimensional Poverty Index: Unpacking Deprivation Bundles to Reduce Multidimensional Poverty*. New York.
[5] World Bank Poverty and Inequality Platform. https://pip.worldbank.org/country-profiles/IND.
[6] US$3.65 per capita per day (2017 purchasing power parity). World Bank Poverty and Inequality Platform. https://pip.worldbank.org/country-profiles/IND.
[7] Government of India, Ministry of Health, and Family Welfare. 2022. *National Family Health Survey (NFHS - 5) 2019–21 Report.*
[8] World Bank Macro Poverty Outlook. October 2022. Estimates from PLFS data (2020-21).

3. **Investments in water infrastructure and service delivery are especially important for improving rural health and livelihoods.** Although almost 90 percent of the rural population have access to at least basic water supply service[9], only 32 percent has access to piped water supply.[10] Moreover, such access does not always yield reliable, sustainable, and affordable services. Large numbers of rural habitations slip to a 'partially covered' status, mainly due to sources going dry or inadequate financial allocation to Operations and Maintenance (O&M) leading to poor upkeep of assets and their eventual disuse. A depleting groundwater table and deteriorating groundwater quality are further threats to sustainability.

State Context

4. **Karnataka is located on the western edge of the Deccan peninsular region of India.** The capital, Bengaluru (formerly Bangalore), is a high-tech hub and the state's GDP per capita is approximately US$3,000 compared to US$1,900 for India. The state comprises the Deccan Plateau, the Western Ghats Mountain range, and the coastal plains covering an overall area of 5.8 percent of the total geographical area of India - the sixth largest state by area. It has a total population exceeding 61 million according to the 2011 census, making it the eight largest state by population with around 60 percent living in rural areas spread across 31 districts, 5,963 Gram Panchayats (GPs)[11], 28,970 villages and 59,774 habitations. The state has seven river basins, with Krishna and Cauvery basins dominating. There is high rainfall diversity with the western ghats receiving nearly 4,000 mm rain annually compared to less than 500 mm in the eastern districts, and an overall decline in annual rainfall is predicted for the south-western and north-eastern regions of the state (2021-2050). About 77 percent of Karnataka is arid or semi-arid making the state the second most drought-prone state in India.[12] Water scarcity in Karnataka is mainly concentrated in the Deccan plateau (Bayaluseeme) region, which accounts for 23 of the 31 districts in the State, and where average per capita water availability in a normal climatic calendar is estimated at 817 Cubic Meter (CM). With regions with water availability below 1,500 CM considered as water scarce; 80 percent of Karnataka is in a state of acute water stress, considering this criterion.

5. **Although Karnataka has made rapid progress in rural water provision in the last three decades, ensuring reliable rural water supply in Karnataka is increasingly becoming a challenge.** In 1991, it became one of the first states to provide at least one safe drinking water source in all 27,000 villages. By 2001, it was able to increase investment in infrastructure enabling provision of 40 liters per capita per day (lpcd) of drinking water supply to most of its rural population.[13] More recently, all 59,774 rural habitations in the state have been provided with water supply infrastructure. However, service levels in these habitations are not uniform, and many have poor water quality. Groundwater levels have been declining at an alarming rate for several decades in many parts of the state, attributed to overreliance on groundwater coupled with insufficient groundwater recharge[14]. About 80 percent of rural habitations depend on approximately 350,000 borewells for drinking water in rural Karnataka. Thus, there is severe stress on groundwater from multiple sectors, especially irrigation. Moreover, fluoride and nitrate contamination of groundwater, along with other contaminants compound the problem of water supply provision. In fact, the groundwater status in 43 percent of the taluks (block, sub-district) has been assessed

[9] 33 percent of the rural population has access to basic service, while 56 percent has access to safely managed service.
[10] JMP 2020. Estimates on household access to water supply, sanitation, and hygiene. Data accessed on September 16, 2022, https://washdata.org/data/household#!/table?geo0=country&geo1=IND
[11] https://www.panchatantra.kar.nic.in/stat/gp_off_mem.aspx
[12] EMPRI and TERI (2013).
[13] ICR, Second Karnataka Rural Water Supply and Sanitation Project (2014). Report No: ICR00003124
[14] http://cwp-india.org/wp-content/uploads/2018/03/Report-on-Karnataka-SWP-with-regard-to-National-Water-Policy-2012.pdf

as not safe[15]. Groundwater-based sources, thus, pose the twin challenges of insufficient water yield and water quality issues. These trends, accelerated by climate change, will directly impact the rural water sector as water sources increasingly become seasonal or simply dry up. Thus, the traditional ways of handling sector challenges by simply constructing infrastructure will no longer help.

The Karnataka Rural Water Supply (RWS) Service Delivery Model

6. **Karnataka has two service delivery models for rural water supply, the traditional and prevalent single-village scheme (SVS) and the multi-village schemes (MVS) implemented more recently.** The Rural Drinking Water and Sanitation Department (RDWSD), Government of Karnataka (GoK) plans and constructs both SVS and MVS infrastructure through private sector contractors selected through tender process. SVS is operated by the GPs and the GP's Village Water and Sanitation Committees (VWSCs) which employs bill collectors, watermen/plumbers and outsources pump maintenance etc. to the local private sector. The GPs own and operate the SVS with water typically sourced from groundwater (borewells or open wells) pumped to overhead tanks (OHT) and piped to household by gravity. Recently, the GoK made the strategic decision to use surface water for its rural water supply through MVSs, thus moving the sector to increasingly rely on surface water rather than groundwater. Investments in MVS can be seen as a necessary response to groundwater depletion, water quality concerns and increasing water demand. In Karnataka, MVS can range from smaller schemes comprising 3-5 villages, to larger bulk water supply where one MVS covers more than 500,000 people. The MVSs are built through design-build-operate-transfer (DBOT) contracts with private contractors, which include five-year O&M post-construction contract meant to be re-tendered every five years. The MVS contractors are tasked with sourcing, treating, and distributing bulk surface water to village OHTs.

7. **Regardless of the bulk water supply mechanism, in-village distribution network (IVDN) for the retail distribution of piped water supply to households and institutions under their jurisdiction is operated by the GPs.** From the OHT, the GPs and their VWSCs are responsible for the distribution and in-village O&M equivalent to SVSs. The RDWSD is tasked with installation of the bulk water meters and collecting of bulk water tariff[16] from GPs towards the supply of water from MVSs, with the GPs collecting tariff from users; however, the bulk water collection is yet to be implemented. While the shift to bulk surface water supply ensures more reliable drinking water, mitigates water quality concerns, and provides resilience against climate change, it inevitably brings about higher O&M costs, requires more professional management by private contractors, and necessitates more support from district-level governments.

Program Description

Jaladhare (the 'program')

8. **The Government of Karnataka's (GoK) Jaladhare rural water supply program was announced in 2018, to provide safe and sustainable drinking water at the rate of 55 lpcd in rural areas by treating water drawn from rivers or reservoirs.** GoK set a goal that all rural households of Karnataka should be provided with functional household tap connection (FHTC) at the earliest to achieve Sustainable Development Goal (SDG) 6.1 on Safe Drinking Water.[17] The program was to be undertaken in a phased manner at an estimated cost of US$6.4 billion (Rs 53,000 Crore), through the state's own budget, the 15th Finance Commission Grants given by the GoI to the GPs, GPs' own sources, and the collection of water

[15] Department of Mines and geology, Government of Karnataka

[16] Government Order No: RDP 215-RWS (5) 2013 Bengaluru, dt: 22.07.2014 and Government Circular No: RDP/14 RWS (5) 2016 Dated 18.03.2016.

[17] SDG 6.1 is defined as: By 2030, to achieve universal and equitable access to safe and affordable drinking water for all. The corresponding indicator is "Proportion of the population using safely managed drinking water services". To meet this criteria households must use an improved source that is: accessible on premises, available when needed, and free from contamination

rate from the households. When the GoI introduced the Jal Jeevan Mission (JJM) program in 2019 to provide all rural households with drinking water in adequate quantity of prescribed quality in regular and long-term basis through FHTCs, the GoK aligned its rural water program to the national program. However, while the JJM ends in 2024, the Jaladhare's mandate is to continue beyond 2024 to facilitate speed, scale, and a dedicated focus on achieving universal access to FHTC.

9. **GoK's program is in line with the national vision and goals to increase access to safe drinking water to rural communities at an affordable cost, in an environmentally sustainable manner, and lead to improvement in living standards of rural communities.** It has demonstrated its commitment to the objectives of the RWS program by developing relevant policies and guidelines for program implementation, allocating requisite financial resources, and putting in place mechanisms to strengthen the community approach to the provision of water. The program will in the initial years, co-finance tap connections for supplying drinking water on a sustainable basis along with the GoI sponsored JJM Scheme and later provide state funding to address any gaps to achieve the goal of 100 percent FHTC coverage. The objectives of the Jaladhare go beyond the provision of FHTCs and the funding for the other objectives of Jaladhare will continue beyond 2024, henceforth referred to as Jaladhare/JJM program, meaning Karnataka's JJM program which goes beyond 2024.

10. **The GoI and GoK will share the costs for construction of infrastructure under the JJM equally (50-50).** For the in-village distribution network (IVDN) system, the GoI's JJM program will contribute 43 percent; the GoK (including the World Bank loan) will contribute 47 percent; and Gram Panchayats through community contribution will be ten percent. The World Bank IBRD loan will complement the state budget support in sustaining O&M of the drinking water infrastructure created under the scheme. The O&M of the drinking water infrastructure created under JJM will be sustained through community ownership and management of the rural drinking water service. The financing for the O&M will come from: (a) the State Government through Jaladhare, which will be funded through the state budget; (b) Gram Panchayat's (GPs) own sources; and (c) and collection of water rate from the households.

11. **The overall government program ("p") is US$2,926.16 million to be implemented over five years (FY23-24 to FY28-29).** The Program is estimated at US$1,144.90 million, of which the World Bank (IBRD) will finance US$363 million as per table 1 below.

Table 1: Government program versus PforR Program by Activity (US$, millions)

Activities	PforR Program ("P")			Government program ('p')
	WB	GoK/GoI	Total	
In-village water supply infrastructure	280.6	774.4	1,055.0	2,725.00
Staffing, PMU, and office improvement	13.0		13.0	104.25
Lab construction (including mobile lab)	10.0		10.0	30.00
Tanks rejuvenation	7.50	7.5	15.0	15.00
Energy efficiency	10.0		10.0	10.00
M&E and IVA	10.0		10.0	10.00
Training, capacity building and exposure visits	6.0		6.0	6.00
Other program related activities including IEC	25.0		25.0	25.00
Sub total	**362.1**	**781.9**	**1,144.0**	**2,925.25**
Front end fee[18]	0.9		0.91	0.91
Total	**363.0**	**781.9**	**1,144.91**	**2,926.16**

[18] Front end fee of US$907,500 has been rounded off to one decimal place.

12. **The one-time community contribution towards the capital investments for the in-village distribution network (IVDN) is typically around US$250 per household; this does not include the capital cost of the bulk water supply scheme (MVS).** In terms of O&M costs, most villages in Karnataka still pay a flat rate for water ranging from US$0.5-1.5 per household per month. The tariff is set by each GP and is generally sufficient to cover basic O&M costs, but insufficient when electricity, salaries, and bulk water costs are included. The state has, through the introduction of FHTC connections included volumetric meters at every household without introducing a volumetric tariff. The overarching goal for the sector is to achieve long-term financial sustainability and efforts are made to raise community awareness of GP-incurred O&M costs to start a community led transition to cost-recovery. Relatedly, no formal arrangements for payment of bulk water supply currently exist between the MVS contractors operating the MVS, RDWSD, and the benefitting GPs.

13. **With the transitions to bulk surface water from groundwater source, and household connections from public standposts, reforming the institutional and policy architecture is essential for the achievement of long-term sustainability.** Conscious of the need for reform, GoK has prepared a comprehensive O&M Policy with the clear objective to improve institutional capacity and human resources of the state implementing agency, RDWSD, GPs, and GP sub-committees, the VWSCs to provide sustainable water supply services. The O&M Policy clarifies institutional roles and responsibilities of sector stakeholders, and provides guidance on technical, institutional, and financial sustainability of water schemes in the state.

Karnataka Sustainable Rural Water Supply Program (KSRWSP) Program-for-Results (PforR) (the 'Program')

14. **The PforR Program aims to support the GoK in the implementation of the Jaladhare in Karnataka and to ensure the sustainability of service delivery.** The Program will cover: (i) delivery of infrastructure in new and existing SVS with metered household connections, and in-village facilities (such as distribution systems, additional storage reservoirs) where bulk water is available through MVSs, and third party quality assurance inspection, (ii) strengthening of existing MVSs[19], (iii) institutional performance enhancement at state, district and GP levels; (iv) enhancing implementation capacity on greywater management, water quality, energy efficiency, M&E system and (v) investments in climate resilience with water source sustainability and recharge through tank rejuvenation.

15. **PforR instrument: The GoK and the World Bank agreed that the PforR instrument is the appropriate vehicle for the World Bank support** to GoK's own program, through GoK's own systems and procedures. The GoK's existing implementing capacity for procurement and financial management is strong and there is a degree of familiarity with social and environmental risk management. The PforR instrument has proven effective in Government programs where the results are clear, in this case functional and sustainable household taps. The results can be structured to incentivize institutional and policy reforms at all levels of governments including progressive performance metrics to help the Government evolve the sector as well as leverage sector funds in the long run. There is strong support for improving outcomes in service delivery and sustainability for GoK's program. The PforR instrument provides better alignment with GoK's objectives of strengthening capacity to improve the focus on service improvement.

[19] The Program will not finance new MVS but aim to improve the sustainability and efficiency of existing MVSs.

Table 2: GoK's Jaladhare program supported by the KSRWSP PforR Program

	Value addition	GoI's JJM in Karnataka	GoK's Jaladhare	World Bank KSRWSP PforR
Objective		The vision of the JJM is for every rural household to have drinking water supply on premises, in adequate quantity of prescribed quality on regular and long-term basis at affordable service delivery charges.	The goal is for all rural households of Karnataka to be provided with FHTC at the earliest to achieve SDG 6.1 on Safe Drinking Water, by drawing water from rivers or reservoirs, after purification.	The Project Development Objective (PDO) is to increase access to safely managed rural drinking water services and strengthen institutions to deliver sustainable services of drinking water to rural communities of Karnataka.
Program v. Program elements	FHTC provision	• Construction of rural FHTC including retrofitting to provide minimum of 55 lpcd	• Construction of rural FHTC including retrofitting and augmentation of in-village distribution network to provide minimum of 55 lpcd • Installation of household water meter	• Construction of rural FHTC including retrofitting and augmentation of in-village distribution network to provide minimum of 55 lpcd • Installation and operationalization of household meters
	Bulk and distribution infrastructure	• Construction of bulk water transfer, treatment plants and distribution network through either SVS or MVS	• Construction of bulk water transfer, treatment plants and distribution network through either SVS or MVS	• Construction of GP-level distribution network through in-village distribution networks.
	Source sustainability	• Support groundwater recharge investments	• Support groundwater recharge investments	• Tank rejuvenation for source sustainability • O&M for tank rejuvenation
	Greywater management	• Greywater management planned	• Greywater management planned	• Greywater management plan developed and implemented
	Water Quality	• Water quality testing	• Water quality testing done by laboratories that may not be of national standard	• Testing of water quality to national standards • Development of water quality app for results dissemination to public
	Financial sustainability		• Commitment to cost-recovery	• System for cost-recovery • Billing system implemented • Energy efficiency investments • Preparation of GP O&M budget
	Institutional sustainability			• Field level leadership • Introduction of GP performance benchmarking and reward
	M&E	• Advanced M&E System incl. real time dashboard to track FHTCs • Water Quality Monitoring and Surveillance Program	• Advanced M&E System incl. real time dashboard to track FHTCs • Water Quality Monitoring and Surveillance Program	• Operationalization of detailed M&E system • Water quality app
	Technical sustainability			• 24/7 service
Geographic scope		Entire state	Entire state	Entire state
Period		2019-2024	2018-no end date	2023-2028
Cost			US$781.9m	US$363m

Program Activities

16. **The Program will support three results areas (RAs) to contribute to the Government program.**

Results Area 1 - Increase access to safely managed rural water supply

17. **Providing access to metered household water connections.** RA 1 will support metered household connections through new and rehabilitated in-village water infrastructure. The KSRWSP seeks to support delivery of 2 million FHTCs. Quality assurance of infrastructure construction will be ensured through private sector third-party quality assurance inspections, as required under Jaladhare, which will then be verified by the Program's independent verification agent (IVA). The IVA will ensure that all the results provided by third-party quality assurance inspections are verified by the IVA.

18. **Citizen engagement.** In line with the JJM requirements, participatory planning and appraisal through social audits will be carried out to strengthen beneficiary engagement and track overall performance of JJM, focusing on capacity enhancement of VWSCs and GPs, who are responsible for undertaking the audit. RDWSD, in collaboration with the Directorate for Social Audit under Rural Development and Panchayat Raj (RD&PR), will prepare a social audit manual and provide extensive training on the social audit proceedings. The KSRWSP program will implement information, education, and communication (IEC) activities such as Inter-Personal Communication, and BCC among others. RDWSD has developed PARIHARA, a Grievance Redress Mechanism (GRM) software, to redress water related complaints. PARIHARA has the following features: multiple options to file complaints (internet, phone, or social media), user categorization, alert generation, response, real-time monitoring, customer feedback, and escalation flow. KSRWSP will strengthen PARIHARA by enhancing staff capacity to manage the PARIHARA call center, increasing public outreach and awareness, strengthen linkages with field staff and other relevant agencies for improved efficiency and extend PARIHARA to tank rejuvenation works.

19. **Greenhouse gas emissions.** A greenhouse gas emissions accounting analysis was carried out for the Program's water supply activity. Because of the energy usage by water pumps in the water schemes in the Program compared to the baseline scenario, the net emissions for the provision of FHTCs is estimated to be an average of 35,531 tCO_2e annually and total of 710,621 tCO_2e over 20 years.

Results Area 2: Strengthen institutions, policies, and finance to improve sustainability of water services

20. **The policy and institutional framework for Jaladhare is still to be adopted and operationalized.** The O&M Policy to sustain service delivery has been prepared but not yet notified. Among others, the key objectives of the O&M Policy are to provide guidance on technical, institutional, and financial sustainability of RWS schemes and systematically introduce cost recovery at the GP and community levels from operations of MVSs and SVSs in the state. Specifically, the policy includes detailed tariff setting calculations and progressive rollout of guidelines along with budgeting and reporting guidelines. Supporting the institutionalization of the policy will be transformational to the management of RWS not only in the state but also in informing policy reform at national level by operationalizing steps towards cost recovery in the sector. Achievements toward the notification and implementation of sector policies are supported by disbursement-linked indicators (DLIs) under RA 2.

21. **Institutional performance metrics and enhanced monitoring functionalities.** The goal for the sector is to ensure that the 20-year design life of the investments of Jaladhare investments is realized and ideally surpassed. Currently, RDWSD's attention and expertise are focused on construction of infrastructure, but it recognizes the need for improving service delivery and sustainability of these assets. The Program will help RDWSD develop and institutionalize a set of performance criteria at the GP level to this effect—an approach which has been proven effective in similar World Bank PforR operations

elsewhere.[20] The performance criteria will encapsulate core elements from the O&M Policy and move the focus to planning, gradual cost recovery, accounting, reporting, and system maintenance, among others, which are core elements for ensuring sustainability. These ambitious efforts will apply to all GPs in the state. To measure the performance, the Program will significantly expand the functionalities of the sector monitoring system to enable RDWSD to remotely monitor GP-specific revenue generation, O&M budgets, VWSC activities, and so on. This improved monitoring system will be a pivotal part of the KSRWSP and seek to harness Bangalore's leading IT expertise and digitally capture undisputed GP data sources such as energy bills and bank account information.

22. **Water quality.** RA2 supports the state in modernizing its Water Quality Monitoring Information System (WQMIS) and data governance architecture to make reliable water quality data easily accessible to policy makers and citizens. To enhance water quality testing capacity in the state, RA2 supports construction of laboratories and their accreditation through NABL to ensure testing conforms to the national standards along with a pilot on mobile laboratories to enable testing in remote areas. The KSRWSP will help the Jaladhare program prioritize microbiological testing capacity which will inform the rollout of chlorination to treat water in SVSs to address the risk of coliform bacteria**.**

23. **Shifting the RWS focus from engineering of water infrastructure to social, institutional, and financial engineering of the sector.** The proposed reforms and service improvements require behavior change especially at the GP and community levels. Each GP will need to carry out an annual O&M budget exercise which is to be uploaded into the advanced M&E system which is under development. The O&M Budget will include electricity costs which many GPs are currently not paying in full and a new bulk water charge which will be introduced in line with the O&M Policy. Through this exercise each GP will determine the need to adjust the water tariff accordingly. The new monitoring system will remotely track the GP's performance against the O&M budget, its revenue, and costs along with electricity and bulk water charges. A sector benchmarking performance scheme will be developed to reward and celebrate GPs that meet these targets.

24. **The Field-Level Leadership (FLL) approach is a multi-agent model of leadership development, that aims at creating a broad cadre of change champions at all levels of government.** The KSRWSP supports an innovative approach for effecting positive changes in staff behavior and organizational culture of RDWSD. Under RA2, FLL will be progressively rolled out and cover approximately 1,145 staff of RDWSD. Initial implementation, to be completed in the first two years of the KRSWSP, will include (a) training of FLL master trainers and (b) rollout of FLL workshops led by the master trainers. The momentum of the initial phase will be sustained by conducting regular impact evaluations, documenting successful initiatives, recognizing change leaders, and supporting their informal support groups. As these peer-to-peer networks expand, and as more staff join this dynamic, they explore process improvements, enhance community outreach, and strive to deliver better results.

25. **Roll out 24/7 service delivery.**[21] The 24/7 service delivery would entail a continuous supply of household piped water of a quality adhering to nationally prescribed standards and available when needed. This involves technical assessment at water scheme level and GP-level social behavior change activities to sensitize rural communities on changing household water storage habits helping water users trust continuous service, and conserving water for enhanced climate resilience against drought through

[20] Vietnam: Results-Based Rural Water Supply and Sanitation Under the National Target Program (P127435) and Results-Based Scaling Up Rural Sanitation and Water Supply Program (P152693); Tanzania: Sustainable Rural Water Supply and Sanitation Program (P163732); and Bangladesh: Local Governance Support Project - 3 (P159683).

[21] 24 hours per day and seven days a week is also referred to as continuous water supply.

ISAs' existing in-village activities. This will also involve capacity building of RDWSD at the district and block levels to demonstrate the technical and social transition to 24/7 service.

26. **Enhancing sustainability.** RA 2 will incentivize sustainability by establishing technical, social, and financial sustainability criteria which applies to all GPs and measured in year 3, 4 and 5 of the Program.

27. **Link informal women workers to technical job roles such as plumbers**. The rural water and sanitation sector currently lacks certified plumbers, which is an important sustainability parameter. The Program will support localized needs assessments and deliver on-the-job skills training for technical jobs (i.e. plumbers) to 3,000 women. The technical training on skills will be complemented by delivery of life skills training for female workers which includes digital, financial, reproductive, and legal literacy. To measure women's sustained participation in technical and life skills training, completion of the training modules will be tied to interactive digital assessments. Finally, the Program will support design and rollout of digital learning tools and performance assessments to help track female workers' uptake of technical skills and improvements in productivity and performance.

Results Area 3: Improve water source sustainability and energy efficiency to enhance climate resilience

28. **The GoK is yet to develop a comprehensive assessment and strategy that cuts across departments and enables the state to carry out state-wide long-term planning and decision making for water security.** The Program will support the development of a Water Policy Implementation Roadmap that will support the state in navigating increasing water demand from irrigation, rural, and urban sectors and the growing uncertainties attributable to water shortages and droughts that are exacerbated by climate change. This includes modernization of sector monitoring and reporting systems for the RWS subsector specifically as well as systems for the entire water sector. As part of these efforts, a scoping study on PPP financing models for photovoltaic (PV) solar energy (potentially for 5–10 MW) will be carried out along with training of engineers in PV powered water pumps.

29. **Energy and operations expenditures.** Lifting water from deep wells or distant surface reservoirs is energy intensive. Some of RDWSD's MVSs use more than 5 MW to power pumping operations. The energy cost related to water pumping will in many areas be a key determinant of the long-term price of water or the required subsidy to the sector. RA3 will provide increased focus on energy expenditure to reduce overall energy intensity and carbon footprint through energy audits and development of energy performance criteria for DBOT and build-operate-transfer contracts and explore energy service company financing models for investments in energy efficiency. Under the energy audits, data-driven technologies including supervisory control and data acquisition (SCADA) in MVSs would be integrated for monitoring energy use and performance, thereby optimizing operations; training engineers on solar water pumping; and a scoping study on solar energy plants for multi village schemes (MVS).

Climate resilience to droughts through water storage. RA3 will invest in tank rejuvenation to increase water storage in seven water-stressed districts, which will in turn accelerate groundwater recharge. The focus will be on small tanks with an irrigation command area less than 40 ha. There are around 33,000 minor tanks in the state. Under the Program, rejuvenation of 500 minor irrigation tank with a command area of 40 hectares will accelerate groundwater recharge and sustainability in the seven water scarce

districts in Karnataka[22]. The World Bank Program would fund the design, use of modern machinery and quality assurance for core areas of tank rejuvenation such as deepening, repair of bunds and waste weirs. This activity brings in two new elements: (a) the site selection will be informed by analyzing satellite imagery and (b) the Program will seek to institutionalize O&M for tanks ensuring that the tank desilting infrastructure is maintained along with other preventive maintenance activities. This activity is linked directly with the overarching goal of promoting source sustainability of the borewells for RWS schemes by contributing to the natural recharge of aquifers, making rural area residents more resilient to water shortages and droughts. In addition, there are clear synergies between tank rejuvenation and RA1 and RA2, especially because the responsibility of small tanks falls to GPs and can hence be incorporated into the performance scheme and O&M budgeting. Tank rejuvenation will also be linked with the GP's Water Policy Plans which are supported under the World Bank's National Groundwater Management Improvement Program. The World Bank has five lending operations in Karnataka that focus on the water sector. With this operation, there is an opportunity to strengthen the convergence across these projects.

Disbursement Linked Indicators

30.Program resources will be disbursed based on the achievement of eight DLIs. These DLIs have been selected to incentivize the achievement of improvements in access, service, quality, and performance. The DLIs are not timebound[23] and weighing of resources across different DLIs reflects their importance toward achieving the Program results. Resources allocated to the DLIs do not represent the total financial outlay required. Table 3 details the DLIs and their allocated funding from IBRD.

Table 3. Disbursement-Linked Indicators

DLI	GCRF Pillar	DLI value (US$)
Results Area 1: Increase access to safely managed rural water supply		
DLI 1: Functional Households Tap Connections Installed Provide access to 2 million FHTCs equipped with volumetric water meters. The DLI will finance approx. 25 percent of the actual cost of FHTCs.	Pillar 3	160,000,000
Results Area 2: Strengthen institutions, policies and finance to improved sustainability of water services		
DLI 2: Strengthening Institutions to Ensure Safe and Reliable Water Services DLI 2.1. Sector M&E system enhanced (US$10M) DLI 2.2. O&M Policy notified in official gazette (US$10M) DLI 2.3. Water Quality System Modernization (US$10M) DLI 2.4. Centre of Excellence for Water and Sanitation established & operational (US$10M)	Pillar 4	40,000,000
DLI 3: Gram Panchayats with Basic O&M Capacity The DLI will systematically increase GP-level O&M capacity and performance. Target: 5,000 GPs to achieve basic-level O&M criteria	Pillar 4	40,000,000
DLI 4: Gram Panchayats with Improved Financial Sustainability of Water Services Target: 3,500 GPs to increase GP-level financial capacity and performance		50,000,000
DLI 5: Gram Panchayats with 24/7 Water Service Target: 500 GPs to achieve 24/7 service level		18,000,000

[22] The proposed districts are Bengaluru Rural, Bengaluru Urban, Bidar, Chikka Ballapura, Chitradurga, Kalaburgi, Kolar and Tumakuru

[23] With the exception on DLI 1 on long-term sustainability.

DLI 6: Gram Panchayats with Sustained Service The DLI will incentivize RDWSD to prioritize sustained functionality and O&M. Starting from year 3: 3,500 GPs will meet core functionality and O&M criteria		21,000,000
Results Area 3: Improve water source sustainability and energy efficiency to enhance climate resilience		
DLI 7: Operationalize Energy Efficiency & Explore Solar Energy Operationalize energy effeciency & explore solar energy	Pillar 4	18,092,500
DLI 8: Tanks Rejuvenated in Water Scarce Select Districts Rationale: GoK requires support to increase water storage capacity. Target: Rejuvenate 500 small tanks.	Pillar 3	15,000,000
Sub-total		**362,092,500**
Front end fee		**907,500**
Total		**363,000,000**

31. **DLI 1** incentivizes the construction or rehabilitation of in-village water infrastructure including metered household connections (FHTCs) regardless of the source (SVS - groundwater and MVS - surface water). Only infrastructure that adheres to technical standards and minimum service-level criteria will be eligible for disbursement, as detailed in the Program Operational Manual (POM). These hardwired conditions include, among others, (a) adherence to quality assurance inspection procedures for construction, water quality and resilient design standards, (b) presence of an environmental and social (E&S) screening and assessment mechanism, and (c) FHTC designed for 55 lpcd and the inclusion of a volumetric water meter at every household. The design process will ensure that supported infrastructure is resilient to the risks posed by climate-induced drought.

32. **DLI 2** incentivizes RDWSD to take critical institutional steps through three strategic sub-DLIs. This will include DLR 2.1. Advanced monitoring system which includes enhancement of the sector M&E system, adding critical functionalities to capture financial and technical sector data and launch of the sector benchmarking performance and reward scheme; DLI 2.2. O&M Policy notified in official gazette; DLI 2.3. Water Quality System Modernization to ensure water quality by securing NABL accreditation for all 31 districts and NABL recognition for 48 block water quality laboratories, one mobile laboratory for remote areas, and a phone application for citizens to view their water quality; and DLI 2.4. Operationalization of a Centre of Excellence for rural drinking water and sanitation within RDWSD to pave the way for professional sector support to support specialized operational staffing in all districts to support the human resource capacity to implement infrastructure, strengthen safeguards and fiduciary execution, and implement BCC activities. The Centre of Excellence would provide dedicated and comprehensive support on contract management of MVS private contractors, lead the digitalization of assets and arrange international exposure visits for innovation through assimilation.

33. **DLI 3** applies to all GPs in the state and rewards the progressive move toward high-performing and sustainably functioning water service delivery institutions. This scalable sub-DLI pays against GPs that meets the following basic criteria: (a) the VWSC is active and meets regularly; (b) GRM is active; (c) the water scheme is functional; (d) the water quality is tested twice per year and the results are publicly disseminated; and (f) greywater management plan is in place. Greywater management includes soak pits and waste stabilization ponds under the Program.

34. **DLI 4** applies to all GPs in the state and rewards the strengthening of the GPs' financial capacity and performance. This scalable sub-DLI pays against GPs that meets the following criteria: (a) designated GP water bank account in place; (b) O&M Budget exercise completed (budget includes electricity and bulk

water costs), (c) Gram Panchayats with a water tariff collection rate above 90 percent, and (d) electricity and bulk water bills paid for the current year (excluding arrears and interest on arrears).

35. **DLI 5** incentivizes the achievement of 24/7 service in 500 GPs that have either MVS or SVS and regardless of the technology used. A GP can achieve this DLI if a minimum of 1 village in a GP has access to 24/7 service and further meets the criteria in both DLI 3 and DLI 4.

36. **DLI 6:** incentivizes strengthening GP-level capacity and improved performance built under the Program that are sustained over the entire Program period. The DLI applies to year 3-5 and pay for GPs that meet the following criteria: (a) water scheme is functional; (b) the GRM is active; (c) the fixed tariff collection rate is 90 percent, and (d) GP has paid electricity and bulk water bills for the current year (excluding arrears and interest on arrears.

37. **DLI 7** incentivizes an energy package to reduce energy intensity and carbon footprint, including (a) energy audits implemented in 50 MVS with the highest energy cost and implementation of core recommendations commenced in 10 MVSs (investments in solar energy is also an eligible activity) and (c) a scoping study including PPP financing models for solar energy plants (Potential scope: 5-10MW).

38. **DLI 8** rewards the state for the rejuvenation of 500 small tanks in water scarce districts to foster resilience to climate change-exacerbated droughts and floods. The GoK requires support to modernize its tank rejuvenation efforts with satellite imagery and quality assurance to recharge the groundwater and increase water storage capacity.

Program Strategic Relevance and Technical Soundness

Strategic Rationale

40. The proposed Program – with the objective of increasing access to safely managed rural drinking water services and strengthen institutions to deliver sustainable services of drinking water to rural communities of Karnataka – is strategically relevant and aligned with the visions of both GoI and GoK. It is also consistent with the World Bank's country engagement as per CPF FY 2018-22.

41. ***National level:*** **The GoI has undertaken a number of programs to provide rural water supply since Independence.** More recently it has promoted flagship programs to improve services such as the National Rural Drinking Water Program (NRDWP) introduced in 2008-09 ensuring sustainability of water availability using decentralized approach, which was restructured into the latest program, the Jal Jeevan Mission (JJM) launched in 2019. While previous efforts were focused on providing safe drinking water to rural population either through hand pumps, protected wells or piped water supply with public stand posts as delivery points, JJM aims to provide every rural household with an FHTC by 2024. The JJM investment is by any measure the largest and most ambitious investment in rural water supply in India to date. The central and state governments have jointly pledged to allocate more than US$44 billion[24] to the JJM program. The program aims to provide every home with drinking water in adequate quantity of prescribed quality on a regular and long-term basis.

42. ***State level:*** **The Program seeks to build on the Bank's long-term engagement with Karnataka in the rural water supply sector over the past three decades.** By engaging with an advanced state such as Karnataka, there is a potential to set new benchmarks in the sector. The World Bank has supported two projects in rural Karnataka since 1993. The first Karnataka Rural Water and Sanitation Project (KRWSSP I, 1993-2000, US$92 million), covered 1,200 villages in 12 selected districts across the state. The second project from 2001-2014 invested US$301.6 million covering 3,062 villages in 11 drought prone districts of Karnataka. KRWSSP I was one of the first projects in India to implement a community demand driven and decentralized approach with cost sharing by the community towards both capital and O&M costs. The Second Karnataka Rural Water Supply and Sanitation Project (Jal Nirmal Project-JNP) also sought to assist GoK in increasing rural communities' access to improved and sustainable drinking water and sanitation services. It closed with a 'Moderately Satisfactory' rating and had many positive outcomes including the establishment of a culture of paying for water among consumers and the introduction of a sustainability monitoring index to assess completed schemes across several parameters. Based on this index, it was found at the time of project closing that at least 92 percent of the schemes were functioning well and likely to continue to perform per expectations[25]. Despite the progress made, challenges remained for implementing sustainable cost recovery mechanisms, and the targets for cost recovery and tariffs were not met.

43. **Karnataka has prioritized decentralized approaches to rural water supply management as per the devolution of responsibilities under the 73rd Amendment to the Constitution of India.** In accordance with this approach, all SVSs and intra-GP distribution network of MVSs of the rural water supply schemes have been handed over to the GPs and are managed by VWSCs/GPs who responsible for the operations, maintenance, and service delivery of drinking water post construction. However, lack of ownership and inadequate capacity at the GP level have led to poor operational performance. Many GPs are unable to

[24] Rs 3.50 lakh crore
[25] Implementation Completion Report for the Second Karnataka Rural Water Supply and Sanitation Project, 2014, p.29.

establish cost recovery mechanisms and as a result, tariff collection targets are not met leaving critical O&M activities unfunded and undone. Moreover, water supply schemes with groundwater as their source suffered from source dwindling and drying, resulting in many defunct or partially defunct schemes.

44. **Under Jaladhare and JJM, the GoK seeks not only to provide every household with an FHTC, but also to ensure sustainable service delivery.** The infrastructure is being constructed at record pace, to achieve the goal of FHTC to every household in rural areas by 2024. According to the official data, FHTC connections were increased from 24 percent in 2019 to 55 percent of rural household in 2022, benefitting more than 3 million households since the start of the program.[26] District-wise FHTC coverage is provided in Annex 1. The Rural Drinking Water and Sanitation Department (RDWSD), the implementing agency for the JJM in Karnataka, is stretching its implementation capacity to achieve the ambitious infrastructure targets. The GoK recognizes that in parallel with infrastructure investments, they need to ensure long-term sustainability of service delivery going. Thus, it aims to address the following through its rural water supply service: (i) sustainable and resilient water supply services; (ii) comprehensive approach to water storage, use, and recharge; and (ii) improved institutional capacity for better service delivery. It has sought the help of the World Bank in improving rural water service delivery, sector-wide capacity building, and institutional strengthening and performance enhancement.

45. The key lessons from the World Bank's support in scaling up the RWSS reform program were: (a) to implement decentralized RWSS service delivery, with strong institutions and political will at State, District, and GP level; (b) the need for a sustainability framework for establishing cost recovery mechanisms ideally backed by legislative support to ensure consistent and uniform implementation of RWSS projects across the state; and (c) building the overall O&M capacity especially of the lowest tiers of local government is criticalfor successful outcomes.

46. **WB's PforR will support GoK to operationalize its O&M Policy to core technical, social, institutional, and financial performance criteria at the state, district, and GP levels.** These performance criteria relate not just to the actual provision of water supply through construction of infrastructure, but also to ensure quality of service. These criteria will include targeted incentives to promote and strengthen institutional capacity that foster a culture of water scheme maintenance and enable long-term sustainability of these connections through the life of the infrastructure. The Program will support the GoK in institutionalizing a three-pronged approach that will: (i) develop a system of incentives for improvements in source, financial, and technical sustainability across all levels of government for improved service delivery; (ii) establish a last-mile monitoring system to track performance at GP level across technical, social, institutional, and financial parameters; and (iii) establish a system of rewards to ensure that GPs are incentivized towards sustaining service delivery over time. The WB is well-placed to support the state to systematically institutionalize, operationalize, and monitor new rural water services performance criteria, which otherwise would have proven problematic for the state to achieve at scale.

47. **World Bank Engagement Strategy in India.** The Program is consistent with the World Bank Group Country Partnership Framework (CPF) FY18-22 approved by the Board in 2018 (Report 126667-IN). The Program directly aligns with Focus Area 1 of the CPF on Resource Efficient Growth by improving disaster risk management and resilience to climate change and Focus Area 3 on investing in human capital through improvement in access to rural water supply. The Program also contributes to the WB's twin goals of ending extreme poverty and boosting shared prosperity through the equitable provision of household tap

[26] Jal Jeevan Mission Dashboard. Last accessed on 19 September 2022 https://ejalshakti.gov.in/jjmreport/JJMState.aspx.

connection which would reliably provide a guaranteed amount of water of a prescribed quality. It also aligns with the Systematic Country Diagnostic, which highlights the protection of water resources to combat water scarcity which is made more urgent by deteriorating water quality. The SCD emphasizes water use efficiency which the proposed Program seeks to address through the introduction of volumetric metering and source diversification.

The rationale for government intervention in the provision of rural water supply

48. **The water sector has several unique features which make the government's active role an absolute requirement in the sector.** These include the social desirability of the increased use of safe water and sanitation services because of the health benefits and the increased productivity of individuals, additional positive benefits to society due to individual consumption, the monopoly nature of networked production and the common pool nature of water as a resource. Because of these characteristics which make individual benefits well below societal benefits, private investors are deterred from investing in the sector. This is even more pronounced in the rural sector, which have historically been excluded from non-networked services. Although the role of the government in provision of services is crucial, there are several areas in the sector, where private sector can participate, due to their technological and project management superiority. The private sector can play a premiere role in downstream activities such as bulk water supply provision, maintenance of water supply systems, water conservation (leakage reduction) efforts and energy efficiency through performance-based contracts. The GoK understands this and it has a well-defined decentralized institutional mechanism whereby the state level institution has the responsibility for policymaking, finance mobilization, and sector monitoring while devolving other responsibilities to the local governments or by engaging private contractors for O&M related tasks. Given the ambitious targets of the JJM, the gaps in coverage, and the government's goals towards recharge and reuse of water, the government has to continue investing in the sector to improve outcomes while ensuring that it facilitates the sustainability of services. The PforR aims to strengthen the role of the various levels of government to ensure sustainability of service delivery by incentivizing performance at the district and GP level, enhanced monitoring of service delivery, and supporting necessary policy implementation for effective O&M.

Karnataka's Track record on Rural Water Supply

49. **As noted earlier, the state has invested heavily in the rural water sector through various past programs undertaken by the state's own resources and through support from GoI and external agencies.** The coverage of water services has improved in rural areas under these programs. During 2020-21, an amount of US$94m (Rs 779.35 crore) was utilized under the Jaladhare program up to the end of November 2020 covering 109 habitations that were not affected by water quality issues and 34 habitations affected by water quality issues covered under MVS schemes. During 2021-22, an amount of US$773.8 million (Rs 6,366.85 crore) was allocated to the program, of which US$0.85 million (Rs 6.96 crore) was utilized up to the end of Nov 2021 and covered 19 habitations not affected by water quality issues and 1,387 habitations affected by water quality issues under the MVS schemes.

50. **As at the end of 2019, administrative approval had been given to 548 MVSs covering 11,953 habitations and a population of 19.5 million** with a cost of US$1.56b (Rs. 12,875.51 crore) approved under the NRDWP, 13th Finance Commission, and Jal Nirmal (World Bank financed RWS project). These MVSs include those under the Karnataka Urban Water Supply and Drainage Board. Four hundred and seventy-four MVSs costing US$687 million (Rs 5,655.63 crore) are already completed & operational, while

the remaining MVSs are under implementation with an estimated cost of US$1.45 billion (Rs 11,909.22 crore). During 2021-22, 41 MVS schemes covering 1,653 habitations were targeted for completion.

51. **The state is also rapidly increasing the number of households with FHTCs through its batch-wise implementation.** Batch one was completed in 2020-21, with subsequent batches planned for 2021-22, 2022-23, 2023-24. In the current year, FHTC provision under batch 2 and 3 is underway, with 50 percent of the works in batch 3 having been tendered and only about 10 percent of works remaining to be completed in Batch 2. In batch 1, those habitations were prioritized for FHTC provision where a minimum of 70-85 lpcd of water was readily available mainly through MVS. The second batch included those schemes that were providing 40 lpcd of water to households and augment them to reach a minimum of 55 lpcd as per JJM guidelines. FHTCs in batch 3 were extended to the remaining districts in the state where SVS water is assured to be potable except the seven water stressed districts. Batch 4 provides FHTCs to any remaining areas or individual households left out under the previous batches and the seven water stressed districts. The Detailed Project Reports for this batch are under final stages of preparation.

52. **Water quality is a priority for the GoK.** Although all of the 59,774 rural habitations in the state have water supply infrastructure, the service level in these habitations is not uniform across the state. Four hundred and twenty-four habitations have water quality issues. To ensure clean drinking water, the state has installed Reverse Osmosis (RO) based water purification plants utilizing local government grants. In 2013-14, the RDWSD approved the installation of 18,958 water purification plants, or water ATMs as they are locally known, in rural habitations that were affected by water source quality issues. Of these, 18,465 have been installed and commissioned up to the end of November 2021. Initially, the RDWSD had engaged Karnataka Rural Infrastructure Development Limited (KRIDL) to implement these RO plants, but post-2015, this work has been undertaken through private agencies and contractors on a 5-year build and operate contract. The operators typically charge Rs 2-5 for 20 liters of water. Alternatives to the RO technology are being adopted in various locations to mitigate contamination in source water after testing such as ultrafiltration where source water has microbiological contamination, and capacitive deionization in addition to ultrafiltration where the source water has physiochemical and microbiological contamination. The GoK expects to decommission most of the ROs once the habitations are provided water through MVS and SVS where water quality is assured to be potable. However, it expects about 100 plants to be still functional in 3-4 districts and is exploring options for safely and sustainably disposal of RO rejects. The GoK is working with technology providers to provide selective media to absorb and safely dispose of specific contaminants such as nitrate, fluoride, arsenic, and radioactive substances in the RO rejects.

53. **Testing of water quality is done at various levels in the state.** The state provides water quality field test kits (FTKs) to GPs, where the water quality at source is tested for six chemical parameters, and the results are displayed in the GPs. Water sample collectors train registered village members like VWSC members, Paani samiti, Anganwadi, Govt School Teachers, Asha workers, self-help group members, watermen, PDO, and secretary of the GP on the use of FTKs. Incipient plans are underway to recruit high school or middle school science teachers as trainers on the use of FTK. Although all five female members of the VWSC are supposed to be trained in the use of the FTK to test water, only two or three of them are trained to do so in practice. However, the state is gradually making progress in training more women (Table 4). Details on district-wise training status are provided in Annex 3.

Table 4: Status of training for women in the use of FTKs

Total no. of Villages	No. of villages wherein no women trained	No. of villages wherein 1 woman trained	No. of villages wherein 2 women trained	No. of villages wherein 3 women trained	No. of villages wherein 4 women trained	No. of villages wherein 5 women trained
28,335	12,976	1,811	822	570	548	11,608

54. In addition, water samples from various sources in 28,335 villages are collected by water sample collectors, who are contracted by the RDWSD. These samples are collected pre- and post-monsoon and tested for 16 chemical parameters at the taluk and district level laboratories. The RDWSD has a Memorandum of Understanding (MoU) with the Karnataka State Pollution Control Board (KSPCB) as the state referral laboratory and has empanelled a private NABL-accredited laboratory, Shri Krishna Aqua Engineering works - to cross-check five percent of the water samples tested in these laboratories, including samples that test positive for chemical contamination. Based on the reports provided by the state laboratories, if the water sample in a particular area is found to be unsafe, a water purification plant is installed by the RDWSD in that area as a temporary solution. Remedial actions are to be taken by the District Water and Sanitation Committee (DWSC) Member secretary, who is the Executive Engineer. There is limited testing capacity for coliforms bacteria such as Escherichia coli (E. coli) as the microbiological testing capacity is still being built. More data on bacterial contamination, a leading indicator of fecal pollution, could inform decisions to increase the application of chlorination in SVSs which is currently not standard.

55. The GoK is committed to policy reforms and the sustainability of RWS service delivery. There is a strong push towards establishing sustainable cost recovery mechanisms and a focus on service delivery improvement as opposed to asset creation. The focus of GoI's support to the sector is also shifting from mere expansion of infrastructure to ensuring drinking water security to rural communities through an integrated approach to water supply by the GPs. These interventions require strong institutional strengthening at all levels of government, complementing financing of infrastructure. The Program is thus designed to demonstrate solutions to the challenges identified from the previous projects through appropriate interventions and strategies in rural water supply.

Technical Soundness

56. **The Program is technically sound relying on strong government ownership and building on past experiences in the rural water sector in the state and in India.** The focus in the sector is shifting from building assets to delivering services and sustaining them. Program activities will thus help to fill gaps in planning, implementation, service delivery, and monitoring through institutional strengthening. The Program has strong support from the implementing agency, RDWSD and the Rural Development & Panchayat Raj Department, which oversees the RDWSD.

57. **With this Program, the World Bank has a unique opportunity to leverage international and national lessons on rural water supply, and to facilitate convergence between its five active water related operations in the state of Karnataka.** The current operations include the Second Dam Rehabilitation and Improvement Project (P170873), National Groundwater Management Improvement (P158119), Rejuvenating Watershed for Agriculture Resilience through Innovative Development (P172187), Karnataka Urban Water Supply Modernization Project (P176107), National Hydrology Project (P152698) coupled with analytical work such as the India Water Analytical Program (P176229). This

Program will facilitate convergence across the ongoing projects, focusing on enhancing climate resilience through a comprehensive approach to water storage, use, and recharge. Protection and preservation of water bodies will be helpful in achieving drinking water security.

58. The Program will support a three-pronged approach that will: (i) develop a system of incentives for improvements in source, financial, technical, institutional, and social sustainability for improved service delivery; (ii) establish a last-mile monitoring system to track performance at GP level across technical, social, institutional, and financial parameters; and (iii) establish a system of "rewards in installments" to ensure that GPs are incentivized towards service improvement (24/7) and sustaining service delivery over time.

59. **Focus on five aspects of sustainability:** The Program seeks to ensure that the goal of RWS in the state shifts from infrastructure delivery to quality of service and sustainability, and that the 20-year design life of the investments and operations of the Jaladhare investments is realized and ideally surpassed. For this reason, it will focus on five sustainability parameters, namely, source, financial, technical, institutional, and social sustainability. The Program will incentivize the GPs in implementing the state's O&M policy towards achieving these sustainability parameters. The communities in these GPs will be provided systematic training and capacity building to demonstrate the operation and maintenance systems for sustainable service delivery across each of these five sustainability parameters. The Program activities for each of these is summarized below:

I. The focus on source sustainability under the Program to safeguard and recharge water supply sources includes activities should as groundwater recharge, rainwater harvesting, rejuvenation and desilting of tanks etc. Other measures such as reuse of water and greywater management help to conserve water and reduce the pollution of water bodies.

Convergence with Swachh Bharat Mission (SBM) on greywater management. There are number of ongoing central and state funded schemes for water conservation, groundwater recharge, rainwater harvesting and greywater management aiming to achieve water security. Convergence of Program activities with such ongoing schemes will augment funds and enhance water resources in terms of quality, quantity, and longevity. One area of convergence is greywater management. The Program moves water access points from the traditional community standposts to household taps (FHTC) typically placed outside the house and facing the road. The provision of 55 liters per capita per day equates to 275 liters for the average household (of five people) for drinking, bathing, washing etc. This creates post-use challenges for villages as about 65 percent of the total water supplied reemerges as greywater. Greywater management is a small component under the Jaladhare and JJM programs, and the collection, treatment and reuse are included in the Village Action Plan (VAP). However, neither the Jaladhare program nor the JJM formally fund such activities, as funding is expected to be sourced from other programs such as the SBM. The WB KSRWSP will support the in-village greywater

Box 1: Swachh Bharat Mission

SBM was launched in 2014 to accelerate the efforts to achieve universal sanitation coverage and to put the focus on sanitation. Under the mission, all villages, GPs, Districts, States, and Union Territories in India declared themselves "open-defecation free" (ODF) by 2 October 2019, the 150th birth anniversary of Mahatma Gandhi, by constructing over 100 million toilets in rural India. To ensure that the ODF behavior is sustained, no one is left behind, and that solid and liquid waste management facilities are accessible, the Mission moved towards the next phase – Phase II of SBM (G) i.e ODF-Plus. ODF Plus activities under Phase II of SBM (G) will reinforce ODF behavior and focus on providing interventions for the safe management of solid and liquid waste in villages.

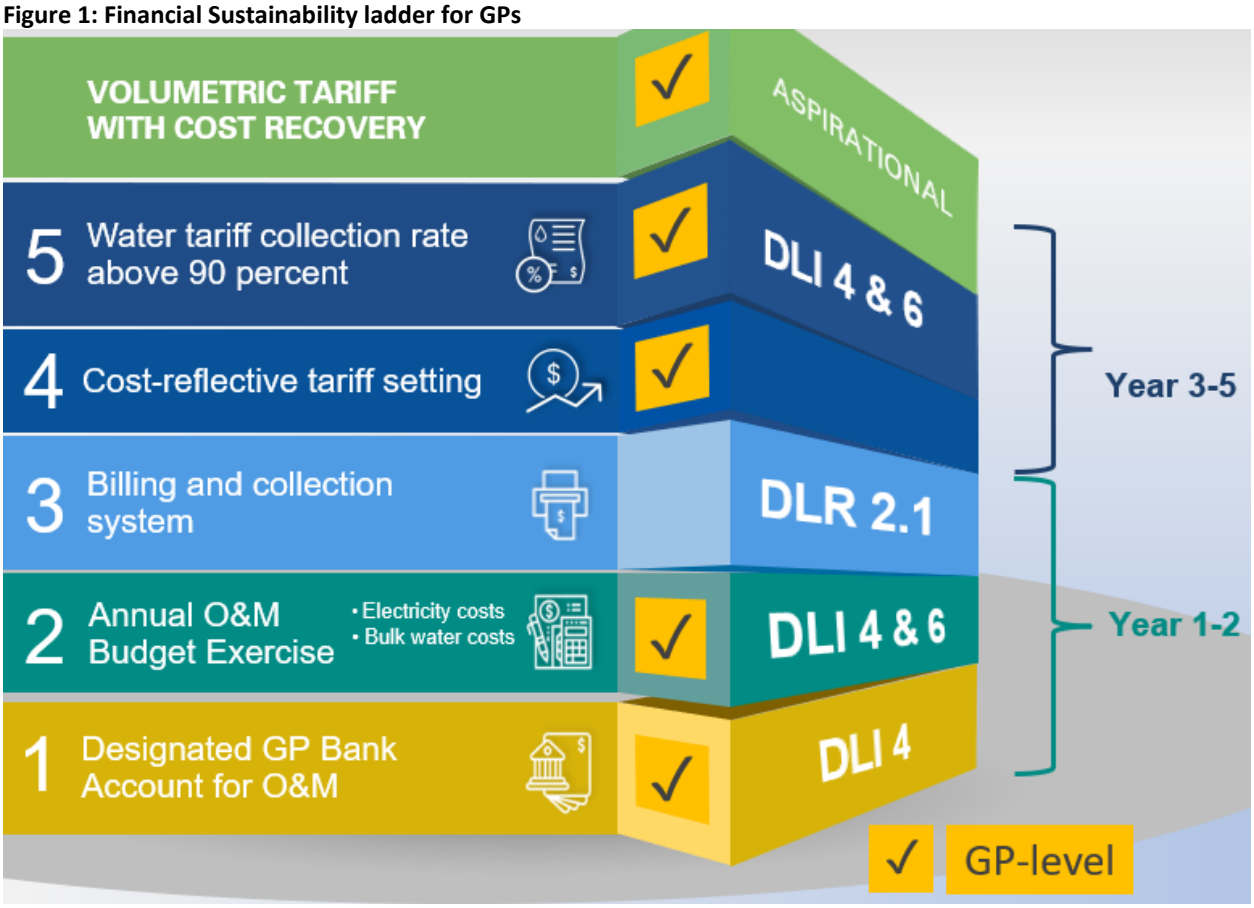
management activities, fostering synergies between the Jaladhare, source sustainability, and the SBM. If correctly triggered, communities will fund greywater activities themselves, which is why part of the greywater activities fall under "social sustainability".

II. Financial sustainability under the Program aims to move the GPs gradually up the financial sustainability ladder (Figure 1) such that they are ultimately capacitated to recover the O&M costs related to the delivery of the water supply service. Generally, service providers do not spend enough on O&M and the tariffs are often set such that cost recovery of the O&M costs are not achieved. Recent data from the state shows that 97-98 percent of the GPs are able to cover almost all of the required costs of maintenance for the water supply schemes from their water revenue collection rates. However, this estimate excludes electricity costs and the costs of supplying bulk water to the GPs from MVSs. When electricity arrears are included, about 42 percent of GPs meet less than 20 percent of their O&M requirements from the collection of water revenues[27].

Thus, the Program seeks to improve the financial sustainability of the GPs through measures designed to encourage GPs to develop budget for and shoulder the actual share of the O&M costs without relying on the state government. This will include having a designated and ring-fenced GP bank account for water, completing an annual GP-specific O&M budget exercise approved by the district that includes electricity and bulk water expenses, setting a tariff as per the requirements of the budget, setting up an appropriate billing system to levy the tariff, and ensuring an annual collection rate of a minimum of 75 percent of the planned expenditure per the O&M budget. Achieving long-term financial sustainability is important for the sector and efforts will be made to raise community awareness of GP-incurred O&M costs to start a community-led transition to cost-recovery (see paragraph on social sustainability); the metered household connections may play a critical role in reaching this goal in the future.

[27] In 2015, the state had cleared the principal electricity arrears for GPs in 2015. However, the amount corresponding to the compounding interest, which could constitute approximately 25 percent of the arrears, remains.

Figure 1: Financial Sustainability ladder for GPs



III. Measures on technical sustainability of schemes will be buttressed under the Program to ensure that GPs are able to provide water supply service efficiently without any breakdowns in the system. The Program will incentivize GPs to carry out routine O&M activities such as cleaning of overhead tank, testing of water quality twice in a year with public dissemination of results, regular chlorination of water and other defined preventative maintenance activities for ensuring scheme functionality.

Piloting 24/7 service delivery: The Program also seeks to demonstrate excellence and incentivize GPs that are able to provide continuous water supply (24/7 service) in villages under their jurisdiction to encourage and aim for a higher level of service delivery. The provision of a 24/7 service involves assessments of where 24/7 service delivery is technically possible and subsequently GP-level social behavior change activities to sensitize rural communities to turn off their taps when not in use, which is already part of the Jaladhare program. The KSRWSP Program goes further as it is important to change household water storage habits and make water users trust that the water will flow from the pipes continuously. This will involve capacity building of RDWSD at district and block levels including adding 24/7 sensitization to the existing Implementation Support Agency's (ISA) in-village work programs.

IV. Institutional sustainability refers to the ability of the institutions and policies at all levels to meet the demands of a sustainable water supply service delivery to the communities. The government programs, Jaladhare and JJM, goes beyond RDWSD's civil engineering capacity as it also necessitates steps towards improving financial management, strengthening capacity and orientation of institutions towards improved service delivery, and improving trust among customers for the improved service. Thus, the

Program will support the GoK in capacity building at district, block and GP levels through trainings, exposure visits and a field level leadership initiative (see Box 2 below) to create champions who can then train others across the state.

Box 2. Field-level Leadership

The Field-Level Leadership approach is aimed at creating a broad cadre of change champions at all levels in the public service delivery agencies. This approach, first developed and implemented in the public service departments of the Government of Tamil Nadu in southern India, has demonstrated positive changes in the attitude and behavior of civil servants and significantly improved project performance in the targeted areas as compared to the control areas under the same projects. The key elements of the approach are (a) creating a safe space for open dialogue for staff of the project IAs; (b) encouraging the optimistic and entrepreneurial individuals to emerge and self-organize into informal groups; and (c) encouraging these informal groups of change leaders to explore process improvements, better community outreach, and taking on self-assigned results targets.

The Program will help the state develop and institutionalize a set of performance criteria at the GP level; an approach which has been proven effective in similar WB PforR operations elsewhere[28]. The performance criteria will encapsulate core elements from the O&M Policy and move the focus to planning, gradual cost-recovery, accounting, reporting and system maintenance among others. These efforts will apply to all GPs in the state. To measure the performance, the Program will significantly expand the functionalities of the sector monitoring system to enable RDWSD to remotely monitor GP specific revenue generation, O&M budgets and VWSC activities etc. This new monitoring system will be a pivotal part of the proposed Program and seek to harness Bangalore's leading IT expertise.

V. Social sustainability in terms of fostering appropriate social conditions among communities to sustain the provision of water supply services will be attained through various community initiatives. Communities will be engaged using Information, Education and Communication (IEC) activities to "turn off the tap" for water conservation, to manage greywater, on the need for O&M recovery for water supply schemes and distribution infrastructure, and on building trust in the quality of piped water etc.

60. **Energy Efficiency under the Program.** For the 548 MVSs in Karnataka, the GoK estimates electricity costs from the MVSs to amount to US$100 million per year. There are considerations to extend the operation period from the current 5 years to 10-15 years, and the proposed Program will seek to include energy efficiency performance criteria for re-tendering the operations contracts for the existing MVSs. Additionally, energy audits will be implemented in 50 MVS with the highest energy cost and implementation of core recommendations commenced in 10 MVSs to save energy.

61. **Improvement of Grievance Redressal Mechanism under the Program.** The RDWSD has launched a dedicated helpline called the Parihara, to redress water related complaints between 9AM and 6PM daily. This Public Grievance & Redressal Application allows complainants to register and track their complaints through internet, phone, or social media. Several districts have already received more than 1,000 complaints demonstrating the effectiveness of the current GRM. The Program will further strengthen the GRM through a closed feedback loop relating to report generation, categorization, storage, and resolution.

[28] Vietnam: Results-Based Scaling Up Rural Sanitation and Water Supply Program - (P127435, P152693); Tanzania: Sustainable Rural Water Supply and Sanitation Program - (P163732); and, Bangladesh: Local Governance Support Project - 3 - (P159683).

Institutional arrangements

Rural Water Supply

62. **The prime responsibility to provide safe drinking water is allotted to the State Government and further to respective Local Self Governments, whether rural or urban**. The RDWSD has the overall responsibility for rural water supply and sanitation in the state. It was established in 2014 under the RD&PR. The state institutional structure for rural WSS is decentralized with responsibilities delegated to GPs at the village level, taluks at the block level, and zillas at the district level.

63. **The RD&PR department is headed by the Additional Chief Secretary (ACS) and has three Commissionerates,** namely Commissioner Panchayati Raj, Commissioner Rural Development (RD) who heads the Panchayat Raj Engineering Division (PRED), and Commissioner RWS who heads the RDWSD. The Commissionerate's of RDWSD is head quartered in the state capital Bengaluru and are supported by their respective staff and offices in each district. These offices report to the district Chief Executive Officer (CEO) at the district level as well as the head offices (HO). The district office of RDWSD is headed by an executive engineer of RDWSD who looks after the Jaladhare program including water and sanitation works.

64. **The Chief Engineer under the Commissioner, RDWSD oversees all the field support comprising of engineers at the zonal or district level, as well as the office support staff.** The Commissioner, RDWSD is further aided by the Chief Accounts Officer, in charge of the department's finances and Director, ISA who oversees all the Information, Education and Communication (IEC) activities related to water and sanitation in the state.

65. **The Karnataka Gram Swaraj and Panchayat Raj Act (KGSPRA) 1993 introduced a three-tier structure of rural local governments at district, taluk, and village levels.** There are 31 Zilla Panchayats (ZPs, districts), 226 Taluk Panchayats (TPs, blocks) and 5,963 GPs in the State today. The Act empowered the GPs, TPs, and ZPs with 'functions, functionaries, and funds' over 29 subjects, including drinking water. The Act empowers the GPs to make bylaws regarding provision of water supply the GP, use any source of water supply for drinking and contract with any person for supply of water. The GPs were also given the power to fix water tariff, collect and revise rates from domestic and commercial users according to Government Circular issued in 2013. GPs alone have been given powers to levy tax within the Panchayat limits on land and buildings. The major non-tax revenue source for GPs is the water tariff collected from consumers for the water supplied for drinking and domestic purposes. At the GP level, village level committees called VWSC have been formed to coordinate, manage, operate, and maintain rural water supply schemes and sanitation. The administrative head of the GP is the Secretary who is assisted by clerk and other personnel such as pump operators and watermen. The TPs have the power to perform the functions of prevention and control of water pollution, construction, and maintenance of drinking water supply systems beyond GPs and provide inputs and technical support to GPs for implementing drinking water supply. The Executive Officer (EO) of the TP monitor and review the performance of the GPs.

66. **The ZPs are empowered to perform functions of establishment of drinking water projects or multi taluk drinking water projects,** setting up drinking water testing laboratories, providing financial support to GPs and TPs and construction of underground water recharge structures to ensure availability of water in the drinking water wells. At the zilla or district level, each district has an engineering division under the RDWSD, with the exception of a few bigger districts which have two engineering divisions, headed by an Executive Engineer (EE) with line staff (Assistant Executive Engineer, Assistant Engineer and

Junior Engineer) under the EE. These engineering divisions assist the RDWSD in implementing its programs. The EE is the nodal person at the district level and through the sub-divisions implements the rural water supply programs. District level engineers report to the Chief Executive Officer (CEO) of the Zilla Panchayat. A subdivision is set up at the taluk/block level with an Assistant Executive Engineer (AEE) overseeing the activities in the whole taluk/block. The AEE has Assistant Engineers supporting the implementation of the rural water program at the GP level. The Assistant Engineers office is called a Section Office which covers a certain number of GPs allocated based on the number of AEs working in the subdivision.

67. **The GPs are primarily responsible for the abstraction and storage (in the case of SVS) and distribution from both SVS and MVS of safe drinking water to the entire population under its jurisdiction.** In addition to the O&M of SVS and IVDN and the distribution of water to the GP population, they also approve new connections, fix and revise tariffs, collect water tariffs from households, appoint watermen and pump operators, constitute and empower the GP sub-committee (VWSCs) and assign them responsibilities, be the first point of contact for SVSs and IVDN with regard to Grievance Redressal Mechanism (GRM), and ensure testing of water quality. The Panchayat Development Officer (PDO) is considered the authorized official representing the GP in all official transactions. The PDO and GP secretaries report to EO of the TP.

68. **The GPs are aided by a sub-committee, called the Village Water and Sanitation Committee (VWSC), in their responsibilities to carry out water supply management in the villages.** GPs form VWSCs with a tenure of 30 months in every village of the GP. One VWSC may cover one village and adjacent habitations and the GP is empowered to decide on the number of VWSCs. The VWSC consists of 10 members of which 50 percent are female, and two members are from the Scheduled Caste/Scheduled Tribes community. The VWSC is headed by an elected President and the Panchayat Development Officer is the Secretary of the VWSC. The VWSC meets once in every two months and supports the GP in the following:

a. Supplying treated and required quantity of water to the public, by helping the GP with repairs and drawing water from water tanks, wells, etc. and preventing pollution of water.
b. Maintenance of drinking water supply works, protecting plants and machinery.
c. Motivating and entering into an agreement with owners of private water sources for supplying water to the village in case of scarcity of drinking water.
d. Creating awareness among the people on water and sanitation, especially on health- hygiene-water-sanitation linkages as well as on judicious use of water.
e. Supporting the GP and PDO in collecting monthly water charges.
f. Conducting water quality tests using Field Test Kits.
g. Preparing O&M plan for SVS & IVDN (in-village distribution system).
h. Ensuring every household/ward is getting adequate supply of water.

69. **In addition, under the Jaladhare program funded by JJM, the VWSC is responsible for the Village Action Plan (VAP),** which lays out a plan to provide FHTC to every rural household, treat the generated greywater and plan its reuse, undertake surveillance activities, etc. The VAP also indicates the fund requirement and timelines for completion of work and is approved by the Gram Sabha (Village Assembly of all adults of a village, whose names are on the Electoral Rolls). Irrespective of source of funding, all drinking water-related works in the village are taken up based on the VAP.

70. **The GP also appoints a waterman for operation of pumps/valves and distribution of water to the consumer community in the GP.** Karnataka employs a total of 26,144 watermen and 8,453 pump operators. Their main role is to operate and maintain pumps of SVS, test water quality, check for residual chlorine in the water and chlorinate as necessary, clean village level OHTs, undertake meter readings, and collect monthly water charges from consumers. The state is now looking into involving Self Help Groups (SHGs) composed primarily of female members in the collection of water charges for O&M.

71. **The program puts great emphasis on Information, Education and Communication (IEC) activities** to spread awareness about water issues and act as catalysts for behavior change. At the district level, the GoK has contracted Implementation Support Agencies (ISA) who are selected following the due tender process of the government. Currently, there are 36 Non-Governmental Organizations (NGOs) empaneled as ISAs across the state to conduct various capacity building and behavior change activities in the field, with plans to engage 33 more NGOs. These ISAs are local organizations contracted by the districts who play a key role in IEC and work as partners in mobilizing and engaging the communities to plan, design, implement, manage, operate & maintain in-village water supply infrastructure. These ISAs are typically contracted for a one-year period with six to eight staff covering 40-60 villages. The main role of the ISAs is to facilitate the constitution of VWSCs; provide handholding support to the GPs and VWSCs in opening bank accounts, mobilization of community contribution, O&M arrangement, etc.; motivate communities to get FHTCs; build awareness on various aspects of water such as greywater management, water quality, water source augmentation, etc.; carry out social behavior change communication activities; and document and upload success stories from villages. The Jaladhare's resource allocation to community mobilization is arguably underfunded and insignificant compared to similar efforts like the Swachh Bharat Mission.

Tanks

72. The tanks being considered for rejuvenation under the Program are minor tanks, with a command area of less than 40 ha, under the jurisdiction of GPs. RDWSD will implement this activity through its district engineers.

Table 5: Summary table listing key stakeholders and their respective roles and responsibilities

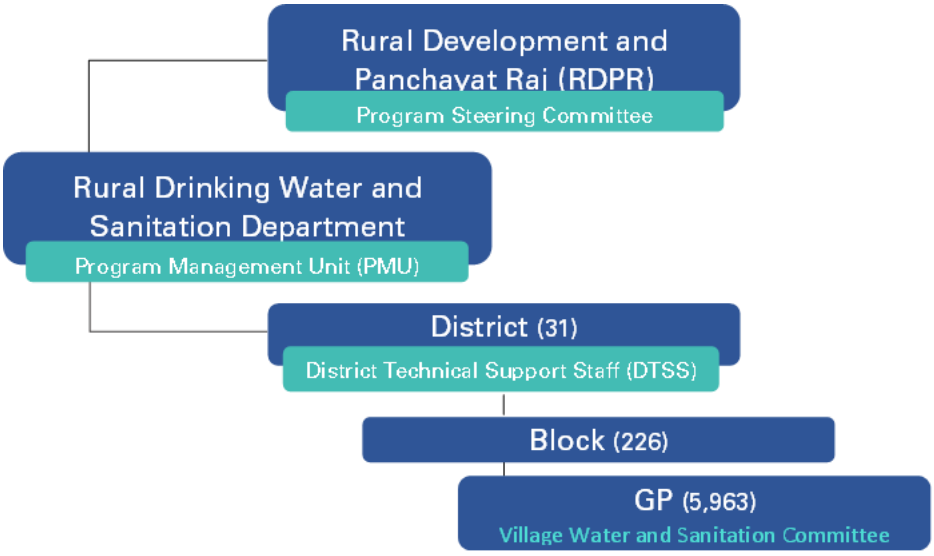
Role	Level	Institution
Policy Making	State	RDWSD with approval from Government
Finance mobilization for infrastructure, water quality monitoring, capacity building	State	RDWSD through budgetary allocation based on the consolidation of annual action plans of the engineering divisions
Sector Monitoring	State	RDWSD through district level engineering divisions
Capacity building initiatives for officials and members of GPs, TPs, VWSCs	State	RDWSD in collaboration with Abdul Nazir Sab State Rural Development Institute, Mysore
Infrastructure design and construction of bulk water and treatment plant	State	RDWSD through contractors
Infrastructure design and construction of distribution pipelines	State	
O&M for SVS including all repairs from the distribution line to the point of delivery	State	GP/VWSC
O&M for MVS including repair, refurbishment, and replacement of bulk water supply infrastructure	State	RDWSD through O&M contractor for bulk water supply
Water Quality Monitoring	State	RDWSD through district level water quality labs
Major Repairs – source failure, drilling of borewells, etc.	State	RDWSD through district level engineering divisions
Repairs of water meters	Village	Repairs and replacements of meters in the bulk supply network will be done by the Contractors if the scheme is under a O&M Contract and otherwise by the department for existing schemes without an O&M Contract. GP will get the meters repaired/reinstalled, but the costs are borne by consumers.
BCC, handholding support to GPs/VWSC, building awareness among communities on various aspects of water use, reuse, and recharge	Village	ISA
Tank O&M	Village	GP

Implementation Arrangements under KSRWSP

73. **The Program is mainstreamed into this institutional structure and no new institutions are proposed to be created.** The Program will be implemented by the Rural Drinking Water and Sanitation Department (RDWSD) which is the custodian of the state-level Jaladhare program. The district and block units of RDWSD are mandated to implement the government program and hand over the water assets to the GPs. RDWSD will help coordinate Program-level activities, including monitoring and evaluation, and will provide necessary technical and financial support to the relevant service delivery agencies. The Program will be implemented following government systems.

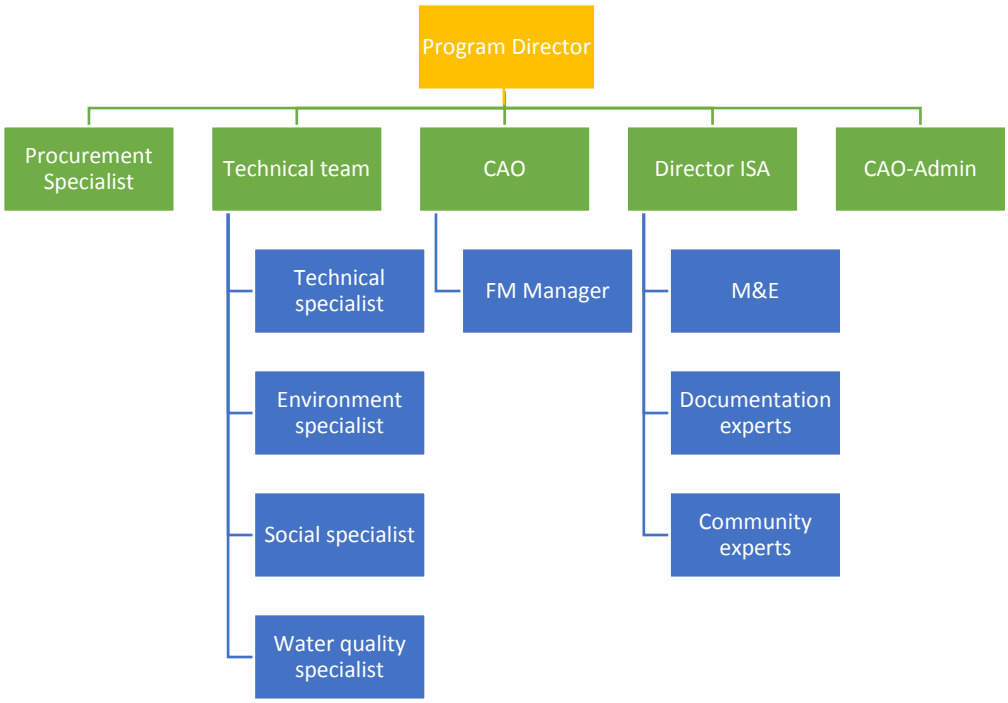
74. A Project Steering Committee will be established, chaired by the Development Commissioner to provide high-level advice to the IAs and address major implementation issues. Members of the Committee will include the ACS (RD&PR), representatives from Finance Department, and representatives from the Implementing Agencies (IAs). Project Implementation Committee headed by the ACS, RD&PR will be established to oversee the project preparation and implementation.

Figure 2: Implementation Arrangements



75. **A Program Management Unit (PMU) will be established in RDWSD.** RDWSD will use its district staff for implementation along with the government officers at the block and GP levels. The PMU will have overall responsibility for compliance, monitoring and implementing the Program. The PMU will include specialized technical personnel, as well as Environment, Social, Financial Management (FM) and Procurement experts (Figure 3). The proposed Program will support RDWSD's HR in building capacity and will deploy District Technical Support Staff (DTSSs) to further accelerate the JJM implementation across the state. The district-level TSS will support the executive engineers and CEO, Zila Panchayats and will include a technical specialist, a finance and contract management specialist, an M&E specialist, and an environmental specialist.

Figure 3: PMU Structure



76. **Given the staffing and skill shortages at all levels of governments, capacity building measures within these institutions will be undertaken and incentivized under the Program.** The Program will establish a center of excellence as a consultancy service at the state level housed in RDWSD. This center will provide troubleshooting, guidance etc. to the incoming and contracted staff. The Program will also support the training and capacity building and exposure programs for district, block and GP level potential champions who can be roped in for further strengthening operation and maintenance systems in other GPs, blocks, and the districts. These potential champions can be GP and VWSC representatives, Implementation Support Agencies, government grassroot level functionaries like PDOs, other influential leaders etc. This will be coupled with Field Level Leadership approach, a broad-based decentralized leadership program to identify champions across the staff ranks.

Program Expenditure framework

The Purpose of the EA

77. The purpose of the assessment of the expenditure framework of the Program is primarily to understand whether the government is able to clearly budget, track, and report against those expenditures on an annual and multi-year basis. A typical EA has five components:

i. Assess the implication of the fiscal context on the PforR and any impact of the PforR on the fiscal outlook.
ii. Review the budget structure and classification.
iii. Assess the Program's financial sustainability and funding predictability.
iv. Assess the adherence of the budgeted Program expenditure and its execution to the government's priorities.
v. Assess the efficiency of program expenditures.

Overall Fiscal Context

78. The state of Karnataka has been in the forefront of other Indian states in terms of fiscal discipline and the quality of government expenditures. The state has maintained fiscal prudence as one of its main policy goals. The fiscal consolidation efforts in the state have continued and has ensured all the fiscal parameters are within the stipulated limits of the Karnataka Fiscal Responsibility Act, 2002 (KFRA). Over the last several years with an exception in 2020-21, the fiscal deficit could be maintained within 3 percent of Gross State Domestic Product (GSDP) as mandated by the KFRA and managed by the Government of India (Table 6). The state has budgeted the fiscal deficit at 3.26 percent of GSDP in 2022-23 (BE) in spite of the relaxation of this limit to 4 percent of GSDP following the pandemic (as suggested by the 15th Finance Commission). For 2022-23 and for 2023-24, the 15th Finance Commission suggests a fiscal deficit target of 3.5 and 3 percent, respectively, for state governments.

Table 6: Fiscal Indicators for the Government of Karnataka

Category	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22 (RE)	2022-23 (BE)
Fiscal deficit as a % of GSDP	1.83%	2.37%	2.33%	2.58%	2.34%	3.72%	2.84%	3.26%
Revenue deficit as a % of GSDP	-0.17%	-0.11%	-0.34%	-0.05%	-0.07%	1.07%	0.36%	0.78%
Liabilities as a % of GSDP	16.80%	17.48%	17.43%	18.14%	19.61%	22.04%	26.32%	27.30%
Breakdown of Revenue								
Revenue receipts	11.37%	11.03%	11.00%	11.07%	10.77%	8.69%	11.01%	10.07%
Revenue expenditure	11.20%	10.92%	10.66%	11.02%	10.70%	9.76%	11.38%	10.85%

Note: (RE): Revised Estimates; (BE): Budget Estimates

79. As the fiscal deficit is already below 3.5 percent, achieving these targets in the next two years may not be difficult for Karnataka. Despite the pandemic, there is no deterioration of the quality of expenditure with the state ring-fencing the public capital expenditure around 2.2 percent. Widening on the revenue account from surplus to deficit is not as substantial as compared to the Centre as well as several other state governments.

80. Karnataka has been in the forefront in terms of adhering to the fiscal consolidation efforts as mandated by the FRA. To achieve this, similar to the Centre's Expenditure Management Commission, the state had its own Expenditure Reforms Commission. Based on the Commission's recommendations, by and large, the state has been protecting the targets on the capital outlays even when there are some distresses on the revenue side. In other words, the state has been trying not to resort to compression of capital outlays even when there are revenue shortages compared to budgeted numbers (Table 7). In addition to expenditure reforms, the state has also undertaken tax reforms and revamped the tax administration, which seems to have yielded results in terms of higher revenue receipts.

Table 7: Receipts and expenditures of Karnataka (Rs crore)

Receipts and expenditure of Karnataka (Rs crore)								
Items/ Years	**2015-16**	**2016-17**	**2017-18**	**2018-19**	**2019-20**	**2020-21**	**2021-22**	**2022-23**
	(A/Cs)	**(A/Cs)**	**(A/Cs)**	**(A/Cs)**	**(A/Cs)**	**(A/Cs)**	**(RE)**	**(BE)**
Revenue receipts	1,18,817	1,33,214	1,47,000	1,64,979	1,75,443	1,56,716	1,89,579	1,89,887
Revenue expenditure	1,17,028	1,31,921	1,42,482	1,64,300	1,74,258	1,76,054	1,95,814	2,04,586
Revenue Deficit	1,788	1,293	4,518	679	1,186	(19,338)	(6,235)	(14,700)
Capital Expenditure	20,713	28,150	30,667	34,659	35,530	45,406	39,481	43,572
Fiscal Deficit	19,169	28,664	31,101	38,442	38,166	67,098	48,890	61,564
GSDP (Current Prices)	10,45,168	12,07,608	13,36,914	14,90,624	16,28,928	18,03,609	17,21,336	18,85,750
% of GSDP								
Revenue receipts	11.37%	11.03%	11.00%	11.07%	10.77%	8.69%	11.01%	10.07%
Revenue expenditure	11.20%	10.92%	10.66%	11.02%	10.70%	9.76%	11.38%	10.85%
Capital Expenditure	1.98%	2.33%	2.29%	2.33%	2.18%	2.52%	2.29%	2.31%
Fiscal Deficit	1.83%	2.37%	2.33%	2.58%	2.34%	3.72%	2.84%	3.26%
Revenue Deficit	-0.17%	-0.11%	-0.34%	-0.05%	-0.07%	1.07%	0.36%	0.78%

Source: (i) Economic Survey 2020-21, Planning Department, GoK; **(ii)** Annual Financial Statement 2021-212); **(iii)** Medium Term Fiscal Plan (2021-25), Finance Department, GoK; **(iv)** Volume I of Budget Documents 2021-22, Finance Department GoK Note: **(a**) Capital Receipts (net) does not include **(i)** Miscellaneous Capital Receipts; **(ii)** Ways and Means and Market Borrowings but include Contingency Fund(net) and Public Account(net). **(b)** Capital Disbursement does not include Ways and Means and Market Borrowings.

Trends in Expenditures

81. With the pandemic prevailing for the last two years, the trends in major expenditure indicators are expected to have been volatile at all levels of governments. In Karnataka there has been some volatility in the last two years. As may be noted in Table 8, the Budget for 2022-23 has tried to revert to pre-pandemic levels in terms of expenditures, as a share of GSDP. The developmental expenditure that has seen a dip to 8.4 percent in 2020-21 has been budgeted to decrease to 6.78 percent in 2022-23. An increase is expected in social and general services while a decrease is budgeted in economic services. However, the rise in interest payments from 1.09 percent in 2019-20 to 1.56 percent in 2022-23 is a cause for concern. With the increasing outstanding debt from to 18.8 percent to 25.9 percent in the same period only resulting further rise in the interest payment burden for the state. Similar trend is expected in the wage bill and pensions as well. This is expected to push-up the revenue expenditure to capital expenditure

ratio, which could suggest the future vulnerability of the state fiscal position. One silver lining in all these expenditures is that state could ring-fence the capital expenditure pattern from the pandemic shock and continue to ensure at least 2 percent every year. But to meet the FRA limits, there is a need to further enhance these expenditures to over 3 percent in the medium term.

Table 8 - Expenditure Indicators in Karnataka (% of GSDP)

Particulars	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23
	(A/Cs)	(A/Cs)	(A/Cs)	(A/Cs)	(A/Cs)	(A/Cs)	(RE)	(BE)
Revenue Expenditure (RE)	11.20	10.92	10.66	11.02	10.70	9.76	11.38	10.85
Development Expenditure	13.05	11.1	10.28	10.97	9.29	8.4	9.28	6.78
Social Services	7.06	5.65	5.17	5.69	4.45	4.1	4.63	4.20
Economic Services	6.59	5.45	5.11	5.28	4.6	4.18	4.49	2.58
General Services	4.32	2.89	2.68	3.09	2.92	3.38	3.97	3.75
Interest Payments	1.46	1.08	1.05	1.1	1.09	1.25	1.6	1.56
Total Expenditure (RE+CE)	18.72	14.33	13.06	14.13	12.35	11.99	13.44	13.16
Total Consolidated Fund	19.36	15.16	14.07	15.24	13.19	12.75	14.46	13.89

The Medium-Term Fiscal Plan (MTFP) 2022-26

82. The Medium- Term Fiscal Plan outlines the medium-term fiscal objectives of GoK. It also includes a brief evaluation of the key fiscal indicators along with the latest economic trends and prospects for the future growth and development. Overall, the state has a well-defined MTFP for 2022-26 which has been projected with the several assumptions on growth trends in revenues, expenditures and other key parameters (Table 9). Overall, the medium-term expenditure framework does not exhibit any concerning patterns in the medium-term future of the state fiscal situation. The fiscal deficit is well under control, but the revenue deficit is marginally increasing. The revenue shortfall and increased expenditure commitments has pushed the state into revenue deficit. With the end of GST compensation from 2022-23, the reduced revenue collection may result in reduction of capital expenditure in future years.

Table 9: Medium Term Fiscal Plan Projections 2022-2026 in Rs crore

Particulars	2020-21	2021-22	2021-22	2022-23	2023-24	2024-25	2025-26
	(A/Cs)	(BE)	(RE)	(BE)	Proj	Proj	Proj
Revenue Receipts	1,56,716	172,271	189,579	189,887	199,019	217,323	237,868
Revenue Expenditure	1,76,054	187,405	195,814	204,586	239,587	262,431	288,836
Revenue Surplus	(19,338)	(15,134)	(6,235)	(14,699)	(40,568)	(45,109)	(50,968)
Capital Receipt (Non Debt)	315	131	131	89	93	97	101
Capital Expenditure	45,406	44,237	42,366	46,955	20,729	23,776	26,877
Fiscal Deficit	67,098	59,240	48,470	61,564	61,204	68,788	77,745
Outstanding Debt	385,099	440,835	440,713	502,432	576,043	644,831	722,576
Total Liabilities	397,505	457,899	458,042	518,366	591,977	660,766	738,510
GSDP at current prices	1,803,609	1,721,336	1,721,336	1,885,750	2,110,499	2,372,009	2,680,845
GSDP Growth Rate	0.062	-0.046	-0.046	0.096	0.119	0.124	0.1302
Revenue Receipts	8.69%	11.03%	11.00%	11.07%	10.77%	8.69%	11.01%
Revenue Expenditure	9.76%	10.92%	10.66%	11.02%	10.70%	9.76%	11.38%
Revenue Surplus	-1.07%	-0.88	-0.36	-0.78	-1.92	-1.9	-1.9
Capital Receipt (Non Debt)	0.02	0.01	0.01	0	0	0	0
Capital Expenditure	2.39	2.57	2.46	2.49	0.98	1	1
Fiscal Deficit	3.72%	3.44	2.82	3.26	2.9	2.9	2.9
Outstanding Debt	21.35	25.61	25.6	26.64	27.29	27.19	26.95
Total Liabilities	22.04%	26.6	26.61	27.49	28.05	27.86	27.55
* State Own Tax Revenue is inclusive of GST compensation and GST Loan, # excludes Implicit subsidy.							

Source: Karnataka Economic Survey 2022 and State Budget 2022

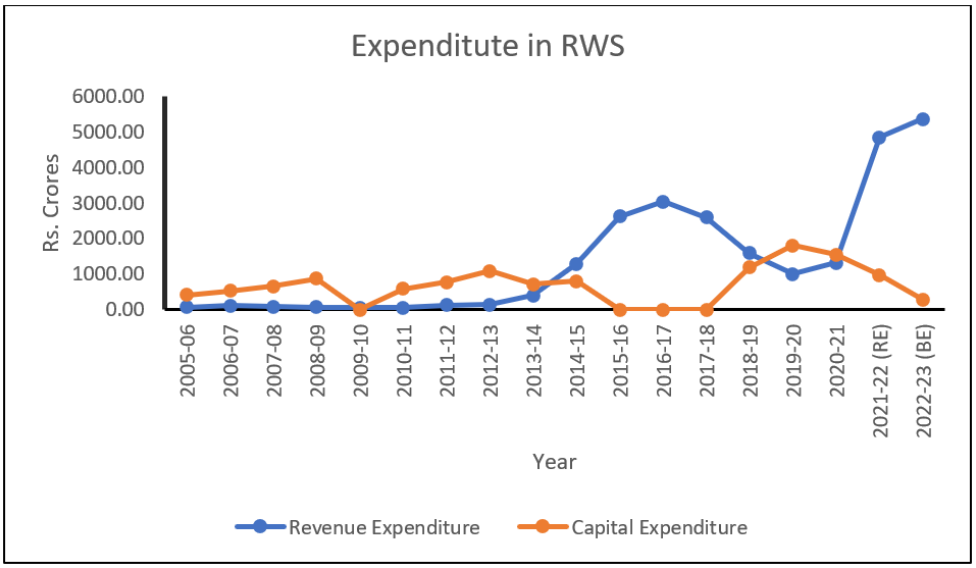
Patterns of Expenditure in the Rural Water Sector, by Budget Structure

83. Karnataka State has a well- developed and systematic system of accounting based on budget codes which help to track expenditures based on administrative, program, functional and economic classifications. This allows the tracking of rural water supply sector expenditure patterns on various dimensions.

84. The RWS expenditure is carried out through RDWSD which is the main implementing department for all the RWS programs in the state. All activities such as implementation, capacity building, IEC, sanitation programs are carried out through RDWSD with support from the district and taluka level engineering offices as well as through the Zilla Panchayats & Taluk panchayats. Program expenditure for all national programs converging to the GP level such as JJM and SBM are made through RD&PR department and managed through RDWSD. The account maintenance and reporting system is available on the RD&PR portal as well as finance, planning and state accounts departments' portal. The information uploaded are the audited statements and are reliable. Also, Annual Reports of the RD&PR provides details of implementation and the financial and physical progress of activities carried out under the department.

85. Overall, the total expenditure in rural water supply has been increasing from the previous years since 2005-06. However, in certain years it has shown a sudden decline (Figure 4). Detailed table available in Table 1, Annex 2. This is primarily due to the changes in capital spending, which is typical for the water sector where lumpy capital spending is normal. The apparent oscillating pattern could also be due to various programs (sponsored by the Center and the State Governments) which were initiated at various points in time. The shift in the implementation strategy by Government of India from the supply driven approach to demand driven approach through sector reforms project and upscaling under the Swajaldhara Programme[29] increased investment in the sector resulting in increases in RWS investment.

Figure 4. Trends in Public Expenditure in Rural Water Supply and Sanitation



86. In terms of the sources of funds, except in 2010-11 and 2011-12, a larger share of the total expenditure in the rural water sector in Karnataka is contributed by the state government (Table 10) Moreover, it is interesting to note that the Center's share in the total spending in the sector shows an

[29] A community based rural drinking water supply program launched in 2002.

oscillating pattern, indicating the major role played by centrally sponsored rural water sector programs in determining the actual expenditure levels in the sector. Further in 2021-22, the total expenditure has nearly doubled from the previous year, primarily due to the inception of the JJM, which is a flagship program of the Central Government. Expenditure in the sector from both the central and state funds have also increased indicating the priority given to the JJM by both the center and the state.

Table 10. Financial Progress under Rural Water Supply Program in Karnataka - Allocation, Release and Expenditure (Rs Crore)

Year	Central Release	Expenditure				Expenditure of Central and State as a % of release
		Central	% against the central fund	State	Total	
2009-10	627.86	473.71	71.78%	386.35	860.06	82.20%
2010-11	703.8	573.93	64.11%	373.6	947.53	74.68%
2011-12	667.78	782.85	78.60%	398.68	1181.53	84.72%
2012-13	869.24	874.78	80.82%	940.16	1814.94	87.61%
2013-14	897.29	921.65	80.82%	790.5	1712.15	88.10%
2014-15	546.1	620.64	79.83%	826.2	1446.84	90.22%
2015-16	278.08	349.52	80.37%	1,096.78	1446.3	94.43%
2016-17	343.72	339.83	79.20%	1,547.00	1886.83	95.48%
2017-18	365.81	272.77	59.94%	1,173.64	1446.41	88.69%
2018-19	276.06	433.95	94.22%	433.95	867.9	97.03%
2019-20	546.06	492.24	85.96%	297.87	790.11	90.76%
2020-21	446.36	349.62	66.37%	431.32	780.94	81.51%
2021-22	2,504.40	1,418.56	52.90%	1,557.92	2976.48	70.21%
2022-23	0	600.61	47.55%	641.64	1242.25	65.22%

Source: IMIS JJM Portal

87. The capacity of the rural water supply sector to absorb the allocated funds is shown by the budget execution rate, which is shown in the last column in Table 10. The budget execution rate has been above the 80 % in nearly all years. However, in 2021-22, allocated funds from the center increased about five times due to the JJM, and the execution rate fell expectedly from 81.2 percent to 70.2 percent. However, during the two quarters of 2022-23 allocations of over two thirds of the budget has been spent indicating the earnestness with which the government is implementing the program. It is clear that RD&PR has been able to substantially step up its capacity to construct schemes and provide FHT connections.

88. Table 11 and Table 12 present the two components of total expenditure on rural water supply - revenue and capital spending respectively from 2005-06 to 2022-23. These are the two main accounting heads under which the RWS investments are recorded. The investments are recorded under the head of account 2215-01-102, while the capital expenses corresponding to the O&M of the schemes are accounted under the head of account 4215-01-102. As seen from Table 11, the RWS investment has been significantly increasing over the years indicating the governments priority to the sector. The capital expenses under the capital expenditure account (comprising of overall capital expenses and expenses in the 'aspirational taluks' and sub-plan expenses such as those for Scheduled castes and Scheduled Tribes) is declining over the years indicating that the O&M of the schemes are the responsibility of the GP's.

Table 11: Revenue Expenditure under RWS Programmes (2215-01-102) - Rs crore

Year	Direction and Adm.	Training	Survey & Investigation	Machinery and Equipment	Rural Water Supply	Assist. to District	Assist. to Block	Assist. to GP	Deduct Recoveries of Overpayments	Total	% RWS Expenditure
2005-06	5.34	0.13	0.64	0.16	2.18	0.15	3.70	58.56	0.00	70	3%
2006-07	5.23	0.10	0.59	0.12	1.79	0.16	3.77	107.71	0.00	119	1%
2007-08	6.53	0.00	0.67	0.13	1.97	0.27	4.11	65.78	0.00	79.48	2%
2008-09	7.64	0.05	0.79	0.18	2.48	0.23	4.10	52.50	0.00	67.96	4%
2009-10	8.30	0.03	0.89	0.14	2.38	0.27	2.86	42.09	0.00	56.95	4%
2010-11	10.29	0.01	0.00	0.15	0.00	0.00	2.79	35.40	-0.01	48.62	0%
2011-12	11.90	0.01	0.00	0.18	0.00	60.91	3.09	50.49	-0.25	126	0%
2012-13	14.29	0.00	0.00	0.19	0.00	75.00	3.23	53.67	0.00	146	0%
2013-14	15.42	0.00	0.00	0.18	253	89.09	3.45	39.98	0.00	401	63%
2014-15	23.38	0.00	0.00	0.19	802	0.00	3.68	458.66	-0.04	1,288	62%
2015-16	82.23	0.00	0.00	0.18	1,929	45.00	3.98	562.55	-0.04	2,623	74%
2016-17	101.74	0.08	0.00	0.13	2,914	0.00	4.56	14.47	-1.47	3,033	96%
2017-18	111.40	0.19	0.00	0.11	2,447	0.00	4.90	28.02	-0.01	2,592	94%
2018-19	132.20	0.01	0.00	0.05	1,425	0.00	5.21	31.54	-11.00	1,583	90%
2019-20	129.72	0.00	0.00	0.00	906	0.00	5.60	31.22	-77.57	994	91%
2020-21	150.38	0.00	0.00	0.00	1,151	0.00	6.16	6.50	-0.18	1,314	88%
2021-22 (RE)	159.57	0.00	0.00	0.00	4,655	0.00	6.16	16.04	-2.45	4,834	96%
2022-23 (BE)	146.21	0.00	0.00	0.00	5,200	0.00	7.53	0.00	-0.93	5,352	97%

Source: Budget Documents and Accounts & Audits Reports

Table 12: Capital Expenditure (4215-01-102) (Rs crore)

Year	Capital Expenses	SDP/ Aspirational Taluka	SDP/ Aspirational Taluka - SCP	SDP/ Aspirational Taluka - TSP	Schedule Caste Sub Plan	Tribal Sub Plan	Total	% of Capital Expenses
2005-06	406.86	0	0	0	0	0	406.86	100%
2006-07	522.81	0	0	0	0	0	522.81	100%
2007-08	659.89	0	0	0	0	0	659.89	100%
2008-09	877.37	0	0	0	0	0	877.37	100%
2009-10	0	0	0	0	0	0	0	
2010-11	384.79	125	60	0	0	18	587.79	65%
2011-12	518.46	169.5	57.66	0	0	20.38	766	68%
2012-13	736.03	253.64	0	0	61.87	37.02	1,088.56	68%
2013-14	720.8	0	0	0	0	0	720.8	100%
2014-15	601.85	0	0	0	148.19	47.1	797.14	76%
2015-16	0	0	0	0	0	0	0	
2016-17	0	0	0	0	0	0	0	
2017-18	0	0	0	0	0	0	0	
2018-19	538.04	216	0	0	367.12	65.94	1,187.10	45%
2019-20	938.18	241.22	0	0	514.28	102.06	1,795.74	52%
2020-21	623.08	232.74	0	0	544.23	146.12	1,546.17	40%
2021-22 RE	514.85	371.61	0	0	75.74	15.15	977.35	53%
2022-23 BE	78.39	91.55	77.18	31.28	0	0	278.39	28%

Assessment of the Program's Financial Sustainability and Funding Predictability

89. As seen from Tables 6 & 7, the overall fiscal discipline in the state is within the stipulated limits of the KFRA. The pandemic did not negatively affect the overall fiscal growth as well as expenditure. Following the norms of states expenditure reforms commission, capital outlays are increasing and also through tax reforms by the state financial discipline is maintained. Expenditure in a given program is said to be flexible if a substantial portion of the expenditures are pre-committed and is difficult to be changed. A good indicator for assessing budget flexibility is the share of the total expenditure that is allocated to salaries and administration. The program expenditure is flexible as seen that the share of RWS expenditure in the total expenditure made by RD&PR has increased from 55 percent to 90 percent in the last 10 years while the expenditure on Direction & Administration has remained at less than 5 percent (Table 13). Data from the last 15 years is provided in Table 2, Annex 2.

Table 13. Relative Flexibility of the RWS Expenditures, 2013-23

Year	% share of RWS in revenue expenditure	% Share of Direction and Administration in revenue expenditure
2013-14	55%	3%
2014-15	62%	2%
2015-16	72%	3%
2016-17	70%	2%
2017-18	57%	3%
2018-19	56%	5%
2019-20	75%	11%
2020-21	78%	10%
2021-22 (RE)	89%	3%
2022-23 (BE)	90%	3%

Source: Accounts and discussions with the concerned officials

Assessment of the adherence of the budgeted Program expenditure and its execution to the government's priorities

90. With respect to whether Program budget allocations are aligned with government priorities, the priorities under each sector are assessed from the grassroots level and the financial support needed is estimated. This is consolidated in the budgetary proposal of the government. Hence the program is directly aligned to the priorities. With respect to whether budgetary allocations are sufficient to achieve intended results, the budgetary allocation are made with sufficient buffers in case of if the program undergoes any financial crisis. Budgetary allocations are made based on the priorities of the program. The deviations from the proposed and approved action plans have to be approved again by the government and the necessary additional budgetary needs are met from the available resources. Verification of whether the Program budget allocations are consistent with intended results is done based on the action plans. Analysis of budget allocations across the various types of Program transactions is conducted in the action plans which provide details of activities and the budgetary requirements.

Efficiency of the program Expenditures

91. The efficiency of program expenditure as indicated in Table 10 reveals that the state is able to efficiently utilize nearly 90 percent of the RWS funds released under the state and central sectors. The state's execution performances in relation to other states is presented below (Table 14). The O&M expenses are subsidized by the government under the capital expenditure (4215-01-102) account, which has been reducing over the years (Table 12) indicating the increased GP responsibility towards the O&M

of the schemes. The M&E systems developed under the Program will generate detailed and harmonized expenditure data on water supply provision at the GP level, which is currently unavailable. This will enable RDWSD to both analyze and guide GPs on their O&M spending and develop mitigating measures. Like in other states, the O&M in the state is a problem, with the GP depending on the government for financial support towards the payment of electricity charges. However, the government of Karnataka has issued an O&M Guideline indicating the responsibility of the GPs towards the maintenance of in-village schemes. Also, the state government has released guidelines for review of local taxes which are to be levied on users in the villages in the state, which will provide additional finances to the GPs for better O&M of the schemes. The GPs have to develop systematic plans to optimally utilize the resources available to them from different sources, which will make program expenditure more efficient.

Table 14. Comparison of Karnataka WSS and other States (Financial Performance)

S. No.	States	2015-16	2016-17	2017-18	2018-19	2019-20	2022-23	2021-22	2020-21
1	Andaman & Nicobar Islands	0%	0%	0%	100%	0%	1%	41%	74%
2	Andhra Pradesh	97%	87%	95%	93%	39%	48%	40%	81%
3	Arunachal Pradesh	82%	91%	86%	95%	71%	45%	73%	98%
4	Assam	64%	51%	53%	50%	47%	50%	61%	89%
5	Bihar	71%	86%	63%	53%	71%	32%	86%	94%
6	Chhattisgarh	94%	85%	81%	72%	57%	86%	87%	73%
7	Goa	0%	80%	85%	100%	100%	96%	73%	84%
8	Gujarat	96%	96%	100%	100%	99%	88%	88%	92%
9	Haryana	91%	96%	85%	94%	61%	76%	82%	89%
10	Himachal Pradesh	71%	77%	98%	100%	96%	65%	66%	62%
11	Jammu & Kashmir	84%	84%	91%	89%	60%	30%	17%	45%
12	Jharkhand	79%	89%	76%	76%	48%	63%	83%	79%
13	**Karnataka**	**94%**	**96%**	**89%**	**98%**	**91%**	**54%**	**70%**	**81%**
14	Kerala	99%	95%	99%	98%	74%	75%	82%	94%
15	Ladakh					1%	27%	31%	12%
16	Madhya Pradesh	102%	92%	97%	100%	71%	59%	73%	91%
17	Maharashtra	85%	83%	63%	73%	72%	52%	36%	75%
18	Manipur	90%	59%	75%	100%	36%	46%	79%	93%
19	Meghalaya	89%	99%	100%	99%	61%	72%	64%	94%
20	Mizoram	99%	100%	59%	100%	56%	59%	78%	81%
21	Nagaland	100%	98%	100%	100%	46%	99%	96%	78%
22	Odisha	95%	82%	81%	100%	85%	53%	68%	99%
23	Puducherry	0%	0%	0%	0%	76%	0%	28%	51%
24	Punjab	67%	78%	72%	68%	37%	68%	62%	70%
25	Rajasthan	83%	70%	79%	85%	57%	54%	74%	64%
26	Sikkim	97%	82%	58%	97%	57%	58%	47%	85%
27	Tamil Nadu	100%	98%	100%	100%	45%	48%	64%	72%
28	Telangana	97%	92%	80%	100%	88%	40%	70%	79%
29	Tripura	100%	88%	51%	57%	33%	87%	79%	79%
30	Uttar Pradesh	82%	82%	91%	98%	52%	81%	68%	85%
31	Uttarakhand	73%	80%	97%	95%	67%	52%	53%	69%
32	West Bengal	96%	99%	80%	54%	48%	64%	79%	71%
Total		88%	87%	82%	83%	61%	65%	70%	81%

Source: IFMS

Results framework and monitoring and evaluation

Assessment of existing M&E framework and Program's M&E capacity

92. **A dedicated JJM Integrated Management Information System (IMIS) is designed to capture every FHTC by state**. The JJM IMIS includes data on, in addition to household tap connection, (i) state wise status of physical and financial progress of schemes; (ii) coverage of schools/'aanganwadis'/public institutions with tap connections; (iii) status of drinking water samples tested in laboratories; (iv) allocation, release, and expenditure statement etc. A real-time dashboard, available in public domain[30], captures the essential monitoring parameters i.e., number of FHTCs provided since the launch of the program in 2019 and number of FHTCs remaining to be provided before 2024. Currently monitoring, evaluation, and reporting is completed on a daily basis by the Ministry of Jal Shakti, Department of Drinking Water and Sanitation (DDWS). The national M&E system, of which JJM-K is part of, produced its first national data set in 2019, when the DDWS portal was migrated to the JJM portal. In Karnataka, the data is typically collected at the habitation level by the pump operator or an Accredited Social Health Activist (ASHA) worker[31], and reported into the IMIS at the GP or taluk level. This data is approved by the IMIS coordinator for each district in Karnataka, who reports to the Executive Engineer's office. The district-wise data is then approved by the RDWSD for the state level and is logged into the JJM dashboard.

93. Although the JJM has a well-defined results framework with four key measurable outcomes on improved health conditions of rural communities; reduction in drudgery faced by women and girls and empowerment of women; reduced school dropout rates of upper primary level girls; and increased employment opportunities for rural communities, most of the outcome-based indicators are not part of the JJM IMIS or the JJM dashboard. These indicators are:

i. Number of FHTCs provided
ii. Number of FHTCs delivering water in adequate quantity, i.e., 55 lpcd
iii. Number of FHTCs delivering water of prescribed quality, i.e., BIS standards
iv. Percentage reduction in water borne disease at households
v. Increased participation of women in GPs and SHGs
vi. Percentage increase in number of upper primary girls going to school.
vii. Percentage increase in number of days of employment per year

94. Not only are non-infrastructure indicators not monitored or reported, the functionality of schemes and source is also not monitored. The focus of the results exclusively on provision of FHTC limits the sustainability of any intervention and it is difficult to access quality M&E data for planning and budgeting purposes. The proposed Program would support the development of an improved M&E system.

95. The RDWSD also has a Water Quality Monitoring and Surveillance Program (WQMSP) under which the State has established 32 district-level & 48 Taluk level laboratories to monitor the quality of drinking water in rural Karnataka vis-à-vis drinking water standards. However, only 17 of the 32 district laboratories are NABL accredited and seven of the 48 taluk level laboratories are NABL recognized (Details in Annex 4). The KSRWSP PforR intends to support the department in this accreditation process and in procuring and operationalizing mobile laboratories capable of testing for 13 parameters to strengthen their water

[30] https://ejalshakti.gov.in/jjmreport/JJMIndia.aspx
[31] A community health worker employed by the Ministry of Health and Family Welfare (MoHFW)

quality testing capacity in remote areas. These laboratories will also test for arsenic in areas with water quality issues. Although, all data related to water sample tests gets reported to the WQMIS portal that is monitored by the JJM, the state is also yet to develop a modern water quality database where information can easily be accessed by the public. The RDWSD also collects detailed data on the water sample source through KOBO Collect, an android based application used to collect data which feeds into the Kobo Toolbox account of the Department, such as the location, type and functional status of the source, the time of sample collection etc. The source is also geotagged with a picture of the sample collector. However, there is no system for water quality test results to be disclosed to the public. The Program will support the RDWSD in developing a mobile phone water quality application for the customers to be able to view their water quality.

96. **The GoK has empanelled and contracted various agencies to supervise construction and provide quality assurance.** The RDWSD has empaneled third-party verification agencies as required under JJM to check the quality of work executed, quality of materials used for construction, and quality of machinery installed in each of the schemes under the government program and to ensure that the work carried out conforms to the Bill of Quantities. The EE in each district contracts these third-party audit agencies, and one percent of the in-village cost under JJM is provided for this. Additionally, the GoK has also empanelled Central Institute of Petrochemicals Engineering & Technology (CIPET) to collect samples from the new HDPE distribution pipes being used to check for quality. Bills towards these distribution pipes are paid only upon their certification. Finally, there are several Project Management Consultants (PMCs) who have been contracted by the EE as construction supervisors for MVSs and act as liaisons between the MVS contractor and the EE. The GoK also has plans to conduct a one-time evaluation study of where JJM progress stands, including the progress of bulk water from MVS. The tender is expected to be floated by the end of December 2022.

Results framework for the Karnataka State Rural Water Supply Program

2. The proposed key results areas and corresponding DLIs are presented below.

Result Area	DLIs
Results Area 1: Increase access to safely managed rural water supply	**DLI 1**: Functional Households Tap Connections Installed
Results Area 2: Strengthen institutions, policies and finance to improved sustainability of water services	**DLI 2:** Strengthening Institutions to Ensure Safe and Reliable Water Services **DLI 3:** Gram Panchayats with Basic O&M Capacity **DLI 4:** Gram Panchayats with Improved Financial Sustainability of Water Services **DLI 5:** Gram Panchayats with 24/7 Water Service **DLI 6:** Gram Panchayats with Sustained Service
Results Area 3: Improve water source sustainability and energy efficiency to enhance climate resilience	**DLI 7:** Operationalize Energy Efficiency & Explore Solar Energy **DLI 8:** Tanks Rejuvenated in Water Scarce Select Districts

97. The following list of PDO level indicators has been identified for these result areas.

Results Area 1:

- Functional Household Tap Connections installed (Number)

Results Area 2:

- Gram Panchayats with sustainably functioning water service (Number)
- Sector M&E system enhanced (Yes/No)
- Gram Panchayats with water tariff collection rate above 90 percent (Number)

Results Area 3:

- Tanks rejuvenated in water scarce districts (number)

98. The PforR aims to develop and strengthen the MIS system for monitoring the state's rural water supply to go beyond just the provision of household taps. The proposed Program supports the development of an advanced M&E system linking to the proposed O&M Policy. The system will include the ability to capture scheme functionality, household meter readings to ensure service delivery, non-revenue water, and GPs' revenue collection from water billing. The system will also be able monitor VWSCs activities (meeting minutes, gender balance etc.), enable viewing of the O&M budget, the number of times the ISA visited the GPs, and when cleaning of overhead tanks was undertaken. A key feature of the proposed advanced M&E system is the focus on capturing autogenerated data such as the electricity bill, bulk water bill and data from the GP's bank account. Through the Program, the GPs and districts will be encouraged to strengthen internal data verification mechanisms and the use of routine monitoring data to improve data reliability, strengthen process tracking and develop feedback loops that enable districts and GP to take appropriate action.

Disbursement and Verification Process

99. The results and achievements under the WB Program will be independently verified by an Independent Verification Agent (IVA), procured by the RDWSD. The role of the IVA is to verify, through credible and independent means, the results reported by the RDWSD. The IVA will verify Program results using agreed-upon protocols between the World Bank and the GoK. The IVA will be hired by the RDWSD and will undertake the verification assignments in accordance with the agreed methodology.

100. The IVA will verify on a semiannual and continuous basis[32] that the results as laid out in the DLI matrix have been physically delivered, in an approved manner, and properly documented. To validate the disbursement request submitted by RDWSD, the IVA will verify all DLI target indicators through desk review of reports, records, and technical designs; phone interviews and sites visit with interviews with beneficiaries; and physical inspection that tests the accuracy and quality of results claimed. Physical site verifications will be conducted on a semi-annual basis and will include a random selection of sampling units from lists of completed infrastructure provided by RDWSD. On the basis of results of the verification process, the IVA will prepare a Results Verification Report which will be shared with RDWSD and the World Bank in order to guide the disbursement amount of the loan to GoI. The IVA will also examine the quality of the third-party quality assurance.

[32] Depending on the DLI.

Program economic evaluation

101. **Methodology.** A cost-benefit analysis comparing "with" and "without" project scenarios has been used to calculate the economic net present value (NPV) and internal rate of return (IRR) for the Program. The stream of financial costs was adjusted to exclude applicable VAT and was considered for shadow price of carbon to arrive at the economic value, using an estimated Standard Conversion Factor (SCF) of 0.97. The domestic price numeraire was used in the analysis. All prices are expressed in constant values of the base year 2022.

102. **Assumptions.** The Rural Water Supply Project in Karnataka will deliver many quantifiable and non-quantifiable benefits and will be implemented through five DLIs. The Economic Analysis presented below comprises only quantifiable benefits incurring from DLI 1, 3 and 4 and therefore the estimated benefits are considerably lower than what the actual stream of benefits from the project would be. The key assumptions used in the analysis are as follows:

Table 15. Key assumptions used in EA

Description	Estimates
Estimated population served with FHTC	8,800,000
Population growth rate (WB)	0.98%
Average household size in rural areas National Family Health Survey (NFHS-5) 2019-2021	4.4
Number of FHTC provisioned under the project	2,000,000
Number of districts to be covered	31
Number of GPs to be covered	5000
Portion of the households need to trip 100 meter or more to collect water (Periodic Evaluation Studies on implementation of SBM-G and JJM in Karnataka 2021-2022)	41%
Estimated time saved per household per day due to on premises water(minutes/day)	12
Treatment cost saving due improved on-premise water supply, hh/month (Maharastra PforR WSS/ Waddington et al.)	195
Portion of energy cost saved by the project through energy efficiency measures (mission findings/ team's estimation)	15%
Number of connections to be given 24/7 water supply	10
Portion of the energy saved due 24/7 water supply (mission findings/team's estimation)	16%
Shadow price of carbon emission USD/tCO2eq (lower bound, WB, 2022)	40
Shadow price of carbon emission USD/tCO2eq (upper bound, WB, 2022)	80
Estimated project life (years)	20
Opportunity cost of capital	10%

103. **Economic benefits.** The impact of water interventions on welfare is multi-faceted, some being easily identifiable and quantifiable (e.g., avoided treatment costs and time saved) and others being more intangible and difficult to measure (e.g., living standards, well-being, and environmental quality). A meta-analysis of different studies suggests- improvements in water quality, sanitation, and hygiene, reduce diarrheal incidents by 40 percent, 37 percent, and 32 percent, respectively and the result of water supply

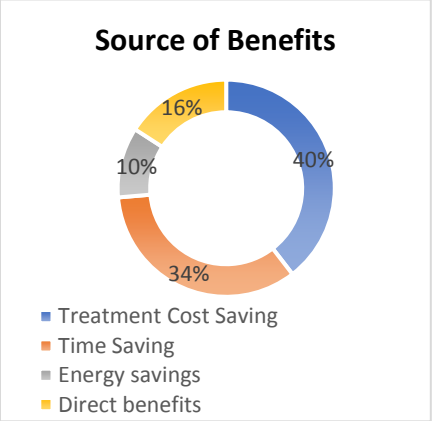
has been used to quantify the benefits in a 'with-project' scenario.[33] The other with-project benefit- time saving because of the provision of on premises piped water supply. According to "Periodic Evaluation Studies on implementation of SBM-G and JJM in Karnataka 2021-2022", 41 percent households in the rural Karnataka collect water from equal or more than 100 meters distance. The benefits (or costs) of water interventions included in the analysis are the following:

(a) Treatment cost savings stemming from the averted incidents of water-borne diseases, particularly diarrheal incidents among the targeted beneficiaries of FHTC;

(b) Time saved from access to on-premise piped water supply;

(c) Saving in energy costs due to project's energy efficiency measures stemming from the energy efficiency measures provisioned DLI 7. There will be energy savings also in case of 24/7 water supply as the water pumps will consume less energy due to fewer hours of pumping as households will not need water to be stored.

(d) Direct benefits from households paying portion of capital and O&M costs as connection fee and water tax.



104. The project would deliver substantial benefits through notification and operationalization of O&M policy, sector wide enhancement of M&E systems, that will reduce O&M costs in the medium and long run. Installation of water quality laboratories under DLI 2, including the mobile ones, will have positive impacts on public health. The performance-based incentives will encourage the water schemes to run efficiently and potentially attain economies of scale. DLI 8 is provisioned to rejuvenate water tanks and will enhance climate resilience by alleviating impacts of draughts and floods. The benefits from these two DLIs, despite being significant, are difficult to quantify and thus were not included in the Economic Analysis (EA).

105. **GHG Accounting.** As the beneficiaries were using unimproved sources of water supply with little pumping, the energy consumption at the baseline was very low. Due to energy usage by water pumps of the water schemes, the project is carbon positive. The provision of improved water supply through FHTC would emit net 35,531 tCO2 eq on average per year or a total of 710,621 tCO2 eq over the design life of 20 years. The shadow price of carbon is considered as project cost.

Table 16 The GHG Accounting results

Totals by Category	Total CO2 Equivalent (tonnes CO2eq) Project Gross Emissions	Total CO2 Equivalent (tonnes CO2eq) Baseline Emissions	Total CO2 Equivalent (tonnes CO2eq) Net Emissions	Total CO2 Equivalent (tonnes CO2eq/year) Net Average Annual Emissions
Emissions for Water Utilities	727,979	17,358	710,621	35,531
Total Emissions	727,979	17,358	710,621	35,531

[33] Waddington, H., & Snilstveit, B. 2009. Effectiveness and sustainability of water, sanitation, and hygiene interventions in combating diarrhea. *Journal of development effectiveness*, *1*(3), 295-335.

106. **The calculation of BCR, NPV and IRR.** The calculation of NPV and IRR at 10 percent discount rate for a project life up to 30 years has been carried out as a part of the exercise. However, the NPV and IRR of a 20-year project life has been conservatively considered to assess the economic viability of the project.

107. **Results: BCR and IRR of 20-, 25- and 30-year project life.** The project's Benefit-Cost Ratio (BCR) is more than one for all three project life spans considered. In a 20-year project life, the BCR is 1.60, which implies that for every dollar spent, the project would return a value equivalent to 1.6 dollars. The Economic Internal Rate of Return (EIRR) at a 10 percent discount rate is also significant for 20 years project life. The IRR for base case is 21.4 percent.

Table 17 Benefit-Cost Ratio and IRR in different project life span

BCR = 20 Years	BCR=25 Years	BCR=30 Years
1.60	1.64	1.68
IRR = 20 Years	**IRR=25 Years**	**IRR=30 Years**
21.4%	25.9%	26.0%

108. **Results: NPV of 20-, 25- and 30-year project life at different discount rate.** The project's economic net benefit is significant in the base case up to 25 percent discount rate with a positive NPV for a 20-years project life.

Table 18: Net Present Value of the project at different discount rate (USD million)

Discount Rate	NPV = 20 Years	NPV = 25 years	NPV = 30 years
0.10	224	258	279
0.11	194	222	239
0.12	169	191	204
0.13	146	164	174
0.14	126	141	149
0.15	108	120	126
0.16	91	102	106
0.17	77	85	89
0.18	64	71	74
0.19	52	58	60
0.20	42	47	49
0.21	33	37	38
0.22	24	27	29
0.23	17	19	20
0.24	10	12	13
0.25	3	5	6
0.26	(2)	(1)	(0)

Sensitivity analysis. The base-case of EA have been tested in four possible scenarios:

(i) Increase of capital cost by 20 percent
(ii) Increase of operations and maintenance(O&M) cost by 20 percent
(iii) Decrease of benefits by 20 percent
(iv) An implementation start delay by 2 years

109. As the base case was stress tested for CAPEX costs overrun, increase in O&M costs, reduced expected benefits, and delayed implementation (see Table 19), the results show the project will produce net economic benefits even under potential high-risk scenarios.

Table 19: EA results and sensitivity analysis

Scenario	Change	NPV (USD million)	IRR (%)
Base case		224	21.4%
Increase in capital costs	20%	176	17.1%
Increase in O&M costs	20%	145	17.4%
Decrease in benefits	20%	52	14.1%
Implementation start delay	2 years	132	21.1%

Technical risk rating

110. The Program's overall technical risk is assessed as "moderate." Risks have been assessed in three areas, and the plan for their mitigation is presented in the following table. The evaluation of the level of risk is based on the current context.

Table 20: Risks and Mitigation Measures

Risk -1	**Inadequate O&M budget at GP level**
Risk Rating	**Moderate**
Mitigation Actions	GPs have been unable to establish cost recovery mechanisms and tariff collections are not met leaving critical O&M activities underfunded. Moreover, the full O&M costs of the water schemes are not being borne by the GPs as the bulk water from MVS, energy, and staff costs are paid by the state of Karnataka. To avoid a situation where inadequate O&M leads to defunct or partially defunct water schemes, the following activities will be incentivized through DLIs 1.2, 2, and 3: 1. Notification and implementation of the O&M Policy to include systematic training and capacity building of communities for sustainable service delivery; 2. A designated GP water bank account, to ringfence the revenue and expenditures for WSS; 3. The GP adopts an annual O&M Budget approved at the district level; 4. The GP ensures that a minimum of 90% of the planned O&M budget is collected annually; and 5. An enhanced M&E system to enable monitoring GPs' financial performance remotely.
Risk - 2	**Opposition to higher tariffs from customers**
Risk Rating	**Substantial**
Mitigation Actions	Under the program, ISAs play a role the last-mile delivery of the Jaladhare and towards the implementation of Karnataka's O&M Policy. ISAs and local stakeholders will be trained on sensitizing communities through the O&M budgeting exercise and the celebration of high performers. This will be simultaneously undertaken with improved service delivery parameters. BCC campaigns on the link between high costs and improved service delivery will also be undertaken. It is important to note that rural households are currently accustomed to paying for water; this risk presents itself when moving the sector towards O&M cost-recovery. Lastly and noteworthy, the Program does not mandate the GPs to raise water tariffs.
Risk – 3	**Lack of adequate technical staff at RDWSD and GPs**
Risk Rating	**Moderate**
Mitigation Actions	One of the key capacity gaps for RDWSD is staffing shortages and staff retention, which is hampering their ability to implement to speed, scale and quality. However, there is high enthusiasm in the government to

	address the lack of capacity and build the necessary skills among its staff as demonstrated by their prompt mobilization to some of the following measures under the Program: 1. Establish a center of excellence as a sector knowledge hub which will provide troubleshooting, guidance etc. to staff within the department. 2. Outsource responsibilities to the private sector, such as a GRM call center and O&M for MVSs; and 3. Offer international training opportunities, exposure visits, and Field-Level Leadership training to RDWSD staff.
Risk -4	**Groundwater depletion**
Risk Rating	**Moderate**
Mitigation Actions	Groundwater levels have been declining at an alarming rate for several decades in many parts of the state, which is attributed to overreliance on groundwater, especially by the irrigation sector, coupled with insufficient groundwater recharge. Water sources thus have increasingly become seasonal, or simply dried up, accelerated by climate change. The Program will support tank rejuvenation and demand management activities to mitigate groundwater depletion. In particular, the Program envisages the following activities: 1. Household water meter readings to increase awareness on water consumption levels; 2. BCC campaigns on the need for water conservation and measures aimed at households; 3. Support for tank rejuvenation in water stressed districts; and 4. Improved selection of sites for tank rejuvenation.

Annex 1: District-wise Coverage of FHTC as of September 2022

District Name	Total GPs in the District	No. of GPs with 100% FHTC	% GPs with 100% FHTC (Har Ghar GP)	Total HHs in the District	Number of HH with FHTC	% FHTC
Bagalkote	191	24	13%	334,702	242,140	72%
Ballari	100	6	6%	203,327	96,871	48%
Belagavi	490	40	8%	852,433	492,302	58%
Bengaluru Rural	101	0	0%	208,906	33,802	16%
Bengaluru Urban	86	0	0%	317,279	54,427	17%
Bidar	185	5	3%	314,882	142,735	45%
Chamarajanagara	127	6	5%	251,867	183,296	73%
Chikkaballapur	157	0	0%	247,587	54,866	22%
Chikkamagaluru	225	1	0.4%	241,262	134,739	56%
Chitradurga	189	0	0%	380,788	185,577	49%
Dakshina Kannada	228	30	13%	334,184	268,366	80%
Davangere	192	32	17%	259,439	170,170	66%
Dharwad	143	93	65%	204,091	197,405	97%
Gadag	121	106	88%	200,113	196,709	98%
Hassan	264	26	10%	431,593	195,864	45%
Haveri	220	60	27%	294,426	219,951	75%
Kalaburagi	261	0	0%	456,182	215,598	47%
Kodagu	104	11	11%	135,935	93,174	69%
Kolar	156	0	0%	271,971	60,721	22%
Koppal	151	1	1%	305,419	243,640	80%
Mandya	228	1	0.4%	396,328	311,941	79%
Mysuru	258	8	3%	499,675	254,405	51%
Raichur	176	14	8%	362,123	239,954	66%
Ramanagara	123	4	3%	231,118	161,859	70%
Shivamogga	266	42	16%	309,414	214,506	69%
Tumakuru	322	0	0%	564,928	209,560	37%
Udupi	155	7	5%	247,188	156,978	64%
Uttara Kannada	229	5	2%	286,087	125,007	44%
Vijayanagara	137	0	0%	277,645	77,777	28%
Vijayapura	208	7	3%	464,370	225,316	49%
Yadgir	121	1	1%	232,515	124,382	53%
Grand Total	**5914**	**530**	9%	**10,117,777**	**5,584,038**	55%

Source: JJM Portal

Annex 2: Assessment of Program Expenditure Framework

Table 1: Trends in Public Expenditure in Rural Water Supply (Rs crore)

S. No	Year	Revenue Expenditure	Capital Expenditure	Total RWS expenditure
1	2005-06	70.87	406.86	477.73
2	2006-07	119.47	522.81	642.28
3	2007-08	79.48	659.89	739.37
4	2008-09	67.96	877.37	945.34
5	2009-10	56.95	0.00	56.95
6	2010-11	48.62	587.79	636.41
7	2011-12	126.33	766.00	892.33
8	2012-13	146.38	1088.56	1234.94
9	2013-14	401.86	720.80	1122.66
10	2014-15	1288.78	797.14	2085.92
11	2015-16	2623.39	0.00	2623.39
12	2016-17	3033.54	0.00	3033.54
13	2017-18	2592.07	0.00	2592.07
14	2018-19	1583.35	1187.10	2770.46
15	2019-20	994.97	1795.74	2790.71
16	2020-21	1314.59	1546.17	2860.76
17	2021-22 (RE)	4834.95	977.35	5812.30
18	2022-23 (BE)	5352.81	278.39	5631.20

Source: Budget Documents and Accounts & Audits Reports

Table 2: Relative Flexibility of the RWS Expenditures, 2005-2023

Year	% share of RWS in Revenue Expenditure	% share of Direction & Administration in Revenue Expenditure
2005-06	2%	5%
2006-07	1%	3%
2007-08	1%	4%
2008-09	1%	4%
2009-10	2%	6%
2010-11	0%	6%
2011-12	0%	6%
2012-13	0%	6%
2013-14	55%	3%
2014-15	62%	2%
2015-16	72%	3%
2016-17	70%	2%
2017-18	57%	3%
2018-19	56%	5%
2019-20	75%	11%
2020-21	78%	10%
2021-22 (RE)	89%	3%
2022-23 (BE)	90%	3%

Annex 3: Status of training for women in the use of FTKs by district as of November 9, 2022

District	Total no. of villages	No. of villages wherein no women trained		No. of villages wherein 1 woman trained		No. of villages wherein 2 women trained		No. of villages wherein 3 women trained		No. of villages wherein 4 women trained		No. of villages wherein 5 women trained	
		Total number	%	Total number	%	Total number	%	Total number	%	Total number	%	Total number	%
Bagalkote	641	158	24.7	201	31.4	74	11.5	33	5.2	39	6.1	136	21.2
Ballari	282	143	50.7	48	17.0	37	13.1	15	5.3	12	4.3	27	9.6
Belagavi	1,215	152	12.5	53	4.4	28	2.3	26	2.1	12	1.0	944	77.7
Bengaluru rural	889	2	0.2	1	0.1	1	0.1	2	0.2	13	1.5	870	97.9
Bengaluru urban	692	587	84.8	17	2.5	10	1.5	6	0.9	6	0.9	66	9.5
Bidar	637	595	93.4	4	0.6	1	0.2	9	1.4	5	0.8	23	3.6
Chamarajanagara	677	448	66.2	98	14.5	56	8.3	27	4.0	12	1.8	36	5.3
Chikkaballapur	1,487	1,299	87.4	135	9.1	44	3.0	7	0.5	1	0.1	1	0.1
Chikkamagaluru	1,013	603	59.5	187	18.5	35	3.5	34	3.4	56	5.5	98	9.7
Chitradurga	1,359	103	7.6	100	7.4	24	1.8	29	2.1	28	2.1	1,075	79.1
Dakshina kannada	366	87	23.8	27	7.4	33	9.0	40	10.9	21	5.7	158	43.2
Davangere	696	343	49.3	236	33.9	66	9.5	32	4.6	8	1.2	11	1.6
Dharwad	353	-	-	15	4.3	16	4.5	2	0.6	4	1.1	316	89.5
Gadag	317	64	20.2	2	0.6	4	1.3	8	2.5	21	6.6	218	68.8
Hassan	2,303	261	11.3	1	0.0	1	0.0	1	0.0	3	0.1	2,036	88.4
Haveri	697	-	-	34	4.9	15	2.2	22	3.2	27	3.9	599	85.9
Kalaburagi	859	1	0.1	-	-	-	-	-	-	-	-	858	99.9
Kodagu	297	207	69.7	2	0.7	3	1.0	2	0.7	6	2.0	77	25.9
Kolar	1,522	1,448	95.1	6	0.4	1	0.1	1	0.1	2	0.1	64	4.2
Koppal	577	11	1.9	5	0.9	4	0.7	11	1.9	16	2.8	530	91.9
Mandya	1,402	426	30.4	3	0.2	1	0.1	-	-	3	0.2	969	69.1
Mysuru	1,198	792	66.1	23	1.9	6	0.5	10	0.8	18	1.5	349	29.1
Raichur	979	710	72.5	40	4.1	73	7.5	44	4.5	32	3.3	80	8.2
Ramanagara	846	117	13.8	23	2.7	2	0.2	2	0.2	9	1.1	693	81.9
Shivamogga	1,539	526	34.2	218	14.2	113	7.3	88	5.7	77	5.0	517	33.6
Tumakuru	2,596	2,474	95.3	15	0.6	-	-	-	-	4	0.2	103	4.0
Udupi	246	-	-	11	4.5	3	1.2	7	2.9	4	1.6	221	89.8

District	Total no. of villages	No. of villages wherein no women trained		No. of villages wherein 1 woman trained		No. of villages wherein 2 women trained		No. of villages wherein 3 women trained		No. of villages wherein 4 women trained		No. of villages wherein 5 women trained	
		Total number	%	Total number	%	Total number	%	Total number	%	Total number	%	Total number	%
Uttara kannada	1,246	845	67.8	148	11.9	80	6.4	41	3.3	37	3.0	95	7.6
Vijayanagara	319	293	91.9	14	4.4	9	2.8	2	0.6	1	0.3	-	-
Vijayapura	620	108	17.4	38	6.1	15	2.4	20	3.2	38	6.1	401	64.7
Yadgir	465	173	37.2	106	22.8	67	14.4	49	10.5	33	7.1	37	8.0

Annex 4: District and Taluk-level Laboratories with NABL status

Status of District laboratories with NABL status

CHEMICAL LABORATORIES				MICROBIOLOGY LABORATORIES	
S. No.	Name of the Lab	NABL Certificate Issue date	NABL Certificate valid up to	Laboratory status	Planned
1	Belagavi	06.09.2021	05.09.2023	To start functioning by April	Planned
2	Vijayapura	08.09.2021	07.09.2023	To start functioning by April	Planned
3	Dharwad	06.09.2021	05.09.2023	To start functioning by April	Planned
4	Haveri	01.11.2021	31.10.2023	To start functioning by April	Planned
5	Bengaluru (U)	14.07.2021	13.07.2023	To start functioning by April	Planned
6	Bengaluru('R)	12.07.2021	11.07.2023	To start functioning by April	Planned
7	Chikkaballapura	14.07.2021	13.07.2023	To start functioning by April	Planned
8	Davanagere	16.11.2021	15.10.2023	To start functioning by April	Planned
9	Chitradurga	17.03.2022	16.03.2024	To start functioning by April	Planned
10	Kolar	03.03.2022	02.03.2024	To start functioning by April	Planned
11	Shivamogga	27.05.2022	26.05.2024	To start functioning by April	Planned
12	Ramanagara	08.09.2021	07.09.2023	To start functioning by April	Planned
13	Kalaburagi	01.11.2021	31.10.2023	To start functioning by April	Planned
14	Dakshina	30.06.2021	29.06.2023	To start functioning by April	Planned
15	Kodagu	17.01.2022	16.01.2024	To start functioning by April	Planned
16	Mandya	24.08.2021	23.08.2023	To start functioning by April	Planned
17	Mysuru	18.10.2021	17.10.2023	To start functioning by April	Planned
18	Bagalkote	06.09.2022	05.09.2024	To start functioning by April	Planned
19	Tumkur	Awaiting NABL certificate	NA	To start functioning by April	Planned
20	Udupi	Audit completed	NA	To start functioning by April	Planned
21	Hassan	Audit scheduled on 06.10.2022 and 07.10.2022	NA	To start functioning by April	Planned
22	Yadgiri	Application under scrutiny	NA	To start functioning by April	Planned
23	Uttarkannada	Application under scrutiny	NA	To start functioning by April	Planned
24	Bidar	NABL audit planned by November	NA	To start functioning by April	Planned
25	Raichur	NABL audit planned by November	NA	To start functioning by April	Planned
26	Gadag	NABL audit planned by November	NA	To start functioning by April	Planned
27	Chikkamagaluru	NABL audit planned by November	NA	To start functioning by April	Planned
28	Chamrajanagara	Construction yet to be completed	NA	To start functioning by April	Planned
29	Chikkodi	Construction yet to be completed	NA	To start functioning by April	Planned
30	Vijayanagar	NABL audit planned by December	NA	To start functioning by April	Planned
31	Ballari	NABL audit planned by Dec	NA	To start functioning by April	Planned
32	Koppal	Construction yet to be taken up	NA	To start functioning by April	Planned

Status of Taluk laboratories with NABL status

CHEMICAL					MICROBIOLOGY
S. No.	District Name	Laboratory Name	2022-2023	PDC date for NABL Recognition filing	Microbiological laboratory status
1	Haveri	Ranibennur	19 Labs recognized . Certificate valid up to 2025	NA	NA
2	Mandya	Nagamangala		NA	NA
3	Uttara Kannada	Sirsi		NA	To start functioning by April
4	Dharwad	Kalaghatgi		NA	NA
5	Chikodi	Gokak		NA	NA
6	DK	Belthangady		NA	NA
7	Mysuru	Krishnarajanagar		NA	NA
8	Ramanagara	Kanakapura		NA	NA
9	Bagalakote	Jamakhandi		NA	NA
10	Shimoga	Sagar		NA	NA
11	Bagalakote	Hungund		NA	NA
12	Shimoga	Hosanagara		NA	NA
13	Mandya	Pandavapura		NA	NA
14	Chikkballapua	Chintamani		NA	NA
15	Tumkur	Madhugiri		NA	To start functioning by April
16	Kolar	Srinivasapura		NA	NA
17	Ramanagara	Magadi		NA	To start functioning by April
18	Kolar	Bangarpet		NA	NA
19	Kalaburgi	Sedam		NA	NA
20	Tumkur	Tiptur	2 Labs under scrutiny at NABL	NA	To start functioning by April
21	Uttara Kannada	Honnavar		NA	To start functioning by April
22	Bidar	Humnabhad	15 Labs NabL recognition Filing completed (Payment pending from PFMS)	NA	NA
23	Bidar	Aurad		NA	NA
24	Chitradurga	Hosdurga		NA	To start functioning by April
25	Hassan	Holenarasipura		NA	NA
26	Chikodi	Athani		NA	NA
27	Davanagere	Channagiri		NA	NA
28	Chitradurga	Challakere		NA	NA
29	Yadgir	Shorapur		NA	NA
30	DK	Puttur		NA	NA
31	Belagavi	Soundathi		NA	NA
32	Hassan	Arasikere		NA	NA
33	Kalaburgi	Jewargi		NA	NA
34	Mysuru	HD Kote		NA	NA
35	Chickkaballapura	Gowribidanur		NA	NA
36	Chikmanglur	Kadur		NA	NA
36	Vijayapura	Sindhagi	12 Labs Under Construction/ Renovation (Procurements) NABL Recognition by December 2022	15.11.2022	NA
37	Raichur	Lingasugur		25.10.2022	To start functioning by April
38	Uttara Kannada	Haliyala		09.12.2022	NA
39	Haveri	Shiggaon		30.12.2022	To start functioning by April
40	Kodagu	Virajapet		10.02.2023	NA
41	Chamarajnagara	Kollegal		25.11.2022	NA
43	Chikmanglur	Koppa		21.11.2022	NA
44	Koppala	Kustagi		25.02.2023	NA
45	Raichur	Sindhanur		25.02.2023	NA

CHEMICAL					MICROBIOLOGY
S. No.	District Name	Laboratory Name	2022-2023	PDC date for NABL Recognition filing	Microbiological laboratory status
46	Vijayanagara	Kudligi		25.11.2022	NA
47	Vijayanagara	Huvina Hadagli		15.11.2022	NA
48	Bellary	Bellary		16.01.2023	To start functioning by April